

The Organizational Implementation of Information Systems: towards a new theory

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I dedicate this work to my children, Marco and Sara.

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Abstract

This dissertation provides fundamental conceptual building blocks for a new theory of IS implementation. The main argument presented is for a new perspective to supplement and complement the main existing perspectives on IS implementation: the technological determinist perspective, the managerial imperative perspective, and the socio-technical interactionist perspective. In this the research seeks to overcome identified shortcomings of these existing approaches to understanding IS implementation.

The research methodology emphasizes multidisciplinary theory-building, based on the resource-based approach to strategy, using autopoiesis as the key organizational epistemology. The research explores the concept of organizational climate dimensions as the shapers of organizational contexts, and relates these to information systems research on implementation. The new perspective developed emphasizes managerial action and organizational contexts as a mid-level approach, bridging the gap between top-down, rationalist methods and bottom-up, emergent approaches.

Based on this conceptual framework, the context for IS corporate governance is operationalized and presented as a causal model with five independent variables - IS Intent, Discipline, Trust, Support and Structural IS-related factors and one independent variable, IS-Organizational Learning. Data collection is carried out in large Portuguese companies by means of a postal questionnaire. The empirical data is supplemented by five short case studies.

The key conclusions of the thesis are: (1) The duality managerial action - organizational contexts opens up whole new possibilities for research and practice of IS implementation. (2) The use of the notion of organizational contexts dimensions as a research tool allows the analysis to go deeper than the vague generalizations about organizations found in most current literature. (3) The use of quantitative methods to investigate IS-related organizational contexts is not suitable, except for descriptive purposes; semi-structured interviews and in-depth case studies are recommended. (4) Two specific dimensions of IS-related contexts are suggested as topics for further investigation: IS Intent and IS structural factors

Table of Contents

(Please note that the pagination has changed in the conversion to pdf format: the page numbers in this table refer to the bound edition in the LSE library.)

| | |
|--|-----|
| Chapter 1 | |
| 1.1. Introduction | 3 |
| 1.2. The research problem | 7 |
| 1.3. The research approach | 20 |
| Chapter 2 | |
| 2.1 Introduction | 28 |
| 2.2 The strategic justification for the <i>organizational</i> view | 29 |
| 2.3 Organizations and organizational knowledge: the conventional wisdom | 41 |
| 2.4 A new epistemological foundation for organization: autopoiesis and enacted cognition | 45 |
| 2.5 Enaction and sensemaking as methodological foundations for organizational analysis | 53 |
| 2.6 Summing up | 57 |
| Chapter 3 | |
| 3.1 Introduction | 59 |
| 3.2 Managerial action: the key influences | 62 |
| 3.3 Organizational culture, climates and contexts | 78 |
| 3.4 Organizational culture, organizational knowledge and organizational learning: what is the relationship? | 87 |
| 3.5 Summing up | 89 |
| Chapter 4 | |
| 4.1 Introduction | 93 |
| 4.2 IS implementation as a process of organizational learning and change | 95 |
| 4.3 Ontological perspectives on IS implementation | 105 |
| 4.4 The absence of an action orientation in existing views of IS implementation: a critique of Earl's (1996) model | 115 |
| 4.5 Summing up | 118 |
| Chapter 5 | |
| 5.1 Introduction | 123 |
| 5.2 The process of formation or constitution of organizational contexts | 123 |
| 5.3 Conceptualizing IS implementation as a set of managerial roles and processes | 128 |
| 5.4 Operationalizing IS organizational climate or context | 139 |
| 5.5 Operationalizing IS organizational learning | 149 |
| 5.6 Summing up | 151 |
| Chapter 6 | |
| 6.1 Introduction | 154 |
| 6.2 Methodology | 156 |
| 6.3 The empirical research design | 157 |
| 6.4 Defining the empirical research model | 159 |
| 6.5 Data collection | 166 |
| 6.6 The short case studies | 169 |

| | |
|--|-----|
| Chapter 7 | |
| 7.1 Introduction | 190 |
| 7.2 Discussion of the empirical research | 192 |
| 7.3 Some conclusions about the research methodology | 208 |
| 7.4 Towards a new theory (and practice) of IS organizational implementation | 210 |
| 7.5 The contribution of this dissertation to the LSE school of thought in IS research and suggestions for further research | 218 |
| Bibliography | 221 |
| Appendices | 238 |

Chapter 1

Introduction

Like the mainstream of IS writers, the interpretivists have also focused mainly on the nature of IS, to the relative neglect of the concept of organization. Their writings do of course imply particular views of organization, which are different from the goal-seeking model (...) but they do not present well-defined models of organization, which could be used in any detailed sense to shape and guide the provision of IS within an organization
Checkland and Holwell, 1998:71

Chapter 1 summary

- ? 1.1. Introduction
 - ? 1.1.1 Some useful definitions
- ? 1.2. The research problem
 - ? 1.2.1 The information systems discipline and the search for a new paradigm
 - ? 1.2.2 The search for the “measures” of IT effectiveness remains inconclusive
 - ? 1.2.3 The changing nature of IS implementation
 - ? 1.2.4 Information systems needs a more aggregate level of discourse, i.e. an *organizational* level of discourse
 - ? 1.2.5 Our contribution: the justifications and implications of an *organizational* approach to information systems implementation
- ? 1.3. The research approach
 - ? 1.3.1 Fresh views on organization and organizational knowledge
 - ? 1.3.2 Managerial action as the key driver of organizational context
 - ? 1.3.3 Analysing IS implementation and integrating managerial action and IS *organizational* implementation
 - ? 1.3.4 The empirical work, the discussion and the conclusions

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1.1. Introduction

In this dissertation we propose to address the issue of information systems implementation and to contribute towards a new approach to this issue. The new approach is organizational, in opposition to the technical, the strategic or the emergent approaches, which have dominated the discipline so far. We argue that these existing approaches, although useful and relevant, only tackle parts of the problem. We argue that the information systems discipline needs a new approach to complement the existing ones and which will afford an overall, all encompassing view of the implementation phenomenon.

Professor Peter Checkland and Sue Holwell (1998:61) argue that the information systems discipline is in a state of confusion

In a well-established field it would be possible to describe the field in terms of the history of such a learning cycle. But as soon as this is attempted for IS, by going to its literature, confusion reigns, with many contradictory positions and approaches adopted, often without acknowledgement of the existence of alternatives.

One of the reasons for this state of affairs, according to Checkland and Holwell, is the relative ignorance in the field about the diversity of concepts of organization and, therefore, about the existence of alternative approaches to information systems based on alternative views of organization. This is why we believe it is essential to introduce an *organizational* approach to information systems parlance. In other words, by demonstrating that it is useful and important to have a more encompassing (i.e. organizational) view of information systems phenomena (of which implementation is one), we hope to pave the way for a better understanding of the concepts of organization and for less confusion in the field, at least in this respect.

In the present chapter we introduce the key concepts that we will be dealing with throughout the dissertation, as well as the research problem and the research approach. The research problem, as we will see below, is not a single problem but a set of related issues. In a dissertation dealing with such a broad issue as implementation, it would not make sense to have a single research problem. Hence, we put forward several issues, which have been at the origin of the research proposals we have submitted throughout the PhD Programme and which have led to the present thesis. Together, they constitute the research problem (or problems). In the research approach we explain the method we have used to tackle the research problem. Again, it is not a single method but a set of methods, where conceptual development is the most important. In line with the subtitle of this dissertation (*Towards a New Theory*) we have placed a stronger emphasis on theoretical and conceptual development rather than on empirical research. Under the research approach, we introduce the topics and the subject areas where the conceptual development work has been carried out and we also outline the key directions and ideas behind the empirical work.

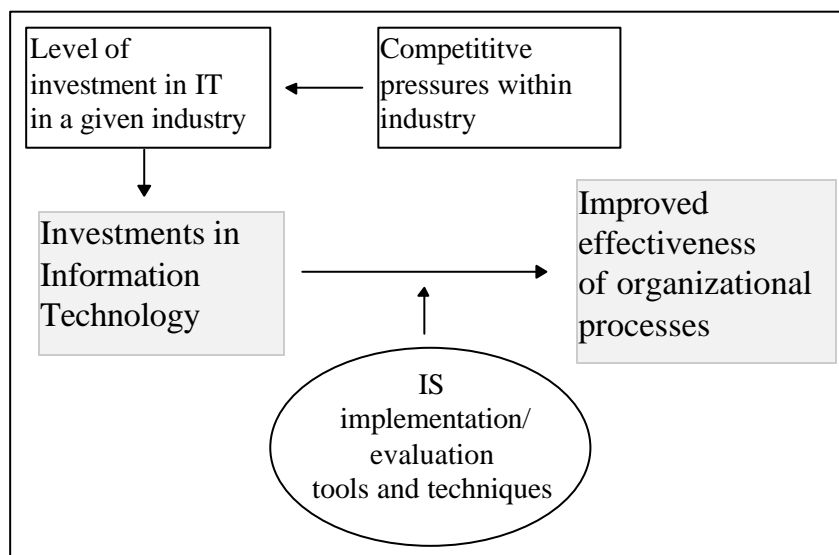
1.1.1 Some useful definitions

One of the issues that Information Systems (IS) researchers and practitioners have been trying to address ever since computers began to be adopted by organizations is a simple one: “how to make the most out of the investment in Information Technology (IT)?”. The problem is shown diagrammatically in Figure 1.1 below. Investors invest in IT hoping to achieve better organizational effectiveness. Better organizational effectiveness can take many forms, but basically IT can help in one or several of the following ways:

- ? reducing costs
- ? improving the firm’s management information
- ? improving the firm’s competitive positioning
- ? enabling organizational restructuring

In order to achieve any such objectives, the firm must be able to *implement* the new technology effectively. And this is where the problem starts. What does *implementation* mean? And worse still, what does *effective implementation* mean? One way of tackling the issue is through evaluation. In other words, for implementation tools and techniques to be considered *effective*, evaluation measures must be put in place, for example, financial measures. The IS literature is rich on research designs aimed at reaching conclusions about effectiveness of IT applications, but unfortunately the outcome of such literature is not very conclusive, as we will see further on.

Figure 1.1 - A simplified view of IS implementation



Before going any further, however, let us look first at some useful definitions. Firstly, what does the dictionary say about the word implementation? Turning to the Oxford English Dictionary (1989) we find:

Implementation: The action of implementing; fulfilment.
Implement: 1. To complete, perform, carry into effect (a contract, agreement, etc.); to fulfil (an engagement or promise). 2. To complete, fill up, supplement.

And to the Webster's Third New International Dictionary of the English Language (1961):

Implementation: The act of implementing or the state of being implemented
Implement: 1a. To carry out; to give practical effect to and ensure of actual fulfilment by concrete measures. 1b. To provide instruments or means of practical expression for

From these dictionary definitions, we see that the notion of *implementation* carries with it a semantic load indicating “completing”, “fulfilling” and “giving practical expression” to something. But, in the specific case of implementing IT, what is the meaning of such expressions, in other words, when can we say that we *have* implemented IT?

The answer to this question can begin to be worked out by looking closely at the types of information systems definitions which we have adopted in this research. The first one is by Land (1985:215, our emphasis).

An information system is a social system, which has *embedded* in it information technology (...) it is not possible to design a robust, effective information system incorporating significant amounts of the technology without treating it as a social system

The second one is taken from Symons (1991:186/187, emphases added).

[An information system is] a complex social object, which result from the *embedding* of computer systems into an organization (...) where it is *not* possible to separate the technical from the social factors given the variety of human judgements and actions, influenced by cultural values, political interests and participants' particular definitions of their situations intervening in the implementation of such a system

The third definitional statement is by Checkland (1998:110/111).

Any and every “information system” can always be thought about as entailing a pair of systems, one a system, which is served (the people taking the action), the other a system which does the serving [the processing of data (capta) relevant to people undertaking purposeful action]

From these definitions, two key points stand out:

- (1) talking about information systems implies talking about two types of entities: one of a social nature and the other of a technological nature;
- (2) the process of integration between the two entities is a fundamental one.

Checkland (1998) argues that the whole process of IS implementation is, in fact, a process of organizational change. From this, it follows that IS implementation could be construed to be a

process of change where a key criterion is *integration*, i.e. the embedding of IT-based systems into organizations. Hence, among other interpretations, we might say that *IS implementation is a (never-ending) process of change aimed at the integration of technological artifacts into the social structures and processes of the organization.*

The definitions above are also useful in bringing out the problem of the distinction (or the non-distinction) between IS and IT. IS (information system) is the new social object, which results from the integration of IT (information technology), while IT comprises the “computer systems”, which are brought in from the external environment. However, as Symons points out, the separation between IS and IT is difficult and sometimes impossible. Therefore, when talking about information systems or about *an* information system sometimes one is focusing more on the social object and other times on the technological artifacts. The distinction is far from being clear-cut and for that reason the dual acronym “IS/IT” is often used in the literature. The same happens in this dissertation.

1.2. The research problem

1.2.1 The information systems discipline and the search for a new paradigm

According to Kuhn (1970), the most fundamental set of assumptions adopted by a professional community, which allows its members to share similar perceptions and engage in commonly shared practices, is called a paradigm. Thus, we might say that the IS discipline paradigm is reflected in the definitions accepted and shared by the IS academic community. Over the years many definition statements for the discipline have been proposed, and trying to arrive at a commonly accepted definition could prove to be a never-ending task.

For purposes of establishing an initial platform of dialogue between us and the readers, we will use a set of definitions, which has been put forward for discussion by an authoritative body, the UK Academy for Information Systems (UKAIS, 1997:5). These definitions are useful because they give us some indications about the prevailing paradigm. Presumably, before having been released the discussion document must have been the object of much discussion among the Academy’s community and must represent some consensus of opinion.

| |
|---|
| Definition |
| Information systems are the means by which organizations and people, utilizing information technologies, gather, process, store, use and disseminate information |

| |
|--|
| Domain of study |
| The domain of Information Systems requires a multi-disciplinary approach to studying the range of socio-technical phenomena, which determine their [i.e. information systems as entities] development, use and effects in organizations and society |

An initial problem with the UKAIS’s definition of *information system* as an entity is that it is overly means-oriented. We take the word *means* used in the definition to imply frameworks,

methodologies, techniques, tools, etc. There is little room in this definition for notions of emergence, serendipity, self-organization or other organizational phenomena. In other words, we might say that in the present paradigm, the technical and the strategic (content) approaches to information systems implementation are favoured to an organizational (contextual) approach.

A second point concerns UKAIS's domain of study for the information systems discipline. Here, multi-disciplinarity is referred to as being the key characteristic of its method. Multi-disciplinarity or interdisciplinarity means having to live with many disciplines, at its theoretical foundations, but especially having to live very closely with its reference disciplines. Two key reference disciplines for information systems are organization science and management.

The world of business and of organizations is moving at increasingly faster velocities. Organizational forms are changing and there is a need to look for new explanations, new ways for understanding the unfolding events and especially new ways of organizing and of managing. The IS research literature shows that a redefinition of the IS function in organizations is in progress as well. But do we really understand what is going on? Do we know enough about what is going on outside the IS discipline, for example in the fields of management and organization science and which reflect such a new understanding of the organization's driving forces ?

In an editorial column in *MIS Quarterly*, in 1992, Blake Ives warned that "within the IS research community we continue to value an extensive trail of references that often reflects outdated assumptions and yesterday's economics. We are not necessarily paving the cow path, but rather extending it. It is a rare article that explores the implications of changing economics on the central research question or that challenges the dated assumptions upon which past works might have been based"(p.lxii). These were wise words, but they do not seem to have had much of an echo in terms of new research directions in information systems, in recent years.

In an editorial essay in *Organization Science*, Daft and Lewin (1993:1) call for a new research paradigm, which will support a radically new mind-set in organizational management, to face the challenges brought about by the global economy. This is characterized by hypercompetition, a highly volatile environment, demographic and political changes, knowledge based competition and demassification of some sectors while others show signs of enormous massification. Such challenges, according to those authors, call for a whole new organizational environment which will favour "flexible, smaller, learning organizations that continuously change and solve problems through interconnected, coordinated, self-organizing processes". Thus, organization science scholars are invited to leave the traditional research paradigms and adopt a new mind set to investigate the new phenomena.

In the field of strategic management there is also a lively movement towards finding new paradigms. In the introductory article to a special issue of *Strategic Management Journal* entitled *Strategy: Search for New Paradigms*, Prahalad and Hamel (1994) single out the following topics as worthy of scholarly attention in the immediate future: (1) the emergence of micro-multinationals (e.g. software industries); (2) protection of intellectual property (e.g.

computer software); (3) pre-market competition (e.g. competence building); (4) intercorporate and intercluster competition (e.g. competition for control of standards); (5) building competencies (e.g. competition to enhance the knowledge base). Looking through these items one recognizes, almost intuitively, the tremendous contribution that could potentially be made by the information systems discipline. This is due, of course, to the overarching presence of information related themes running across most of those topics.

In the case of *Organization Science*, the plea is for a re-think of research methods and practice. In the case of *Strategic Management Journal*, the invitation is for new research areas to be tackled. In both cases, the focus is clearly on the shape of things to come and not on glories of the past. In IS research, however, there seems to be a preference for a reactive rather than a proactive stance. There has been an almost compulsive need to search for unifying research frameworks or paradigms in IS (see, for example, Hirschheim et al, 1996) which, of course, have to be focused on past research. This backward looking emphasis, in our view, takes away the creativity and ingenuity that are needed to focus on the contours of the future.

Moving on to what is the *raison d'être* of the IS discipline, we see that it focusses on “the range of socio-technical phenomena, which determine their [i.e. information systems as entities] development, use and effects in organizations and society”. Leaving aside the deterministic tone of this definition, we may reasonably conclude that organizations and society are the beginning and the end of information systems. In this dissertation, society will not be our focus of attention, but as regards organizations, we agree entirely with this formulation. Organizations are one of the key contextual references of the discipline of information systems. The problem with the present paradigm of the discipline, however, is that because it is overly content orientated (as demonstrated in the definition above), the contextual (i.e. organizational) umbrella tends to be left behind. A shift in the present paradigm, which will bring the focus of the discipline more in line with the letter of the definition proposed by the UKAIS, is needed.

Hence, a contribution towards the search for a new paradigm in IS research and practice has also been among the author's concerns, leading up to the preparation for the present dissertation. It seemed that the aim of interdisciplinarity could be explored and developed further by aligning our research more closely with the concerns expressed by academics from organization science and management in their own search for new paradigms.

1.2.2 The search for the “measures” of IT effectiveness remains inconclusive

Since Nobel Laureate Robert Solow (in Brynjolfsson, 1993) put forward the problem that the massive investments in IT were not being met by equally large increases in productivity, the information systems community has been very involved in the search for an explanation to this phenomenon, known as the “productivity paradox”. It has been found that in a period of rapid increase in the use of IT, there was a slowing down of overall productivity growth. The problem has been particularly serious in the services sector, which had the highest investment in IT among all sectors of the US economy, while its productivity did not show any significant improvements.

The service industry made investments in information technology in the 1980's totalling an aggregate of \$750 billion and had an average productivity growth of 0.7%, which is significantly lower than the growth rate achieved in the 1970's, and much lower than the rate achieved by the manufacturing sector, which invested significantly less in IT (Ives, 1994).

While the cause and effect relationship between IT investment and productivity is inconclusive, efforts to explain the IT productivity paradox highlight other kinds of interesting results. Organisations may not produce more after investing in IT, but they may maintain or increase their competitiveness by improving the quality of their products or services, or by adopting more effective organisational forms (Brynjolfsson, 1993). Another recurrent result from such investigations is that the problem of poor productivity performances is not one of over-investing in IT, but of "management inadequacies in the planning and implementing IT systems" (Quinn and Baily, 1994:47).

The attempts to establish a causal link between IT and business performance have consistently been inconclusive. Banker and Kaufman (1988) and Floyd and Wooldridge (1990) in separate studies about the adoption of ATMs found no overall connection between the adoption of this technology and the performance of financial institutions. Mahmood and Soon (1991) reported that in most industries IT had little impact on entry barriers. Zahra and Colvin (1993) in a study about technology policy and strategy found no direct connection between technology adoption and performance. In a retrospective study of 30 cases of IT adoption from the 1970s and early 1980s, Kettinger et al (1994) found that within five years of IT implementation, 21 of the 30 companies had experienced not an improvement but a decline in market share or profits or both.

Huber (1990) put forward a general theory of the "effects of advanced information technologies on organizational design, intelligence and decision making", where the overall conclusion is that improvements in intelligence development and decision making will be made possible by the availability of more accurate, comprehensive, timely and available organizational intelligence. This, in turn, will become possible by an increased information accessibility and changes in organizational design, enabled by the new advanced information technologies. This conclusion and many others in the same vein is drawn on the assumption that organizational intelligence will increase or improve because technology makes it possible. However, as much of the writing on the evaluation of the investments in Information Technology has shown (see, for example, Remenyi and Sherwood-Smith, 1997 or Willcocks, 1996) the assumption that the presence of advanced information technologies will lead to better intelligence development and better decision making and hence to improved performance, is just too simplistic. In one of the earliest reviews of the literature on the impact of computers on organizations, Attewell and Rule (1984) wrote:

What puzzles us is that people remain so willing to speak and write as though the overall effects of computing technologies were a foregone conclusion, as though they could be determined a priori (...) We argue the opposite: that evidence on these subjects is actually fragmentary and very mixed, and that a priori arguments are particularly inappropriate in light of the range and variety of variables at work in these situations (p.1184). We suspect that the transformations in organizational life through computing are so multifarious as to encompass the most disparate cause-effect relationships (p.1190).

Over the years, the research on the impact of IS on aspects of organizational life, such a structure or jobs and skills has remained quite inconclusive. Daniel Robey has been one of the most persistent researchers in this area and his work is of great value, given its longitudinal nature. In a review of research into the relationship between organizational structures and IT published in 1977, he claimed:

structure does not primarily depend on any internal technologies for information processing, but rather on the nature of the task environment. Under stable conditions computers tend to reinforce centralization. Under dynamic conditions, computers reinforce decentralization. Earlier positions are difficult to support because they are locked into the idea that computers *cause* changes. The present review points to the value of looking beyond computers to more theoretically grounded causal variables in the organization's task environment (p.974).

In 1981, the same author wrote:

we have found several different organizational structures compatible with computer information systems. These cases seem to fuel arguments *against* technological determinism. Newer organizational forms such as the matrix and other dual authority arrangements seem as equally receptive to computer technology as the more traditional bureaucracies. Our studies indicate little uniformity in the way that information systems mesh with formal organizational structure (p.686)

And, eighteen years after his 1977 review, the situation still had not changed. In 1995, Robey writes "Accumulated studies produce *no* consistent picture of the effects of advanced technologies on organizational structures or processes" (p.58). Robey's findings are consistent with many other recent and not-so-recent articles and books on the same topic (see, for example, Gutek, 1984; Strassman, 1985; Eccles, 1991; Kelly, 1994; Petrozzo, 1995; Landauer, 1995). Symons (1991) argues that the issue of the organizational impact of information technology, including its economic appraisal, can only be resolved through an interactionist approach, focusing on the organization's history, its social context, its infrastructure, and its formal and informal information flows.

Boynton, Zmud and Jacobs (1994) suggest that one can talk of IS effectiveness at a very broad level using three measures: organizational benefits obtained (1) from reduced costs as a result of automation, (2) from better management information and (3) from a more suitable positioning in the competitive market. To these three a fourth measure has been added: transformation (Scott-Morton, 1991). Transformation encapsulates the benefits accrued from the previous stages, as well as from new management structures and from process innovation, enabled by the new technologies (Davenport, 1993). Walton (1989) reinforces this view, by stating that the earliest applications of IT improved the efficiency and the effectiveness of individual members of staff or individual functional units, whereas more advanced IT applications yield benefits for the entire organization, thereby transforming the activities of both individual and functional units.

The fairly vague and broad measures or indicators which have been used in the past to evaluate the organizational effectiveness of the implementation of one or more information systems in one organization, often become meaningless, in a cross-sectional research design. Cost reduction, for

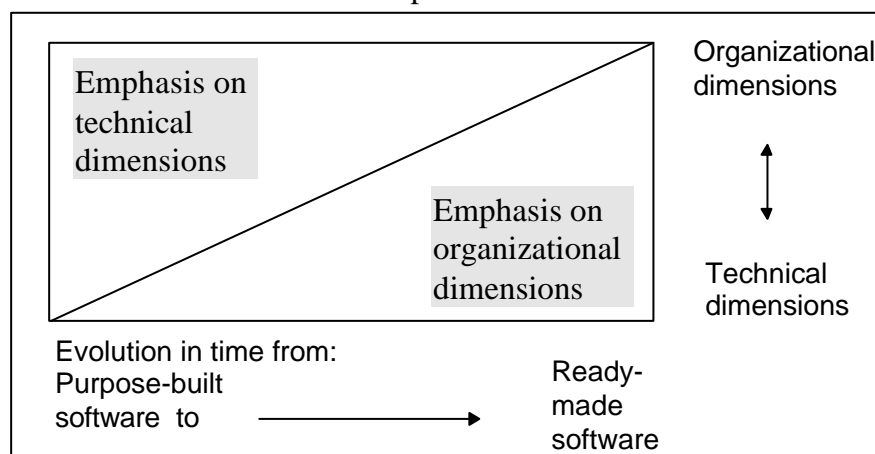
example, can mean different things in different organizations and it would not be feasible to design a questionnaire, which would encompass all possible situations related to cost reductions in all types of organizations. De Lone and McLean (1992:81) agree with this view when they state that “attempts to measure MIS impact on overall organizational performance are not often undertaken because of the difficulty of isolating the contribution of the information systems function from other contributors to organizational performance”. Furthermore, the same authors state that “MIS success is clearly a multidimensional construct and should be measured as such” (p.81).

1.2.3 The changing nature of IS implementation

As time passes, the nature of information systems in organizations and, therefore, the nature of IS implementation is changing. In at least three different aspects, such change is noticeable: (1) information systems in organizations is becoming less and less a technical issue; (2) information systems in organizations are becoming more and more “horizontal” in terms of functional responsibilities; (3) as a consequence of the two preceding points, information systems and the rest of the organization are becoming more and more interdependent.

With the increasing availability of more powerful microcomputers and of high quality ready-made software packages, organizations are opting for less in-house development of information technology applications and more purchases of off-the-shelf software. This means that, with time, the technical dimension of IS implementation is becoming less relevant to an increasing number of organizations, while the organizational dimension is becoming more relevant mainly due to new managerial thinking about IT. This new thinking is related, on one hand, to the increasing costs of the operations and maintenance of IT applications in all organizations and, on the other hand, to a new awareness on the part of most managers regarding the competitive implications of IT management. However, it must also be said that many technical aspects of IS implementation remain important even when software packages are bought off-the-shelf. The relationship of the technical versus the organizational emphases of IS implementation as a function of time and as a result of the developments in software technology can be seen in Figure 1.2.

Figure 1.2 - Evolution of the dimensions of IS implementation



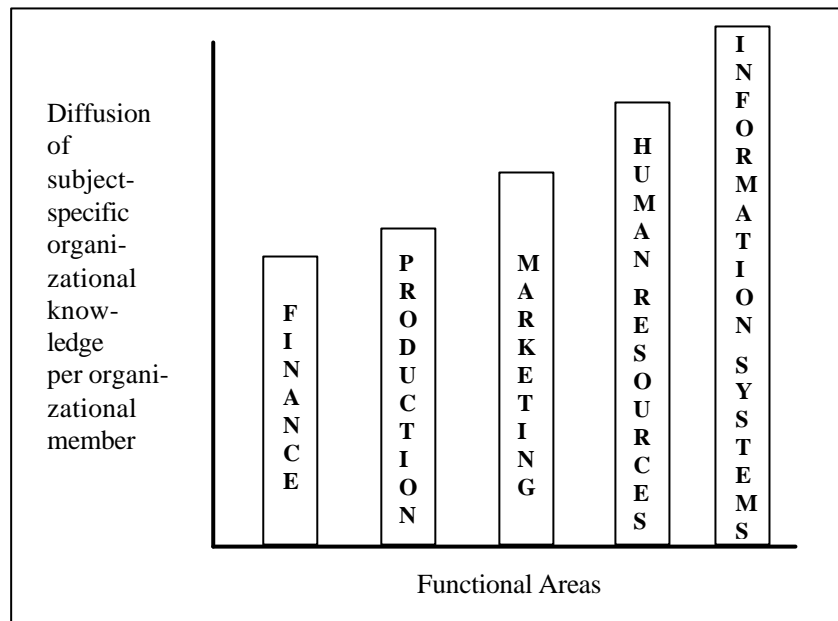
Tsoukas (1996) suggests that we view organizations as “distributed knowledge systems”. This means that we may picture organizations as being made up of many “pockets” of knowledge networked and distributed in a multitude of ways. Because of the vertical specialization of functions in most traditional organizations, such pockets of knowledge are organized primarily in a vertical manner. But because of the “distributed” effect, some organizational knowledge can also be used and organized horizontally, i.e. across vertical functions. This means that everybody in the organization has some knowledge about all of the areas and activities in the organization, while specializing in one or two particular areas. For example, people in marketing will know more about marketing activities, but they also know something about finance or production-related activities.

Hence, it can be said that in organizations some functional areas are more horizontal than others. The concept of functional “horizontality” is related to the level of subject- specific organizational knowledge per organizational member individual that the organization requires to function effectively. For example, it can be argued that the people in financial management need not know a great deal about goes on in the production function because the latter can function satisfactorily without much of an input from the former. However, the same cannot be said, for example, about production and marketing. In order to function effectively, manufacturing organizations need a degree of coordination between production and marketing, meaning that more “horizontality” is required from the marketing function than from the production function. Hence, among these three functional areas it is possible to establish an hierarchy of horizontality, with marketing at the top and finance at the bottom.

Then, there are those highly horizontal functions, such as human resources management (HRM). Modern HRM theory claims that the power to manage people should be devolved to line departments and that few responsibilities should stay with the centre. In fact, every manager in any organization has to manage people and behaviour both in its formal and informal aspects. Hence, we can say that the HRM function has a high degree of horizontality, in terms of the other functional areas but perhaps not as high as IS. With time the IS function has become the most horizontal of all the functional areas (see Figure 1.3).

This assumption is based on the fact that the proliferation of information technology-based systems in all types of organizations, which has been happening for the last 20 to 30 years, still shows no signs of slowing down. On the contrary. The recent “Internet phenomenon” has, in fact, presented yet another boost to this ever growing search for more and better computing. Such proliferation of IT means that not only (a) virtually every person who works in an organization has access to and uses a computer in some aspect of their work but also that (b) more and people are involved in the *management* of this technology. Middle managers, line managers and top managers are all involved both in the *management* and in the *use* of some aspect of IT, in addition to the information systems managers who are involved with all aspects of IT. So, unlike the HRM function, the IS management function has to deal not only with management-related issues but also with use-related issues.

Figure 1.3 - The organizational“horizontality” of information systems



At this point it is important to make the distinction between IS *implementation* and the IS *function*. We see IS implementation as an ongoing set of activities affecting every organizational member as a consequence of a managerial decision to introduce IT artifacts into the organization’s activities. The IS function is a structural sub-division of the organization, which has the responsibility for making IS/IT work and for integrating this function with the rest of the organization. Such a distinction is also useful because it can help clarify the rest of the discussion.

Some observers claim that with time the IS function tends to disappear due to the trends towards decentralization of the function and to the outsourcing of parts of it. Decentralization of the IS function means that there is a trend towards the transfer of functional responsibilities from the IS Manager and the IS staff to line managers and to line staff. But the issue of the decentralization of the IS function does not revolve, exclusively, around the IS Manager and her staff. This issue involves, increasingly, changes in the roles of various organizational players, i.e. top managers, line managers (at various levels), the users and the IS managers themselves.

As regards outsourcing, the picture is also one of profound change. While some minor outsourcing, for example, of the maintenance of the pool of personal computers is possible and desirable, major outsourcing of key information systems is very problematic. This is due to the fact that IT is not just a new technological tool that found its way into organizations. IT has been “engulfed” by the social structures of the organization (thus assuming the form of information *systems*) and it has become *part* of the organization’s knowledge system. In becoming part of organization’s knowledge system, IT has been changed by the organization that has adopted it, and the organization has also changed in order to adopt it. Hence, the two have become

inseparable. Dertouzos (1997:210) makes the point that the outsourcing of IT means not just the sub-contracting of technological services, but the loss of internal knowledge about the interrelationships among the organization's activities, which sometimes are more important than the relationships themselves - "information will be so intertwined with employees' activities that outsourcing IT would be almost like outsourcing all the firm's employees".

Hence, the IS function (and, therefore, IS implementation) and other organizational functions are becoming increasingly interdependent. Ghoshal and Bartlett (1998) argue that the trend in organizational structures is for organizations to become integrated networks of increasingly autonomous units, as opposed to the traditional divisionalised hierarchies. This means an ever-increasing need to create interdependence-building mechanisms. In information systems, the issue of interdependence has also been dealt with by Rockart and Short (1994). These authors point out several important issues, such as the increasing complexity of the line managers' roles, the importance of teamwork and the growth of peer-to-peer activities (as opposed to hierarchical relationships). However, as is the case in much of the IS literature, these authors argue that the *key* to building interdependency are well-defined and transparent networks because "people-intensive integrative mechanisms are limited in what they can accomplish" (1984:358). We are in disagreement with this techno-oriented view, which reduces networks to a technology issue and overlooks the fact that people can never be replaced by machines when it comes to communicating meaning.

The high degree of horizontality of IS implementation activities, the intertwining of the technical and the social issues in the organization and the questions of interdependence help to make our point that IS implementation *is* an organizational problem, which must be approached from an organizational point of view (as opposed to exclusively technical or strategic points of view).

1.2.4 Information systems needs a more aggregate level of discourse, i.e. an *organizational* level of discourse

From the discussion above, we may begin to conclude that implementing IS/IT in organizations needs a broader and more encompassing view of the problem. However, when we look at the IS literature, however, we see that implementation has been systematically carved up into sub-sets or partial views of the issue as a whole.

The two major sub-sets are the technical view (De Marco, 1979; Yourdon, 1982; Jackson, 1983; Finkelstein, 1989) and the strategic view (Parsons, 1983; McFarlan, 1984; Ives, 1984; Porter and Millar, 1985; Wiseman, 1988; Earl, 1989; Galliers, 1991). There is yet a third sub-set, which tries to fill the gap between the other two. The third approach is focused on bottom-up, emergent issues, such as organizational change and on the need to manage such change (Markus, 1983; Swanson, 1988; Walton, 1988; Lucas, 1991; Land, 1992). The problem with this clear-cut segmentation of the implementation phenomenon is that it has made researchers lose sight of the forest and waste precious time in looking at each tree individually. This is why we argue that *IS*

implementation needs globalizing, all-encompassing, organizational views of the phenomenon.

Walton (1989), one of the few writers who gets closer to the problem, talks about the “extended implementation” approach, which really means going beyond the partial or sectoral views of implementation and looking at the broader picture. He puts forward three key ingredients (Alignment, Commitment/ Support/ Ownership and Competence/ Mastery) and three phases for effective IS implementation (Generating the Context for IT, Designing the IT System and Putting the IT Systems into Practice). Although Walton’s approach is still excessively locked into the concepts of systems design and focused on the design of *one* system, it does recognise the problem of the scope of the concept of information systems implementation:

The process must be an extended one, inasmuch as the key ingredients of IT effectiveness - alignment, ownership and mastery - are influenced at various stages, ranging from the conditions that existed prior to the start of system development to actions that take place after the system is in place (p.31)

Walton (1989) acknowledges the fact that IS implementation *is* an organizational phenomenon. He argues that, unlike other approaches that focus selectively on the content, the context or the process of IS implementation, his theory “treats the materialization of IT content (the interacting social and technical dimensions of IT systems) as a process that occurs over time (before, during and after systems development) and in context (strategic, organizational and political)”(p.8).

Swanson (1988) also touches upon the organizational dimension when he suggests a learning model for IS implementation. He explains that learning takes place at two levels: (1) a “within system” level, where communication between user and systems developer creates a learning loop in the systems development process and (2) an “among systems” level, where the historical dimension of systems development in a particular organization is highlighted. He states “ Systems are not typically isolated even when originally conceived as such; rather, they tend to congregate within organizations, often as families. The realization of any one system, therefore, is likely to be intimately related to the realization of others. Problems and solutions associated with one system naturally spill over to others. Thus, the realization of one system informs the realization of another”(p.37).

We share Swanson’s view that IS implementation is a much broader problem than the systems development process. Like Walton (1989), we also see IS implementation as a process that includes all the phases (before, during and after systems development) and at all organizational levels (strategic, tactical and operational). Hence, we propose that the organizational implementation of information systems, in addition to containing the technical, the strategic and the change management dimensions, is also *a process with an organizational history, involving many stakeholders, and mediated by a given IS-related context*. If this argument is valid, then it becomes very obvious why it is so difficult to have clear-cut measures of the effectiveness of IS implementation. Such measures must be inevitably diffuse in nature and found scattered throughout many types of indicators in the organization.

Some writers have argued that the effectiveness of IS implementation in organizations is achieved by means of *cultural infusion* (El Sawy, 1985). As waves of new IT applications find their way into the organization and are used by increasing numbers of staff in increasing numbers of organizational tasks, the structures of the technology are infused into the social structures of the organization (Orlikowski, 1992; DeSanctis and Poole, 1994). But IS infusion must not be taken to mean the organizational effects of IS/IT implementation just through the *use* of information technology applications. IS infusion (and IS diffusion, as we will explain later on in the dissertation) goes beyond use and is also concerned with IT-related planning, selecting, purchasing, evaluating, etc . Such activities, in turn, affect the routines, the practices, the beliefs and the values related to managing IS throughout the organization. In other words, the introduction of IT applications affects the whole knowledge system (or culture) that constitutes the organization.

Organizational culture and its role in IS organizational implementation/management is gaining increased attention among the IS community (Davenport, 1994; Robey and Azevedo, 1994; Willcocks, 1994; Avison and Myers, 1995; Robey, 1995; Ward and Peppard, 1996). Willcocks argues that in the 1980s the major IS managerial emphasis fell on technological-environmental-human resources relationship, but in the 1990s IS management needs to be a

complex multi-faceted set of activities. Not only will it be necessary to manage on the four fronts - technological, environmental, human resources and organizational, but the inter-relationships between the four fronts will also need to be managed (1994:23)

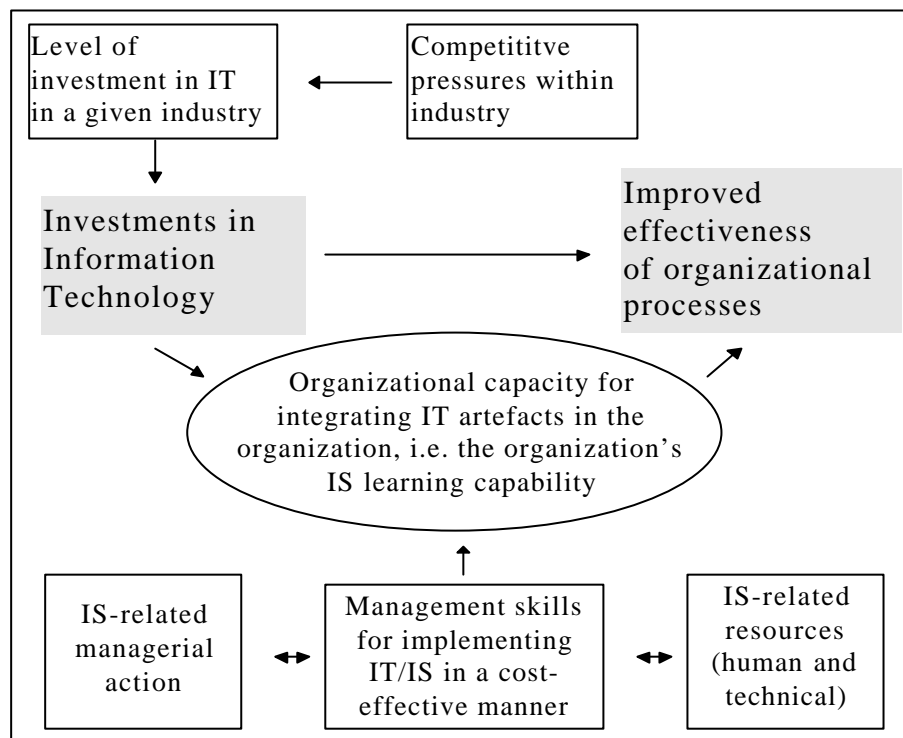
And Willcocks (1994) goes on to say that the way forward is in building an *information systems culture*, which he defines as the shared and the sharing of norms, values, skills, competencies and the continuous learning related to IT needs; the cooperative relationships and the commitment necessary to support existing and required IT applications at organizational, departmental, group and individual levels.

Finally, Ciborra and Lanzara (1994:77) provide a key argument in support of our thesis, that is, that an organizational view of IS implementation is needed. They approach the problem from the point of view of the organizational impact of the introduction of new information systems. They argue that even when the simplest of information systems is designed and implemented, the basis for competence and the formative context related to that particular computer application is affected in at least three ways:

First, the boundary is shifted between what is tacitly held as background knowledge and what we are aware of as foreground “situational” knowledge (*where*, in a specific work situation the focus of attention is explicitly directed to). Second, the basis for the invention, testing and adoption of new forms of practical knowledge surrounding the use of the system in the work setting is altered. New practices, informal rules and ways of circumventing routines are tried out and set in place within the constraints defined by the new infrastructure and its intrinsic requirements. Third, any invention of alternative practices, any radical departure from existing routines is deeply conditioned by the new mix of background and situational knowledge

Thus, we can see that the IS implementation problem is more complex than the simplified view that we started this discussion with. A more appropriate diagrammatic representation of the problem would be the one found in Figure 1.4.

Figure 1.4 - Overview of the IS implementation problem



1.2.5 Our contribution : the justifications and implications of an *organizational* approach to information systems implementation

To conclude this section on the research problem we would like to articulate what we see as being our contribution in this dissertation. This view will be further refined in the final chapter.

We have identified that the “micro-level” where the research discourse in information systems has been pitched in the main, has not been very successful in providing answers and especially in opening up new avenues for better practice in IS management. We feel, therefore, that the field needs a more aggregate level of discourse. Such level of discourse can be provided by the fields of organizational knowledge, learning and culture but they need to be operationalized for the specific case of information systems in organizations. On the other hand, to operationalize means having a very good grasp of the concepts as they have been developed originally, in their respective fields. So, in order to achieve this we have had to go fairly deeply into the roots of such concepts.

Checkland (1998) argues that organizational behaviour is one of the four streams, which makes up the knowledge base of the IS field. The other three streams are information systems (i.e. IS project management, information management, etc), systems (i.e. systems thinking, general systems theory, etc) and technology (i.e. database design, local area networks, intranets, etc). The organization stream includes organization design, organizational culture and organizational change. According to Checkland (1998:60) work in this stream cannot be undertaken “without taking as given (preferably consciously) some concept of what an organization is (...) [however] the current wisdom of IS is based upon a rather poverty-stricken view of what an organization is; there remains much work to be done in this area”.

In this dissertation we propose to tackle this problem and contribute towards a better understanding of the concept of organization and of organizational behaviour in general, within the information systems discipline. More specifically in the area of IS management, we have noticed that although there is a change in the literature towards softer issues, such as those dealing with organizational culture, there are virtually no signs of concerns over leadership. Culture and leadership are concepts that should go together, with culture being the consequence of leadership and leadership being the action side of culture. *IS leadership* is an expression very seldom heard in IS parlance. Perhaps, the idea is that leadership is the same in all areas of management (i.e. in IS or in general management) and that there is no need to focus on IS leadership. While we agree that many of the general principles are the same, IS has brought to organizations many specificities, which did not exist before. From this, it follows that there is the danger of considering such specificities as the exclusive responsibility of the IS Manager, which is reducing the problem to an overly simplistic level.

IS implementation encompasses not only the role of the IS Manager but also various other formal organizational roles (top management, senior and junior line management and even the end users). But formal roles are not the whole picture. Informal IS-related roles and relationships, informed and shaped by IS-related managerial values are also part of this picture. Informal roles and relationships are concepts related to organizational action and change. In that sense, action-based theories of organizational knowledge and learning are adequate bases from which to start investigating the phenomenon of IS *organizational* implementation. The work of Ghoshal and Bartlett (1993,1994,1998) on the development of a new managerial theory of the firm has been very influential regarding this part of the work.

To sum up, our contribution to the IS field can be seen as having three layers. The first will be the justification of the *organizational* approach to IS implementation; this will be carried out by bringing theories from strategic management and organization behaviour into the IS implementation debate. The second will be a response to Checkland’s challenge regarding the need to enrich the “poverty-stricken view of what an organization is”, in the IS world; this will be achieved by bringing a more aggregate (i.e. organizational) level of discourse to the discipline, and operationalizing IS implementation in terms of organizational and managerial action. The third

contribution will be a mapping out of an alternative route to achieving better results in IS implementation, i.e. the route of IS-related managerial action or leadership

PhD Dissertation outline

| | | | | | |
|--|--|---|--|--|--|
| The conceptual research | | | | The empirical research ? Exploring the managerial action framework applied to the governance of the IS function | |
| Introduction IS organizational implementation: ? Definitions ? The research problem ? The research approach | Managerial action, organizational culture and climates ? The managerial underpinnings of the new approach ? Ghoshal and Bartlett's theory of strategic leadership | Perspectives on IS implementation ? IS implementation as organizational learning and change ? Ontological/epistemological perspectives | Operational implementation as managerial action ? A pragmatic view of IS implementation as a set of organizational roles, relationships and values | ? Findings of the empirical research ? An evaluation of the empirical research in the light of the theory ? Some practical guidelines for IS organizational implementation | |
| (Note - The numbers in the top left hand corners denote chapter numbers) | | | | The foundations of the new approach to IS implementation: strategic and organizational ? The resource-based approach to strategy. Autopoiesis as an organizational epistemology. The interpretive approach to organizational analysis. | |
| ? Suggestions for further research | | | | | |

1.3 The Research Approach

In this section, an outline of the dissertation is presented (see figure in previous page). The objective is to summarize for the reader the way in which we propose to approach the research problem that has been identified in the preceding section and to explain how the various topics are interlinked.

We start with a proposition regarding a definition of IS *organizational* implementation:

IS organizational implementation

A continuous process of organizational learning guided by IS-related managerial action and shaped by IS-related organizational contexts, the constitutive bases of the alignment between the organization's strategy and the processes of infusion and diffusion of information technology artifacts into the organization

Such a proposition encapsulates all the ingredients that we feel are needed for the new theoretical approach to IS implementation, which we put forward in this dissertation. Starting from the enunciation of this definition, we proceed to analyse its composition in detail, in chapters two, three and four. In chapter five, we move on to the operationalization of a conceptual model of IS-related managerial action in order to prepare for the empirical research, which is described in chapter six. Chapter seven is devoted to the discussion of the empirical results in the light of the conceptual development, the conclusions and the recommendations.

1.3.1 Fresh views on organization and organizational knowledge

In chapter two we approach the epistemological foundations of the concept of organization. Such an approach means asking the question “what is organizational knowledge?”. This question, in turn, brings with it two other questions: “what is organizational learning?” and “what is organizational culture?”. The issues of organizational knowledge, learning and culture are completely intertwined, although often they are treated in the literature as being quite different issues. It is worth recalling here what Herbert Simon (1945,1997), one of the earliest proponents of the notion of organizational learning has to say about such notion and about its links with culture.

The boundary between one biological organism and others is defined by identity of the shared DNA of all the organism's cells. In a similar way, one might say that shared information determines the boundary of an organization - although the sharing is not nearly as complete as it is among an organism's cells. Understanding the processes of organizational learning is critical to understanding the respective roles of organizations and markets in the economy (1997:228). Among the contents of organizational memories [to include learning] perhaps the most important is the representation of the organization itself and its goals, for it is this representation that provides the basis for defining the roles of organization members (1997:238). Change in representation implies fundamental change in organizational knowledge and skills (1997:237). Learning may bring new knowledge to bear within an existing culture and learning may change the culture itself in fundamental ways (1997:236). The mechanisms that can enable an organization to deviate from the culture in which it is embedded are, therefore, a major topic in organizational learning (1997:232)

Since the publication of Simon's (1945) work, the academic debate about organizational knowledge and learning has been strongly influenced by his theoretical stance on human (and organizational) cognition. Such a stance is known as representationism or cognitivism. After a few decades of research and publishing on organizational knowledge and learning under this theoretical stance, the field does not seem to have evolved a great deal in terms of helping organizational effectiveness or improving managerial practice. Meanwhile, in the cognitive sciences, a debate about the appropriateness of the representationist or cognitivist hypothesis as a basis for explaining human cognition has been going on for many years and alternative explanations have started to emerge (Maturana and Varela, 1980). Maturana and Varela argue that human cognition is not achieved through representations of the environment in the brain, but that cognition is achieved through an "enaction" of the environment and that in such enaction the whole body is involved, not just the brain. The enaction hypothesis is supported by a theoretical body of knowledge in systems theory called autopoiesis.

Autopoiesis is a concept developed more than thirty years ago in biology through the pioneering work of Maturana and Varela (1980,1987/92) primarily as a construct, which enabled them to make the distinction between living and non-living systems. Autopoiesis is a Greek word, which means "self-production". An autopoietic system, therefore, is characterised as one that contains within its own boundaries the mechanisms and processes that enable it to produce and reproduce itself. The biological cell is the paradigmatic example of an autopoietic system as it possesses all the features that define a first-order autopoietic system, that is, it is autonomous, it is operationally closed, it is self-referential, it has its own organization and its own structure and it is capable of structural coupling with its environment. As organisms evolve and become more complex, other forms of autopoiesis arise, namely second-order and third-order autopoiesis (i.e. social systems) where the same basic characteristics or criteria apply, but in higher orders of complexity.

Niklas Luhmann (1995) has adapted autopoiesis theory to the social sciences and von Krogh and Roos (1995) have done the same in respect to organization science. According to von Krogh and Roos, organizational knowledge resides in both the individual organizational member and in the relations among organizational members, that is, at the social level. For these authors, the basis of organizational knowledge is organizational "linguaging". The expression organizational linguaging is intended to emphasize the dynamic properties of communication in organizations as it is created by and based on the experience of the individual organizational members. It is also pivotal in the organization's knowledge system - "linguaging may be understood as the 'stuff' that the organization is made of"(1995: 97). Given its dynamic nature, linguaging fulfils a dual but conflicting function: on one hand it contributes towards creating a unique identity for the organization in the form of its culture and, in that respect linguaging can be instrumental in bringing about change. But, on the other hand, linguaging becomes also the most important element in the maintenance of the status quo and resistance to change, given the self referential nature of autopoietic systems, of which linguaging is one.

It must be emphasized that we consider autopoiesis theory and the notion of languaging as *major* breakthroughs in the management and organization sciences and for that reason, we are devoting a large part of the chapter to these new concepts and theories. With organizational autopoiesis, the view of organizational knowledge as being made up of representations of the environment changes quite radically. With the new emphasis on languaging, the view of organizational knowledge turns to the inside of the firm and in this sense, autopoiesis gives new support to one of the propositions from strategic management theory underpinning our thesis: the resource-based approach. This approach, which is dealt with in the first part of chapter two, is really the key justification of the organizational view of IS implementation, from the point of view of strategic management theory.

The resource-based approach is a theoretical body of knowledge, which is gaining ground in the strategic management literature as an alternative to the analysis of firm growth and of the competitive advantage between firms (Wernerfelt, 1984 and 1995; Conner, 1991; Barney, 1991; Grant, 1991; Mahoney, 1995; Conner and Prahalad, 1996). This approach analyses firms from the resource side rather than the product side. A resource can be anything that might be considered as a strength or a weakness of a given company. Resources are the tangible and intangible assets, which are tied semi-permanently to the firm. Examples of resources are: brand names, trade contacts, machinery, capital, in-house knowledge of technology, etc. The resource-based approach forms the basis of the core competence movement in the management literature, which has gained notoriety through the book *Competing for the Future* by Hamel and Prahalad (1994).

In IS research/management many of the models and frameworks used in developing strategies and in aligning IS with the business are based on environmental analysis (Porter and Millar, 1985) and on the product-side (McFarlan, 1984) of information technology rather than the resources side. The present author suggests, however, that *the overall effectiveness of IS-related activity in organizations depends upon internal intangible assets, such as IS-related managerial skills and not on environment factors such as new developments in IT*. Hence, the adoption of the resource-based approach as more adequate theoretical basis for IS implementation/management than industry analysis or “product-based” models.

1.3.2 Managerial action as the key driver of organizational context

Organizational autopoiesis also underpins our approach regarding the need for a more action-oriented view of IS implementation, especially at the managerial level. Managerial action is important, it is argued, because the success of the introduction of information technology artifacts into the organization depends upon the IS-related collective learning, which the organization accumulates over the years. The successive waves of IT-based “solutions” implemented in the organization creates a level of IT/IS-related knowledge which, in turn, is influenced by the climates or contexts surrounding such implementation efforts.

The development and routine management of IS depend on many human judgements influenced by strategic and operational priorities, political interests and participants’ perceptions of the role of

IT in their organization. All of these factors contribute towards the collective learning of a pattern of shared basic assumptions and values, also known as organizational culture (Schein, 1992) or organizational climates (Schneider, 1990). Ghoshal and Bartlett (1993,1994,1998), influenced by the early management writers on managerial leadership (Barnard, 1938/68; Selznick, 1957) have contributed further towards an operationalization of the notion of organizational culture, by establishing a relationship between managerial action, organizational climates and the performance of companies.

Managerial action is the result of managerial choices that actors within firms have made over time, and organizational cultures, climates and/or contexts are the consequence of managerial action. Ghoshal and Bartlett's theory is anchored on two premises: (1) through their actions, managers are responsible for the establishment of given contexts in firms, the key objective being to establish a context conducive to an appropriate "work ethic" (Barnard, 1938) or "code of conduct" (Burns and Stalker, 1961). (2) organizational contexts, in turn, are responsible for the creation of "willingness to cooperate" (Barnard, 1938) on the part of organizational members, which results in higher productivity and higher profitability.

Following Ghoshal and Bartlett (1994), the key proposition is that the managerial action approach occupies a "middle-ground" between two paradigmatic positions in management theory: one, which is representative of a "fairly extreme vision of the rational strategy model that implicitly assigned to top management the superhuman role of being the designers of strategy, the architects of structure and the builders of systems" (p.108) and another, which embodies an "heroic celebration of lack of management" (ibid) characterized by a view of organizational choices and actions as "severely constrained by ambiguity and uncertainty, opportunism, cognitive limits and political agenda" (ibid) of organizational members.

The rational view presents the realization of strategy as a process of imposing strategic intent and design through a mechanistic process of implementation, which will not be challenged throughout its course. The emergent view focuses on strategies that come into being through a process similar to the crafting of an object by a craftsman, relying mostly on tacit knowledge, which can never be made explicit. In both cases, what seems to be missing are the answers to the HOW question. For the top-down camp unanswered questions are "how to overcome barriers to the implementation processes", "how to overcome the gap between intent and realization" or "how to test the strategic design in action". And for the bottom-up camp, unresolved issues seem to be "how are emergent strategies integrated with formal strategies", "how should the organization cope during a period of revolutionary, emergent change" or "how to distinguish the more positive from the less positive emergent effects".

Chapter three ends with a discussion about organizational culture, climates and contexts where some key authors are reviewed and compared with Ghoshal and Bartlett. The purpose of such comparison is the identification of dimensions of organizational climate or context. A set of dimensions is arrived at, which will be used later on, in chapter five.

1.3.3 Analysing IS implementation and integrating managerial action and IS *organizational* implementation

In chapter four, the approaches to IS implementation are analysed from several perspectives. Firstly, IS implementation is discussed as a process of organizational learning and change. Secondly, IS implementation is analysed from an ontological/epistemological point of view, where three conventional perspectives are briefly reviewed - the technical, the strategic and the emergent perspective. The fourth, new perspective - managerial action - is analyzed in greater depth.

The question of alignment of information systems with the organization's strategy has been a concern of the IS discipline especially since the launching of the Management in the Nineties research initiative at MIT (Scott-Morton, 1991). Earl (1996) has taken up this issue more recently and has made new proposals regarding how such alignment might be achieved. According to that author, alignment is the result of four IS-related processes that organizations have to develop: the clarification, the innovation, the infrastructure and the constitution processes. While agreeing that the articulation of such processes is an important step forward, we fail to see *how* alignment of IS will come about. Earl's proposals are still enslaved by a perspective on IS implementation, which we have called the "organizational imperative" perspective, dominated by a worldview of managerial rationality and choice.

From Earl's paper, the notion of "constitutive process" is singled out as being particularly useful in furthering the view of IS implementation as an organizational phenomenon. Organizational values, roles and relationships are the key elements of the IS *constitutive* process, a process that shapes the organization's ethos (Barnard, 1938/68), its codes of conduct (Burns and Stalker, 1961), its culture (Normann, 1985), its climates (Ashforth, 1985) or its contexts (Ghoshal and Bartlett, 1993;1994). Among other climates or contexts, one can talk about an IS organizational climate. Other authors have dealt with IS-related culture or climate, but using different approaches. Kraemer et al. (1989) talk about the organization's "state of computing", Orlikowski (1992) develops the notion of "technological frames", Ciborra and Lanzara (1994) have created the notion of IS "formative context" and Boynton, Zmud and Jacobs (1994) proposed the "IT management climate" as factor contributing towards the absorption of IT into the organization.

In chapter five we will be postulating the existence an IS organizational climate in organizations as a construct made up of *perceptions and attitudes concerning the history, the management and the use of IT in the organization and reflected in the values, informal roles and relationships of managers and users*. In order to arrive at the IS organizational climate construct firstly, we have created a scenario of IS corporate governance in large organizations by reviewing the current trends in this area. Secondly, we have defined a model of organizational roles where the key stakeholders in the IS implementation process are featured, i.e. the top manager, the IS manager, the senior line managers, the middle managers and the users. Thirdly, after explaining that our focus of attention will be only the first three types of stakeholders just

mentioned, we proceed to adapt our IS organizational roles and their relationships to the climate dimensions identified in chapter three.

1.3.4 The empirical work, the discussion and the conclusions

The empirical work, described in chapter six is of an exploratory nature. The objective was to explore the managerial action model as a conceptual framework for analysing IS corporate governance in large organizations and, hopefully, to draw some useful conclusions, which might enhance the practice of such governance. Another objective was to find out how some of the theoretical propositions put forward as part of our definition of IS *organizational* implementation are of value in analysing the IS implementation phenomenon. It must be stressed, however, that the empirical work was not carried out with the purpose of proving or disproving the conceptual development work. We see the empirical part of the research as supplementary to the conceptual development part and not as an outcome or conclusion of such part.

The empirical work is structured as follows:

(1) A set of 25 pilot interviews aimed at testing and validating the questions to be included in the survey questionnaire. The interviewees were ten IS researchers and lecturers based in the UK and twenty IS managers based in Portugal.

(2) A postal survey involving the largest 300 companies in Portugal aimed at: (a) establishing a “picture” of the typical climate or context of IS corporate governance in such companies, with special attention to the so-called cultural gap between IS and non-IS personnel; (b) testing the internal validity of an hypothetical model of relationships based on the following constructs: IS-related values, IS-related structural factors and IS-related learning

(3) A set of 16 final interviews aimed at probing deeper the IS corporate governance climate dimensions present in five companies from the group of 45 that responded to the survey questionnaire (with at least three usable replies each). These interviews have been put together as short case studies. The interviewees were top managers, information systems managers and senior line managers from these companies.

The final chapter is devoted to a discussion of the results of the empirical work against the background of the IS-related climate dimensions, which had been identified in chapter five. Next, the discussion returns to the theoretical concepts proposed in the initial chapters, which are used to show how a fresh view on organizations and organizational knowledge can be used to underpin an organizational approach to IS implementation. From this, some guidelines for IS corporate governance are extracted. The dissertation ends with a note on the contributions of this dissertation to the discipline of information systems and some recommendations for future research.

Chapter 2

The strategic and organizational foundations of the new approach to IS implementation

We need an organization theory because some phenomena are more conveniently described in terms of organizations and parts of organizations than in terms of the individual human beings who inhabit those parts (...) Employing a more aggregate level of discourse is not a declaration of philosophical anti-reductionism, but simply a recognition that most natural systems do have hierarchical structure, and that it is often possible to say a great deal about aggregate components without specifying the details of activity within these components
Herbert Simon, 1997:230

Chapter 2 summary

- ? 2.1 Introduction
- ? 2.2 The strategic justification for the *organizational* view
 - ? 2.2.1 The question of organizational effectiveness
 - ? 2.2.2 Porter's (1991) theory of strategy
 - ? 2.2.3 The resource-based approach to strategy
 - ? 2.2.3.1 The resource-based approach in IS research
 - ? 2.2.4 What are organizational skills?
- ? 2.3 Organizations and organizational knowledge: the conventional wisdom
 - ? 2.3.1 The information-processing view
 - ? 2.3.2 Social systems and the open systems model
- ? 2.4 A new epistemological foundation for organization: autopoiesis and enacted cognition
 - ? 2.4.1 Enaction or embodied cognition
 - ? 2.4.2 Autopoiesis theory as one of the pillars of enacted cognition
- ? 2.5 Enaction and sensemaking as methodological foundations for organizational analysis
- ? 2.6 Summing up

† † †

2.1 Introduction

In this chapter, our aim is to discuss the epistemological and methodological foundations of the approach we have chosen for the implementation of information systems: the organizational approach. Recalling our definition of IS *organizational* implementation - *a continuous process of organizational learning guided by IS-related managerial action and shaped by IS-related organizational contexts, the constitutive bases of the alignment between the organization's strategy and the processes of infusion and diffusion of information technology artifacts into the organization* - we can see that it contains elements, which go to the fundamentals of the concept of organization. When we talk about climate or learning in organizations, we have to be clear about what we mean by organization, in the first place. Notions such organizational climate, context, culture, knowledge and learning are all interrelated and whatever epistemological stance we take for one of such notions will affect our understanding of the others. So, we believe that at this early point in the dissertation, it is appropriate to look at the foundations of what will be said henceforth regarding organizations.

The foundations we will be looking at are epistemological and methodological. By epistemological we mean the understanding of the “origin, nature and validity of knowledge” (von Krogh and Roos, 1995:7). In the case of organizations, epistemology is concerned with the theories of knowledge behind organizational knowledge (and learning). By methodological we mean “both the ways of attaining and the ways of interpreting knowledge (ibid, p. 7). Hence, methodology encompasses epistemology but goes further for the reason that it aims at making sense of the knowledge that is being analysed. However, the two concepts are deeply intertwined and sometimes they are used interchangeably.

Organizational skills, organizational learning, organizational knowledge and organizational culture are all concepts created by academics or researchers and informed by one or more epistemologies. Basically, there are two competing epistemologies: the positivist epistemology informed by cognitivism and by the information-processing view of human cognition and anti-positivism, sometimes also known as the postmodernist view of cognition. The latter is the result of a convergence of a number of theories and intellectual influences, which have been applied in different ways and with different degrees of depth to the social sciences. In our case, we are particularly interested in autopoiesis and enacted cognition and in their application to social and organizational systems, as we believe that these theories are especially well adapted to explaining many aspects of the organizational phenomenon.

These epistemologies, in turn, influence the methodologies, which are used in researching and analysing organizations. A methodology influenced by a positivist epistemology will treat the organization as an objective entity with given features, which can be freely researched by an independent observer. A methodology informed by autopoiesis and enacted cognition will recognize that organizations cannot be researched as wholly objective phenomena and that, in

fact, organizations are the result of a joint effort of their members to make sense of the reality around them.

The best way to structure this chapter is to start off by looking at the dominant views from the literature on management and organization science about the concept of organization. From there, we will go on to follow the evolution of such concepts through a few intellectual traditions, and arrive at the systems view. This view is important because it contains the new perspectives on individual and social systems from a stand point of autopoiesis theory. Such perspectives are not new in hard systems theory but they are quite novel in social and organizational systems thinking. But before we go into the discussion on autopoiesis we will carry out a quick synopsis of the current views about human cognition, in order to situate the epistemological debate. The dominant views on organizational knowledge often follow very closely the dominant views on individual knowledge and they define the epistemological stand point of the observer. In the latter part of the chapter we will discuss the application of autopoiesis to social and organizational systems.

In order to achieve this, we have resorted to the literature on strategic management because this is the field of management, which is more encompassing and which deals with policy and organizational issues. Within strategic management, we have found that the resource-based approach was the theoretical ground better suited to build the organizational perspective to IS implementation. We consider the resource-based approach to a sound building block because its roots are to be found in the theory of the firm.

Theories of the firm are propositions, which have been advanced by economists since the writings of Coase (1937) to explain why firms exist and the role of firms in the economy. Several theories have been put forward over the years (Conner, 1991) but the one, which has had the greatest impact on the management literature over the last ten years or so has been the resource-based theory. This theory changes the focus of attention from the external environment to the internal environment of the firm and to the internal capacity of organizations to accumulate knowledge and skills. The resource-based approach has been developed primarily by researchers affiliated to the field of strategic management (Wernerfelt, 1984) rather than by researchers from industrial economics, as it was the case with the earlier theories of competitive advantage (Porter, 1980; 1985). Due to the new emphasis on human and organizational resources as the locus of advantage over the competition, the resource-based theory is very close to organizational behaviour and, therefore, to organizational epistemological issues.

2.2 The strategic justification for the *organizational* view

2.2.1 The question of organizational effectiveness

Ever since authors started writing about management and management practice (Follett, 1924; Barnard, 1938/68; Drucker, 1954; Selznick, 1957) their aim has been to provide some helpful rules or guidelines, which would make the task of management more fruitful and, therefore,

organizations more effective. Information systems management is no different from the management of any other function in the organization. It has some specificities, in the same way that Marketing, Finance or Production also do, but essentially it is a management task ultimately aimed at making the utilization of IT applications more effective.

Going back to our initial model of the IS organizational implementation problem (Figure 1.4) we can propose that management invest in IT applications in order to improve the effectiveness of organizational processes and, ultimately, to stay in the market. In business organizations to stay in the market usually means to remain competitive, but in non-business or not-for-profit organizations there is also a concern regarding staying in the market. The only difference between profit and not-for-profit organizations in this respect is the time span, which has to be considered. In profit organizations the time span over which an outcome can be expected regarding staying or leaving the market is much shorter than in not-for-profit organizations. Universities, for example, also wish to stay in the market in a world where competition in higher education grows stronger every year. While this issue may not be a problem for university authorities on a daily basis, it will be a problem in the long run if the university starts to lose students because of stronger competition. What we are trying to say is that the issue of organizational effectiveness affects all organizations - profit and not-for-profit.

Thus, organizational effectiveness is a very complex problem that management writers have been trying to solve since the earliest of times and for which there is no solution in sight (Lewin and Minton, 1986). Although we will not be attempting to deal with or even to define the concept here, we feel it is important to state one's idea of what the concept might entail. From the many existing views of what organizational effectiveness is we have decided to opt for the view generally followed in strategic management circles.

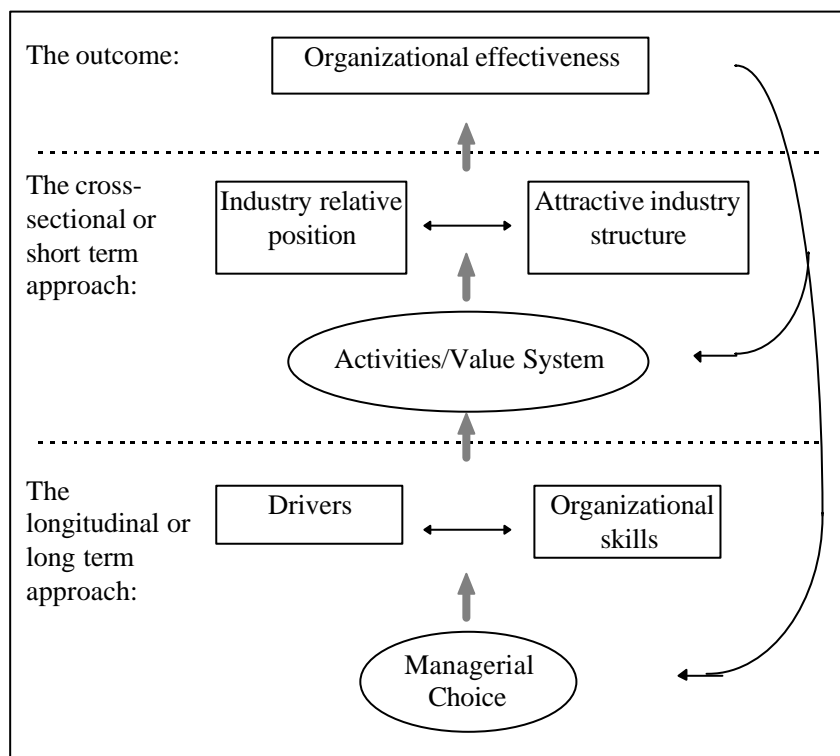
Effectiveness has been a concern of strategic management writers throughout the 1980s and early 1990s (Porter, 1980;1985;1991) because it is seen as one of the organizational capabilities that will lead to business advantage. According to Porter (1991:102) competitive advantage "results from a firm's ability to perform the required activities at a collectively lower cost than rivals or perform some activities in unique ways that create buyer value and hence allow the firm to command a premium price". Hence, we take the view that one measure of organizational effectiveness can be such capability that some firms possess. We believe that this is a reasonable interpretation of organizational effectiveness given that it can also be applied to not-for-profit organizations.

Restating our understanding of the concept as it is used in strategic management circles: effectiveness means that organizations which can operate with low costs and/or high levels of quality are likely to be successful at whatever they do.

2.2.2 Porter's (1991) theory of strategy

In 1991, Michael Porter published an article entitled *Towards a Dynamic Theory of Strategy*, which adds some new features to his previous work (1980, 1985) but whose main achievement, in our view, is in the integration into a simple model of elements, which were previously disperse. There are several new elements in this work, but the one, which signals a new orientation in Porter's thinking is the notion of managerial choice. Such new elements seems to have been introduced in response to criticism to his earlier work, on the grounds that it was overly deterministic regarding the influence of the environment in the shaping of competitive strategy. We shall be referring to such criticism in more detail further along in this chapter, but for the time being it will be useful to briefly review the main features of this theory. Figure 2.1 below provides an outline of the chain of causality proposed by Porter and which, ultimately leads to organizational effectiveness.

Figure 2.1 - Outline of Porter's dynamic theory of strategy



Source: Porter (1991)

Porter (1991) makes a distinction between the longitudinal or long term view and the cross-sectional or short term view of strategy. Included in the short term view are the elements, which are better known from Porter's earlier work, namely, the techniques for environmental analysis and competitive positioning. The former are aimed at determining the relative attractiveness of a given industrial sector, achieved by means of the well-known "five forces" model. Holding

industry structure constant, a business organization has to choose an adequate competitive position in relation to the other players in the market; this is achieved through the use of the framework known as the “three generic strategies”, namely, differentiation, overall cost leadership and focus. These managerial decisions have a relatively short term impact on the performance of the organization and they can be altered so as to suit changing environmental conditions. However, it is in the long term that the conditions are established for the organization to create an internal environment supportive of competitive advantage, in a sustainable manner.

The basic unit of analysis of competitive advantage for Porter is the discrete activity. An activity can be anything to which a cost can be attributed and the way of performing discrete activities determines the firm’s costs. The firm as a whole can be seen as a collection of interrelated activities such as, for example, “buying input A”, “manufacturing component B”, “advertising product C”, “selling service D” or “making an after-sales visit regarding product E”. The strategy of an organization, broadly understood as an overall pattern or disposition for behaviour, can be seen as both cause and consequence of the configuration and interrelationships of discrete activities, i.e. the organizational structure. The arrows coming down in the figure are intended to represent the feedback effect, which the final outcome has on both the structuring of activities and on the long term effects of managerial choice.

The value system is an alternative way of approaching the firm’s collection of activities. Instead of being represented as costs, activities can also be represented as value for the customer, in such a way that the whole company’s activities can be schematically arrayed in a series of value chains (Porter, 1985). Not only can the company’s own activities be arranged on a value chain, but the company’s suppliers’ and the company’s customers’ activities can also be displayed as value chains, thus providing a useful checking system for the sources of buyer and customer value.

Performing activities requires tangible assets or “working capital” and intangible assets or “intellectual capital”, embodied in human resources and in the technology. Some tangible and intangible assets are internal to the company and some are external (for example, contracts and brand images). But performing activities not only requires assets as it also creates intangible assets “in the form of skills, organizational routines and knowledge”. And “while the tangible assets normally depreciate, the intangible assets involved in performing activities can cumulate over time” (1991:102). In making these statements, Porter moves from the cross-sectional to the longitudinal approach of his model and gets closer to the crux of his research into competitive strategy, i.e. the “origin of origins” of competitive advantage. Moving to the longitudinal approach means that one’s concerns change from questions such as “What specific activities and drivers underlie the superior competitive position?” to questions such as “Why do some firms achieve favourable positions vis-à-vis the drivers in the value chain?” In information systems implementation, this is precisely the question that we ask when approaching implementation from an organizational and, therefore, longitudinal, point of view, i.e. *why do some firms achieve much better results from implementing IS, as reflected in the drivers in the value chain?*

The answer to our question perhaps lies in Porter's longitudinal approach, that is, in the triad Drivers-Organizational Skills-Managerial Choice. The "drivers" of competitive advantage are the "structural determinants of differences among competitors" (1991:104) and they range from attributes such as "cumulative learning" and "ability to share activities" to attributes like "the activity's location" and "the timing of investment choices". So, the notion of drivers contains a mixture of attributes of "things" that the company does well and which gives it an edge over the competition. It is a notion similar to "competencies" (Prahalad and Hamel, 1990), which will be discussed in the next section. Parallel with this notion but also contained within it to some extent, there is the notion of "organizational skills". Organizational skills are the outcome, in terms of accumulated organizational learning, of carrying out activities in the organization. They are described as "the ability to link activities or share them across business units" (1991:109) and in that sense, they seem to be the same as drivers. But a closer look shows that the notion of drivers contains more static attributes (such as, for example, "the activity's location"), which could not be included in the notion of organizational skills, which has a predominantly dynamic connotation. It is debatable whether Porter's distinction between drivers and organizational skills is accurate or even appropriate, but our aim at this juncture is simply to highlight the fact that Michael Porter (1991) has *acknowledged the role of organizational skills as a longitudinal concern and as the key rung of the organizational effectiveness ladder*.

Porter's (1991) article appeared, to some extent, as a reaction in relation to a movement, which has been gaining popularity in strategic management circles since the mid-eighties, known as the resource-based approach to strategy or the resource-based theory of the firm. Porter argues that such an approach cannot be an alternative theory of strategy because, in his view, resources such as organizational skills cannot be separated from the cross-sectional or short term conditions of competitive advantage, nor from a conception of the firm as a collection of activities. He suggests that "resources and activities are, in a sense, duals of each other" (1991:109). By this, he means that while activities are created by existing resources, activities also allow new resources to be created.

While we feel that Porter's contribution towards a theory of strategy is a useful step forward in integrating components, which had been dispersed hitherto, we also believe that such theory stops short of a major issue in management theory, i.e. the issue of HOW or the implementation question. Porter tries to fill this gap by bringing in "managerial choice" at the very bottom of his causal chain and by saying that all decisions about either the long term or the short term concerns of strategy rest upon the manager. This is a positive development in relation to that author's previous ontological posture characterized by a belief that environmental forces were the sole force dictating the outcome of business competition. But claiming that "pure" managerial choice is the cause of all causes seems to be a very meagre argument. The way that managerial choice is formulated by Porter (1991) indicates that he believes choice to be a one-off activity - "pure managerial choices lead to the assembly or creation of the particular skills and resources required to carry out the new strategy (p. 105). Once the choice is made, implementation will just follow. Thus, this part of Porter's theory is like a "black box", which will produce outputs if the right inputs are fed into it, but the actual "workings" inside the box are not to be scrutinized.

Managerial choice has been identified by J. Child (1972:15) as “the critical variable in a theory of organizations”. Furthermore, Child argues that “many available contributions to a theory of organizational structure do not incorporate the direct source of variation in formal structural arrangements, namely the strategic decisions of those who have the power of structural initiation - the dominant coalition” (1972:16). The discussion about managerial or strategic choice and the process of goal formation has very often been centred on the dominant coalition, that is, on the political process involving many stakeholders, leading to the formation of organizational goals (Duncan, 1975).

The concept of dominant coalition has been further refined and has been given the broader formulation of “dominant logic” (Prahalad and Bettis, 1986; Bettis and Prahalad, 1995). These authors argue that the dominant logic is an “emergent property of the organization” and that “emergent properties of organizations include political coalitions, values, informal structure and sub-optimization” (1995:11). As much of the so-called “interpretive” research in the organization sciences has shown (Bougon et al., 1977; Batunek, 1984; Daft and Weick, 1984; Weick, 1993; Weick and Roberts, 1993) there is a very important emergent component in the activity of organizations, which cannot be ignored. Managerial choices are made, but then they are met by collective organizational “action” which distorts, modifies and sometimes may even cancel out the original choice made and enforced by the hierarchical structure of command.

Thus, according to the organizational enaction perspective outlined in chapter two, we propose that inside the “black box” we have mentioned earlier, a permanent dialectic process exists between managerial choice and collective action. Managerial choice and collective action are two sides of the same coin: one can never go without the other. Choice implies action and action implies choice. Choice determines action and action determines changes in the original choice. The managerial choice-collective action process is supported by an organizational epistemology founded upon autopoiesis theory, whereby knowledge is conceptualized as effective action and where the act of knowing is characterized by a permanent circularity between body/action and perception/ knowledge.

Going back to the HOW or the implementation question, which Porter’s theory fails to address, we believe that the resource-based approach provides very important contributions. The proponents of the resource-based approach contribute towards an understanding of the HOW question by means of opening doors, which previously were closed in much of strategic management thinking. The doors now being opened are for new organizational epistemologies to enter into the realms of business strategy. We hope this will become clearer as the discussion progresses.

2.2.3 The resource-based approach to strategy

Resources can be anything that might be considered as a strength or a weakness of a given firm - the internal part of a SWOT analysis - as opposed to opportunities and threats, which are the foci of the external part of SWOT. Resources are the tangible and intangible assets, which are tied semi-permanently to the firm and they can be classified under three categories: physical capital resources, human capital resources and organizational capital resources (Barney, 1991). Physical capital resources include the physical technology, a firm's plant and equipment, its geographic location and its access to raw materials. Human capital resources include the knowledge of individual workers, namely, their skills, experience and contacts. Organizational capital resources include the formal and informal organizational structures as well as the relationships among individuals and groups within and outside the firm. Examples of resources are: brand names, trade contacts, machinery, capital, in-house knowledge of technology, etc.

This approach analyses firms from the resource side rather than the product side, as Wernerfelt (1984:171) explains:

For the firm, resources and products are two sides of the same coin. Most products require the services of several resources and most resources can be used in several products. By specifying the size of the firm's activity in different product markets, it is possible to infer the minimum necessary resource commitments. Conversely, by specifying a resource profile for a firm, it is possible to find the optimal product-market activities.

The resource-based approach has appeared, in a way, as a reaction against a degree of "environmental determinism", which has been prevalent in the management literature in the last 30 years or so. All major business decisions revolved around the Product-Market relationship, which has been conceptualized in many different ways over the years. Some landmarks are Ansoff's (1965) product/market matrices, the Boston Consulting Group growth/share matrix (Smith, 1985) and Porter's (1980) five forces model of industry analysis. The work of Porter popularized the notion of industry analysis through the well-known "five forces model", which strongly emphasized the environmental component of business strategy, i.e. its opportunities and threats. The later work of Porter (1985) drew attention to the analysis of the internal resources of the firm through its "value chain". The resource-based movement is really an extension and a more in-depth treatment of the value chain analysis (Barney, 1986).

The main criticism of this view of strategy, i.e. the Product-Market and the environmental analysis models, which has been put forward by the resource-based movement is that it makes the role of management and of managerial choice and action negligible or virtually non-existent. In a large study of competitive performance of British firms, Pettigrew and Whipp (1991:26) make the following comment:

Even allowing for the popular handbooks of business success, little analytical weight in the prevailing accounts of competition has been attributed to the *capacity of management* to adjust to external change. In spite of the recent speculation on supply side improvements in the UK economy, most policy discussion of competition has concentrated on policies at the expense of

processes. Extensive coverage is given to what firm level policies should be adopted. Comparatively little is said of how such policies should be carried out or in what way the changes, which they require might be managed (added emphases).

Another criticism is that the competitive advantage, which is eventually gained from the use of such models and methodologies is often short-lived because products or services are easy to imitate or to replicate. Valuable resources may resist imitation by competitors if protected by imitation barriers. Rumelt (1984) discusses some of such barriers or “isolating mechanisms”: (1) time compression diseconomies - the time factor may be important in achieving uniqueness in a particular resource, if learning, experience or trained proficiency in a particular set of skills can be accumulated in a span of time shorter than normal; (2) historical uniqueness (first mover advantage) - some resources are inherently unique due to either the non-replicability of the conditions under which they were acquired, such as a distinctive location or the advantages gained from being the first mover, such as brand loyalty or the power to establish industry standards; (3) embeddedness of resources - the value of a resource may be inexorably tied to the presence of a complementary resources and the two resources together make up a combination, which is non-imitable; (4) causal ambiguity - the connection between a particular firm’s resource portfolio and its performance may be difficult to determine because the cause

The resource-based approach is not new. It can be traced back to Penrose (1959/1995) and to the notion that what makes a firm grow is the accumulated experience and knowledge from within the company and not the price mechanism from the market. The key differences between the neo-classical school of business economics of the resource-based school, inspired by Penrose’s work, can be seen in the table below.

Table 2.1 - The resource-based approach compared with the neo-classical school of business economics

| | Definitions | Assumptions |
|-----------------------------|---|---|
| Neo-classical school | ? Firms exist to combine resources to produce an end product ? Firm size is determined by the price mechanism, which, in turn is influenced by technological and managerial scale factors (i.e. increasing average costs past a production level, which is small relative to the size of the market) | In the production process: (1) the right input mix can be readily ascertained; (2) marginal contribution of each input is easily calculated; (3) all parties have perfect and complete information ; (4) resources are completely mobile and divisible |
| Resource-based | ? Firms as opposed to markets exist for reasons primarily related to “creating positives” with or without | ? The only limit to the growth of the firm is its internal capability for generating new knowledge |

| | | |
|---------------|--|---|
| theory | opportunistic considerations ? Firms are made up of heterogeneous asset bases, which are costly-to-copy sources of economic rents ? Firms are social institutions with a social responsibility | ? Performance differentials between firms depend on possession of unique inputs and capabilities ? Firm's performance results from (1) the firm's own asset base; (2) the asset bases of competitors; (3) constraints emanating from the broader industry and public policy environments |
|---------------|--|---|

Source: Adapted from Conner (1991)

However, the approach suggested by Penrose's writings in the late 1950s stayed dormant until the 1980s, probably due to the period of fast economic growth that followed in the 1960s and part of the 1970s. It has been the work on evolutionary economics by Nelson and Winter (1982) and the paper in the *Strategic Management Journal* by Wernerfelt (1984), which have provided renewed foundation for the resource-based view to develop. Nelson and Winter's views are centred on knowledge and competence as assets and their endeavour is in finding which knowledge states are amenable to description and quantification and also which control variables can be used to alter such knowledge states. Finding such variables, however, has not been an easy task, as Winter (1987: 164) recognizes:

the tradition of viewing the firm as a unitary actor with well-defined preferences has long been challenged by organization theorists and social scientists outside of economics, and by a few economists of heretical bent (...) there are indeed some key issues in the strategic management of knowledge assets that relate to whether the firm can hold together in the face of conflict among the diverse interest of the participants

One of the latest contributions to the resource-based view of strategy comes from the concept of core competencies developed by Prahalad and Hamel (1990) and Hamel and Prahalad (1994). These authors have developed the concept of core competencies, which they define as "the sum of learning across individual skill sets and individual organizational units [which] is very unlikely to reside in its entirety in a single individual or small team" (1994:203). Furthermore, they define a competence as "a bundle of skills rather than a single discrete skill or technology" (1994:202).

The questions of competencies and skills are central to a key question in industrial economics (and in the theory of the firm), i.e. the question of how resources produce "above-normal" economic rents or, in other words, how differences in performance between companies are created. Teece (quoted in Conner and Prahalad, 1996:494) says "it is not only the bundle of resources that matter, but the mechanisms by which firms learn and accumulate new skills and capabilities, and the forces that limit the rate and direction of this process". And Mahoney (1995) puts forward a "resource learning theory" as a synthesis of resource-based theory and of learning theories focusing on the development of human resources, in general. Mahoney explains that, on its own, resource-based analysis is not sufficient as it is unable to articulate the management practices that enable firms to earn rents. On the other hand, process-oriented models inspired by theories of organizational behaviour are also incomplete because they cannot make the distinction between what is strategically relevant from what is strategically irrelevant. The solution rests upon a

resource learning theory, which may be summarized as follows: “the accumulation of resources creates a base for organizational learning; conversely, organizational learning and new organizational forms, allow firms to increase their rate of resources accumulation” (p.97).

Mahoney’s (1995) formulation of the problem highlights the importance of the role of management and of managerial skills in achieving organizational effectiveness, but it does not address the question of *how* such a role or such skills should be put into practice, in order for organizational effectiveness to ensue. Such gap is filled by Ghoshal and Bartlett’s (1993,1994,1998) managerial theory of the firm, which, as the authors explain, is based on “core management processes” a direct consequence of the interactive development of managerial action and organizational context. Managerial action is the result of managerial choices, which actors within firms make over time, and organizational context (i.e. culture) is the consequence of managerial action. By establishing a relationship between organizational context and managerial action, Ghoshal and Bartlett have contributed further towards a way of operationalizing the notion of organizational or culture, which some authors claim to be another important organizational resource (Barney, 1986; Fiol, 1991). The whole of chapter three in this dissertation will be devoted to a discussion of managerial action and culture, climate and contexts, as organizational resources.

Prahalad and Hamel (1989; 1990; 1994) are also critical of the traditional approach to strategic management, which often has done more harm than good to many companies. They say:

We believe that concepts such as “strategic fit” (between resources and opportunities), “generic strategies” (low cost vs. differentiation vs. focus) and the “strategic hierarchy” (goals, strategy and tactics) have often abetted the process of competitive decline (1989: 63)

The problem with these models is that they are all static models, which try to freeze the life of an organization at a given point in time. Building upon the innovative ideas of Prahalad and Hamel, D’Aveni (1994) is another voice in favour of the need for dynamic as opposed to a static view of strategy. This author explains that static models may be effective in an environment where change is slow and sustaining competitive advantage is the goal. In an era of hypercompetition where “change is rapid and the goal is disruption” (1994: 225), static models are useless. According to D’Aveni hypercompetition is

a condition of rapidly escalating competition based on price-quality positioning, competition to create new know-how and establish first-mover advantage, competition to protect or invade established product or geographic markets, and competition based on deep pockets of alliances (1994:2)

D’Aveni’s (1994:40) advice for companies to succeed in this age of hypercompetition is to outmaneuver competitors with timing and know-how advantages. A timing advantage is created by “skills that allow a firm to be a first mover” and a know-how advantage is “the technological knowledge or other knowledge of a new method of doing business”. In reality, D’Aveni’s framework is totally aligned with the tenets of the resource-based movement, but perhaps one

new element: timing. Timing embodies part of the dynamic dimension which is lacking in traditional models of strategy, but as D'Aveni recognizes timing is also created by an accumulation of organizational skills.

From the point of view of hypercompetition, the question of applying IS and IT to business processes in order to achieve greater speed (and better timing) seems crucial. So, what are the implications of D'Aveni's views on hypercompetition for IS management or IS strategy? In order to address this questions, it is useful to also think about IS/IT as sets of new skills and capabilities, which organizations have to learn. Curley and Pyburn (1982) make the distinction between type A and type B learning. Type A is typically the kind of learning, which ensues from intensive training given to, for example, operators of a new manufacturing tool (industrial technologies). Type B is the kind of learning required for what those authors call the "intellectual technologies", such as the computer. They characterize Type B learning as being "ongoing" and "adaptive" as opposed to the intensive training, which is better adapted to the industrial technologies.

From this, it may be concluded that the question of the timing advantages that D'Aveni discusses cannot be solved purely by the acquisition or application of IT artifacts. IS and IT take time, in terms of both individual and organizational learning. Conceivably, IS and IT take even longer than other organizational resources for appropriate skills and competencies to be developed. A brief discussion of IS/IT from the point of view of the resource-based approach is the topic of the next section.

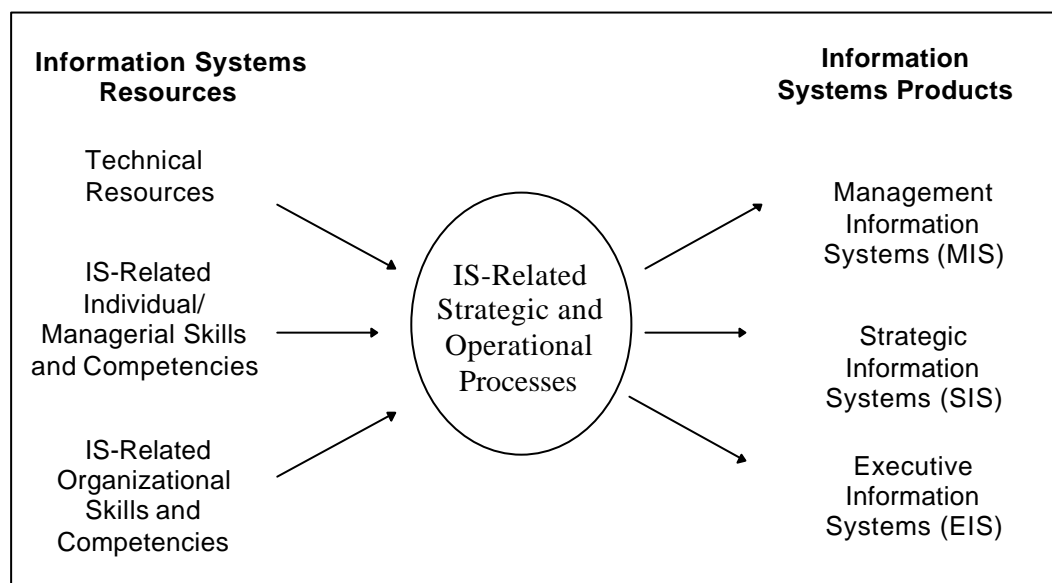
2.2.3.1 The resource-based approach in IS research

As we have stated above, although the idea of the analysis of the firm from the resources side has been around for a long time (Penrose, 1959/1995), it has received little formal attention from the business economics community. "The reason, no doubt, is the unpleasant properties [for modelling purposes] of some key examples of resources, such as technological skills" (Wernerfelt, 1984:171). This remark is very relevant for information systems theory and practice as it illustrates, precisely, the case of much information systems research in the last 15 years. A large proportion of time and effort have been invested in pursuing the "product-based" view, while the resources side of information systems implementation have been relatively neglected. One of the objectives of the present chapter is to show that the resource-based theory is a much more adequate theoretical basis for IS implementation/ management than industry analysis or "product-based" models.

Looking at the information systems implementation literature and especially that which we have classified as belonging to the "context" or the strategic dimension (see chapter five) we can see how much of it is so heavily influenced by industry analysis or "product-based" models. Some examples are McFarlan's (1981) portfolio approach to information systems management, which is inspired on the BCG growth/share matrix, Porter and Millar's (1985) information intensity matrix, Ives and Learmonth's (1988) customer resources life cycle and Wiseman's (1988) strategic option generators. The approach taken by many researchers in information systems, perhaps even

by the majority, is to treat information technology applications as products, which are placed in organizations to fulfil a function. This approach ignores or overlooks the resources, which make up such products, when it is the resources that make a difference to the effectiveness of the organization, in the long-term. In information systems, resources can be thought as all the inputs which go into the organizational implementation of an information system, as opposed to a notion of implementation where information systems are treated purely as products, as is the case in the majority of SISP frameworks and methodologies (see Figure 2.2).

Figure 2.2 - Resources-Based versus Product-Based Views of Information Systems Implementation



Mata, Fuerst and Barney (1995) have applied the resource-based approach to IS strategy and management and they have analysed four types of IT/IS attributes in relation to their potential for creating competitive advantage: capital requirements, proprietary technology, technical IT skills and managerial IT/IS skills. From this research, it was concluded that capital requirements, proprietary technology and technical IT skills were not the kinds of resources, which might bring any form of advantage to firms. However, the building up of *IS-related managerial skills* was found to be crucial for an improvement of the effectiveness of organizational implementation of IS and, therefore, for helping companies to achieve sustained advantage over their competitors, in the long-term. Mata et al. do not define too clearly what they mean by IS/IT-related managerial skills (i.e. they do not distinguish between IS and IT managerial skills). They say that such skills “include management’s ability to conceive of, develop and exploit IT applications to support and enhance other business functions” and give, as examples (1995:498):

- (1) the ability of IT managers to understand and appreciate the business needs of other functional managers, suppliers and customers;
- (2) the ability to work with these functional managers, suppliers and customers to develop appropriate IT applications;
- (3) the ability to coordinate IT activities in ways that support other functional managers, suppliers and customers;
- (4) the ability to anticipate the future IT needs of functional managers, suppliers and customers”

Those authors further explain that organizations use their “managerial IT [IT/IS] skills” to help the technical IT staff fit into the organization’s culture, understand the organization’s policies and procedures and learn to cooperate with the rest of the organization on IT-related projects. And they add that unlike technical IT skills, history plays a role in managerial IS/IT skills, which are developed over the longer term.

While this research is interesting and useful, mainly because it is quite unique in terms of the application of the resource-based theory to IS research, we have some objections to make. Our first objection to this view is that it is far too narrow a view to encompass the whole issue of IS/IT management in organizations. That is one of the reasons why we prefer to talk of IS-related managerial skills and not managerial IT skills. But the main problem of the approach taken by Mata et al., which is typical of much of the main-stream IS literature, is that it restricts the IS/IT organizational issues to the IS/IT manager and her staff. Our view is that, being a horizontal activity “par excellence,” IS/IT organizational issues affect many more people in the organization, notably top management (and especially the member of the top management team directly in charge of IS/IT) and line managers who, increasingly, are having to deal with many complex IS/IT issues at department/division level. Hence, our view of *IS-related skills refer to skills or competencies, which are spreading increasingly wide in the organization and, which are related to the managerial aspects of all the stages of the IS organizational implementation process at all organizational levels.* This will be discussed in greater detail in chapter four.

2.2.4 What are organizational skills?

Von Krogh and Roos (1996a) treat organizational skills as the ability that the organization has been able to build for applying collectively the competencies held individually by organizational members. They treat competencies as sets of skills, which enables individuals to carry out their work and make the following distinction between competence and knowledge “while knowledge is about specific insights regarding a particular topic, competence is about the skills to carry out work” (p.106). Individual skills are the outcome not only of personal knowledge and experience, but also of values, attitudes and exhibited personal characteristics.

But these authors go on to explain that organizational skills are much more than individual competencies. At the group level, the process goes through a stage of “competence interplay”, crucial for an understanding how collective competence or task-specific organizational knowledge is formed. Competence interplay can be thought of as the outcome of each discrete group-level event, which contributes towards the formation of group-level competence. Group-level

competence, in turn, influences the level of effectiveness of competence application, at the organizational level, by limiting or enhancing the overall organizational capacity for effectively applying its stock of competencies.

Competence interplay is also restricted by various other factors, namely hard structural factors and soft cultural ones. Among the hard factors there is the formal organizational structure, which makes the “identification, formation and implementation of groups possible” (p.108) and “organizational slack”. Organizational slack refers to the pressures that exist in the organization, either in terms of time or of financial resources, which also have an effect on the level of achieved effectiveness in competence application. Among the cultural factors there are the leadership style and the organizational climates, which are intimately linked as we will see further on, in this dissertation. Leadership styles and organizational climates are crucial factors in the formation of a collective “mind-set” regarding, for example, information sharing activities (i.e. cooperation and collaboration) in the organization.

From the brief discussion above, we can see that it is not possible to discuss the notion of “organizational skills” without taking a host of other factors into consideration. Some of these factors are individual (i.e. personal values and attitudes, personal knowledge and experience, exhibited personal characteristics), some pertain to the group level (i.e. competence interplay or group-level competence) and many belong to the organizational realm (i.e. the organization’s stock of competencies, the organization’s goals, the organization’s climate, etc).

So, we come to the conclusion that in order to discuss organizational skills we must first discuss the topic of *organization*. In other words, if we wish to understand the strategic foundations of the *organizational* approach to IS implementation, we have to have a very good understanding of the foundations of organization and of organizational knowledge, first of all. This is what we attempt to achieve in the rest of this chapter.

2.3 Organizations and organizational knowledge: the conventional wisdom

The reader is also referred to Magalhães (1996) for a more comprehensive account of this topic.

2.3.1 The information processing view

The strand of intellectual influence that has had, by far, the greatest influence in the field of organizational knowledge and learning is the “information processing” view of the organization, after the work of Simon (1945;1997) and March and Simon (1958). These works put forward a theory of problem solving and decision making based on the assumption that human cognitive capabilities are inherently very limited. Given that human decision makers have to operate within conditions of “bounded rationality”, the decision making processes have to be clearly identified, so that for each decision all the variables are accounted for and the information that has to be processed by the decision maker can be reduced to a minimum. In order to achieve this, Simon developed a model of organizational decision making based on the inner workings of a computer, whereby human beings act as information processing systems, which extract meaning structures from information inputs and store such structures as knowledge for later use in decision making. Such meaning structures, however, are seen as static and disembodied in the sense that they are divorced from the stream of organizational actions that produce and reproduce meaning (Tenkasi and Boland, 1993).

The information processing view has been very influential throughout the organization sciences, which includes a major influence on the mainstream organizational learning movement, introduced to the field in the early 1960s by Cyert and March’s (1963) work on the behavioural theory of the firm. According to this view, organizations are treated as objective entities, rather than as concepts, endowed with a capability for cognition through some type of collective mind. Organizations are, therefore, seen as capable of containing representations of the environment in which they operate, very much in the same fashion that the human brain is said to contain representations of the outside (objective) world.

Following this line of reasoning to its logical conclusion, it can easily be accepted that organizations are capable of learning, with adaptation to the environment as the main evidence of such learning. Cyert and March (1963:123) state that "organizations exhibit (as do other social institutions) adaptive behaviour over time" and postulated a learning cycle between the environment and the firm that would operate roughly in the following fashion. External sources of disturbances, which cannot be controlled by the organization create shocks for the organization. There exist decision variables inside the organization, which are manipulated by decision rules. Each combination of external shocks and decision variables changes the state of the organization, thus each organizational state is determined by the previous state, the corresponding external shocks and the decision rules, which were used. Any decision rule that has led to a preferred state becomes more likely to be used in the future than in the past, i.e. learning takes place.

The criticisms that have been levelled at this view of organizations and learning have been plentiful and from many sources, but they can be summarized into a major argument of epistemological nature. The argument is as follows: if human cognition does not follow the information-processing paradigm, which is behind traditional cognitivist thinking and knowledge is not abstract and representational, but is embodied and situational in nature, the whole paradigm

falls as applied to organizations. Many of the divergent voices in the organization sciences, in the last 40 years (Boje, 1966) have been pointing in this direction, but new and perhaps more “solid” scientific support for this hitherto dispersed criticism is now available from the theory of autopoiesis, to be discussed below.

The information processing view of organizations has been challenged by several information systems authors, but one of the more outspoken has been Boland (1987). Boland centres his criticism around the notion of information (which is closely related to knowledge) and on the way that the computer metaphor paradigm has created a mindset or a set of fantasies in organizational and managerial parlance about information. The first fantasy, from which all the others follow, is that *information is structured data*. This fantasy, according to Boland, is the most pernicious of all “because it undermines the possibility for taking the problem of language seriously” (p.370). It originates in the Simonian notion that it is possible to create information simply by manipulating data and decision premises and that when structured in certain ways, data acquires meaning. The next logical step along this line of thinking, according to Boland, is to use the expressions structured data and meaning interchangeably. In other words, it is the same as saying that meaning that can be established independent of the receiver of the data and, therefore, independent of the use of language.

2.3.3 Social systems and the open systems model

Simon’s theory was not the only influence in the formation of the conventional wisdom on organizations and organizational knowledge. Sociological systems theory has also played an important role. This strand of influence has its roots in the writings of Durkheim (1938), namely in the way that social systems were perceived as being made up of many mutually dependent elements (i.e. individuals) functioning in ways that contributed to the maintenance of the whole (i.e. society). However, the author who has had the greatest influence in bringing systems theory to sociological and organizational thought has been Parsons (1956;1957) with the notion of a self-regulating society. Parson’s argument was that in any social system some of its parts contribute towards the maintenance of the whole (i.e. the functional parts) whereas others detract from the integration and effectiveness of the whole (i.e. the dysfunctional parts).

Systems theory applied to social systems has been enormously influential in organization theory in general. General systems theory, which was put forward for the first time by von Bertalanffy (1950) grew from the study of organisms as complex wholes in the field of biology. One of its main achievements was the distinction between open and closed systems. A system is closed if no material is allowed to enter or leave the system. According to the second law of thermodynamics, a closed system gradually runs down, increases its entropy and reaches an equilibrium state where no energy can be obtained from it. A system is open if it depends on the environment to exist, importing and exporting material and, in the process, changing its internal components. Open systems can temporarily defeat the second law of thermodynamics by exchanging materials with the environment and maintaining themselves in a steady state (Jackson, 1991).

The application of systems theory to social systems continues to evolve and such evolution, as we will try to demonstrate here, has a direct impact on the conception of the organization as a knowledge system. Boulding (1956) has described an overall hierarchy of system levels, which has become very influential in organization science research. This hierarchy is composed of nine layers of increasing degrees of complexity, with the higher levels having all the characteristics of the lower levels plus more complex ones. The layers start with “Frameworks” at the bottom level and go all the way up to “Systems of Unspecified Complexity” at the top level. We will not comment here on the whole hierarchy as proposed by Boulding but we will just highlight those levels, which, to us, are the most interesting.

The fourth level is that of Open Systems or of the “self-maintaining structure” characterized by being able to “reproduce and maintain themselves in the midst of a throughput of material and energy” (Boulding (1956: 203). Life is distinguished from non-life at this level, with the cell as its most paradigmatic example. Level seven is characterized by systems capable of self-reflexiveness rather than just self-awareness; the ability to “produce, absorb and interpret symbols as opposed to mere signs” (ibid, p. 204) is the feature, which differentiates this level from the previous one. Level eight has been labelled as “Multi-Cephalous Systems” (Pondy and Mitroff, 1979) to represent the move from the individual to the social level.

The author who has had the greatest influence in bringing systems theory to sociological and organizational thought has been Parsons (1956;1957) with the notion of a self-regulating society. Parson’s argument was that in any social system some of its parts contribute towards the maintenance of the whole (i.e. the functional parts) whereas others detract from the integration and effectiveness of the whole (i.e. the dysfunctional parts). The equilibrium-function model from Parsons and general systems theory were adapted to organizations by Katz and Kahn (1966) in *Social Psychology of Organizations*. According to this well known textbook, organizations are open systems, which depend on the importation of energy from the external environment for survival. The open system model of organization fits well with the information processing or computer metaphor of the organization, which has been discussed above. The basic input-output mechanistic model is the same and together these two models have laid the foundations in the organization sciences for a host of mechanistic formulations of the organization’s knowledge system, which made their appearance, over the years.

But in his 1956 article, Boulding warned:

The above scheme [the systems hierarchy] might serve as a mild word of warning even to Management Science. This new discipline [General Systems Theory] represents an important breakaway from overly simple mechanical models in the theory of organization and control. Its emphasis on communication systems and organizational structure, on principles of homeostasis and growth, on decision processes under uncertainty, is carrying us far beyond the simple models of maximizing behaviour of even ten years ago (p. 207)

Unfortunately, along the way, Boulding's advice seems to have been lost. The reason why the good advice has probably been lost may have to do with the emphasis on open systems and on open systems characteristics. That is, by treating organizations as predominantly open systems (level four in Boulding's hierarchy), researchers seem to have ignored the idea that social systems have the characteristics described for the whole hierarchy, *above and below* level four. This is why we believe that autopoiesis theory is so useful, as a complementary framework for organizational analysis, i.e. as we will see further on, autopoiesis reminds us, once more, that organizations cannot be seen just as open systems but that they have many closed systems characteristics too.

Some authors have tried to draw attention to some fundamental problems of the open systems orthodoxy as it has established itself in organization science research. Two of the earliest authors to warn about such dangers were Pondy and Mitroff (1979) in a remarkable article, which starts off as follows: "Inventing the future for organization theory is the intention of this article" (p.4). Unfortunately, the article also seems to have been forgotten to a large degree, and the future for organization theory has been postponed somewhat. In their article, Pondy and Mitroff go back to Boulding's hierarchy of systems and demonstrate that systems theory has been wrongly used in organization science research. They argue that the open systems model, which is not amenable to positivist research designs is often forced into mechanistic paradigms, keeping none of the characteristic features of open systems.

The first startling realization that those authors come to is that even though human systems start at level seven, the study of organizations is still fixated, to a large extent, at level four, and in many cases at level three, in strictly controlled cause-and-effect research models. Pondy and Mitroff (1979: 22) argue that "we have seriously misunderstood the nature of open systems and have confused them with natural or control systems" and their endeavour is to show how the (still) current formulation of the open systems criteria for organizational modelling leaves out important organizational phenomena. Such neglected phenomena are, for example, the ecological effects, i.e. the external effects of the organization's actions; or topics such as organizational dysfunction, instead of focusing only on order and congruence; or questions such as organizational birth and reproduction, as opposed to explaining only the functioning of mature organizations.

The major achievement of Pondy and Mitroff's paper, however, has been to show how far apart the "realities" of organizational research are - on one hand, the formal, measurable aspects of organizations and, on the other hand, the less formal, intangible aspects of organizations, such as culture, knowledge or learning. These authors argue that "organization theories seem to have forgotten that they are dealing with human organizations, not merely disembodied structures in which individuals play either the role of in-place metering devices (...) or the role of passive carriers of cultural values and skills" (1979: 17). They go on to say that the models we use to study organizations must take into account the capacity that people have for self-awareness, for the use of language and for learning from their experience.

2.4 The new epistemological foundation for organization: enacted cognition and autopoiesis theory

Organization, culture, knowledge and learning seem to be concepts very intimately linked. But in order to find answers to our basic questions, i.e. “what is an organization and what is organizational knowledge?” we need to say something about cognition.

Cognition and cognitive science try to answer questions such as “what are the mechanisms, which enables us to perceive the world?”, “how do we know what we know?” or “what is knowledge?” Basically, there are three major scientific currents in the cognitive sciences - cognitivism, emergence and enaction. The information processing or computer metaphor of the mind (which has already been referred to) belongs to the cognitivist current, the emergence current comprises a school of thought also known as connectionist, and the enactive current encompasses the notion of embodied cognition. Figure 2.1 offers an overview of these three traditions.

Limitations in the length of this dissertation do not allow us to enter, even superficially, into a discussion about all three schools of thought. Thus, we have opted for discussing only the enacted cognition stream because it is the tradition, which underpins, epistemologically, our entire approach to IS organizational implementation.

Table 2.1 - The three traditions of cognitive science

| | Cognitivism | Connectionism | Enaction |
|---|--|--|---|
| Metaphor for cognition | Symbol processing | Emergence of global states | Ongoing interaction with the medium |
| Metaphor for the mind | Digital computer | Parallel distributed network | No computational metaphor. Mind inseparable from experience and world |
| The world in relation to people | Separate. Objective. Representable in symbols | Separate. Objective. Representable in patterns of network activation | Brought forth. Engaged. Presentable through action |
| The mind/body relationship | Cartesian separation of mind and body | Mind related to body and world via emergence | Mind and body inseparable. World enacted in history of viable structural couplings |
| Evaluation criteria of effectiveness of cognitive system | Symbols represent real world appropriately. Information processing leads to successful solution of problem | Emergent properties are seen to correspond to specific cognitive capacities, i.e. successful solution of required task | Action becomes part of an existing on-going world of meaning or shapes a new one, i.e. effective action |
| Key scholars | Chomsky, Fodor, Simon | McClelland, Searle, Smolensky | Bruner, Lakoff, Johnson, Piaget, Winograd and Flores |

(Sources: Varela et al, 1991; Varela, 1992; Whitaker, 1996)

2.4.1 Enaction or embodied cognition

Varela, Thompson and Rosch (1991) and Varela (1992) are the key works for getting to grips with the debate on cognition and for understanding the propositions being put forward by the embodied cognition tradition.

Varela et al. (1991:147) start their exposition on their view of cognition - cognition as enaction - with a remarkable sub-title: *Recovering Common Sense*. Because the issue of common sense is also so germane to management, one of the scientific fields where this dissertation is grounded, we cannot resist the temptation of quoting a passage about the need to recover common sense (in management too).

Consider, for example, a mobile robot that is supposed to drive a car within a city. One can single out in this “driving space” discrete items, such as wheels and windows, red lights and other cars. But unlike the world of chessplaying, movement among objects is not a space that can be said to end neatly at some point. Should the robot pay attention to pedestrians or not? Should it take weather conditions into account? Or the country in which the city is located and its unique driving customs? Such a list of questions could go on forever. The driving world does not end at some point; it has the structure of ever-receding levels of detail that blend into a non-specific background. Indeed, successfully directed movement such as driving depends upon acquired motor skills and the continuous use of common sense or background know-how.

For Varela et al. cognition cannot be understood without common sense. And by common sense they mean our bodily and social history, the mutual co-specification between the knower and the known or the subject and the object. They use the *enactment* to mean interpretation or the act of *bringing forth meaning from a background of understanding*. They hold a non-objectivist view of knowledge, which they claim to be the result of an ongoing interpretation that emerges from our ability to understand and which enables us to make sense of our world. The notion of the embodiment of cognition has been strongly influenced by the philosophy of European thinkers such as Heidegger, Merleau-Ponty and Foucault who, since the beginning of the Twentieth Century have challenged one of the most entrenched position of our scientific heritage, i.e. the rationalists’ view of world as independent from the knower.

2.4.2 Autopoiesis theory as one of the pillars of enacted cognition

Autopoiesis is a concept developed through the pioneering work of Maturana and Varela (1980;1987/1992), Maturana (1987;1988), Varela (1984;1992) in biology, primarily as a construct which enabled them to make the distinction between living and non-living systems. The concept and its postulates have slowly been gaining ground and generating enthusiasm among many scientific communities. For Fritjof Capra, for example, Maturana and Varela’s book *The Tree of Knowledge* (1987/1992) contains no less than the “outlines of a unified scientific conception of mind, matter and life” (in book’s back cover). According to some authors, autopoiesis is developing into a new theoretical paradigm in the social sciences (King, 1993) and to others into a new general systems theory (von Krogh and Roos, 1995).

Maturana and Varela's work has been applied to the social sciences in general by Luhmann (1995), to the law by Teubner (1989) and, more recently to the organization sciences by von Krogh and Roos (1995). The literature of autopoiesis is already very extensive, so a detailed explication of this important new body of knowledge will not be attempted here and readers will be referred to the above mentioned literature and to Mingers (1995) for an account of the scientific state-of-play of autopoiesis and of its many ramifications. In this chapter, the major features and concepts of autopoietic systems theory will be only touched upon, in order to build a new epistemological framework for a better understanding of organizations and organizational knowledge.

Autopoiesis is a Greek word, which means "self-production". An autopoietic system, therefore, is characterized as one that contains within its own boundaries the mechanisms and processes that enable it to produce and reproduce itself. The system's operations specify their own boundaries in the process of self-production. Maturana and Varela (1980;1987/1992) talk about "autopoietic machines" in order to differentiate them from "allopoietic machines", which are systems not capable of self-production. They define autopoietic machines as

Unities whose organization is defined by a particular network of processes (relations) of production of components - the autopoietic network - not by the components themselves or their static relations (...) An autopoietic machine is an homeostatic (or rather a relations-static) system, which has its own organization (defining network of relations) as the fundamental variable, which it maintains constant (1980:79).

The **autopoietic network** then, is the crucial differentiating factor of the autopoietic system from any other kind of unit, for example a man-made machine such as a motor car.

In a man-made machine in the physical space, there is an organization given in terms of a concatenation of processes, yet, these processes are not processes of production of the components, which specify the car as unity, since the components of a car are produced by other processes, which are independent of the organization of the car and its operation (1980:79)

The biological cell is the paradigmatic example of an autopoietic system as it possesses all the features that define a first-order autopoietic system, that is, it is autonomous, it is operationally closed, it is self-referential, it has its own organization and its own structure and it is capable of structural coupling with its environment. As organisms evolve and become more complex, other forms of autopoiesis arise, namely second-order and third-order autopoiesis where the same basic characteristics or criteria apply, but of higher orders of complexity. Let us start with the basic characteristics of first-order autopoietic systems.

2.4.2.1 First-order autopoietic systems

Autonomy. By autonomy it is meant that a living system is capable of specifying its own laws for its own functioning, independent of its environment. Autonomous systems subordinate all changes to the maintenance of their own organization and do not depend on pre-established or designed

relations (couplings) with their environments whereas non-autonomous systems (i.e. non-living or mechanistic) do, through input/output mechanisms. Autonomy is defined as:

a composite unity by a network of interactions of components that (i) through their interactions recursively regenerate the network of interactions that produced them, and (ii) realize the network as a unity in the space in, which the components exist by constituting and specifying the unity's boundaries as a cleavage from the background (Varela, 1981:15)

Autopoietic systems produce the components and processes, which realize them as unities whereas in allopoietic systems (i.e. the non-autopoietic) the product of their operation is different from themselves. The distinction between autopoietic and allopoietic is the basic distinction between living and non-living systems.

The notion that autopoietic systems have no inputs or outputs is not straightforward because “the system” is specified by the observer and the whole classification of inputs and outputs can be very arbitrary. However, the proponents of autopoiesis theory clarify this issue by saying that a system should be regarded as auto- or allopoietic depending on the context. Autopoietic systems may be treated as being allopoietic when the boundaries of the system are enlarged. “That is to say that the context is the recursion of systems within which the system we study is embedded, instead of being the cloud of statistical epiphenomena generated by our attempt to study it” (Beer in Maturana and Varela, 1980:68).

Organizational closure. Autopoietic systems do not need inputs from the environment to go about their task of self-production. This is one of the major breakthroughs of this theory, which places it diametrically opposed to hitherto mainstream thinking in systems theory. Open systems thinking maintains that systems need inputs, namely energy from the environment, in order to function. This is how Varela (1984:26) perceives organizational closure:

the study of biological systems forces us to consider a complementary mode of description [to the input-output type description], which is based on the fact that some systems exhibit, intuitively speaking, an internal determination of self-assertion. For such autonomous systems, the main guideline for their characterization is not a set of inputs, but the nature of their internal coherence, which arise out of their interconnectedness. Hence the term operational closure (...) Examples of organizational closure abound: nervous systems, immune systems, ecologies, conversations, etc.

Self-reference. The self-referential feature refers to the fact that in their organizational closure, all living organisms make constant use of past knowledge or past experience in order to continue their self-production. Maturana and Varela (1980:25) explain this feature as follows:

The closed nature of the functional organization of the nervous system is a consequence of the self-referring domain of interactions of the living organization; every change of state of the organism must bring forth another change of state and so on, recursively, always maintaining its basic circularity. Anatomically and functionally the nervous system is organized to maintain constant certain relations between the receptor and effector surfaces of the organism

Organization and structure. The distinction between organization and structure is crucial for understanding the nature of first-order autopoietic systems. By “organization” it is meant the necessary relations, which define the system, hence the invariant part of the system. By “structure” it is meant the actual relations between the components, which integrate the system; these can vary provided that they satisfy the constraints placed by the “organization”. Maturana and Varela (1980:76-77) ask the question “what is the organization of living systems, what kind of machines are they, and how is their phenomenology, including reproduction and evolution determined by their unitary organization?” and they provide the answer:

The relations that define a machine as a unity and determine the dynamics of interactions and transformations, which it may undergo as such a unity, constitute the *organization* of the machine. The actual relations, which hold among the components, which integrate a concrete machine in a given space, constitute its *structure*. The organization of a machine (or system) does not specify the properties of the components, which realize the machine as a concrete system, it only specifies the relations, which must generate to constitute the machine or system as a unity

Structural coupling. Changes in autopoietic systems are induced by independent events (signals) and do not depend on inputs or outputs, in the sense used by traditional systems theory. However, systems are not isolated from their environments and they may be stimulated or disturbed by events, which are known as “perturbations”. But such perturbations remain always external to the system and are not in any way allowed to become internal components of it. The environment creates perturbations that can lead to changes in the structure of the system, in accordance with its self-defined organizing rules, but it does not determine, direct or control such changes. Such changes in structure are known in autopoietic terminology as structural couplings.

Autopoietic machines do not have inputs or outputs. They can be perturbed by independent events and undergo internal structural changes, which compensate these perturbations. If the perturbations are repeated, the machine may undergo repeated series of internal changes (...), whichever series of internal changes takes place, however, they are always subordinated to the maintenance of the machine[’s] organization, condition, which is definitory of the autopoietic machines (Maturana and Varela (1980:81)

Structural couplings follow the rule of self-reference and when a history of recurrent interactions between two or more systems is established, such couplings become stable and they may lead to the development of second-order autopoietic systems.

Before going into the ontogeny of autopoietic systems, however, let us look at the last of the key concepts in autopoiesis theory, the concept of the **observer**. “Everything said is said by an observer” (Maturana and Varela, 1980:8). This is one of the most often quoted sentence by these authors, perhaps indicating the relevance and the novelty of the concept. What Maturana and Varela are trying to emphasize is that it is very easy to forget how subjective all observations and all judgements are. We, as human observers are also biological systems and, therefore, we are also subject to all the laws or principles of biological systems we have outlined above. In other words, we are also closed and self-referential systems. Linked to the notion of the observer, there is the closely associated notion of distinction, which is the ability to tell that something is different

from the background. The relationship between the observer and the ability to make distinctions is better understood in Maturana and Varela's (1980:8) own words:

For the observer an entity is an entity when he can describe it (...) the observer can describe an entity only if there is at least one other entity from, which he can distinguish it and with which he can observe it to interact or relate. This second entity that serves as a reference for the description can be an entity, but the ultimate reference for any description is the observer himself.

2.4.2.2 Second and third-order systems

As organisms evolve and in some cases develop nervous systems, the possibilities for the organism to exhibit behaviour are expanded dramatically. The nervous system emerges in the history of living beings as a network of a special type of cell (neurons), which is embedded in the organism in such a way as to couple points in the sensory surfaces with points in the motor surfaces. It participates in the operation of a metacellular organism as a mechanism that maintains its structural changes within certain limits (for example, changes in the heart beat following an upsurge in the flow of adrenaline). Multi-celled organisms are networks of first-order autopoietic systems, which are structurally coupled, operationally closed and which develop their own internal organization (identity) and structure. They exhibit, therefore, all the properties of first-order autopoietic systems (Maturana and Varela, 1987/1992).

Thus the presence of a nervous system allows behaviour to become observable, which, in turn, makes interaction between living beings possible. Such interactions, which can also be called social phenomena are at the basis of a higher level of autopoietic activity. "We call social phenomena those phenomena that arise in the spontaneous constitution of third order couplings and social systems the third order unities that are thus constituted" (Maturana and Varela, 1992:193). Third-order autopoiesis is especially relevant for the purposes of this dissertation as it forms the basis of languaging - the essence of the organization's knowledge system - and for this reason it is worth dwelling on it a little longer.

Social systems are of course not exclusive to the human species. They are to be found in all species endowed with a nervous system and vary in sophistication in close relationship with the species' nervous system complexity. However, what all species have in common is an internal phenomenology, which is unique to that species and which causes uniform patterns of behaviour to appear among the members of that particular third-order unity. Such behaviour patterns usually require reciprocal coordination among the group and it is this coordinated behaviour triggered among the members of a social unity, which Maturana and Varela (1992) call *communication*. Among social insects, for example, the mechanism of structural coupling and of coordination of behaviour takes place through the interchange of chemical substances, called *trophallaxis*. Trophallaxis, then, is communication for social insects. It is worth noting here that in autopoiesis theory, communication is not defined, as is the tradition, as exchange of information, but instead it means *doing* something. Communication has to imply action; in this case, coordinating action.

Communication can be innate or acquired. Innate communicative behaviour depends on structures that arise in the development of the organism independent of its particular history of social interactions, whereas acquired communicative behaviour does depend on such history of social interactions. Learned communicative behaviour constitutes a *linguistic domain*. A linguistic domain, however, is not to be confused with language. Human beings are not the only animals who are able of generating linguistic domains in their social life. Many other species are capable of developing linguistic domains, that is, learned communicative behaviour. There are many well-known examples of highly developed communicative behaviours among, such as that of primates or dolphins. In the words of Maturana and Varela (1992), “linguistic domains arise as cultural drift in a social system with no pre-established design. The process is one of behavioural transformation contingent on conservation of the social system through the behaviour of its components” (p.209), but such transformation of behaviour does not give rise to language.

The domain of language is uniquely human, first of all because it coordinates all social action. Language stands for human being as trophallaxis stand for social insects “social unity is based on “linguallaxis” (a linguistic trophallaxis): a linguistic domain constituted as a domain of ontogenic coordinations of actions” Maturana and Varela (1992:212). Secondly, language is unique to the human species because it is closely related to the notions of consciousness and reflection. To operate in language means to be able to make linguistic distinctions of linguistic distinctions. In other words, it means to be conscious that a word (for example PROFIT) carries a linguistic distinction (for example the contrary of LOSS) and to reflect such awareness back in action. Language enables those who operate in it to

(1) develop and maintain “an ongoing descriptive recursion, which we call the *I*” (op. cit.p.231), i.e. consciousness and

(2) “describe themselves and their circumstances” (op. cit.p.210), i.e. reflection.

Thirdly, language is uniquely human because it generates meaning. Language does not exist as isolated items of behaviour, but must be seen as an ongoing process of *linguaging*. “To an observer, linguistic coordinations of actions appear as distinctions, linguistic distinctions. They describe objects in the environment of those who operate in a linguistic domain. Thus when an observer operates in a linguistic domain, he operates in a domain of descriptions” (Maturana and Varela, 1992:211). The notion of observer and observing is crucial in autopoiesis. An autopoietic process can never be observed from the inside and it must always depend on one (or more) observer for its description. So, linguaging arises when two (or more) observers engage in an exchange of linguistic distinctions, which, in turn, gives rise to *meaning* being created and re-created. And “meaning becomes part of our domain of conservation of adaptation”(op. cit.p.211), as members of the human species.

2.4.2.3 Social Autopoiesis

Turning now to the work of Luhmann (1986;1995) let us see how the autopoietic view of language and languaging has been brought closer to the study of social groups. Following the original work of Maturana and Varela, Luhmann has also developed a three-level classification of autopoietic systems: living systems, psychic systems and social systems. The first level pertains to the functioning of cells and metacellular organisms. Individual human beings belong to the second level and groups of individuals are placed on the third level. The first level uses life as its mode of reproduction while the second and third levels use meaning, which is produced and reproduced over time, also as a mode of reproduction. The basic difference between psychic and social systems, as regards their mode of functioning, is that the first uses consciousness and the second uses communication, as the means to produce and reproduce meaning over time. Consciousness, communication and the production and reproduction of meaning are processes, which are entirely dependent on language.

For Luhmann (1986;1995) social systems are systems of meaning produced autopoietically, that is produced by the social group itself. Meaning is produced primarily by individuals, as psychic systems, through the use of language. But in interacting with other individuals, in the social system, a different meaning may arise around the same object or concept, and the new meaning, which holds true for the group, may not exactly hold true for the individual. Interpretations of the same event may differ (and they often do) between the group and the individual. In other words, social groups develop their own systems of meaning and because social systems are third order autopoietic system, they also become autonomous, operationally closed and self-referential. Social groups acquire their own knowledge and, in this sense, individuals are not part of the autopoietic system, which the group constitutes but are observers placed in the system's environment. Luhmann's conclusions about the primacy of the social system over the individual are not very different from Habermas' (Bran, 1990) notions of the "system" dominating the "life world", but the innovation achieved by Luhmann was in the integration of these concepts into autopoiesis theory, thus opening up a host of new possibilities for the investigation of the behaviour of social groups, for example, organizations.

In order to resolve the problem of how individualized organizational knowledge becomes socialized, i.e. how organizational knowledge is formed, von Krogh and Roos (1995) adopt Luhmann's (1986;1995) view of social systems. Following that author, von Krogh and Roos define social groups (e.g. organizations) as systems of meaning reproduced autopoietically. That is, through communication among its members the group creates its own autopoiesis, which becomes independent from each of the group's members. The system acquires its own knowledge system, which is operationally closed regarding its internal organization, is self-referential insofar as it relies on its historical events to uphold its system of meaning and it becomes structurally coupled with its environment, that is, its internal structure is shaped and changed in the processes of accommodating recurrent "perturbations" coming from the environment.

The only difference between Luhmann and von Krogh and Roos is that for the former the unit of analysis is the social system itself and the individual becomes almost irrelevant, as an entity in the

environment of the social system. Von Krogh and Roos have a problem with this particular feature of Luhmann's theory as one of their main interests lies precisely in the mechanisms, which allow individual knowledge to become socialized (or organizational) knowledge. The solution they have found to solve this particular difference lies in a theory of scaling, which we will look at briefly ahead. However, this should not lessen the importance of the contribution of Luhmann towards von Krogh and Roos' organizational epistemology. Such contribution can be summed up in the following sentence "organizational knowledge when socialized, has to be knowledge of the organization" (von Krogh and Roos, 1995: 64).

Scaling is a process similar to a "zooming" of events up or down in the organization. For example, the organization's strategy can be scaled down to the operational levels and certain events at the operational levels can be scaled up to the strategic level. Such scaling, however, should not be seen as a mechanistic process, which can be divorced from purposeful communication actions. In other words, although scaling exists, naturally, in many organizational activities, the *use* of such scaling depends entirely on managerial action. As von Krogh and Roos (1995: 73) point out scaling simply "provides a language for better understanding knowledge development and the [purposeful] linkage between individualized and socialized organizational knowledge".

"The scale between socialized and individualized organizational knowledge is achieved by means of language", it is argued by von Krogh and Roos (1995: 95). Language is what allows all action to be coordinated in the organization, and such coordination is achieved by means of organizational members making distinctions about the organization, starting with the first and broadest distinction of them all, which is the concept of "organization" itself. Linguistically, the organization has to be distinguished from its environment. The simple emergence of a new entity, in this case the organization, presupposes languaging. Organizational members feel part of the organization they are working for through language, and from this very broad distinction (i.e. the organization from the environment) other finer distinctions can start to be made. For example what are the linguistic distinctions associated with the concept of "product" in this particular organization? We will return to the issues of language and languaging in chapter seven.

2.5 A new methodological foundation: organizational enaction

Sensemaking (Weick, 1969;1979;1995) belongs to a school of thought in organizational methodology, which broadly can be called *interpretivist*. It views organizations not as rational systems - groups created for the pursuit of specific goals and with highly formalized social structures (Weber, 1947); nor as natural systems - collectivities whose participants cooperate towards the survival of the system (Barnard, 1938/1965) ; nor does it view organizations as open systems - coalitions of interest groups who activities and structure are strongly influenced by the environment (Katz and Kahn, 1965). Instead, it views organizations as interpretation systems, systems, which scan, interpret, learn and "enact" their environment (Daft and Weick, 1984), that

is, organizations “create an environment that people can comprehend and manage” (Weick, 1995:165).

Weick (1995:133) defines sensemaking as follows:

Sensemaking is about the enlargement of small cues. It is a search for contexts within which small details fit together and make sense. It is people interacting to flesh out hunches. It is a continuous alternation between particulars and explanations, with each cycle giving added form and substance to the other. It is about building confidence as the particulars begin to cohere and as the explanations allow increasingly accurate deductions

He describes sensemaking in terms of seven properties: (1) Grounded in identity construction. (2) Retrospective. (3) Enactment. (4) Social. (5) Ongoing. (6) Focused on and by extracted cues. (7) Driven by plausibility rather than accuracy. We will not comment upon all the properties, but only on one - enactment or enaction. The reason why we propose to comment on this property alone is that it provides an important key for understanding our methodological approach to organizations - the interpretive approach. But before embarking on that task, let us first try to understand Weick’s conceptualization of organizations. For that author, organizations are

social structures that combine to the generic subjectivity of interlocking routines, the intersubjectivity of mutually reinforcing interpretations, and the movement back and forth between these two forms by means of continuous communications. Tensions between the innovation of intersubjectivity and the control of generic subjectivity animate the movement and communication (1995:170)

Let us start with the notions of generic subjectivity and intersubjectivity, which can be confusing. Sensemaking activity above the individual level of analysis can be divided into three levels: the intersubjective, the generic subjective and the extrasubjective. The level of intersubjective meaning happens when at least two persons communicate their thoughts, feelings or intentions, moving the interaction from the “I” state to the “we” state. The intersubjective level is the level where “social reality” begins to emerge. The next is the generic subjectivity level, which corresponds to social system and includes organizations. At this level, interacting human beings are no longer present. “Social structure implies a generic self, an interchangeable part - as filler of roles and follower of rules - but not concrete individualized selves” (Wiley, quoted in Weick, 1995:71). Such a conception of the social system is very similar to Luhmann’s (1995) where people are no longer part of the autopoiesis of the social group. At the top of the pyramid there is the third level - the extrasubjective - a level of symbolic reality, which we might associate with culture or with the institutional realm. This third level is not featured in Weick’s definition of organization above, but we can take it to be the same as Schein’s (1992) basic level of organizational culture, i.e. the organization’s unconscious, taken-for-granted beliefs, thoughts and feelings.

According to Weick, organizations are adaptive social forms. As intersubjective forms they create, preserve and implement the innovations that continually arise from personal interactions. As forms of generic subjectivity, they exert control over the energies generated by such

innovations. This, in turn, resembles the conception of organizational languaging (von Krogh and Roos, 1995), which also has a duality of valences: on one hand it can enable innovation through the development of new forms of languaging, but on the other hand, it inhibits innovation given its organizational closure and self-referential properties. Hence, there is a tension between the two forms of subjectivity inherent in the attempt to reconcile the innovation afforded by intersubjectivity with the control exerted by generic subjectivity. Such tension is animated by communication, because “communication activity *is* the organization” (Weick, 1995:75, emphasis added).

Related to the use of a common language, there is the phenomenon of “mutually reinforcing interpretations” in Weick’s definition of organization. Frequent interpersonal communication about work has to reinforce shared meanings and make participants more mutually dependent and their activities more mutually predictable, thus increasing intersubjectivity and generic subjectivity. Lastly, there is the phenomenon of interlocking routines. The notion of interlocking routines is linked to the notion of interchangeability of people in organizations, that is, by continuously reinforcing generic subjectivity through “habituated action patterns” or interlocking routines, people can substitute for one another in carrying out organizational tasks. Interchangeability of people is obviously important due to staff turnover, rotation of personnel and many other operational reasons, so pressure exists in organizations towards the formation of generic subjectivity. Hence, by developing generic subjectivity organizations develop two types of control mechanisms: the interchangeability of people and premise control. These controlling structures, in turn, “dominate the more intimate intersubjective interactions where innovations in arguments, expectations, justifications and objects are formed” (Weick, 1995:170).

How can sensemaking theory help towards a better understanding of organizations? In the first place, sensemaking explains how the organization’s knowledge is formed and, in the second place, it provides a framework for understanding organizational knowledge development. Thus, we can talk of sensemaking as a mechanism operating at individual, organizational and extra-organizational level to create knowledge systems. In the case of organizations, the knowledge system is the result of a cumulative process of individual and collective construction of organizational reality, through a continuous interpretation and re-interpretation of the environment (internal and external).

Through Weick’s notions of the innovation property of intersubjective formation of meaning and the control property of meaning formation through generic subjectivity, we can draw interesting conclusions about the forces for and against learning or knowledge development in organizations. Intersubjective formation of meaning is concerned with the interaction of dyads and is the principal locus for the informal development of relationships, including all forms of work processes. Meaning formation through generic subjectivity, on the other hand, is more likely to be framed within the formal side of organizational relationships. Given that intersubjectivity is associated with innovation (i.e. knowledge development) and that generic subjectivity is associated with control (i.e. the cultural forces towards the maintenance of the status quo), we might infer that the tension between informal, face-to-face relationships and formal,

depersonalized relationships is parallel to a similar tension between knowledge development and the cultural status-quo in organizations.

Let us now try to understand the concept of enaction. For Weick, the concept of enaction seems to carry two meanings. In his earlier writing, Weick (1977) uses the concept to explain how the boundaries between the organization and its environment are not as clear cut as much of the open systems literature made them out to be. He argued then that “organizations are more active in constructing the environment that impinge on them than is commonly recognized. That is, organizations often impose that, which subsequently imposes on them” (1977:267). In his later writing Weick (1995) continues to place much emphasis on the more static meaning of the concept, i.e. enaction as a result of a legislative act - “I like the word [enactment] because it suggests that there are close parallels between what legislators do and managers do. Both groups construct reality through authoritative acts” (1995:31).

In saying that managers “construct reality through authoritative acts” Weick appears to be indicating that managers, in exerting their *choice* in terms of strategies, policies or procedures and imposing such choice upon the organization, are co-determining the enaction process. It is true that when a manager enacts strategies and policies she takes “undefined space, time, and action and draw lines, establish categories and coin labels that create new features of the environment that did not exist before” (1995:31). However, enaction does not stop here. The reality constructed by organizational members, at the local level and around such new features, is not the same as the reality that the manager had in mind and wished to construct in the first place.

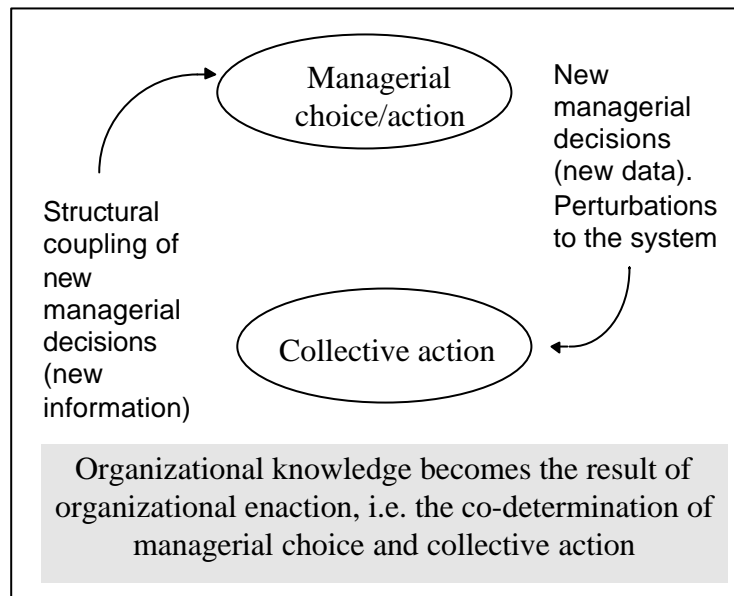
So, an important distinction must be made at this juncture: enaction in organizations can be seen at two levels of discourse and using the two meanings of the word. Enaction can be the beginning of a process through a static managerial decision or *choice*, giving rise to *managerial action*. But it is also an outcome of a dynamic process of sensemaking involving all organizational members and not just the managers. This second step, which we have called *collective action*, includes everything that the organization knows and does. Thus, enaction is the basis of the organization’s *knowledge system*.

These two meanings, corresponding to two notions of enactment, are by no means independent. Instead, they are both part of the overall autopoietic state of the organization. Recalling von Krogh and Roos (1995), these authors explain that organizations, as autopoietic systems, are open to data but closed to information. Using this distinction, we might think of the “static” part of enaction as new data, which is allowed into the system and which, for a length of time, amounts only to “perturbation” for the system. After a number of recurrent interactions between the new perturbation and the system, the new data slowly turns into information by becoming structurally coupled to the system. In other words, managers create data while collective action within the organization creates information. To this relationship between managerial choice and collective action, based on the dual meaning of the enactment concept, we have called the *organizational enaction process* (see Figure 2.3).

Conceptually, the organizational enaction process is very close to the process of embodied cognition as defined by Varela et al.'s (1991:173), i.e. that

- (a) perception consists in perceptually guided action and
- (b) cognitive structures emerge from the recurrent sensorimotor patterns that enable action to be perceptually guided

Figure 2.3 - The organizational enaction process



And it is also very similar to the process of structuration studied by Giddens (1979; 1984), the notion of the hermeneutic circle as described by Inrona (1997) or the method of dialectical analysis discussed by Morgan (1997).

2.6 Summing up

Although it still needs further work towards becoming a fully-fledged paradigm for organizational analysis, autopoiesis is a very attractive approach because it offers explanations that are much closer to the “reality” of organizations than, for example, open systems theory. The open systems orthodoxy in management research has difficulty in explaining, for example, why the “unlearning” of old routines (Hedberg, 1981) is so difficult to achieve. It can also explain why success is the “worse enemy” of successful companies and why there are so many cases of very successful companies, which suddenly founder. The paradigmatic example of this is the case of IBM in the early 1990s (Lloyd, 1994; Mills and Friesen, 1996).

In drawing attention to the autonomous, operationally closed and self-referential nature of organizational systems, autopoiesis theory brings new support to the resource-based approach to business strategy. If organizations are essentially closed to new information (as opposed to data) their internal growth in terms of knowledge and learning has to come from within. The environment as provider of new knowledge in the form of a constant flow of inputs into the system, as proposed in the writings of Simon (1945; 1997) and his followers, loses much of its previous relevance.

One of the authors who has pioneered the exploration of autopoiesis as a tools for organizational analysis is Morgan (1997). Among his well-known organizational metaphors, Morgan has one, which is partly based on autopoietic systems theory: “organizations as flux and transformation”. Based on Bohm’s duality of the implicate (enfolded) and the explicate (unfolded) orders of the

universe, Morgan argues that in order to discover the “secrets” of the organization, we have to understand the generative processes that link implicate and explicate orders. The “flux and transformation” metaphor is very insightful as it addresses one of the most difficult of organizational “secrets”: the dichotomies. Organizational life is filled with dichotomies: the formal versus the informal organizational structure, the rational versus the intuitive behaviour of managers or the dichotomy between the understanding (planning) and the doing (acting).

All these are problems, which the open systems orthodoxy in organization science cannot solve. But with autopoietic systems thinking translated into Morgan’s “flux and transformation” metaphor, we may begin to find plausible explanations for many of the hitherto intractable organizational “secrets”. Thus, we may be able to argue, for example:

- (1) the idea that organizations as social systems do not necessarily tend towards stability and equilibrium, or
- (2) the notion that organizations are not exclusively open systems with clear boundaries between the organization and the environment, or still
- (3) the model of organization as an input-output mechanism with clear relationships between internal changes and changes in the external environment is largely a misconception

In the next chapter, we will leave the epistemological realm and will enter a more pragmatic domain: management. We will be looking at the management literature in search of the intellectual justification for the view of IS implementation as managerial action, the second part of our definition of IS organizational implementation (see Introduction to this chapter). Managerial action is a managerial doctrine, which stands at a mid-point between a top-down view of managerial rationality and a bottom-up position of emergent, collective action.

Chapter 3

The managerial underpinnings of the *organizational* approach to IS implementation: managerial action, organizational culture and climates

Management is, above all else, about achieving results through people. Not that there is no value to crunching numbers, analysing trends, or restructuring activities. But these traditional responsibilities have, far too long, distracted managers from their most basic and most valuable role - being able to attract, motivate, develop and retain individuals with scarce and valuable knowledge and skills. It is a role that is, at the same time, both enormously simple and incredibly difficult
(Ghoshal and Bartlett, 1998:318)

Chapter 3 summary

- ? 3.1 Introduction
- ? 3.2 Managerial action: the key influences
 - ? 3.2.1 The management pioneers
 - ? 3.2.2 Chris Argyris' (1977,1978,1985,1996) action theory
 - ? 3.2.3 The postmodern turn in the managerial paradigm
 - ? 3.2.4 The innovation of Ghoshal and Bartlett (1993;1994;1998):
a managerial theory based on action
- ? 3.3 Organizational culture, climates and contexts
 - ? 3.3.1 Organizational climates or organizational contexts?
 - ? 3.3.2 The dimensions of organizational climate
- ? 3.4 Organizational culture, organizational knowledge and organizational learning: what is the relationship?
- ? 3.5 Summing up

† † †

3.1 Introduction

In this chapter we put forward managerial action as an appropriate doctrine to understand and to carry out the *organizational* approach to IS implementation. We do not claim that it is the only doctrine, but we argue that it is the doctrine, which best embodies the organizational epistemology informed by autopoiesis and related theoretical frameworks. Furthermore, we argue that an organizational approach with a managerial action orientation is missing from the body of knowledge of information systems in general and of information systems implementation in particular.

S. Ghoshal and C. Bartlett are the major influence behind our interpretation of the managerial action approach. These authors have published a number of articles together (Bartlett and Ghoshal, 1993; Bartlett and Ghoshal, 1994; Ghoshal and Bartlett, 1994) and with other authors (Ghoshal and Moran, 1996; 1996a) and very recently have published a book (Ghoshal and Bartlett, 1998), which contains the gist of their proposals towards a new management philosophy. The key articles, however, are those published in 1993 and 1994 in the *Journal of Strategic Management* and they form a sequence, which is the basis of a new theory of the firm those authors have put forward under the label of “managerial theory of the firm”.

While these authors are clearly within the framework of the resource-based approach to the firm, they go further than other authors within the same school of thought as they committed to making a contribution regarding the HOW question. In other words, how should we, as managers, intervene in organizations so that they may become more efficient, more humane and eventually more competitive? The answer to this question, on an epistemological level, can be found in a closed loop made up of two forces: managerial choice/action and organizational context/collective action. The essence of this closed loop has already discussed in the previous chapter, under the notion of organizational enactment.

Joyce and Woods (1998:51) suggest that in strategic management there is an emergent ‘new modernist’ approach between the two opposing camps - the modernist and the postmodernist. They claim that:

the new modernist approach extends the effectiveness of rational planning by accommodating the defects of modernist thinking. It deals more plausibly with chance and unpredictability and with the need to gain commitment. It is more flexible than modernism as it does not lead to a “locking in” of strategy as environment and experience change, while at the same time being more optimistic about planning than postmodernism is. Simply put, senior managers who reflect and think about the future, and act upon those reflections, will be more successful than those who do not

Ghoshal and Bartlett can be said to be aligned with this kind of thinking, but they go further in the direction of the “need to gain commitment”, as do other important management thinkers (for example, Nonaka and Takeuchi, 1995 or Handy, 1997). Ghoshal and Bartlett talk about leadership and adopt a position of “back to basics” regarding the business of management, thus returning the figure of *the manager* to centre-stage of the theorizing about management, in the tradition of

management pioneers such as Mary Parker Follet (1924), Chester Barnard (1938), Peter Drucker (1955), Philip Selznick, (1957) and Burns and Stalker (1961). In this respect, Ghoshal and Bartlett follow the advice of one of the founding fathers of strategic management theory, Alfred Chandler (1962), who argued that such theory should be developed “from the point of view of the busy men responsible for the destiny of the enterprise rather than being deduced from the disciplinary premises of social scientists” (in Ghoshal and Bartlett, 1993:25).

Going “back to basics” can be said to be one of the tenets of postmodern thinking. In this chapter, we will also approach the issue of the “scientification” of management and explain how there seems to be a trend towards a more situated and action-oriented perspective in academic management circles. Such trend is, in many ways, in line with autopoiesis theory and enacted cognition, discussed in the previous chapter. We will also try to show how Ghoshal and Bartlett’s managerial theory is aligned with such trend, albeit perhaps not consciously.

But the “middle-ground” position and, therefore, the ‘managerial’ action approach has another set of very influential origins, in the writings of Chris Argyris and Donald Schon (1978;1996). These authors claim that by leaving out what actually happens during the implementation of strategy (within the rational view) or during the integration of emergent strategy (within the emergent view) “both perspectives tend to ignore a crucial element of strategic management: the *realtime* microactions through which managers respond to the challenges to implementation or to integration” (1996:255). Furthermore, they state that “The action proposals of the authors on both sides seem to have been afterthoughts of theorizing; they are described as though they were self-evident, if only the right prescriptions were followed or if only managers were able to manage without interference”(1996:253).

As a result, these authors conclude, both the proponents of the rational and the emergent views tend to be inattentive to the *defensive routines*, which are omnipresent in all corporate activities. Defensive routines, in turn, are defined by the *theory of action*, which is held by each player in any organizational interaction. The problem is that to the majority of organizational members, their true theory of action is not known, at a conscious level. The basis of Argyris and Schon’s (1978;1996) action theory is then to surface and make known to each organizational members his or her true theory of action, so that defensive routines can be avoided. Although very deep in psychological reasoning and full of insights into interpersonal relationships, it will shown why such theory cannot serve as a basis for an approach to *collective* action.

Organizational culture and organizational climate(s) have become one of the centres of attention of the academic management literature since the publication of Peters and Waterman’s (1982) *In Search of Excellence*. This book, although considered by many as “unscientific” or as not very sound academically, has nevertheless made a great impact in the academic world due to its down-to-earth approach substantiated by valuable evidence from real companies. Since then, there has been an explosion of interest on this topic with contribution from disciplines outside management, namely social anthropology and social psychology.

We have already discussed organizational knowledge and learning in chapter two, but what about organizational culture ? Is it the same as organizational knowledge? Schein (1992:12 added emphasis) defines organizational culture as follows:

a pattern of shared basic assumptions that the group *learned* as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be *taught* to new members as the correct way to perceive, think, and feel in relation to those problems

Looking at this definition, it is hard to say where the notion of organizational culture stops and where the notion of organizational knowledge begins. In fact, Allaire and Firsirotu (1984) suggest that according to the Cognitive school of thought, organizational learning, as well as organizational climate, are sub-themes of the broader field of culture.

In this chapter we will try to make sense of these competing concepts, including the distinction between organizational climate and organizational culture. As Denison (1996) explains:

Climate refers to a *situation* and to its links to thoughts, feelings and behaviour of organizational members. Thus it is temporal, subjective and often subject to direct manipulation by people with power and influence. Culture, in contrast, refers to an evolved *context* (within which a situation may be embedded). Thus, it is rooted in history, collectively held, and sufficiently complex to resist many attempts at direct manipulation (p. 644)

Moreover, he adds that the culture and climate research traditions

should be viewed as differences in *interpretation* rather than differences in the *phenomenon* (p. 646)

and that these two areas of study

actually address a common phenomenon: the creation and influence of social contexts in organizations” (p. 646).

In this chapter we will not attempt even to “scratch the surface” of this lively debate, but we feel it important, at least, to apply some sensemaking to it. Our aim is, firstly, to understand the notions of organizational culture, climates (and contexts?) and their links to the managerial action tradition discussed in this chapter. Secondly, in the wake of Ghoshal and Bartlett’s theory, we intend to find out how the notions of culture and climate can be used to make managerial action an operationalizable framework.

3.2 Managerial action: the key influences

3.2.1 The management pioneers

Mary Parker Follett (1924), a relatively unknown pioneer of management had some extraordinary insights into the idea that managerial action is central to the whole process of managing

organizations. The centrality of the idea has to do with the notion that action implies “enaction”. In other words, when we do something we immediately create something else and that something else inevitably affects what we do next. Formulated in a different way, Follett’s view of cognition is that people receive stimuli as a result of their own activity. Such a view, expressed back in the 20s, is identical to that expressed by much more recent authors in the field of the cognitive sciences (Varela et al., 1991) and in the organization sciences (von Krogh and Roos, 1995). Weick (1995) claims that Follett was the first author to study and apply an “enactive” approach to cognition in organizations.

The activity of the individual is only in a certain sense caused by the stimulus of the situation because that activity is itself helping to produce the situation, which causes the activity of the individual. In other words, behaviour is a relating not of “subject” and “object” but of two activities. In talking of the behaviour process we have to give up the expression “act on” (subject acts on object, object acts on subject); in that process the central fact is the meeting and interpenetrating of activities. What physiology and psychology now teach us is that part of the nature of response is the change it makes in the activity, which caused so-to-speak the response, that is, we shall never catch the stimulus stimulating or the response responding (Follett quoted in Weick, 1995:32)

Chester Barnard (1938/68) was the first organizational theorist to come not from academia but from the world of management practice. This gives his writing a true “managerial” flavour in the sense that he makes a strong case for the responsibility of the company’s executive in creating a “work ethic”, which will lead people to cooperate willingly and for the benefit of the organization. The “vitality” of organizations depends upon the willingness of individuals to contribute their efforts towards the cooperative system, that is, to the organization. Barnard emphasized the point that what constitutes organizations are not people but the acts or actions or influences (i.e. the “forces”) of persons. He compares the organization to an electromagnetic field: people are to the organization the same as electromagnetic forces are to the electromagnetic field. The electromagnetic field can only be identified when an electromagnetic force is applied to it, otherwise the electromagnetic field does not exist. Similarly, the organization is only identifiable when people apply their energies (actions) to it or when certain phenomena occur as a direct result of such application of energies. However, “neither the persons nor the objective results are themselves the organization. If they are treated as if they were, inconsistencies and inadequacies of explanation of phenomena ensue” (p.76)

In this respect, Barnard’s approach to organization is remarkably similar to the view held by supporters of organizational autopoiesis, in the sense that individuals are considered to be outside the autopoiesis of the organization. The organization is a unity in its own right, with its own languaging and its own knowledge made up of cognitive and of emotional elements. Considered in this light, we can say that the organization’s autopoietic knowledge (including the willingness to cooperate) is the essence of Barnard’s central notion of the “work ethic”.

Together with the “willingness to serve”, Barnard singles out “purpose” and “communication” as the key elements of organization. Regarding purpose, he makes a clear distinction between organizational purpose and individual motive and claims that with rare exceptions the two are not

identical. In order to get individuals to cooperate, organizational purpose must be translated into inducements or motivating factors, which will enable organizational members to find satisfaction of some of their personal needs in helping the organization achieve its aims. Another key mechanism that is offered as a means of bridging the gap between organizational purpose and individual motive is communication, which is not just about the spoken word. Perhaps, the most important part of communication is unspoken and is dependent upon mutual understanding or mutual acceptance. Barnard talks about an “observational feeling”, which he describes as a capability developed by some organizations whereby, for example, “decisions are arrived at and acted upon without having ever been formulated by anybody”. Such a capability, which Ghoshal and Bartlett (1993,1994) refer to as the “feel of the place” must be very close to the modern day constructs of organizational climates or contexts.

Burns and Stalker (1961) became well known for their work on technical innovation and their distinction between mechanistic and organic management systems. It is worth recalling such dichotomy, not only because it is still relevant today but especially because the organic system which, back in the 1960s, seemed to be the most appropriate for turbulent and fast-changing environments, in the environmental conditions of the late 1990s is the only system that makes sense.

Two important points about Burns and Stalker’s writings: (1) They emphasize that the mechanistic versus the organic distinction does (or did) in fact exist in real companies, that is, it is based on extensive empirical work and it is the result of speculation by sociology theorists. (2) More importantly, they claim that each of those management systems would establish itself as a “code of conduct” in the company and determine the kinds of formal and informal relationships, which developed as the result of the day-to-day functioning of the organization. This notion, very similar to Barnard’s (1938/1968) notion of the “work ethic”, is explained as follows:

The differences between the two kinds of management system seemed to resolve themselves into differences in the kind of relationships, which prevail between members of the organization, whether of the same or of different rank and thus into the kinds of behaviour, which members of an organization treat as appropriate in their dealings with other (...) The observable way in which people in a concern dealt with each other - the code of conduct - could therefore be regarded as the most important element in a concern’s organization, given the structure of the management hierarchy and the skills and other resources at its disposal. It expresses the framework of beliefs, which decision-making invokes. In a realistic, operational sense, it *is* the organization (Burns and Stalker, 1961:10)

3.2.2 Chris Argyris’ (1977,1978,1985,1996) action theory

The notion of “action” in managerial parlance has been strongly influenced by the writings of Argyris (1977), Argyris, Putnam and Smith (1985) and Argyris and Schon (1978;1996). Together, these writers have put forward an “action theory”, which has a very specific meaning but which has often been confused with other more general approaches also bearing the “action” label. For Argyris and colleagues, action means individual action and not group or collective action. It means that each individual manager operates from one of two theories of action: an espoused theory or a

theory-in-use. A starting assumption of the interventionist approach modelled upon this body of knowledge is that learning in organisations is a paradox. On the one hand, organisations can only learn through individual members, but on the other hand, organisations create constraints that prevent their individual members from learning, by leading individuals into the creation of defense mechanisms.

There are two types of managerial (and organizational) behaviour: Model I behaviour, a consequence of an espoused theory of action and Model II behaviour, which results from a theory-in-use type of action. An espoused theory of action in non-technical terms, means preaching one doctrine and acting in accordance with a very different doctrine. People in organisations are very often pressured into saying and doing not what they think is right, but what is right for the company. With time, this process becomes internalized, meaning that, on the surface, organizational members are unaware that they do not use the theories that they explicitly espouse and few are aware of the theories they actually use. However, through some deep emotional or psychological mechanism, individual organizational members find it necessary to justify for themselves the behaviours, which they practice as opposed to the behaviours, which they preach. This process of self-justification is the process of creation of defense mechanisms. Such organizational defense mechanisms, in turn, have as a consequence the locking in of Model I type of behaviour, meaning that change becomes very difficult as it interferes with the innermost emotions and psychological make-up of the individual. The solution to this problem, then, involves some sort of intervention usually in the form of an external consultant, designed to unlock the undesirable behaviour and to replace it by the Model II variety.

Model I behaviour is founded upon four basic “governing variables” (Argyris, 1977): (1) that one must achieve one’s goals as one sees them; (2) that one must win rather than lose; (3) that one must minimize eliciting negative feelings in relationships and (4) that one must be rational and minimize feeling or showing emotions. Such governing variables lead to behaviour, which makes one feel safe, in control of others, and requiring minimal confrontation and emotionality. From the studies carried out by Argyris and colleagues by means of interviews with hundreds of managers, it was shown that overt behaviour was not only non-confrontational but also in direct contrast with the person’s inner feelings. However, because subordinates too conceal their true feelings and emotions in interacting with the manager, the end result is a guessing game of who is feeling what, with both the manager and the subordinate trying to manipulate the situation as best they can. Model I behaviour is “self-sealing” and leads to single loop learning, that is, people set up the situation to confirm their own premises. Seen from the view point of autopoiesis theory, this is the normal way for cognition to happen, that is, knowledge is self-referential.

Model II behaviour is put forward as the solution to single loop-learning. Argyris’ proposition is that if managers could adopt a different set of premises about human relationships, organizations would be more effective because learning in them would be enabled. The proposed new premises for organizational action, then, are as follows: (1) it should be based on valid information; (2) it should be based on free and informed choice; (3) it should be based on internal commitment to the choice and on the permanent monitoring by each individual of her own efforts to implement such a

choice. This is the recipe for the so-called double-loop learning or the “learning how to learn” techniques, typical of the American style Organization Development (OD) interventions designed to build up interpersonal competencies (French and Bell, 1995).

For Argyris and colleagues, knowledge structures are embedded structures in individuals in organizations, which can be described as systems of rules for action. In order to study these knowledge structures it is necessary to surface such rules. The rules themselves cannot be surfaced because they are hidden and unwritten, but we can easily detect the outcome of the application of such rules through action. Argyris’ proposal is that by uncovering the theory of action, which lies behind the behaviour of each manager, i.e. by discovering her theories-in-use (as opposed to her espoused theories) it is possible to change such theories, and if this process could be extended to all the managers, then the organization would be much more effective. However, this process of going “inside the minds” of managers is, in itself, highly problematic because it tampers with people’s innermost emotions and requires them to be more open and more ready to share feelings, perceptions and assumptions. It is problematic because it is intimately linked to national cultural values and to how people are expected to behave in society in general (Magalhães, 1984).

One of the followers of Argyris and Schon (1978;1996) in strategic management is Normann (1985). That author claims that “what we need is an action theory for implementation - for mobilizing and focusing energy throughout an organization” (p.247). According to that author the only way to do so is by reconstructing the invisible theory of action that each organizational actor holds. And that can only be achieved by asking the actor about her own beliefs on a variety of organizational situations. The theory of action refers to what people actually do, not to what people say they do. In order to research such theories, Normann recommends a clinical approach where the researcher tries to make sense of the “real” behaviour of each organizational actor by a variety of methods, such as direct observation, a survey of the actor’s expressed intentions and research into the historical influences upon the actor’s behaviour.

Another problem with this type of approach, but now on an epistemological level, is the question of organizational power. The suggestion that once all the managers have been changed into Model II-type of behaviour, then the organization as a whole will follow suit, just cannot happen in such a way. This is due to the fact although each individual relationship can be changed in a psychologically secure environment of a consultancy meeting, when individuals are put together in “real world” groups, a host of new (power) relationships develop all the time, and behaviour becomes impossible to predict. Defense mechanisms can be down at one point in time but they will be up again as soon as a new element is introduced in the organization’s power network and that can happen at any time. “The manager, as a manager, is already one of the prime effects of power. The manager can never get out or distance herself from the circular grid of power. This is part of being-in-the-world. To rise above power is a useless abstraction” (Introna, 1997:144). So, the answer is to accept power as something endogenous to the organization and, which can never be fully, analysed, dissected or controlled.

In our view, what managers should focus their attention on, therefore, is not on how open or truthful each organizational relationship is but on something, which hangs high above all power relationships like a large umbrella: the organization's "constitution" (Nomann, 1985), or "work ethic" (Barnard, 1938/1965) or "codes of practice" (Burns and Stalker, 1961). We take a "constitutive" approach to organizational knowledge development, meaning that the organization and, therefore, its knowledge is always being constituted by the actions of all the individuals involved. Such constitution is made up of the "linguaging" of the organization, which is what enables distinctions and value judgements to be carried out on daily organizational life (von Krogh and Roos, 1995). Autopoiesis theory tells us that values and facts are inseparable in the formation of knowledge and, in indeed, values precede facts in action - "our mood or *emotioning* is an ever-present background to our use of language. It conditions our stance or attitude (are we happy or sad, caring or self-concerned, deferential or confident, angry or upset?) and thereby the course of our conversation [i.e. action]" (Mingers, 1995:79).

Hence, Argyris's theory of action is less useful for prescribing organizational learning and organizational change than it is in drawing attention to the emotional basis of theories-in-use and to the difficulties involved in changing cultural values. Behind organizational values, there are human emotions and emotions are the building blocks of social organizations, as Maturana (1988) has shown. The problem of espoused theories versus theories-in-use and of the games of concealment of feelings and guessing of intentions in organizations, all have to do with the rationalist ethos. In western world societies at least, we have evolved in a paradigm, which encourages the separation of logic from emotion and this, in turn, can only give rise to hypocrisy or insincerity in all types of social systems. Maturana explains (1988:68):

A social system, in which the emotional contradiction hidden by the hypocrisy or insincerity in which some of its members live becomes apparent, either disintegrates immediately, or it undergoes a structural change that results in the disappearance of the insincerity of its members, or hypocrisy hides again the emotional contradictions, or it goes on with the exclusion of its insincere members. In other words, a social system can persist in the presence of hypocrisy of some of its members as long as these continue performing the actions of mutual acceptance, but it is unstable because insincerity always shows up in conflicting actions due to the emotional contradictions entailed in hypocrisy. In other words, it is the behaviour of mutual acceptance between the components of a social system, not their sincerity that is essential for its continued realization

3.2.3 The postmodern turn in the managerial paradigm

The activities of organizing and managing inevitably are a reflection of what goes on in society at large. As the traditional explanatory paradigms for society and social life change, the frameworks that govern organization and management must change accordingly. But, what is it that is changing in society at large? According to Lyotard (1984), the two major intellectual trends, which have influenced our understanding of the "the social bond" has failed. The Marxist trend, supported by the critical theorists from the Frankfurt school of thought has failed. This trend explains the social bond as the result of a permanent conflict between opposing forces in society (capital and labour). The main reason for such failure is that the class struggle between work and capital has been absorbed by the existing advanced forms of liberal democracy and turned into a

regulator of the system (Lyotard, 1984). An example of this is the changing behaviour of the trades unions and their links with the established political forces.

The other intellectual trend is represented by Talcott Parsons (Parsons and Smelser, 1956) and the functionalist school of thought. The functionalist view explains the social bond as a result of forces of order and integration inherent to society, which work permanently towards making society holistic and functional. However, it is no longer possible to accept that society is a functional whole. The dysfunctional elements are prevalent and are clearly visible in every manifestation of social life: unemployment, drugs, crime and general social unrest. Society is no longer led by the traditional leaders, such as the church, the government, the professional groups, but by forces, which are increasingly beyond the grasp of the ordinary person. Global corporations, international capital markets and invisible market forces are the institutions which lead society and over which society seems powerless most of the time. In other words, people have become *alienated* from the society that they live in.

This search for the nature of the social bond has led to the so-called postmodern movement. According to postmodern writers, such as Foucault, Lyotard and others, the old models of society no longer apply. They served their purpose by making sense of social life at the time that they were put forward, but the world has moved on and new models are needed. But, if neither the uniting nor the dividing properties of society constitute the social bond then, what does? We need a new discourse, which focuses on what actually happens in the way society works, and not on abstract generalizations. We need to focus on the force behind all social interactions. According to Foucault, such a force is to be found in power and in networks of power. Power is a force, which does not reside in any particular person or any particular institution, but which is found in the relationships between persons or between institutions. And because all social interaction is based on relationships, power influences all social interactions, through relationships.

The quotation below, by Lyotard, shows the importance of a renewed view of power, in all social settings.

Young or old, man or woman, rich or poor, a person is always located at “nodal points” of specific communication circuits, however tiny these may be. Or better: one is always located at a post through which various kinds of messages pass. No one, not even the least privileged among us, is ever entirely powerless over the messages that traverse and position him at the post of sender, addressee or referent. One’s mobility in relation to these language game effects (language games, of course, are what this is all about) is tolerable, at least within certain limits (and the limits are vague)” (Lyotard, 1984:15)

Let us take, as an example, the power held by a manager. In interacting with a normal subordinate, such power will take a particular form, but in interacting with a subordinate with whom this manager had a previous social relationship, the form or feeling of power will change radically. In the field of management, more and more of this kind of thinking is filtering in, and one of the most enlightening increments to the existing body of knowledge is the work by Introna (1997).

Introna explores the concept of organizational power in the context of management information. This work is influenced by Foucault and builds on the pioneering work of Stewart Clegg (1989) on power in organizations. Introna rejects the conventional conceptions, which view power as something that (1) is possessed (e.g. by individuals, by a social class, by the people); (2) flows from a centralized source from the top to the bottom (e.g. the law or the state); (3) is primarily repressive in its exercise (i.e. backed by legal sanctions). Instead, he defends power as something that is endemic in human relationships, which can best be described as a network of force relations. He states (1997:127-128):

- ? power is not essentially repressive. It plays a directly productive role; it is multidirectional, operating from the top down but also from the bottom up
- ? action implies actions of the other; acts imply counter acts. The existence of power relationships depends on a multiplicity of points of resistance which are present everywhere in the power network

The views that power plays a “directly productive role” in organizations and that “action implies actions of the other; acts imply counter acts” are novel within traditional managerial parlance. Power and institutional politics, often regarded as something negative and even harmful to organizational effectiveness are, in fact, the driving force behind the organization’s self-production process. In the light of autopoiesis theory, power is part and parcel of the concept of organization. Organizations self-produce by means of power relationships and managerial action influences and is influenced by such relationships. The notion of power as a “network of relations” also focuses the mind on the foundational characteristics of dyadic relationships. In other words, organizations are made of a myriad of dyadic relationships, each with a unique power composition. This is consistent with the notion from autopoiesis theory that systems are “unities whose organization is defined by a particular *network* of processes (relations) of production of components - *the autopoietic network*” (Maturana and Varela, 1980:79).

This brief discussion on organizational power and of the role of autopoiesis theory therein is fundamental for an understanding of the nature of organizations and the relationship between organization and ?managerial? action. Hence, managerial action, power and the act of organizing are concepts, which are totally enmeshed and which cannot be dissociated from each other, in the light of autopoiesis theory. Organizations self-produce by means of power relationships and managerial action influences and is influenced by such relationships.

In line with the evolution in the views of cognition, discussed in chapter two, we believe that a similar evolution exists in the field of management, with many parallels between the two. Introna (1997) traces the origins of the word “management” to the Latin word “manus” and explains how the Cartesian subject-object dualism has separated the present-day concept of management from its original roots. Just as Descartes clearly separated and demarcated the rational subject (*res cogitans*) from the objective world (*res extensa*), management thinkers over the years have also separated the rational manager from the tasks being managed (including the workers). Just as Descartes emphasized laws, theories and models (representations of reality), modern

management emphasizes the creations of maps (plans, policies and standards), which must correctly represent the situation of the firm. Introna makes the distinction between management and *manus* - management is the hand that is “distant, cold and clean” whereas *manus* is the hand that is “present, ready, dirty and actively involved” (p.85) and concludes by saying “*Manus*, the authentic management can only happen when dualism, the inauthentic separation is surpassed” (p.90).

The idea that there is a need to surpass the mind-body dualism in management is also strongly argued by Nonaka and Takeuchi (1995). These authors argue that although the literature keeps referring to the importance of knowledge and learning in the post-industrial society very few studies have been carried out on the specific issue of how knowledge is created within or between business organisations. The main reason for this failure, according to these authors, is the Cartesian dualism between subject and object or mind and body, still very prevalent in western thinking. To talk about knowledge in western organisations is to talk about the explicit and objective aspects of knowledge while the tacit and subjective dimensions are almost completely neglected. They explain this state-of-affairs as a result of the growing “scientification” of business strategy, where models upon models have tried to point the way to more cost cutting, excellent optimization of resources and better market share, but still with no guarantee of success. This one-sided view of strategy has some major limitations: firstly, the preoccupation with explicit and quantifiable information has made researchers ignore the creation of new visions or value systems; secondly, the emphasis on top-down strategy implementation has neglected a wealth of knowledge, which exists at lower levels in the organization; and thirdly, the prevailing strategic management concepts have made the whole issue of knowledge not “respectable” enough to be considered as a source of competitiveness.

As we have suggested above, these two opposing views of management, i.e. the Cartesian-Taylorist versus the Situated and Action-Oriented, view are mirrored in the evolution of cognitive science over the last forty years, according Francisco Varela (1992). Such an evolution, which embodies the turn from a cognitivist to an emergent/enacted epistemological stance can also be given a reading of in terms of the managerial paradigm (see Table 3.1). Thus, organizational autopoiesis may lend additional support to a turn in managerial thinking, from a position that considers managerial knowledge as being abstract, universal and task-specific to one which sees such knowledge as being history-bound, embodied, context sensitive and creative.

Table 3.1 - Evolution in the views on managerial knowledge and action

| Rational Management (Descartes, Taylor, Simon) | Action-Based Management (Maturana & Varela, Bartlett & Ghoshal, von Krogh & Roos, Nonaka and Takeuchi, Intraña) |
|--|---|
| Task-specific | Creative |
| Problem solving | Problem definition |
| Abstract, symbolic | History, body bound |
| Universal | Context sensitive |
| Centralized | Distributed |
| Sequential, hierarchical | Parallel |
| World pre-given | World brought forth |
| Representation | Effective action |
| Implemented by design | Implementation by evolutionary strategy |
| Hierarchy | Network |
| Command and control | Heuristic rules |
| Information | Learning |
| Subordinate | Apprentice |
| Doing and thinking separate | Doing and thinking together |

Sources: Adapted from Varela (1992) and Intraña (1997)

In the world of business schools this turn in managerial thinking is also being felt. Managerial action, collective action and cooperative action are at the centre of a new management philosophy, which business schools professors Ghoshal and Bartlett (1998) discuss in their new book *The Individualized Corporation* (see quotation at the outset of this chapter).

3.2.4 The innovation of Ghoshal and Bartlett (1993, 1994, 1998): a managerial theory based on action

Bartlett and Ghoshal argue that the general environment for large (and small) firms has changed beyond recognition and a new approach to the roles of management is needed. They base their argument on the general macro trends, which have been affecting companies more acutely in the last 10 to 15 years. Such trends are (1) a fundamental change from a suppliers market to a consumers market; (2) serious overcapacity in production due to a slowing down of market growth; (3) profound changes in the traditional structures and boundaries of many industrial sectors due to deregulation and also to general technological developments; (4) deep internal changes in the work processes and roles in organizations due to ever more powerful and diversified information processing and communication technologies, among others.

The combined impact of these changes has led to a major shift in the strategic emphases of many companies. The principal strategic task is no longer allocating capital, but managing the existing human capital, namely, managing the company's knowledge and learning capabilities. The main

production task is no longer to produce excellent products, but to be close to the customer. The key managerial task is no longer to devote time to elaborate planning, coordination and control systems, but to concentrate on adding value. The main organizational task is no longer structuring organizations based on the principle of division and devolution of resources and responsibilities from the top down, but of proliferation and subsequent aggregation of small independent entrepreneurial units from the bottom up. This is the new management agenda, which companies can no longer ignore. Such agenda is really the cause and the consequence of the customer-oriented and quality focused programmes, such as TQM, which companies all over the world are trying to implement. Ghoshal and Bartlett state:

Existing theory is stretched too thin in accommodating these emerging [macro] changes not just in organizational forms but also in the fundamental assumptions about structure, processes and people that underlie how managers think about the task of organizing. This, we believe, is the principal cause for the widening gap between positive and normative analysis in the fields of strategic management and organizational behaviour (1994:110)

Bartlett and Ghoshal (1993) propose a fresh look at organizations and management, not emphasizing organizational structures and formal managerial roles, but managerial processes and their interrelationships, instead. These authors go to the heart of general management and they start by reviewing what the founding fathers of this discipline put forward as being the basic roles of management. Chandler, Bower and Cyert and March wrote in the sixties and seventies at the height of the explosion of “big business” in the US and in Europe and when the new multi-divisional organizational form was invented, to cope with the ever increasing size of companies. Thus, they propose a management framework, which is a radical departure from the models suggested by the founding fathers. The main differences among the traditional approaches and that of Ghoshal and Bartlett’s can be seen in Table 3.2.

Table 3.2 - Bartlett and Ghoshal’s (1993) new model in comparison with traditional models of management

| | Chandler | Bower | Cyert and March | New model |
|------------------------------|-------------------------------------|-------------------------------|---|---|
| Top management | Entrepreneur and resource allocator | Creator of structural context | Establisher of strategic/ operational plans and resolver of conflicts | Creator of purpose and challenger of status-quo |
| Middle management | Administrative controller | Vertical information broker | Advocate of sub-unit goals | Horizontal information broker and capability integrator |
| Front-line management | Operational implementer | Initiator | Problem solver | Entrepreneur and performance drivers |

| | | | | |
|--|--|--|--|--|
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In the “new model” top managers are the creators of organizational purpose and challengers of the status quo, as opposed to resource allocators or makers of strategy. Middle managers are horizontal integrators of strategy and capabilities as opposed to controllers or information brokers. Front-line managers the organizational entrepreneurs as opposed to implementers of plans or problem solvers. The new model is a radical departure from the traditional management thought on the structuring of organizations. It is based on a new conceptualization of organizational endeavour whereby organizations are “developed and managed on a principle of *proliferation* and *subsequent aggregation* of small independent entrepreneurial units from the bottom up”, rather than on a principle of *division* and *devolution* of resources and responsibilities from the top down” (Bartlett and Ghoshal, 1993:42).

In defining organizations as social structures, Bartlett and Ghoshal state “even though actions of and within organizations may be motivated by a variety of economic and other objectives, they emerge through processes of social interactions that are shaped by the social structure”(1993:43). This view of organization is very similar to that put forward by Weick (1995), as discussed in chapter two. Recalling Weick, organizations are conceptualized as “social structures that combine the generic subjectivity of interlocking routines, the intersubjectivity of mutually reinforcing interpretations, and the movement back and forth between these two forms by means of continuous communications” (1995: 170). In adopting this interpretivist view, unusual in mainstream strategic management circles, Bartlett and Ghoshal bring to the fore the constructs of values, roles and relationships as the principal shapers of organizational life and not generalizations about those relationships, which is the case in the bulk of the literature on organizational structure. They explain their position as follows:

our model reflects a different research perspective. Despite the obvious fact that organizations are social structures that shape and are shaped by the relationship among actors within their social systems, organizational analysis has historically focused on abstract generalizations of relationships represented by its formal structure. In contrast, we have defined our model in terms of three core processes that are built around a specific set of relationships among the front-line, middle and top management of a company. In this way, we have presented a conceptualization of organizations, not as a scheme for dividing the overall corporate activities among a group of subunits, but as a cluster of roles and their interrelationships. From this perspective, it is the behaviours and actions associated with each of these roles that collectively define the social structure of a company within which its management processes are embedded. (1993: 41)

Bartlett and Ghoshal base their management model on extensive research into the management practices of a well managed global corporation (INTEL, Kao Corporation, McKensey, Philips, Skandia and, especially, Asea Brown Boveri), which serve as role models. From the case studies and their academic experience, these academics draw conclusions about new roles (i.e. expected patterns of behaviour) for the three core positions within the management structure of most companies: top management, middle management and front line management. These roles, according to the authors, reflect all the major changes, which have been taking place in large organizations and which have been briefly discussed above. Furthermore, they develop the notion

of “management processes”. Management processes are the “interlocking behaviours”, the relationships or the interactions of managers with the organization in performing their daily activities. They are the managers’ key tasks, as seen by themselves. This is why the authors claim that this line of thought is leading them towards a new theory of the firm, which they have labelled as the *managerial* theory of the firm.

A managerial process is a notion, which cannot be functionally described because it is an interpretive concept, i.e. it is the result of organizational enaction. Managerial processes are the outcome of an act of managerial choice, in the form of managerial formal roles and the interpretation (enaction) of such roles by collective action. In the words of Ghoshal and Bartlett

it is the behaviours and actions associated with each of these [managerial] roles that collectively define the social structure of a company within which its management processes are embedded (1993:41)

Hence, managerial processes are the result of the organizational enaction processes. Formal functional roles are vertically planned but they can be executed in a more or less horizontal manner, depending on the type of context, which management has been able to build in the organization.

The three core managerial processes proposed by Ghoshal and Bartlett are: the Renewal, the Integration and the Entrepreneurial process. They are “core” processes because each of them is present in all three managerial roles. In line with the view of organizations as “networks of roles and relationships” (Bartlett and Ghoshal, 1993:44) argue that

Each of the three core processes is structured around a specific set of relationships across these three roles; the three processes coexist because of the overall symbiosis within and across those roles. In this way, we have defined the structure of the organization not in terms of how subunits are composed and decomposed but as clusters of statuses and associated roles that collectively define the social structure of a company within which its core management processes are embedded.

By creating an interaction between managerial roles and processes, Bartlett and Ghoshal create a new framework for *managerial action*, which has a truly social-relational flavour. The framework can be seen in Table 3.3.

Table 3.3 - Bartlett and Ghoshal’s managerial roles and processes

| | Front-Line Management | Middle Management | Top Management |
|---|--|---|--|
| The Renewal Process: <i>creating purpose and challenge</i> | Managing the tension between short-term performance and long-term ambition | Creating and maintaining organizational trust | Shaping and embedding corporate purpose |
| The Integration Process: <i>linking and leveraging</i> | Managing operational interdependencies and personal networks | Linking skills, knowledge and resources | Developing and nurturing organizational values |

| | | | |
|---|-------------------------------------|--|--|
| <i>capabilities</i> | | | |
| The Entrepreneurial Process: <i>aligning and supporting initiatives</i> | Creating and pursuing opportunities | Reviewing, developing and supporting initiatives | Establishing strategic mission and performance standards |

The model is based on the assumption that people are inherently interested in and motivated by their work. The processes of Renewal, Integration and Entrepreneurship require certain qualities or work propensities amongst the staff. Entrepreneurship assumes that individuals have personal initiative and are capable of bringing a degree of creativity to their work. Integration is built on the assumption that individuals are capable of giving and accepting collaboration to and from others in the organization. Renewal assumes a disposition in individuals to build new knowledge, which is relevant to the organization, and to create an environment around them, which is conducive to others developing their organizationally-relevant knowledge as well. However, as Ghoshal and Bartlett point out, in many organizations there is a feeling that individuals are much more prone to behaviour characterized by “free-riding or shirking” (as opposed to initiative and creativity), by “opportunism” (as opposed to collaboration) and by “inertia” (as opposed to learning).

In organizations, individuals are capable of different types of behaviour in fulfilling the organization’s expectations about their work performance. As we have suggested above, such behaviour can range from very effective to very ineffective, in terms of organizational effectiveness. The actual behaviour, eventually adopted is, in the first place, the individual’s own personality characteristics and, in the second place, the situation she faces in her particular organizational environment. In terms of the first condition, there is not very much organizations can do, except in the staff selection processes it adopts. But regarding the second condition, organizations can influence very decisively the behaviour of individual organizational members. So, what can organizations do in order to promote and support an environment (or context) characterized by capabilities such as Creativity, Collaboration and Learning? According to Ghoshal and Bartlett, “the same managerial actions that drive the three processes also help create an organizational context that reinforces the effectiveness of the processes by inducing organizational members to take initiative, cooperate and learn” (1993:45). In addressing these issues, Ghoshal and Bartlett are moving into the realms of organizational cultures, climates or contexts.

Conceptualizations about behaviour in organizations also depends very much on how managers themselves view the nature of organizations and of the people who work in them. This point had already been made in the organizational behaviour literature by several authors. Among the better known are McGregor (1960) with the opposing theories X and Y and also by Burns and Stalker (1961) with their organic versus mechanistic organizational modes. Ghoshal and Moran (1996) also address these issues in the context of a theory of the firm. Why do organizations exist and why do human being work in organizations are fundamental questions, which can be answered in an “organic” or in a “mechanistic” mode, as it has been suggested by Burns and Stalker (1961). In the first instance, the role of human emotions is recognized; in the second instance, the

prevailing discourse is one of logic and rationality and the role of emotions and therefore of human and organizational values is consistently played down.

Regarding the nature of organizations, Ghoshal and Moran defend the position that organizations are much more than economic instruments that mirror the market or respond to market forces. Instead, they argue, “organizations’ real contribution to economic progress is in their unique ability to create their own distinct contexts”, which enables them and their members to “actually defy the relentless gale of market forces” (1996:63). In viewing organizations as social institutions rather than economic instruments, and in expressing the view that people in organizations possess vast reserves of knowledge and aspiration, which managers must strive to capture and retain, Ghoshal and colleagues clearly take an “organic” rather than a “mechanistic” stance on the nature of both, organizations and human beings in organizations.

In their theory building, Bartlett and Ghoshal give great emphasis to managerial values. They defend the notion that improved organizational performance depends, primarily, on the organizational contexts (or climates) that managers are able to build in fulfilling their managerial roles and processes. They state “we suggest that an organization can create and embed in its context a work ethic that would induce rational yet value-oriented actions on the part of its members in furthering the interests of the organization as an end in itself, not just a means to an end” (1994:92). As the outcome of their research into the practices of successful companies, Ghoshal and Bartlett have identified a number of value-oriented characteristics of managerial action, which they claim are the key dimensions for quality management, that is, a type of management, which induces the creation of a favourable or supportive organizational context for improved organizational performance. Such characteristics have been grouped into four key dimensions: Stretch, Discipline, Trust and Support, which the authors define as follows:

- ? **Stretch** - The attribute of an organization’s climate that induces its members to voluntarily strive for more rather than less ambitious objectives (e.g. the development of a collective identity or the establishment of a shared ambition)
- ? **Discipline** - The attribute of an organization’s climate that induces its members to voluntarily strive for meeting all expectations generated by their explicit and implicit commitments (e.g. the establishment of clear standards of performance or the consistency in the application of sanctions)
- ? **Trust** - The attribute of an organization’s climate that induces its members to rely on the commitment of each other (e.g. the involvement of individuals in decisions and activities affecting them)
- ? **Support** - The attribute of an organization’s climate that induces its members to lend assistance and countenance to others (e.g. freedom of initiative at lower levels or personal orientation from senior staff)

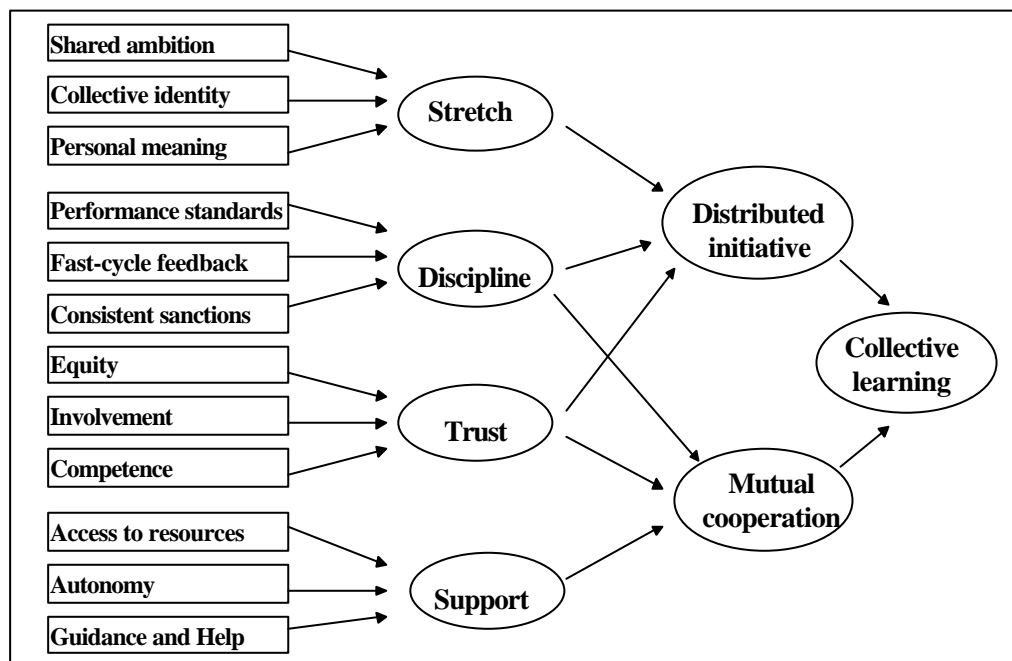
Ghoshal and Bartlett (1994) have conceptualized the causal model shown in Figure 3.1, which explains how the interaction of these four key dimensions will result in an organizational climate

conducive to Initiative and Creativity, Collaboration and Learning, and, therefore, to improved organizational performance.

The most important point to be made at this point about Ghoshal and Bartlett’s work and which makes it different from the work of many other writers in strategic management, is that these authors inter-relate many previously held notions. In their theory, they inter-relate the nature and function of organizations within the economy with the nature of organizations as social entities and with the nature and function of management within the firm. They are concerned with characterizing the “ethos” or the overall context of the organization, both for external purposes (the role of firms in the economy) and for internal purposes (the role of workers and of management in the firm). And they put forward four key organizational value dimensions, which, in their own words, have not received the attention they deserve:

Concepts like Stretch, Discipline, Trust and Support have little relevance in existing theory. Yet, we believe they are of central importance for the analysis of organizational effectiveness (1994:110)

Figure 3.1 - Ghoshal and Bartlett’s (1994) causal model for organizational learning



Having described Ghoshal and Bartlett’s models of managerial values, roles and processes (1993, 1994), it is appropriate to ask at this point: “why is this a middle-of-the-road approach to strategic management?” and “how does it work?”. We are talking about a middle-of-the-road approach firstly because both the top-down view of managerial strategic choice and the bottom-up perspective of collective and emergent action are taken into consideration. These two perspectives are linked by managerial processes, which, in turn, are shaped by organizational values. Secondly, we are talking about a middle-of-the-road approach because success lies in the

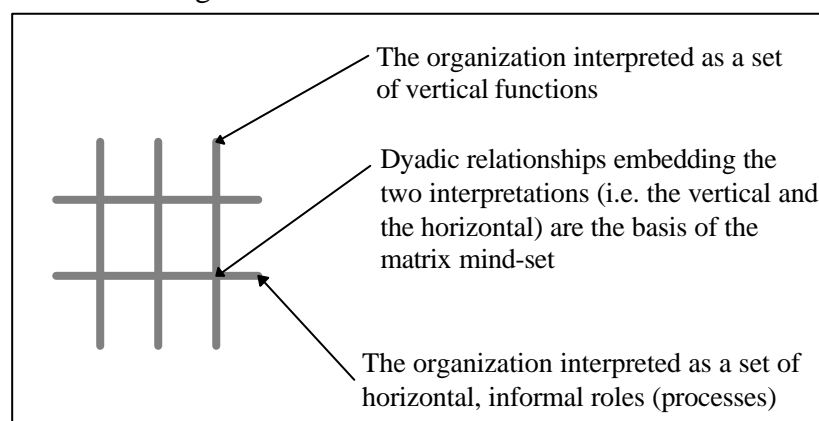
middle, the middle being the organizational context created by the interaction of managerial choice and collective action.

Appropriate organizational contexts allow a kind of virtual matrix to be created in the minds of managers. Bartlett and Ghoshal (1990) argue that the matrix is not a type of structure, which management can simply choose to adopt but something much more complex than that, i.e. the matrix is a state of mind. According to these authors, the reason why many companies have failed to make the matrix structural system work was that they assumed that changing the formal structure would force the decision processes to change, as well. This, in turn, would cause individual behaviour of managerial and non-managerial staff to change. In reality, this has not happened. Instead, they propose that:

companies that are most successful at developing multidimensional organizations begin at the far end of the anatomy-physiology-psychology sequence. Their first objective is to alter the organizational psychology - the broad corporate beliefs and norms that shape managers' perceptions and actions. Then, by enriching and clarifying communication and decision processes, companies reinforce these psychological changes with improvements in organizational psychology. Only later do they consolidate and confirm their progress by realigning organizational anatomy through changes in formal structure (1990:140)

In order to maintain a matrix-type of collective thought, organizations need appropriate organizational contexts, shaped by purpose and values. Contexts, in turn, create a dual perspective on organizational roles: a vertical, hierarchical perspective and an horizontal, process perspective. At the intersection of these two perspectives are the relationships between people in the organization. As it has been discussed earlier in this chapter (Introna, 1997), [power] relationships are the basic building blocks of any social system. When people endowed with such a matrix mind-set interact, they do so with the dual perspective in their minds, meaning that they are constantly aware of both their roles: the vertical and the horizontal.

Figure 3.2 - The matrix state of mind



Source: Ghoshal and Bartlett (1990)

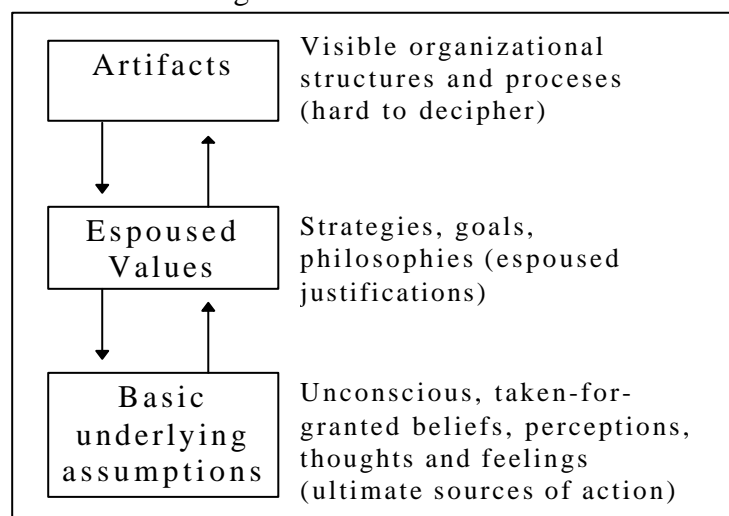
The matrix state of mind (see Figure 3.2) is really the final outcome of the thinking of Professors Ghoshal and Bartlett (1990;1993;1994). If managers succeed in building such matrices in the minds of employees, they have solved the managerial dilemmas of how to balance control with empowerment or how to merge individual ambition with corporate purpose.

3.3 Organizational culture, climates and contexts

Now, it is important to go a little deeper into the discussion of the organizational contexts that are so central to the thinking of Ghoshal and Bartlett. But to talk about organizational contexts it is inevitable to talk about organizational climates and the discussion on climates inevitably leads to the concept of organizational culture. In order for the notion of organizational climates or contexts to be operationalized it is essential that they are well understood, in the first place. This is the reason why we have decided to include the present section in this dissertation.

Schein (1992), perhaps the leading contributor to the field of the organizational culture, has put forward a basic model of three levels of culture (see Figure 3.3). The first level - “Artifacts” - refers to phenomena one can see, hear and feel in an organization. The point is made about this level that it is easy to observe but hard to decipher and that, therefore, it is dangerous to draw conclusions about culture just on the basis of such artifacts. The second level - “Espoused Values” refers to corporate values (including business mission values), which organizational members profess to but which are not necessarily the values “in-use” in the organization. Espoused values can become shared, underlying assumptions if a manager or a leader succeeds in instilling in the group’s beliefs her own chosen values and convincing it to act accordingly. Schein claims that the espoused value will become a basic underlying assumption “if the action based on it continues to be successful” (1992:19).

Figure 3.3 - Schein’s three levels of organizational culture



Source: Schein (1992)

Fiol (1991) has taken up Schein’s work on the levels of culture (originally published in 1985), and has given it a new reading in the light of the theory of semiotics. Semiotics is the study of how signs combine to convey meaning, and uses natural language to show how meaning is generated and conveyed in other systems of signification, such as behaviour. Fiol’s research question centres around the link between organizational competency and organizational culture. Taking a cognitive approach to competency, she tries to explain how people make sense of particular organizational skills and how they use and transform such skills into action outcomes. “Cognitive processes are thus not equivalent to the behaviour themselves. Nor are they equivalent to an abstract set of beliefs. Though they are shaped by both, they reside in the *linkages* (our emphasis) between behaviours and their social meanings” (1991:196).

Fiol’s comparative model of culture is a powerful explanatory framework as it succeeds in establishing a convincing explanation for the linkages between behaviour and the larger social or organizational context (see Table 3.4). This is achieved by comparing Schein’s (1992) three levels of culture with the three levels of semiotic analysis: the level of words, the level of speech acts and the level of language. Thus, the level of language can be equated to the level of deep underlying cultural assumptions; the level of speech acts can be paired with Schein’s intermediate level of espoused values and, finally, the level of words, which can easily be recognized as being equivalent to the level of artifacts or observable behaviours.

Table 3.4 - Fiol’s (1991) comparative framework

| | Language/Culture | Speech Acts/ Identities | Words/Behaviours |
|-------------------|---|---|---|
| Definition | General system of rules that governs meaning | Contextual understanding of rules | Observable expressions/ behaviours that combine to form speech acts/ identities |
| Boundaries | Describes a whole system | Describes a contextual frame that links parts of the system to a whole | Describes observable parts of a system |
| Source | Result of multiple converging speech acts/ identities over time | Result of patterned word use or behaviours over time | Result of existing system and new contexts |
| Function | Maintenance: General standard against which the meaning of discrete speech acts/ identities are understood | Renewal: Incorporation and differentiation of new contextual understanding | Change: Additions or substitutions to fit changing contexts |

According to Fiol (1991:198), just as in Schein’s three levels of organizational culture, the three components of language “include an underlying and unobservable set of rules, observable expressions in the form of words, and speech acts that contextualize words and thus serve as a link to the system of rules. None of the components can be understood without the others. Grammatical rules are the result of patterned speech acts over time, which, in turn, are the result of patterned word use over time”. Understanding the relationships between the three elements of semiotics theory can furnish us with new insights into the evolution of culture and knowledge in

organizations. Words are the signs that combine to convey meaning in natural language. Grammatical rules are the system, which governs the meaningful combinations of words, but there is not a one-to-one relationship between words and a grammatical system. The content attributed to an expression depends on unobserved linkages between those two levels, which constitutes a mid-level layer made up of speech acts. Speech acts imply contexts, which rest upon the general system of grammatical rules and which give precise meaning to individual words. And the whole system is in constant evolution, with the grammatical rules changing as a result of new meanings and with new words being introduced as a result of changing environmental contexts.

In organizations, trying to understand culture by analysing the level of deep underlying assumptions would be the same as trying to understand a word by looking at the general system of grammar; furthermore, the underlying assumptions level of culture is unconscious by definition (Schein, 1992) and, therefore, it cannot be analysed directly, in any useful way. On the other hand, trying to understand culture by looking at behaviours would be misleading because behaviours can have many different interpretations. Hence the level of “identities” or speech acts assumes a very special role in the linkage between those two levels.

Fiol (1991) explains that *Identity* is a concept used in psychology and sociology to characterize an individual in relation to a larger cultural system. “It thus serves as a critical link between people’s particular behavioural contexts and the underlying values that give them meaning. Within the context of organizations, identity describes what people define as central, distinctive and enduring about their organizations” (p.200). And she goes on to say: “Identities, rather than the discrete behaviours that drive them, are the keys to understanding and managing behaviours in relation to an overall belief system” (p.208).

Fiol’s (1991) main contribution rests in the drawing of attention to the mid-level of three-layer model originally proposed by Schein (1992), as being the locus for the development of a framework of managerial action, that is, the level at which managers can influence both the larger cultural context of the organization, on one hand and behaviour at the individual level, on the other hand. “Identities, rather than behaviours or general cultural systems, must be the focus of our efforts to understand the management of culture” (p. 203); “culture can be managed by attending to the interface between high culture and multiple emerging identities” (p.209). Thus, we assume that Fiol’s mid-level layer is the same as the organization’s climates or contexts.

3.3.1 Organizational climates or organizational contexts?

The notions of organizational climate and organizational context overlap to a great extent. Authors from industrial economics or strategic management tend to talk of “context” instead of “climate” but the content of the two notions tends to be exactly the same. Hansen and Wernerfelt (1989) have identified the need to establish an “organizational model” of the firm, which would enable them to establish comparisons with an “economic model” and draw conclusions about firm performance. These authors complain that such an organizational model (as opposed to the economic model) is difficult to arrive at because there are so many alternative and competing

theories trying to explain organizational performance and effectiveness. However, they agree that the organizational climate construct is useful for establishing the basis of the organizational model which they are seeking for, but in discussing such construct they use the expressions “climate” and “context” interchangeably. Ghoshal and Bartlett (1993; 1994;1998) also use the expressions “context” and “climate” with interchangeable meanings. Hence, for the purposes of this dissertation these two expressions will be taken to mean the same, but in the plural form - contexts and climates.

Schneider (1975;1990), one of the leading writers on climate, defends the idea that it is misleading to talk of organizational climate as being one omnibus concept applicable to the whole organization - the global climate. He suggests that each organization creates a number of different types of climates and that one way of thinking about these climates is to consider either the kind of behavioural outcome that the climate would lead to (e.g. leadership climate or climate for conflict resolution) or the organizational unit of analysis of interest (e.g. the climate for after sales service or the information systems climate). In this sense, i.e. climate as a manifestation of the behaviour of a particular occupational group within the organization, “a” climate could be taken to be virtually the same as “a” sub-culture.

The appropriate way to address the issue of organizational climate, according to Schneider, is to specificity first the criterion or focus of interest behind the particular climate construct, which is being articulated. Secondly, he suggests, climate should be researched in “strategic mode” rather than in “global mode”. In the strategic mode, climate research focuses attention on specific routines and rewards, which are related to the criterion of interest to the researcher. “The utility of the climate construct is that it explicitly assumes that there will be numerous routines and rewards requiring assessment, because it is the perception of multiple routines and rewards that is assumed to communicate the meaning of what is important in a setting” (1990:386). In this quote, Schneider outlines three important principles for an understanding of organizational climates or contexts. Thus, climates or contexts:

- (1) are a reflection from and are reflected in organizational *routines and rewards*;
- (2) reflect *what is important* in an organizational setting;
- (3) are an organizational means for *communicating meaning*.

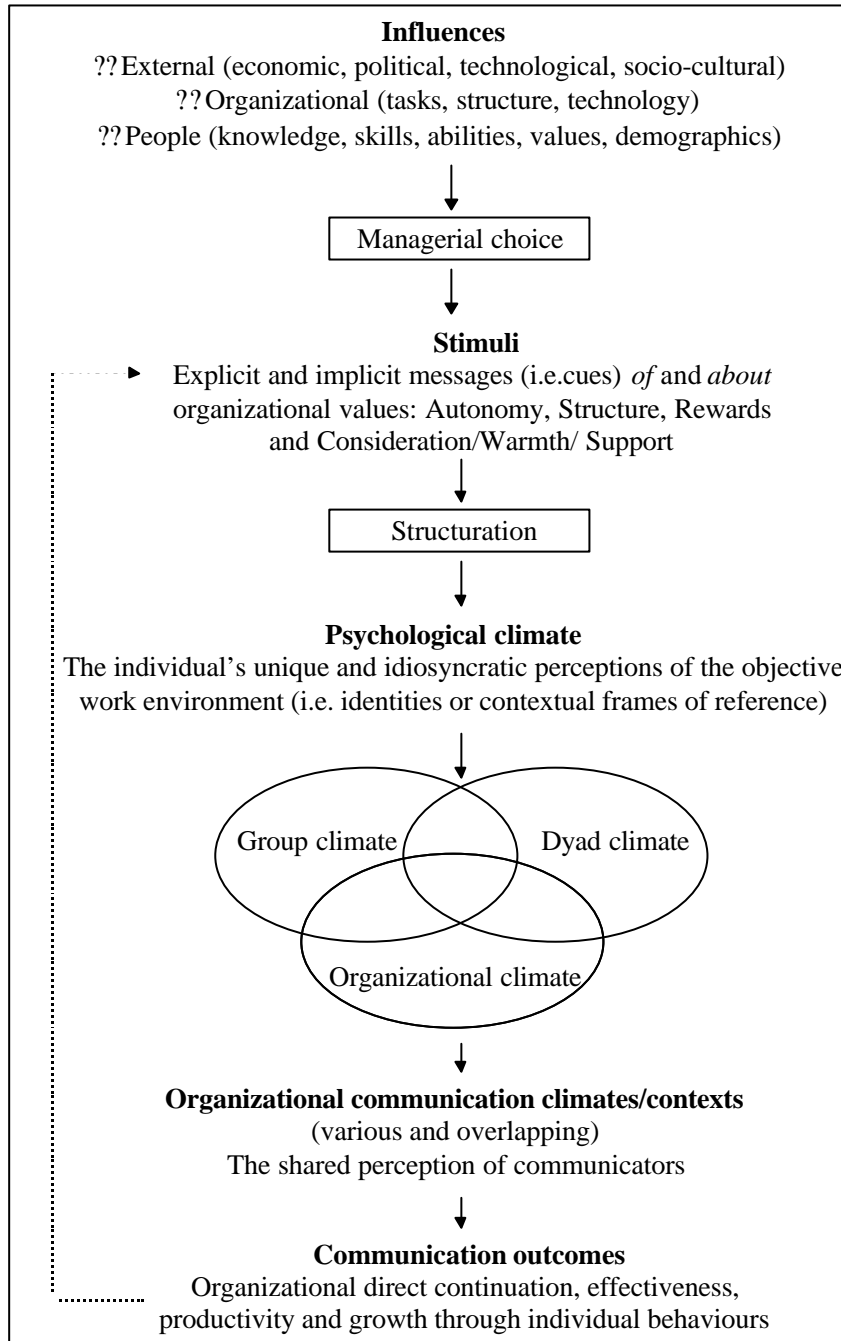
These principles are in accordance the concepts developed by other authors in the organizational climate tradition.

Ashford (1985) assumes a very similar position to Fiol (1991) as regards the concept of “identities”, i.e. he attributes to climate the role of establishing “situational identities” for organizational members, but especially for newcomers. “Newcomers must learn the logistics of the organization, the general role expectations of peers, the tacit norms governing behaviour and appearance, the status and power structures, the reward and communication systems, the various organizational policies, and so on. They must understand the organization so that they can act within it” (p.838). In other words, newcomers must familiarize themselves with the *context*,

before they can function adequately in the new environment. This, in turn, is very similar to Ghoshal and Bartlett's (1993;1994;1998) notion of organizational context is also very close to Fiol's (1991) notion of "identities" as a mid-theoretical construct, which serves as a bridge between the levels of culture and of observable behaviours.

How are organizational climates formed? Falcione, Sussman and Herden (1987) put forward a model (see Figure 3.4) for explaining the formation of the organization's "communication" climate. They start from the premise that communication is the "constitutive force for all climates in an organization, no matter what the unit of analysis" (p. 203). These authors take an "interactionist" or socially constructed view of the climate phenomenon, which they define as "an intersubjective phenomenon that in its continuous structuring and restructuring affects individuals' actions and organizational outcomes" (p.203).

Figure 3.4 - A model of organizational climate/context formation



Source: Adapted from Falcione, Sussman and Herden (1987)

The model starts off by considering the “influences”, that is, all the external and internal environmental conditions, which are the sources of the “stimuli”, which act upon each and every

individual in the organization. From the various influences that contribute to climate formation there is one, which is the origin of all the others: managerial choice (Child, 1972; Porter, 1991). Managers are the first agents in the process of “enacting the organization” (Weick, 1995). This means that because managers have the authority invested in them by whoever owns the organization, they are in a position to make policy decisions and establish organizational systems and structures, which will have an influence on all the other environmental conditions, including external ones.

Climate formation proceeds from the individual level to the organizational level through stages of interaction within the organization. When individuals interact on a one-to-one basis, a localized “interpersonal” climate is formed and when individuals interact in groups, localized “group” climates are formed. Interpersonal climate is defined as

the shared perceptions of a dyad about molar factors representing the setting within which dyadic message sending and receiving processes occur and which affect those processes (Falcione, Sussman and Herden, 1987:217)

And group communication climates is define as

those molar factors, objective and/or perceived, which affect the message sending and receiving process of members within a given organizational group (Falcione, Sussman and Herden, 1987: 205)

In their model, Falcione and colleagues distinguish between “psychological” and “communication” climates. In other words, they distinguish between the individual and the organizational levels, as regards the climate formation process. Psychological climate is formed by means of structuration (Giddens, 1984) through the establishment of rules and resources used in the production and reproduction of each organizational member’s identity or contextual frame of reference. This process is self-referential and hermeneutic, that is, people make distinctions on the basis of past distinctions and new data does not become immediately new information. It is only when there is a recurrent history of new data (i.e. perturbations to the autopoietic system) that new information is eventually formed. This explains, for example, the relative resistance to new organizational cues about new organizational values being introduced by a new management team.

3.3.2 The dimensions of organizational climate

Climate dimensions take the form of messages (i.e.cues) and are transmitted or communicated to organizational members explicitly or implicitly, that is, they might be perceived consciously or they might impinge on perceivers unconsciously or subliminally (Falcione, Sussman and Herden, 1987). According to these authors, the essence of communication climate are such cues or “messages and metamessages reflecting autonomy, [degree of] structure, rewards and consideration, warmth and support” (1987:220).

These four “climate dimensions” are the types of managerial values that Ghoshal and Bartlett (1993;1994) call the “dimensions of quality management”. In fact, there is considerable overlap

between the two sets of dimensions or values put forward by Falcione and colleagues and Ghoshal and Bartlett. Structure and rewards contains elements of “stretch”; autonomy and consideration, warmth and support overlaps with “trust”, to a certain extent; structure contains elements of “discipline”; and consideration, warmth and support integrate much of the “support” dimension. Such dimensions, which reflect also managerial values, are consistent with dimensions identified by other authors writing on organizational climate, namely Litwin and Stringer (1968), Likert (1976) and Nonaka and Takeuchi (1995). In Table 3.5 we carry out a comparative exercise concerning the work of the two sets of authors writing in the 1990s and approaching climate from a managerial perspective (as opposed to a psychological one) - Ghoshal and Bartlett (1993;1994) and Nonaka and Takeuchi (1995).

The analysis of these two approaches shows that Ghoshal and Bartlett and Nonaka and Takeuchi have different ways of viewing climate formation. On the surface, they are all saying that the dimensions of quality management (Ghoshal and Bartlett) or the enabling conditions for organizational knowledge creation (Nonaka and Takeuchi) are the key conditions for the formation of climates or contexts favourable to increased organizational learning. But on closer scrutiny, one can see that they differ on some fundamental assumptions. Ghoshal and Bartlett leave out “structure” as one of their key dimensions and emphasize control (discipline), motivation (trust and support) and also intention and purpose (stretch). Nonaka and Takeuchi, on the other hand, while also emphasizing intention and purpose (intent and fluctuation/creative chaos), seem to give more emphasis to communication (redundancy) and especially to structure (autonomy and requisite variety).

Table 3.5 - Organizational context or climate dimensions related to knowledge development Ghoshal and Bartlett (1993,1994) or knowledge creation (Nonaka and Takeuchi, 1995)

| Ghoshal and Bartlett (focused on control and motivation) | Nonaka and Takeuchi (focused on structures and communication) |
|---|--|
| <p>1. Stretch</p> <ul style="list-style-type: none"> ? <u>Shared ambition</u> through the establishment of clear corporate standards, i.e. company's vision ? <u>Collective identity</u>, i.e. "our own way to do things together" ? <u>Personal meaning</u> through the association of one's own work and the company's overall objectives | <p>1. Intention</p> <ul style="list-style-type: none"> ? Defined as the <u>organization's aspirations</u> to its goals ? Expressed by organizational <u>standards</u> or visions ? Re-oriented and/or promoted through <u>collective commitment</u> <p>2. Fluctuation and creative chaos</p> <ul style="list-style-type: none"> ? When fluctuation is introduced into an organization its members face a "<u>breakdown</u>" of <u>routines</u>, habits or cognitive frameworks which is an opportunity to reconsider fundamental perspectives ? Creative chaos increases the tension within the organization and focuses the attention on <u>defining problems</u> and <u>resolving crises</u> ? Ambiguity with respect to philosophy or vision can lead to a <u>questioning of value premises</u> as well as of <u>factual premises</u> upon which corporate decision making is based |
| <p>2. Support</p> <ul style="list-style-type: none"> ? <u>Access to resources</u> as a key enabler of decentralized initiative ? <u>Autonomy</u> as a cause and consequence of decentralization ? <u>Guidance and help</u> achieved through a radical change from a control to a support emphasis in the roles of senior management | <p>3. Autonomy</p> <ul style="list-style-type: none"> ? Autonomy increases the chances of <u>unexpected opportunities</u> being introduced and of new being knowledge being developed ? A powerful way for creating circumstances in which individuals can act autonomously is provided by the <u>self-organizing team</u> ? <u>Original ideas</u> emanate from autonomous individuals, diffuse within the team and then become organizational ideas |
| <p>3. Discipline</p> <ul style="list-style-type: none"> ? Establishment of accountability through <u>performance measures</u> ? <u>Fast cycle feedback</u> through not only accounting systems but also other processes such as indirect peer reviews ? <u>Consistent sanctions</u> through a policy of "no excuses" | <p>4. Redundancy</p> <ul style="list-style-type: none"> ? <u>Sharing redundant information</u> promotes the sharing of tacit knowledge because individuals can sense what others are trying to articulate ? Strategic <u>rotation of personnel</u>, frequent <u>meetings</u> and informal <u>communication networks</u> |
| <p>4. Trust</p> <ul style="list-style-type: none"> ? <u>Equity</u> achieved through a "growing sense of fairness" ? <u>Involvement</u> through the use of team work, meetings, etc ? <u>Competence</u> a pre-requisite for trust | <p>5. Requisite variety</p> <ul style="list-style-type: none"> ? An organization's internal diversity must match the variety and complexity of the environment in order to deal with the <u>challenges posed by the environment</u> ? Assure the <u>fastest access</u> to the <u>broadest variety</u> of necessary information to everyone in the organization, in order to maximize variety ? A way of dealing with the complexity of the environment is through a <u>flat and flexible</u> organizational <u>structure</u> |

Note: The shaded areas indicate a degree of overlap between the two conceptions of climate/context dimensions

Such differences are probably a result of different national cultural values. Japanese culture places greater emphasis on structure than the anglo-saxon type of culture. On the other hand, anglo-saxon cultures have a greater belief in the individual and individual values, such as trust (Hofstede, 1980; 1991). Nonaka and Takeuchi and Ghoshal and Bartlett writing from different cultural backgrounds would be affected by such national cultural values and hence interpret their research findings in different ways. However, looking at other authors also coming from an anglo-saxon background (for example, Litwin and Stringer, 1968) or Falcione, Sussman and Herden, 1987), one can see that they have also elected structure as one of the key climate dimensions.

In Table 3.6, a summary of the climate/context dimensions put forward by five different sets of authors is shown. In the rows of the table, a certain degree of matching of dimensions has been attempted, but it is clear how difficult such a task could become if an exact matching was to be attempted. Different authors start from different assumptions and have different definitions of the key dimensions. The result is that each author has his or her slightly different conception of organizational climate and of its formation process. Nevertheless, looking at the table below, one might say that there seems to be some consensus among the five sets of authors around the four dimensions put forward by Ghoshal and Bartlett (1993;1994) and discussed in this chapter.

Table 3.6 - Organizational context or climate dimensions:
a comparison of several authors

| Ghoshal and Bartlett (1994) | Nonaka and Takeuchi (1995) | Falcione, Sussman and Herden (1987) | Likert (1976) | Litwin and Stringer (1968) |
|------------------------------------|---|--|--------------------------------------|--|
| Stretch | Intention Fluctuation and creative chaos | | Leadership Goals | Identity Standards Risks |
| Discipline | | Rewards | Control | Responsibility Rewards |
| Trust | | | Motivation | Conflict |
| Support | Autonomy | Autonomy Consideration/ Warmth/Support | | Warmth Support |
| | Redundancy Requisite variety | Structure | Communication Decision-making | Structure |

As we have mentioned before, the one dimension where there is no consensus is structure. Ghoshal and Bartlett do not mention structure in their theory of organizational context formation and they do not, explicitly, say why. The reason for this, in our view, is that their whole theory is geared towards explaining how structure is more informal than formal (i.e the matrix state of

mind) and how in successful companies structure is replaced by a network of vertical (formal) and horizontal (informal) roles (or processes). This type of new informal structure is enabled by organizational values or climate dimensions. However, we differ from Ghoshal and Bartlett in this point. We believe that structure should also be one of the key climate dimensions.

In chapter two, when we discussed the organizational enaction process, we made a distinction between two kinds of enaction: (1) enaction as a direct result of managerial choice, i.e. managers enact the organization through acts of authority and (2) enaction as a result of collective action, i.e. all the organizational members collectively enact the organization in their daily effort to make sense of the world around them. The two kinds of enaction form an autopoietic loop of self-referentiality, which is the basis of the formation of organizational contexts. Formal structure as an authoritative act imposed by managers upon the organization is a key starting point of this organizational enaction process. Thus, structure must be one of the key dimensions of organizational climate, although it may not be considered an organizational value.

3.4 Organizational culture, organizational knowledge and organizational learning: what is the relationship ?

Allaire and Firsirotu (1984) propose a framework for studying culture where they identify no less than eight schools of thought - Cognitive, Structuralist, Mutual Equivalence, Symbolic, Functionalist, Functionalist-Structuralist, Historical-Diffusionist and Ecological-Adaptationist. The Cognitive school of thought, which has its roots in the work of Goodenough (1957; 1971) is the one that has had the strongest influence on managerial thinking. As far as the Cognitive school of organizational culture is concerned, culture is defined as:

A system of knowledge, of standards for perceiving, believing, evaluating and acting. Culture is the form of things that people have in mind, their model for perceiving, relating and otherwise interpreting them. It consists of whatever it is one has to know or believe in order to operate in a manner acceptable to the members of one's society. As a product of human learning, culture consists of the ways in which people have organized their experience of the real world so as to give it structure as a phenomenal world of forms, that is their precepts and concepts (Allaire and Firsirotu, 1984:219)

In accordance with this approach, organizations are seen as *knowledge systems*, as living entities capable of cognition and learning. Sackmann (1991), who is also part of the cognitive school, builds her definition of culture around the notion of *cognitions* or cognitive structuring devices. Such devices is what people use to attribute meaning to events. Cognitions can also be thought of as sets of categories, which guide perception and thinking. "In general, cognitions are neutral sense-making, planning and acting devices that are individually held. What makes them cultural is the aspect of *collectivity* and the kind of emotional attachment that goes with it. Individuals draw on those frames of reference that they have learned and acquired over the years. These may have emerged in different socialization processes: within the family (...) or working in a specific firm" (1991:38). Hence, Sackmann is suggesting is that the factual knowledge, which is usually

the focus when the discussion is centred on organizational learning or knowledge development, cannot be divorced from the emotions, values and attitudes, which are the foci when the discussion is about organizational culture. This point is very strongly reinforced by autopoiesis theory.

We believe that it may more useful and less confusing to assume very clearly that organizational culture and organizational knowledge we are not two unrelated concepts. Sackmann (1991;1992) proposes that as an alternative we should use *cultural knowledge* as a unifying concept. Cultural knowledge is what the organization knows. It is the same as organizational knowledge in the sense that it encapsulates the sum total of the factual knowledge of the individuals that work in that particular organization, when they come together as a group. But, at the same time, such collective knowledge is also cultural because it pertains to that organization and none other. Just as it happens with national cultures, the peoples' cultural knowledge entail a certain amount of factual knowledge, which is that knowledge shared collectively by all of the members of that nationality. For example, in Portugal it is common cultural knowledge that on Christmas Eve everybody eats boiled salted cod.

Autopoiesis is a very powerful epistemological tool when applied to the study of knowledge and learning in organisations because it by-passes the tensions between the individual learning and the social knowledge biases (Magalhaes, 1996). The autopoietic view of languaging is one of the missing links between individual and organizational knowledge (von Krogh and Roos, 1995). The notion, derived from the sociology of Luhmann, that organizations are systems of meaning based upon communication among organizational members gives new strength to hitherto scattered voices claiming for an alternative view of organization. Hence, autopoiesis theory and the epistemology behind organizational enactment open up the way for a common intellectual stance to be adopted around the concepts of organizational knowledge and culture.

Autopoiesis also helps us understand why organizations are not just open systems and why they have many characteristics of closed systems, such as self-reference, which makes organizations, essentially, historical and cultural systems. Because all knowledge is cultural, the organization's knowledge cannot help but be deeply embedded in the organization's cultural system. Autopoiesis theory provides a very reasonable explanation for the intertwining between the phenomena of organizational culture and knowledge and the influence of organizational culture on knowledge and vice versa. While organizational knowledge is usually related to factual or task-specific knowledge, culture is associated with beliefs, perceptions, and value-related knowledge. Varela (1992: 260) explains why the two types of knowledge can never be separated

to the extent that we move from an abstract to a fully embodied view of knowledge facts and values become inseparable. To know is to evaluate through our living, in a creative circularity

If we agree that organizations are autopoietic systems, there is no reason to disagree with Sackmann's (1991) proposal that it would be more appropriate to use the expression "organizational cultural knowledge" as a way of overcoming the conceptual divide between

organizational culture, knowledge and knowledge development (or learning). Organizational learning is about increasing the collective stock of knowledge whereas culture (or context formation) is about creating the conditions for knowledge development. Hence, while culture is about stability, organizational learning is about change. Organizational learning is also the outcome of the tension between individual creativity (i.e. individualized organizational knowledge) and the control exerted by group norms and values (i.e. socialized organizational knowledge), related to the notion of organizational culture. The whole relationship between organizational learning and culture (i.e. managerial/organizational contexts) has been very well summarized by Normann (1985:222) in the following way

[In organizations] new knowledge [i.e. learning] is manifested in new structural arrangements, new culture and new collective action

Unlike Fiol and Lyles (1985), we believe that organization learning and organizational change are *not* two different processes. We hold this view precisely because learning seen through the lens of autopoiesis theory cannot be divorced from action, and action, by definition, is constantly changing. Furthermore, organizational learning depends only very partially upon the relationship between the environment and the organization and is not a direct consequence of such relationship. The stimulus-response model imported from individual psychology and informed by the cognitivist hypothesis is not adequate as a model for organizational learning (Weick, 1991).

Organizational learning, in the cognitivist hypothesis is about change in the cognitive structures of the “organizational brain”, that is, it is an abstract and disembodied concept. In the enaction hypothesis supported by autopoiesis theory, organizational learning is embodied and linked to action of people. If there is no action, there is no learning. The focus, therefore, goes back to people as it was the case with the “human relations” movement in the organization theory of the 1950s and 60s (McGregor, 1960; Likert, 1961), but this time the focus is less on motivating the individual worker and more on creating the conditions for the individual to apply her full potential as an organizational member (Handy, 1997; Ghoshal and Bartlett, 1998).

We consider organizational learning as both an organizational *process* and an organizational *outcome*. It is a process of knowledge development (i.e. acquiring and building up organizational skills) but it is also an outcome of knowledge development, which can be measured in terms of tangible results (e.g. what is the rate of defective articles in our production line?). As a process, through organizational languaging, learning is about communication, ephemeral and very difficult to “freeze” in time, to measure or to analyse. But as an outcome, learning can be analysed as a phenomenon of change in the existing stock of collective knowledge. *Organizational learning as knowledge development occurs when the capacity to enhance organizational action is achieved over time. Such capacity to enhance organizational action can be regarded as the organization’s collective stock of knowledge or organizational knowledge.*

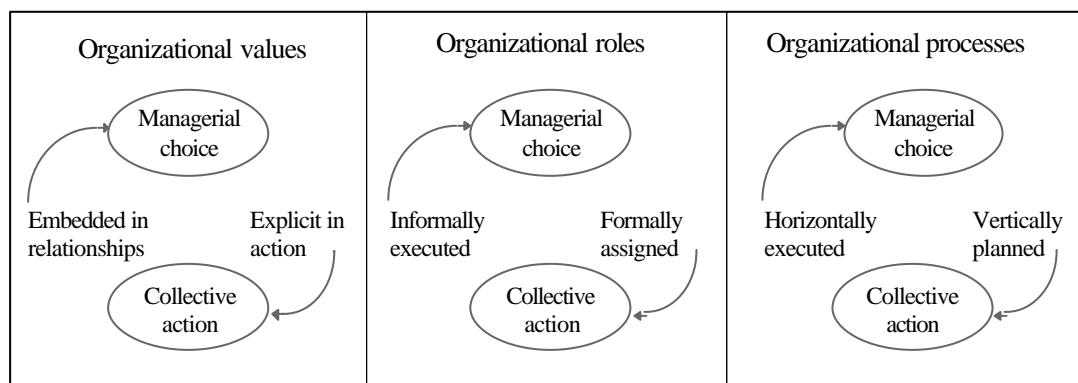
3.5 Summing up

One of the main achievement of autopoiesis theory has been the ability to help shift the discourse from positivism and rationality to interpretivism and emotionality, in management and organization science circles. This is opening up the doors for the work of writers such as Chester Barnard (1938/68), often dismissed as being “poetic and evocative rather than precise and definitive” (Leavitt and March, 1995:11), to be brought back into the mainstream of managerial thinking by scholars such as Ghoshal and Bartlett. Ghoshal and Bartlett’s (1993,1994,1998) theory is positioned in the “middle-ground” of the current scene of managerial paradigms. On one of the extremes of the managerial paradigms continuum, there is the “managerial choice” position where words such as “rationality” stand out. On the other extreme, there are the various schools of organizational analysis influenced by Berger and Luckmann’s (1967) social constructivism and where expressions such as “emergence” dominate. In the literature on strategic management, however, there seems to be a clear movement towards a “rapprochement” between these two extremes (see, for example, Schendel, 1994) and an active search for such “middle ground”.

Argyris and Schon (1996) claim that the literature on strategic management is “inattentive” regarding the gap between intent and realization and they suggest that such gap must be filled by a theory of action. A theory of action posits, first and foremost, that “there is a behavioural world created by the parties to an interaction and that such interaction (i.e. relationships) is the basic building block for understanding organizations and organizational life” (Argyris and Schon, 1996:253). Thus, one of the innovative proposals of the “mid ground” position is its emphasis on the organization’s context and on the role of context in pushing the organization into new directions. Action and context are thus the main tenets of the “middle ground” position.

Supported by autopoiesis theory, the (managerial) action approach brings together several strands of managerial knowledge. It is an attempt at integrating such strands of knowledge, rather than a proposal for a totally different approach. It recognizes that *managerial choice* (the top-down perspective) has a fundamental role in the final outcome of implementation, but it also aware of the emergent properties of *collective action* (the bottom-up perspective). The interaction of managerial choice and of collective action creates a dialectic, which can be considered as the basis of the constitution of organizational climates or contexts.

Figure 3.5 - Organizational enaction applied to values, roles and processes



The enacted view of cognition, together with theories of structuration and sensemaking also help to explain the dialectic relationship that exists between the top-down and the bottom-up views. According to the notion of “organizational enaction”, put forward in chapter two, these two perspectives of the managerial process are co-determined, that is, one exists always in the light of the other. Organizational enaction is a powerful methodological tool, which can be applied, for example, to the thinking of Ghoshal and Bartlett (1993;1994) and provide a good explanation for the influence of organizational values on the transformation of organizational roles and processes. Such sequence of transformations, starting with organization values, is depicted in Figure 3.5. In this figure we suggest that organizational values are introduced to the organization by means of managerial choice, through explicit action. After a while, and through collective action, such values become embedded in the interpersonal relationships which make up the organization. Similarly, roles are formally assigned to organizational members by managerial choice, but soon their formal content is replaced by their informal interpretation, as parts of the organization’s autopoietic processes. Given a supportive (i.e. learning) organizational ethos such informal roles will develop characteristics akin to cooperation and self-initiative. Finally, organizational enaction helps an understanding of Ghoshal and Bartlett’s notion of “processes”. Most processes in organizations are vertical, that is, they are a direct consequence of the traditional functional form which is (still) adopted by the majority of organizations. However, there is also increasing recognition that real added value is not achieved through the vertical organization but through horizontal processes. Such recognition has fostered the appearance of the matrix form, which, according to Ghoshal and Bartlett should not be used as a tangible device but instead should be perceived as a “state of mind”. Thus, although most organizational processes are planned (managerial choice) as part of vertical functions, a conducive ethos (collective action) will allow such functions to develop many informal features, essential for the horizontal organization to flourish. In the next chapter the discussion moves closer to the information systems discipline proper. We review various perspectives on IS implementation and focus on one perspective which, generally speaking, has been neglected by the discipline’s research community. Such perspective is inspired on the managerial action approach discussed in this chapter and constitutes a significant part of the theoretical propositions we offer, in this dissertation, to the organizational implementation of IS.

Chapter 4

Perspectives on IS implementation

Can we expect “frameworks” and “methodologies” to show anything other than the palest shadow of organizational complexity ? This dynamic and ambiguous complexity of an organization’s future just cannot be reduced to such simplistic data structures, which imply a tidy and convenient homogeneity in organizations that is just not there (...) An approach, valid or otherwise, will come to nothing without the input of a quality individual, the “thinking manager”, who can fully understand the disposition of the organization

Angell and Smithson, 1991: 35-36

Chapter 4 summary

- ? 4.1 Introduction
- ? 4.2 IS implementation as a process of organizational learning and change
 - ? 4.2.1 IS implementation as a process of technical innovation
 - ? 4.2.1.1 The action-oriented view of the technical innovation process
 - ? 4.2.2 IS implementation as a process of organizational maturity
- ? 4.3 Ontological perspectives on IS implementation
 - ? 4.3.1 Technological determinism
 - ? 4.3.2 Organizational imperative
 - ? 4.3.3 Socio-technical interactionism
 - ? 4.3.4 Managerial action
- ? 4.4 The absence of an action orientation in existing views of IS implementation: a critique of Earl’s (1996) model
- ? 4.5 Summing up

† † †

4.1 Introduction

The term “implementation” is used in the literature with many different meanings and because there is so much confusion about what implementation is in the context of information systems research and practice, some writers take great care when using the word. As (Cornford, 1995:45) explains:

The word implementation often causes problems. To a programmer or software engineer it means taking design specifications and writing programs. To an information systems analyst it means taking the programs and other components and setting them to work in the real world

To solve the problem, that particular writer prefers not to use “implementation” as a stage of the information systems life cycle, but use “construction” and “changeover” instead to name stages whose contents is roughly equivalent to implementation. The term is used both in operational and in strategic contexts; it is used to mean both a technical and an organizational process; and it is conceptualized both as a technological inevitability and a purely emergent set of social phenomena. So, how should we understand IS implementation?

Walsham (1993) argues that IS organizational implementation encompasses all the human and social aspects of the implementation of information systems in organizations. We suggest that IS organizational implementation goes further than that and has to include also other aspects of organizational reality, such as the technical, the strategic and the managerial aspects, among others. Hence, we have proposed a definition of IS organizational implementation, which encompasses all of the aspects, which are organizationally relevant to the *complete* process of introduction of information technology applications into organizations and which reads as follows.

IS organizational implementation

A continuous process of organizational learning guided by IS-related managerial action and shaped by IS-related organizational contexts, the constitutive bases of the alignment between the organization’s strategy and the processes of infusion and diffusion of information technology artifacts into the organization

Every body of knowledge has some particular epistemological and ontological assumptions that ultimately shape its existential, social, political and economic relations (Boje, 1996). So, regarding the body of knowledge, which guides IS research and practice we should not take for granted that all epistemological and ontological questions are resolved. Hence, two very basic questions can be asked about IS implementation:

- (1) *What* is IS implementation?
- (2) *How* is IS implementation carried out?

The first question belongs to the ontological/epistemological domain, i.e. what is the nature of this phenomenon and what theoretical knowledge governs the worldviews of its research and practice

? The second question belongs to a more pragmatic domain and concerns the actual processes involved in IS implementation.

In our definition, we view IS organizational implementation as a process of organizational learning. In the previous chapter we have seen how, through the lens of autopoiesis theory, the notions of organizational culture, knowledge and learning are so closely intertwined. In this chapter we begin to apply this thinking to IS implementation. Drawing on IS research literature our aim is to show, in the first part of the chapter, how IS implementation can also be seen as a process of organizational learning and change. This will answer the question “*what is IS implementation?*”, in terms of the nature of the phenomenon. In the second part of the chapter, we approach IS implementation from the point of view of the existing (ontological/epistemological) perspectives on IS implementation, i.e. what is theoretical knowledge behind the phenomenon?

Traditionally, IS “theory” has been dominated by three types of approaches: (1) A technology-driven approach focussed, primarily, in the application of the available information technologies to organizational set ups through the use of appropriate methodological tools - “technological determinism”. (2) A strategic, top-down approach, which is concerned mainly with creating the links between the business environment, the business’ strategy and the IS/IT strategies - “organizational imperative”. (3) A bottom-up approach, which is concerned with the interaction between the structures of the technology and the social structures of the organization and with the emergent effects arising from such interaction - “socio-technical interactionism”. None of these three approaches, however, tackles the problem of the managerial action needed, before, during and after the introduction of the IT artifacts.

Taylor and Williams (1994), in the four questions below, summarize quite accurately the confusion that exists in the field about IS implementation.

(1) Should information systems be constructed using a top-down model for organizational transformation or should they be constructed from the bottom up, moving from specific systems-related issues to more general organizational issues?

(2) Should the key focus of change be “the system”, using an “organization free” data model (i.e. totally conceptual) or should information systems be built cumulatively, using the organization always as the key focus and working on specific organizational domains?

(3) Should organizational growth rely primarily on an independent source of change, that is on external factors, such as new technological developments or should it rely on dependent sources of change, that is, internal factors and organic organizational growth (i.e. including information systems growth and maturity) ?

(4) Should the strategic focus be to protect or to challenge organizational capabilities? In some organizations, grand implementation plans for strategic information systems produce

“major disruption to the skills and knowledge-base of the company” (p.64) whereas in others, small-scale change projects seem to yield much better results.

In the third part of the chapter, the question “*how* is IS implementation carried out?” is approached. This is accomplished by analysing in some depth a well-known strategic model of IS implementation put forward by Michael Earl (1996). That model deals, primarily, with the question of the alignment of information systems with the organization’s strategy. According to Earl, alignment is the result of four IS-related processes, which organizations have to develop: the clarification, the innovation, the infrastructure and the constitution processes. While agreeing that the articulation of such processes is an important step forward, we question Earl’s notion of alignment and especially how such a notion is achieved, in practice. We argue that Earl’s proposals are still enslaved by an “organizational imperative” perspective of IS implementation, dominated by a worldview of managerial rationality and choice.

The new managerial action perspective, which we advocate, complements Earl’s organizational imperative perspective. We too concern ourselves with the alignment of IS with the organization’s strategy, but we take a different view of the concept of alignment. We argue that alignment cannot be seen as a static proposition that can be strategically engineered, but that it must be regarded as the outcome of an IS-related organizational context shaped by managerial action and constituted by IS-related organizational values, and roles relationships. In fact, Earl (1996) does argue for a “constitution process” as the “cornerstone” of the organization’s information strategy, but he does not develop any theory about such particular process. We do not believe that the constitution process is just an ordinary process of alignment. We regard the constitution process as a meta-process, as something closely linked to the notions of organizational knowledge, culture and climates.

4.2 IS implementation as a process of organizational learning and change

Viewing IS implementation as a process of organizational change is the recognition that the installation of new information technology applications does bring about change in organizational procedures, processes and behaviour in general. In one of the earliest textbooks on MIS (Management Information Systems) Davies and Olson (1985:593) state that “the implementation of information systems is a process of organizational change”. Lucas (1994:502) agrees that “implementation is part of the process of designing a system, and it is also a component of organizational change”. Land (1992) argues that planning for IS implementation *is* planning the organizational change process and that implementation and change are also essential components of the IS strategic planning activity.

Land (1992) argues that change management is the much needed link between the strategic and the tactical levels of IS implementation. He identifies six factors, which are essential in the change management process and which determine successful adoption of the new system: (1) motivation

for introducing the new system; (2) commitment to the system; (3) organizational culture; (4) management of the implementation process; (5) the “distance” between the existing system and the replacement system; (6) the technology itself. From this summary, it becomes clear how wide-ranging the process view of IS implementation can be. It can include motivational aspects, political aspects, cultural aspects, i.e. all sorts of management aspects, which deal with the integration of the technical and the social aspects of the IS development process.

Organizational change can take many forms, but those forms, which are more closely associated with the implementation of IT artifacts are innovation and learning. These are the foundations of two important streams of research in IS implementation, which we will briefly review.

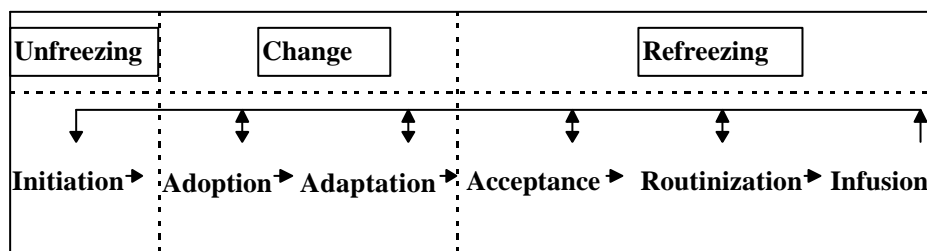
4.2.1 IS implementation as a process of technical innovation

A “process view” of IS implementation has been developed in an important stream of research inspired on technical innovation and diffusion theory (Kwon and Zmud, 1987; Cooper and Zmud, 1990; Saga and Zmud, 1994). This research is important because it attempts to create an integrated framework to deal with the *whole* phenomenon of IS implementation. Furthermore, it draws attention to the fact that IS implementation should be split up into stages, similar to the stages hypothesized for a process of technical innovation. Such implementation stages explain the process and are an alternative view to the steps highlighted in the IS life cycle development models.

Zmud and colleagues have developed a research framework for IS implementation, which integrates much of previous research in this area, but especially the stream of research, which focuses on factors or variables, which facilitate or impede IS implementation (Lucas, Ginzberg and Schultz, 1991). Some of the factors highlighted in this research stream are, for example, the user’s decision style, the user’s knowledge of the system, the user’s job characteristics, user acceptance, user demographics, etc. Slappendel (1996) calls this a “trait approach” to technical innovation, where it is assumed that certain individuals have personal qualities, which predispose them to innovative behaviour.

What Zmud and colleagues have done is to extract the major trends from previous research in IS implementation, and map them onto the stage model, which can be seen in Figure 4.1.

Figure 4.1 - Innovation-based model of IS implementation



Sources: Kwon and Zmud (1987); Cooper and Zmud (1990)

The six stages, which form the main body of the model (Initiation- Adoption-Adaptation-Acceptance-Routinization-Infusion) are derived from the early literature on technical innovation and diffusion process (Rogers, 1962). The organizational change dimension is added on to the model by splitting it into three wider phases, which correspond to the Unfreeze-Change-Refreeze paradigm of change put forward by Lewin (1952). The processes, which characterize each of the six stages are briefly described below (Cooper and Zmud, 1990).

- ? Initiation: Involves the process of scanning of organizational problems/opportunities and of IT-based solutions. There are pressures to change either from internal organizational needs or from external technological innovations. This is the phase of “unfreezing” the organization.
- ? Adoption: After a match is found between organizational problems and IT-based solutions, a decision is taken to invest in the required technology, involving formal and informal negotiations.
- ? Adaptation: The IT application is developed (or purchased), installed and maintained. Organizational procedures are revised and staff receives training. The Adoption and Adaptation stages correspond to Lewin’s “change” phase.
- ? Acceptance: The IT application is launched and staff members are encouraged to use it.
- ? Routinization: The IT application becomes part of normal organizational activity.
- ? Infusion: The IT application becomes more deeply embedded in the organization’s work system and increased organizational effectiveness is achieved through more comprehensive and integrated use of the application. Acceptance, Routinization and Infusion form the “refreezing” phase of change.

From this basic conceptual orientation, two major problems flow: firstly, it treats IS implementation as a linear process composed of sequential and clearly defined stages; secondly, it considers IT use (performance and satisfaction) and the reorganization of work as being the only consequences of IS implementation. Let us take these two problems in turn.

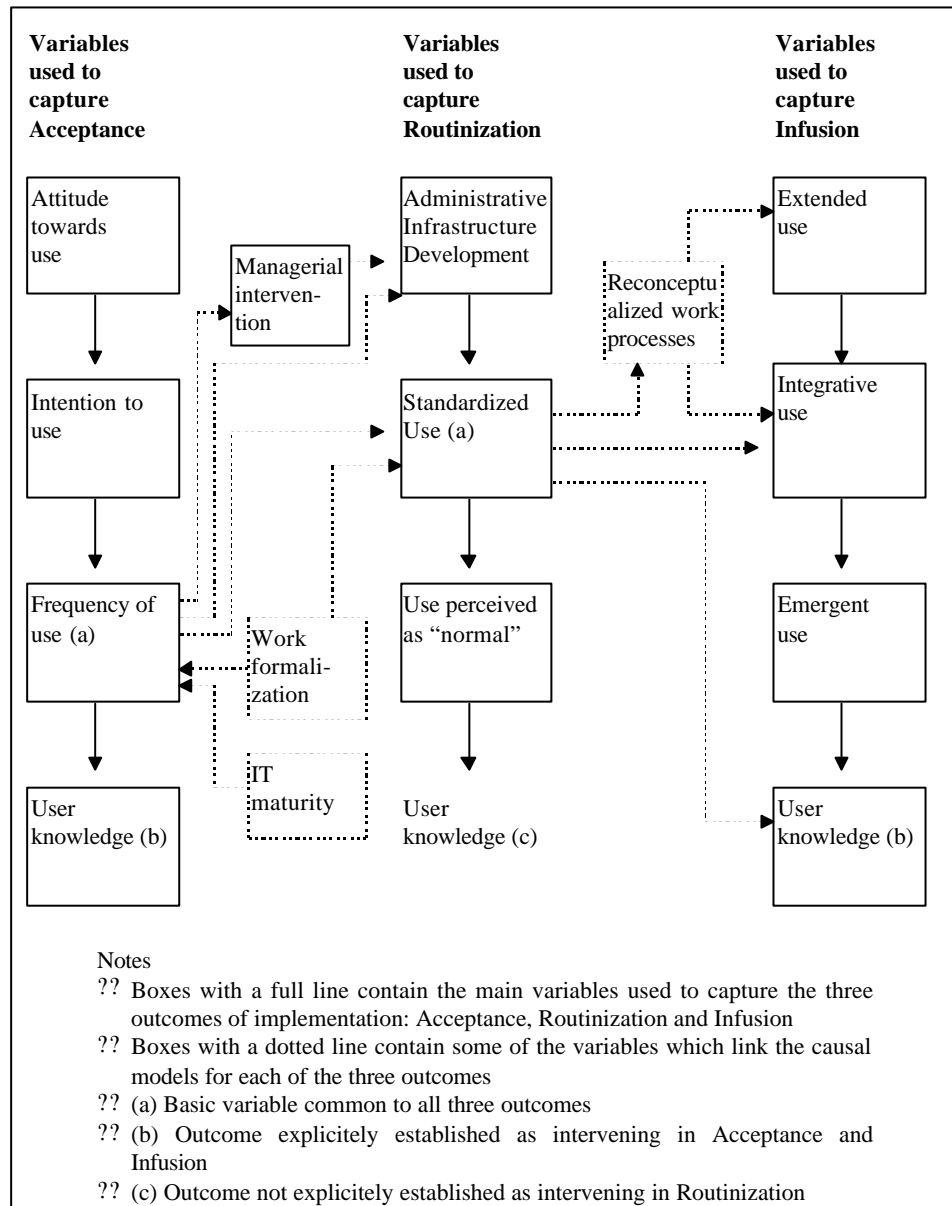
The view of IS implementation as a linear process where the technology is first identified and implemented and then presented to the users, goes directly against the IS development models inspired on socio-technical thinking, which strongly recommend iteration between stages (see section 4.3.1). Saga and Zmud (1994:68) recognize the criticism, but argue that “these linear relationships need not be taken too literally: stages can be thought of as activities, some of which may occur in parallel”. Furthermore, they suggest that sequential models “may be more appropriate for technologies, which are borrowed or adapted rather than custom made” (1994:68). The authors have a point here if we consider that there is a definitive trend towards the adoption of off-the-shelf software applications as opposed to the in-house development of software, which has prevailed in most companies until recently.

The process of innovation, however, is a process of change. But organizational change, as Pettigrew and Whipp (1991:27) remind us “does not move forward in a direct, linear way nor

through easily identifiable sequential phases. Quite the reverse, the pattern is much more appropriately seen as continuous, iterative and uncertain". In the innovation literature too there seems to be some consensus regarding the incremental and the learning nature of processes of technical innovation (Cohen and Levinthal, 1990). Nelson and Winter (1982) propose that innovations are not just incremental but that they are also the result of the combination of old organizational routines. Thus, instead of being depicted as a linear process we propose *that IS organizational implementation should be conceived more appropriately as a spiral process where each loop (i.e. stage) precedes the next but also where there is considerable a amount of overlap and movement back and forth between loops.*

The second criticism, which can be raised at the process model presented by Zmud and colleagues is that it considers *IT use* as being, almost exclusively, the end consequence of IS organizational implementation. In Cooper and Zmud's (1990) definition of infusion (the final stage of the IS implementation process) IT use is the only measure of both the process and the product of infusion. This also becomes apparent in Saga and Zmud's (1994) review of the literature on the determinants of IT Acceptance, Routinization and Infusion, the final stages of the implementation process and essential in its success or failure. A composite chart bringing together the three causal models presented by those authors and which highlights the dominance of IT use, as the major dependent variable can be seen in Figure 4.2.

Figure 4.2 - IT use as the major contributing factor to IS implementation



Source - Adapted from Saga and Zmud (1994)

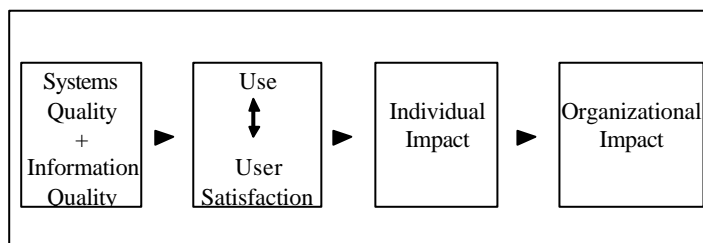
Although it seems very obvious as an overall measure of implementation effectiveness or success, IT use is plagued with problems regarding its power as an unambiguous measure. Can we reliably infer quality of use simply from the quantity of use? The fact that IT use has not been unanimously adopted by the IS research community as the measure of implementation success is a strong indication of its limitations.

We argue that there are manifestations of effectiveness of IS implementation at the organizational level, which do not simply translate into IT use. For example, the increasing personal commitment of top management in decisions regarding the management of IS/IT at corporate level can be an indication of the effectiveness of the implementation of information systems in the past. An additional problem, is that it can only be applied to individual implementation projects, making it impossible to give it any organizational dimension. IT use does not lend itself in any way to be used as an aggregate measure, and analyses, which profess to aim at the organizational level, have to use aggregate measures.

The problem with the adoption of IT use as the major indicator of effectiveness is that it narrows down the whole phenomenon of IS organizational implementation to the operational level, assuming that the majority of IT use takes place at the operational level of the organization. All the organizational consequences of IS-related policy making, policy implementation, relationship building between IS and other personnel are left out of this conceptualization of IS implementation. *Thus, we propose that the concept of IS organizational implementation must include not only the operational level of the organization, where “use” is appropriate as a partial measure of the implementation process, but also the top and the middle levels of the organization where “use” may not be an appropriate measure.*

Another example is De Lone and McLean’s (1992) process model, which also places information use and user satisfaction at the centre, as the ultimate measure of success. This model, shown in the figure below, is an attempt at establishing “success” measures for IS implementation. The authors say that IS success must be seen as a “process construct that must include both temporal and causal influences in determining IS success” and also that the success categories presented in the model must be interdependent while maintaining the “serial, temporal dimensions of information flow and impact”(p.83).

Figure 4.3 - Categories of IS success



Source: De Lone and McLean (1992)

While we agree with the temporal dimension of this model we cannot agree with the causal dimension, which the authors claim the model should have. The

above model places the organizational impact of one (or more) information system at the end of a causal chain of events. It can be assumed from the model that if the previous impacts on the causal chain are positive then the organizational impact will also be positive. However, the organizational impact of an information system can be very high without it having had a significant impact on individual organizational members. For example, an information system, which is visible to the clients of an organization can have a significant organizational impact because of the image factor upon the clients, but have little or no impact at the individual level in the organization.

De Lone and McLean (1992) treat the organizational impact of IS implementation simply as the outcome of a linear process. They consider each information system as a discrete unit divorced from the rest of the organization and they do not consider, for example, the effects of the strategic or tactical planning, which has to go into the implementation of any information system. They treat information systems as something, which just lands on the organization without considering what came before nor what may come after. In other words, they do not consider the learning or knowledge development effects, which the various actors are subject to when going through the various stages of the implementation life cycle.

However, the process models presented by Zmud and colleagues as well as by De Lone and McLean have some relevant features to offer. The first is that the IS organizational implementation process can and should be seen as a technical innovation process, which goes through identifiable stages. Eveland (1987:313) explains why it is important to consider implementation stages in the dynamics of innovations:

Putting technology into place in an organization is not a matter of a single decision, but rather of a series of linked decisions and nondecisions. People make these choices and choices condition future choices (...) Researchers have developed the idea of innovation stages as a way of categorizing decisions and defining how this leverage operates, that is, seeing how some decisions of necessity precede and shape later ones.

Another relevant contribution of these models is that they draw attention to the long-term consequences of the implementation process contained in the “infusion” stage (Cooper and Zmud, 1990) and in the “organizational impact” stage (De Lone and McLean, 1992). These stages, being the final stages in the process of organizational change associated with the implementation of IS, can be understood as the changes, which are brought about in the knowledge system of the organization, by the integration of the structures contained within the technology itself and the social structures, which make up the organization (Weick, 1979). Such changes in the organization’s knowledge system are very relevant because they are mostly emergent, and they occur irrespective of the original purposes behind the implementation of the information system. Such aspects of the organizational implementation process, less amenable to measurement and modelling will be discussed further along in this dissertation.

4.2.1.1 The action-oriented view of the process of technical innovation

The research stream led by Zmud and colleagues has often been criticized on the grounds that if it is divorced from an organizational context, the knowledge of factors or variables is of little or no use at all. Their model is based on an essentially object-oriented view of innovation, where the stages are described in terms of the content of the decisions, rather than in terms of the *actions* taken at each stage of the process. Eveland (1987) has been proposed an action-oriented view of technical innovation. According to that author, technical innovation is a change process of “gradual shaping of a general idea, which can mean many different things to different people into a specific idea that most people understand to mean more or less the same thing” (p. 313).

Roberts (1987:4) expresses a similar view emphasizing also the action component of technical innovation. He observes “technical innovation is a multi-stage process, with significant variations in the primary task as well as in the managerial issues and effective management practice occurring among these stages”. Slappendel (1996) reviews the existing trends in the innovation literature and concludes that the “interactive process” perspective is likely to become the most prevalent. Such a trend assumes that innovations are the outcome of an interactive process between individuals, the organization and the structural factors of the technology.

Moreover, Slappendel (1996:118) argues that the aim of the process view of innovation is to explain organizational change in terms of “the probabilistic rearrangements of discrete events over time rather than to establish efficient causes through the study of variance”. We would like to note that these views of the technical innovation process are also very close to the concern expressed by Bartlett and Ghoshal (1993, 1994, 1998), regarding the relevance of purposeful managerial action in the development of a propensity towards innovation, collaboration and learning, in organizations.

Eveland (1987) suggests five action-oriented stages in a process of technical innovation: (1) Agenda-setting (2) Matching (3) Redefining (4) Structuring (5) Interconnecting. We propose that with due adaptation these five stages could provide an adequate view of IS organizational implementation, as a process of technical innovation.

- ? Agenda-setting. The stage of IS strategic reflection and policy formulation or reformulation, in terms of the organization’s known and emerging strategic options.
- ? Matching. The stage of drawing up implementation plans for establishing or updating the organization’s information systems/technology architectural platform. It is a three-way interactive process of organizational growth, where requirements from the top of the organization are matched with potentially appropriate new technology to be imported from the outside and with bottom-up organizational realities, regarding both the technological legacy and the human issues emerging from past experiences with the technology (Galliers, 1994).
- ? Redefining. The stage of operationally implementing new or modified systems, involving technical and human aspects. The word “redefining” carries a socio-technical meaning whereby both the social and the technical aspects redefine each other. In the language of structuration theory (Giddens, 1984), social and technological aspects structure and restructure each other.
- ? Structuring. Once the structures of the technological and the social sides of the organization have redefined each other at the individual level, the path is set for structuring and restructuring at the organizational level. New organizational structures emerge and new needs are created on the technological front.
- ? Interconnecting - The stage where it is no longer possible to set apart the social structures in the organization from the structures emerging from the implemented technology. It is the equivalent to Kwon and Zmud’s (1987) Infusion stage, but here

the consequences of the implementation process have reached all parts and all levels of the organization. The information technology applications have become embedded in the social fabric of the organization, in a very dynamic manner. Thus, the interconnecting stage does not stop at a given point but goes on evolving all the time with the organization.

Diagrammatically, the best representation for this process of IS *organizational* implementation would be a spiral, with overlapping loops and backward and forward movement between loops. Such circular and spiral view of the process of technical change is supported by Slappendel (1996:124). That author argues that the interactive process perspective requires that innovation researchers not only “think in circles” but also “write in circles”. This view is also consistent with Mintzberg and Westley’s (1992:39) suggestion that “change in organizations can be depicted as a system of moving cycles” of various shapes, namely: concentric, circumferential, tangential and spiralling.

The traditional information systems development life cycle (briefly reviewed in section 4.3) has also been represented as a spiral (Boehm, quoted in McNurlin and Sprague, 1998). But such representation is still, essentially, an object-oriented featuring the traditional phases of development - requirements specification, design, testing and implementation. The point we are trying to make here is that, the notion of the spiral process is not enough to make IS implementation an *organizational* process. For it to be considered organizational, the overall process needs to take into account not only contextual issues, (top-down, bottom-up, intended and emergent) but also *purposeful managerial action at each stage of the process and the new IS-related learning that ensues*.

4.2.2 IS implementation as a process of organizational maturity

Using Information Technology tools to automate organizational procedures is a learning processes within the organization, which, in turn, is partially determined by the history of information systems management in that particular organization. To trace the complete historical development of an organization’s information systems is a laborious processes, as it involves not only the developments in the technology itself but also, and more importantly, all the history of relationships amongst all the (many) actors involved in managing and using the technology. However, the legacy of such relationships are represented in the formal and informal organizational structures, which the organization has adopted over the years.

The earlier attempts to operationalize IS organizational learning were carried out under the metaphor of IS organizational maturity. The idea of measuring the “level” of IS organizational maturity has given rise to the hypothesizing of conceptual models, in an attempt to typify information systems development stages across organizations. These models range from more deterministic to less deterministic, in terms of their normative pretensions.

The best known stages of development model has been put forward by Nolan (reviewed in King and Kraemer, 1988) and comprises six stages: Initiation, Contagion, Control, Integration, Data Administration and Maturity. Nolan postulated that IS evolution in organizations follows two S-shaped learning curves: the first starts with very low levels of learning at the Initiation stage, followed by rapid growth through Contagion, levelling off at the Control and Integration Stages; the second curve starts at the levelling off of the previous curve, has slow growth at first and then more rapid growth through the Data Administration stage, levelling off again at the Maturity stage. The idea of modelling IS organizational growth through development stages has influenced a great deal of research and writing (e.g. Huff, Munro and Martin, 1988; Galliers, 1991).

Nolan's work has left two important theoretical contributions: firstly, it drew attention to the fact that the growth of computing is due to the influence of forces inside and outside the organization; secondly, it introduced the notion that throughout the evolution of IS in organizations, managements go through periods of *slack* and *control*. Huff, Munro and Martin (1988) used similar notions, which they have named *expansion* and *control*, to explain that the introduction of a new type of technology triggers the need for the organization to learn and to expand, either in terms of knowledge or in terms of computing resources. But after such periods of slack or expansion there is usually a need on the part of management to contain the expenditure and a period of tighter control of the development of computing is then initiated.

Nolan's model has been criticized by various authors, on the grounds that it does not stand up to empirical testing. Another criticism is that stage models do not take into account the emergent properties emphasized by the socio-technical approaches to IS implementation. Instead, they conceptualize organizations as machines whose behaviour as well as the impact of IT applications can be predicted. Choo and Clements (1994) reinforce this point and express an alternative view of the evolution of computing in organizations. Those authors write specifically about End User Computing (EUC), but as Huff et al (1988) point out, there is no reason to believe that the evolution of EUC should be any different than other forms of organizational computing.

Growth is driven by advances in the technology and by the organization's capacity to learn the technology. While providing a framework to discuss management strategies, stage models are limited by their failure to recognize an intrinsic social feature of EUC. The growth of EUC is characterized by the tension arising from users' wish to directly control computing and data resources and information systems departments' desire to manage centrally and control EUC (...) EUC growth is not only driven by the technology but is also strongly by environmental forces and organizational traits. (Choo and Clement, 1994:213)

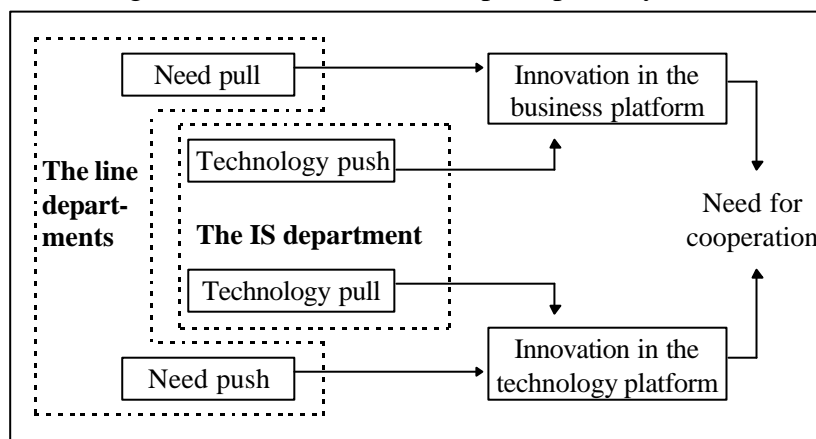
The above authors suggest that IS maturity is a function of the degree of control and influence over computing resources of IS users versus IS staff. They suggest further that such control and influence could be ascertained over a number of criteria (e.g. hardware and software acquisition, Information Centre policies, IS training, etc) used to establish whether an organization is more user-driven or more IS-driven. Although this may sound too simplistic an idea, it does draw attention to the political and sometimes conflictual nature of a *key* element in IS organizational maturity or learning: the relationship between users and IS specialists.

Such conflicting relationship is part of a central issue in IS management, i.e. the debate between the centralized versus the decentralized control of IS/IT resources, also known as the debate between the technology platform versus the business platform, which Zmud (1988) outlines as follows:

Most information products and services are targeted towards an organization’s business platform, that is, its customers, its front- and back-office procedures, and its staff, managers, professionals, and management systems. The nature of this platform creates significant pressure for line managers to disperse IT resources and the decision making responsibilities regarding these resources. However, in order for customers, managers, professionals, etc. to use information products and services, a robust technology platform must exist. This platform, which consists of appropriate data, processing, and communications capabilities and architectures, builds significant pressure for IS managers to prescribe IT policies, plans, standards, and guidelines (...) Technology innovation in today’s IS context must be driven simultaneously within two distinct but interrelated work domains: a firm’s business platform - a line management responsibility - and the firm’s technology platform - an IS management responsibility (p.57).

Zmud (1988) calls this the “push-pull” dilemma. In order to facilitate technological innovation in the business platform “need pull” and “technology push” are required and in

Figure 4.4 - Zmud’s (1988) “push-pull” dynamics



order to facilitate technological innovation in the technology platform, “technology pull” and “need push” are needed. This dynamic relationship is illustrated in Figure 4.4 above. It is from the balance of these forces (technology innovation in the business and in the technology platforms) that success in information systems implementation lies. However, in order to achieve such balance the need for cooperation and for partnership building between IS and business managers is an absolute requisite (Zmud, 1984, 1988)

Brown and Ross (1996) reinforce the “push-pull” dynamics by pointing out that organizations strive constantly towards the maintenance of a balance between the development of an IT infrastructure and the building of partnerships between IS/IT staff and IS/IT users. A centralized corporate IT infrastructure brings benefits such as a more cost-effective utilization of computing resources (Simson, 1990), the synergistic effects of having such resources under a common management structure and all the operational benefits of having standard technology platforms. Strong IS/IT staff-users partnerships create other benefits, such as an IS management style,

which is more responsive to local business needs, a shared understanding of IT capabilities and business unit needs and information systems, which are directly targeted at customer needs (Henderson, 1990).

Thus, we may conclude that IS implementation as a process of organizational maturity is related to two types of learning (and knowledge): the IS-related organizational/ business learning and IS-related technical learning, as it is described below, in very simple terms, by Sprague and McNurlin (1993:43):

Technologically mature organizations are those in which management is comfortable *managing* the use of IT and employees are comfortable *using* the technology. These organizations are the ones most likely to take advantage of the new uses of information technology.

4.3 Ontological perspectives on IS implementation

Behind each ontological domain there is an epistemological foundation but sometimes the distinction between the two domains becomes blurred and it is difficult to say where ontology stops and where epistemology begins. There being no purpose in embarking on a philosophical discussion about the definition of such concepts, we wish to emphasize, in this section, that our aim is to go to the roots of the IS implementation phenomenon. We wish to discuss and question the theoretical assumptions, behind the activities conventionally known as “IS implementation” and propose new avenues, which will better support the new organizational perspective that we advocate.

The question of *what is IS implementation* is a crucial issue to both Information Systems researchers and practitioners. In other words, when researchers and practitioners talk about IS implementation what theoretical assumptions are they making? What are the technical, social and organizational processes, which underlie the IS organizational implementation phenomenon? How do processes interact and why?

The different perspectives on IS implementation, which will be discussed can be seen in Table 4.1.

Table 4.1 - Perspectives on the implementation of information systems

| | Technological Determinism | Organizational Imperative | Socio-Technical Interactionism | Managerial Action |
|---|---|--|--|--|
| Organizational Metaphor | Machine | Brain | Culture | Flux and Transformation |
| Level in Systems Hierarchy | Control systems | Open systems | Higher level systems with emergent characteristics | Higher level systems with emergent, open and closed characteristics |
| Underlying Philosophy | Hard-line determinism | Procedural rationality | Contextualized interaction of technology and social structures | Managed interaction of technology and social structures |
| Methodological approach | Technology engineering (machines and methods) | Organizational engineering (strategy, structure and systems) | Socio-organizational analysis (people and machines) | Leadership, i.e. overall managerial responsibility (people, purpose and processes) |
| Implied implementation strategy | None | Top-down | Bottom-up | Mixed (Middle-Up-Down) |
| Likely outcome of implementation | More rational decision making | Greater efficiency through mechanistic organizational learning | Uncertain/ Emergent | Greater efficiency through organic organizational learning |
| Examples from the IS literature | Leavitt & Whistler (1958); Huber (1990) | Porter & Millar (1985); Galliers (1991); Cash et al. (1992); Earl (1989, 1996) | Kling (1980); Markus & Robey (1988); Orlikowski (1992); Walsham (1993) | Ciborra and Lanzara (1994); Introna (1997) |

4.3.1 Technological Determinism

This particular label for a perspective on IS implementation has been used by Campbell (1996), but it is also known as the “Technology Imperative” (Markus and Robey, 1988), the “Determinist” perspective (Symons, 1991) or the “Decision Making” school (DeSanctis and Pool, 1994). It views technology as an exogenous force, which determines the behaviour of individuals in organizations and, therefore, as the principal force behind technology-related organizational change. This view is imbued with a sense that technology is intrinsically good and with an optimistic attitude in relation to effects of automation on organizations and society in general.

Under this perspective, we classify the approaches to IS implementation, which emphasize the actual steps involved in applying information and communication technologies to organizational set

ups. In circles closer to computer science, for example, IS implementation is used to mean simply the actual installation of IT applications focusing entirely on the technical aspects of the IS development process (Ginzberg, 1981). In the information systems literature, however, implementation is usually considered to be one or more of the stages of the information systems life cycle (ISLC), which is a model of planned change applied to IS development. The IS life cycle approach has its roots in the engineering disciplines and the major emphasis is on how to make the technology work, that is, how hardware, software and data can be utilized to serve a particular organizational need.

There is a wide variety of ISLC models, with the number of stages ranging from four to seven or more. The basic steps are (1) Definition, which includes initiation, planning, requirements determination (i.e. analysis) and design; (2) Construction, which includes programming and/or the acquisition of software and testing; (3) Installation (or Implementation), which includes changeover, training and evaluation; (4) Operations, which includes maintenance, enhancements and further evaluation. In terms of iteration between the stages, with varying levels of dialogue between developers and users, ISLC models range from no iteration among stages as in the “classic project life cycle” to highly iterative “prototyping models” with “circular pattern MIS life cycle models” in the middle (Kappelman and McLean, 1994).

In terms of Morgan’s (1997) organizational metaphors this perspective views organizations as “machines” where human behaviour is highly predictable and determined by clearly defined rules. The mechanistic mode has shaped our most basic conceptions of what organization is all about, e.g. when we talk about organizations we usually have in mind “a state of orderly relations between clearly defined parts that have some determinate order” (p. 13). The introduction of new technology does not pose a problem as long as the rules are in place. Shared goals, an apolitical view of organizational members, overall consensus and organizational stability are also characteristics of the machine organization. In terms the systems approach to organizations, the technological determinist perspective is situated at the “control systems” level, according to Boulding’s (1956) hierarchy of systems. Control systems models describe regulation of system behaviour according to an externally prescribed target or criterion as in thermostats or heat seeking missiles. According to this perspective, implementation is guided solely by externally prescribed criteria, such as the deadlines or performance indicators from the implementation plan.

The technological deterministic perspective is dominated by an engineering worldview with the emphasis on technological and organizational performance measures, such as speed of response and better data for decision making. Implementation is regarded as a straight-forward task where the human and the organizational components are given little priority in relation to the machines and the methods for making the transition from manual tasks to automated tasks. The research approach is positivist and typically quantitative, with the emphasis on the effects of technology manipulation (Orlikowski and Baroudi, 1991). In terms of an implied implementation strategy for the organization, the technological determinist perspective does not treat strategy as an issue, given its views on the nature of human beings and of the organization. Because human behaviour is predictable and organizations can be structured in such a way as to accommodate the future

impact of new IT applications, implementation is simply the final stage in the technical process of getting the technology to work.

Examples from the literature are the early writings on the impact of information technology on management (Leavitt and Whistler, 1958; Simon, 1977), the utopian predictions about the impact of IT on organizations (Huber, 1990) and the deterministic view of information systems on decision support in organizations (Keen and Scott Morton, 1978). Much of the literature on structured design methods (De Marco, 1979; Yourdon, 1982) is also informed by this ontological/epistemological posture.

4.3.2 Organizational Imperative

This perspective on IS implementation has many roots, but it can be argued that its earlier influence is Simon's (1945;1997) so-called information processing model of the organization. However, it was the rise of the strategic management school from Harvard (Chandler, 1962; Andrews, 1971), which has established this perspective and dominated the mind-set of managers for at least three decades. The basic assumption is that through (strategic) planning all organizations will be effective and efficient. In terms of technology, the assumption is that management has unlimited options over the choice of technologies as well as unlimited control over the consequences of their application in the organization. The label "Organizational Imperative" was created by Markus and Robey (1988), but this perspective has also been labelled the "Systems Perspective" (Symons, 1991) and "Managerial Rationalism" (Campbell, 1996).

In terms of Morgan's (1997) organizational imagery, this perspective views organizations as "brains", greatly influenced by Herbert Simon's theory of decision making. According to Morgan, this such intellectual influence "leads us to understand organizations as institutionalized brains that fragment, routinize and bound the decision-making process to make it manageable" (1997: 79). One of the major advantages of the brain metaphor is that it identifies the requirements of *learning* and the true potential, which rests in creating networks of interaction that can self-organize and be shaped by the intelligence of individuals in organizations.

However, the notion of organizational learning derived from the information processing metaphor of organizations tends to be abstract and mechanistic. To give an example: in an interesting application of organizational learning to information systems, Pentland (1995) explains how IT might be absorbed into the organization's knowledge system by using a five-step process of construction, organization, storage, distribution and application of knowledge. At each of those steps, IT applications play a role, which, in turn, has an effect on the organization's knowledge system. Although useful, mainly for purposes of description of events, this type of approach treats the organization as a black box in the sense that it fails to consider the people, the groups, the culture or the leadership, which is necessary for the actual absorption or the learning to take place.

The Organizational Imperative perspective can be said to be situated at the level of open systems in Bouldings's (1956) hierarchy of systems. The conceptual difference between control systems and open systems is that whereas the former tend towards equilibrium in response to externally prescribed targets thereby producing uniformity, the latter resist uniformity while also tending towards equilibrium but using their internal capacity for self-maintenance (e.g. the biological cell). However, as Pondy and Mitroff (1979:22) have argued, in management and organization science research "we have seriously misunderstood the nature of open systems and have confused them with natural or control systems". Organizations are social systems and as such they develop their own rules and codes of practice. They are really "higher level" systems in Boulding's (1956) hierarchy.

Pondy and Mitroff's (1979) criticism has been echoed by many writers, among whom Henry Mintzberg (1990) under the heading of the "design school" of management. The idea of detaching thinking from action, which is the key tenet of the rationalist epistemology, summarizes the criticisms that Mintzberg makes of the school of managerial thought championed by the Harvard Business School. In his critique of the top-down approach to strategy formulation and implementation, Mintzberg highlights the following key issues:

- ? Strategy formation is seen as a controlled, conscious process of thought
- ? The strategy process depends solely upon the top management team
- ? Separation of strategy formulation from strategy implementation
- ? A rigid formulation of "structure follows strategy"

In the information systems literature the same influence was also felt, especially after the writings of Porter (1980;1985) on competitive advantage. Porter's models of industry analysis and of generic strategies have given rise to the publications of many books and articles on IS/IT-induced competitive advantage (McFarlan, 1984; Cash and Konsynski, 1985; Porter and Millar, 1985; Bakos and Treacy, 1986; Ives and Learmonth, 1988; Wiseman, 1988; Earl, 1989; Cash et al., 1992; Ward and Griffiths, 1991; Galliers, 1991). During the 1980s and early 1990s much of the information systems literature was dominated by the notion that strategic planning methodologies and frameworks were the key to success.

This movement gave rise to a number of methodologies, collectively known as Strategic Information Systems Planning (SISP). SISP methodologies present a dual purpose. Firstly, they serve as a means to identify a portfolio of computer-based applications, which will enable the organization to realize its business plans and consequently to fulfil its business objectives; secondly, SISP can also be used in the analysis of the competition and in the search of applications, which will create business advantages for the organization (Lederer and Sethi, 1988).

These methodologies are typically top-down in the sense that they all start from the statement of the organization's business strategies and objectives and with varying degrees of emphases, go through the following steps: (1) from the business strategy, formulate a clearly defined information policy; (2) proceed to the identification of business needs and business processes, eventually to be

represented in the form of an information architecture; (3) the information architecture, in turn, becomes the basis for the formulation of the organization's information systems and information technology strategies and policies. The outcome of a SISP exercise is a priority list of computer applications to be built or updated, taking into account important factors such as costs-benefit considerations, the organization's legacy in terms of its technological architecture, the market trends in the relevant technologies, the potential risks involved and, sometimes, an implementation plan.

In the SISP literature the word "implementation" is often mentioned but always as something, which will follow the planning stage. In other words, IS implementation is not seen as a problem or, at least, not as an important a problem as IS planning. IS implementation issues are assumed to follow from an analysis of the factors which may hinder success in the implementation effort (Lederer and Sethi, 1988; Galliers, 1991). Galliers (1991), for example, writes about "guidelines for successful implementation" of SISP but does not define the scope of the word "implementation". The guidelines are as follows: (1) appropriate commitment and involvement from top and senior management; (2) appropriate choice of strategy; (3) adequate assessment of the benefits of SISP from the point of view of the various stakeholders involved and (4) successful linkage with business strategy. Judging by this list of factors, implementation success is limited to the strategic level of the organization and does not include success at the operational levels. Conceivably, this could mean that an organization might have success at the SISP level, but fail in successfully implementing the resulting applications at the tactical or operational levels (Land, 1992). If this were the case, one would be entitled to ask "what is the point of SISP"?

But the top-down approaches to IS implementation have also been subject to the same criticisms as the top-down managerial methodologies criticised by Mintzberg. For example, Ciborra (1994) and Davenport (1994) argue that the top-down, highly structured approaches typical of the organizational imperative perspective do not lead to the development of effective information systems. The business environment is changing fast and such methodologies are very slow in producing results. By the time that the various stages of the methodology have been completed, the initial assumptions made about the business will have been out-of-date. Gaining a competitive edge over the competition does not depend on the planning and implementation of information systems, but on the overall management of the firm, which is capable of using information systems (old and new) to build a competitive edge. Hence, the top-down approach has failed to deliver the expected results and "what is required is a novel approach to technological and organizational innovation in a rapidly changing context" (Ciborra, 1994:18).

4.3.3 Socio-Technical Interactionism

The strategic dimension of IS implementation is not limited to the top-down view of IS strategy. Using the resource-based approach to business strategy as his main theoretical argument, Claudio Ciborra has been one of the champions of the bottom-up approaches to IS strategy (Ciborra, 1994; Andreu and Ciborra, 1994; Ciborra, Patriotta and Erlicher, 1995). Starting from a revisiting of some well known strategic information systems - SIS (Baxter's ASAP, McKessons' Economost, American Airlines' SABRE and the French Teletel system) Ciborra states "These cases emphasize the discrepancy between ideal plans for SIS and the realities of implementation, where chance, serendipity, trial and error or even gross negligence seem to play a major role in shaping systems that will, but only after the fact, become textbook or article reference material" (1994:10).

Ciborra's approach is based mainly on the internal context of the organization. It emphasizes the "grassroots of IT" and the emergence of an IS-related disposition in the organization, hinging on two factors: "bricolage" and radical learning. However, this type of bottom-up approach is not common among authors writing from a strategic management perspective. Rather, this approach is favoured by authors whose focus of interest are the impacts or consequences of IT in organizations and has given rise to our third perspective in IS implementation. This perspective is also known as "Emergent" (Markus and Robey, 1988), "Interactionist" (Symons, 1991), "Social Technology School" (DeSanctis and Poole, 1994) or "Social Interactionism" (Campbell, 1996). We have chosen the last designation because it encapsulates better the various trends grouped under this category.

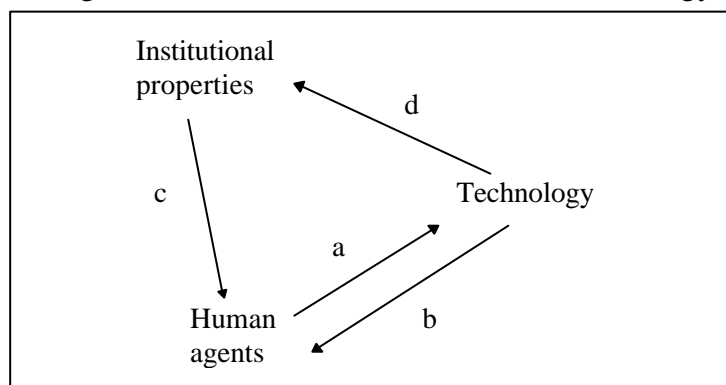
Although still dominated by an engineering mind-set (Avgerou and Cornford, 1993) present-day IS development methodologies take more notice of the organizational and of the human aspects involved in applying information technology to the workplace. This has been achieved by a progressive introduction of socio-technical systems techniques in IS implementation. Socio-technical systems design, which was introduced as a way to decrease the number of failures in IS implementation (Bostrom and Heinen, 1977), has been applied to IS development in a more general way, mainly through the work of Enid Mumford (Mumford and Weir, 1979; Mumford, 1983, Mumford, 1996). Socio-technical systems thinking has provided the first clues regarding the fact that implementing IS was more than just putting together a number of technical devices and organizational procedures and that there was a need to look for other variables within the organization, which might also influence the ultimate success or failure of the implementation effort.

The socio-technical interactionist approach to IS implementation highlights the bottom-up consequences of the introduction of new IT applications. It highlights the fact that the long-term success of such introduction depends, to a large extent, on how IT-based work tasks are managed at the local level. In other words, it emphasizes the fact that the "informating" capabilities of IT can only be maximized if the local management style is also aware of such capabilities and is willing to take advantage of them, as part of the implementation process.

“Informating”, the new concept coined by Zuboff (1988), has had wide implications in understanding the real (i.e. the emergent) impact IT in the work place. The informing capabilities of IT refers to the way that everything in the organization is being turned into text and becoming much more visible, “whether that pertains to thousands of newly codified variables in the production process or the global flow of cash tracked on an hourly basis” (Zuboff, 1995:15).

According to this perspective, the problem of implementing IT in organizations cannot be seen as a “one-way” process. Orlikowski (1992), using concepts from Giddens’s (1984) structuration theory argues that technology has a dual nature. On one hand, technology has objective reality in the sense that it has embedded in it objective features, such as the design of the hardware or of the software; but on the other hand, technology is also a socially constructed product in the sense that new structures *emerge* in human action as people interact with the technology. She puts forward a structural model of technology (see Figure 4.5), which is intended to throw new light of key aspects of the phenomenon of integration of technology into organizations and suggest typical relationships and interactions.

Figure 4.5 - Structural model of technology



| Arrow | Type of influence | Nature of influence |
|-------|---|--|
| a | Technology as a product of human action | Design, development, appropriation and modification of the technology |
| b | Technology as a medium of human action | Facilitation or inhibition through interpretive schemes |
| c | Institutional conditions of interaction with the technology | Professional norms, state of the art in materials and knowledge, design standards |
| d | Institutional consequences of interaction with the technology | Reinforcing or transforming structures of signification, domination and legitimation |

Source: Orlikowski (1992)

This approach is characterized by “soft-line” determinism (DeSanctis and Poole, 1994), meaning that while expected relationships may be proven and tested empirically for certain organizations in certain historical and socio-economic conditions, causality may break down due to the emergent and unforeseen nature of human action, which can always “alter the cycle of development, appropriation, institutionalization and reproduction of the technology” (Orlikowski, 1992:423). From this perspective, information systems are not just equipment, methodologies and policies, but they are also the result of individual sense-making, that is, the perceptions and understanding of the role and value of the data and of the systems themselves (Symons, 1991; Campbell, 1996).

Broadly speaking, the socio-technical interactionist movement takes a cultural view of the organization if we understand culture as “an ongoing, proactive process of reality construction (...) and not as a simple variable that societies or organizations possess or something that a leader can bring with him or her” (Morgan, 1997:141).

The interactionist approaches are essentially tools for organizational analysis. They are adequate for describing and understanding but do not say much as regards acting. And because acting is important in a discipline that is very close to the “real” world of managerial practice (i.e. information systems) interactionist approach must be complemented with other, more managerial-oriented tools. Ciborra and Lanzara (1994) have criticised the approaches based on Giddens’s (1984) structuration theory for being too general and too abstract. In particular, they single out two shortcomings of such approaches:

- (1) They seem to be at a loss in accounting for actions and behaviours that may not be necessarily consistent with the reproduction of existing patterns or even with the structuring of whatever new pattern, but [with patterns] that simply branch out of the currently practised repertoire of routines.
- (2) How do such abstract frameworks come to bear when we come to the question of how a specific structure is actually *produced* (not simply described) or how a new system or organization is designed *in practice*? (p. 63)

4.3.4 Managerial Action

The managerial action approach is characterized, as the label indicates, by a bias towards action and by a clear focus on the roles and the responsibilities of management. It is an attempt to complement the top-down bias of the “organizational imperative” perspective with a bottom-up view of collective action, but it is also based on the recognition that the bottom-up “socio-technical interactionist” perspective lacks a top-down view of managerial choice. It is a middle-of-the-road approach intellectually affiliated to mainstream strategic management authors such as Nonaka and Takeuchi (1995) and Ghoshal and Bartlett (1993;1994;1998).

As discussed in the previous chapter, the managerial action perspective has two major strands: an individual behaviour strand led mainly by the writings of Agyris and Schon (1978;1996) and a managerial behaviour strand, inspired on the work of Ghoshal and Bartlett (1993;1994;1998).

Within the IS field, managerial action is relatively unknown as an ontological/epistemological approach. However, making use of some freedom to generalize, we can say that a managerial action framework is behind the work of Claudio Ciborra from Unisersità di Bologna and London School of Economics, and also much of the writing of Lucas Introna from the London School of Economics.

Ciborra has developed some very interesting work in establishing the links between IT/IS effectiveness and IS-related organizational learning, knowledge and culture (Ciborra and Lanzara, 1989; Andreu and Ciborra, 1994; Ciborra and Lanzara, 1994; Ciborra; Patriota and Erlicher, 1995). Ciborra and Lanzara (1994:64) start off by making organizational learning the centre of attention for “the effective adoption of new systems”. Learning is taken to be the competence gained by organizations “in smoothly turning anomalies and novelties into innovative patterns of behaviour”. Juxtaposed to the notion of a *learning context*, the locus where learning capabilities originate from, these authors introduce another type of context: the *formative context*. The formative context acts a kind of counterbalance to the learning context, in the sense that it is the source for the “limits” of the organization’s learning capabilities. This context is formative because “it may help people see and do things in new ways or, on the contrary, make them stick stubbornly to old ways” (p.72). Furthermore, Ciborra and Lanzara point out that formative contexts have a double nature: on one hand they are “highly stable” and inescapable” but, on the other hand, they are also the cultural bed for innovation and change.

Although not referring to the autopoietic view of social and organizational systems, this kind of argumentation places Ciborra and colleagues very close to the views of authors who defend such ontological/epistemological posture (Maturana and Varela, 1980 and 1987/1992; Luhmann, 1995; von Krogh and Roos, 1995). Morgan (1997) has chosen the expression “flux and transformation” as the metaphor to describe organizations as autopoietic systems. “Flux and transformation” highlighting the fact that, regardless of the environment, organizations are endemically in a permanent state of change. At the same time, organizations are permanently constrained by their internal organization or identity. Such identity is what Ciborra and Lanzara call the “formative context”. These authors are guided by an epistemology of action and intervention, rather than an epistemology of analysis and, therefore, their notion of formative context is tied to the action-enaction dialectic (Weick, 1995). In other words, a formative context is not an abstract notion stored in people’s minds, but it is a situated reality always dependent upon action, being also the outcome of such action.

The notion of “action” in an organizational context, however, is not unproblematic in Ciborra and Lanzara’s (1994) thinking. When using the notion of “action” these authors are influenced, above all, by the action theory, which has been put forward by Argyris (1977), Argyris, Putnam and Smith (1985) and Agyris and Schon (1978;1996). In the theoretical body of knowledge, which these writers have put together “action” has a very specific meaning, which has often been confused with other more general approaches also bearing the “action” label. For Agyris and colleagues, action means individual action and not group or collective action. It means that each individual manager operates from one of two theories of action: an espoused theory or a theory-

in-use. Argyris' proposal is that by uncovering the theory of action, which lies behind the behaviour of each manager, i.e. by discovering her theories-in-use (as opposed to her espoused theories) it is possible to change such theories and create a more open and healthily confrontational kind of behaviour (i.e. Model II-type of behaviour). And if this process could be extended to all the managers, then the organization would be much more effective.

Ciborra and Lanzara (1994) apply this thinking to information systems design. They argue that current systems design practice is focused solely on the functional or problem-solving aspects of organizational routines but they fail to take into account how the same routines may "reproduce or break powerful imageries and institutional bonds at a deeper level" (p.79). As a solution they propose an alternative approach to, which they have called "designing-in-action". Designing-in-action requires the intervention of an outside agent (as is the case with Argyris' approach) who acts as a "watcher" or "reflector" of the design activity and helps designers to "surface conflicts and inconsistencies, to explore deviations from routines and envisage the alternative contexts that they may lead to" (p.81). The outcome of such intervention, it is claimed, is a new formative context conducive to the implementation of information systems, which are much in tune with the "real" needs of the organization.

We see three kinds of problems regarding Ciborra and Lanzara's (1994) approach. In the first place, it is focused on "tailor-made" systems only, when the trend in all types of organizations is to move towards "ready-made" packages. Secondly, it is designed to be used with each individual system, which is implemented, overlooking the rest of the organizational context. As is the case with much of the IS literature, information systems design is seen as an activity with a life of its own, that is, divorced from everything else that is going on around it in the organization. Thirdly, and flowing from the second point, Ciborra and Lanzara's approach ignores organizational power issues.

This last point stems directly from Argyris' approach, that is, it develops as if everything in the organization depended on good interpersonal relations and on the assumption that other informal (power) relations did not exist. This has already been discussed in chapter three, but it worth repeating here Introna's (1997:144) words about the role of power "the manager, as a manager, is already one of the prime effects of power. The manager can never get out or distance herself from the circular grid of power. This is part of being-in-the-world. To rise above power is a useless abstraction".

So, how can we sum up the similarities and differences between Ciborra and Lanzara's (1994) approach and the managerial action approach, which is favoured in this chapter as a new basis for IS implementation? As it has been discussed above, there are many similarities, between the two approaches, namely the bias towards intervention as opposed to analysis, the centrality of the (formative) context in creating or in hampering a learning environment and the situated nature of organizational learning. Where the two approaches fundamentally differ is in the "action" epistemology. Using Argyris and Schon's (1978;1996) theories of inter-personal relations, Ciborra and Lanzara put forward an action approach, which focuses almost exclusively on the

interpersonal level. The approach we favour is founded upon a managerial tradition of collective action, i.e. leadership (Barnard, 1938/1965; Selznick, 1957; Burns and Stalker, 1961) and organizational climates or contexts (Ghoshal and Bartlett, 1993,1994,1998).

Although defending an approach with a strong action and interventionist bias, Ciborra and Lanzara do not mention values - managerial or organizational - as playing a part in the formation of contexts. In their conception, formative contexts are solely concerned with factual or task-related knowledge.

Individual skills and organizational routines supporting every-day practices are grounded on a knowledge-base that is taken for granted when engaging in action (...) The formative context embeds such a knowledge-base represents the hidden, background components of skilled performance, straightforward organizational routines and quiet functioning of institutional arrangements (1994:77)

In the next section we present an example of the “conventional wisdom” in the ontological/epistemological dimension of IS implementation. The example is taken from Earl (1996) and although it may be deemed to contain some features of managerial action it is, above all, influenced by an organizational imperative perspective. We will describe Earl’s framework in some detail and will point out those aspects, which we consider helpful in terms of further a managerial action perspective and those, which do not.

4.4 The absence of an action orientation in existing views of IS implementation: a critique of Earl’s (1996) model

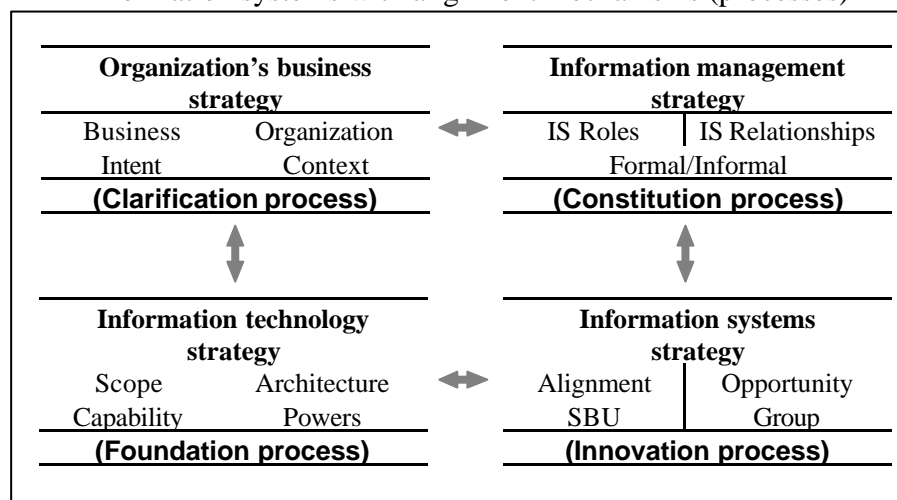
The overall effectiveness of IS implementation has been attributed by several authors, particularly those contributing to the MIT study *Management in the Nineties* (Scott Morton, 1991) to the quality of the alignment achieved between the strategies for IS/IT and the business. Earl (1996) goes along with this proposition, but argues that alignment should be issue-driven, instead of justified by strategic theories of the firm. He proposes, as an alternative model, the Organizational Fit Framework (OFF), whose key feature is a “high-level check-list of factors to consider in integrating information technology with the business” (p.491). Given that Earl’s model is intended to encompass the whole organization and all the areas, which affect or are affected by the introduction of IT, we believe that this model is also about the *organizational* implementation of IS. Although taking a different ontological perspective (the organizational imperative perspective) we consider it to be an interesting basis for building up our argument in favour of the managerial action perspective. Besides, it introduces an important new concept - the IS *constitution process* -, which is an innovative idea, at least in terms of IS research.

Earl’s Organizational Fit Framework (OFF) uses four major processes to provide the linkages needed in order to create alignment or fit among the corresponding four strategic domains. The strategic domains, which provide the strategic contents, are: (1) the business strategy, (2) the information management (IM) strategy, (3) the information systems (IS) strategy and (4) the

information technology (IT) strategy. Each strategic domain is divided up into two key “components”, which are subsets of the strategic domain, and two “imperatives”, which are important factors to be taken into account. For example, the components of IT strategy are *scope* and *architecture* and its imperatives are *capability* and *powers*. The four major processes, in turn, summarize all the aspects, which the organization “must know” in order to manage its information systems and technologies. The complete framework can be seen in Figure 4.6.

Starting with the business or the overall organizational strategy, it comprises two major components: the business’ strategic choices, as translated into its competitive positioning, and its

Figure 4.6 - Earl’s framework for strategic implementation of information systems with alignment mechanisms (processes)



Source: Modified from Earl (1996)

strategic *intent* (Hamel and Prahalad, 1989) in the sense of the organization’s “crystallization of purpose” or “criterion in making choices” (Earl, 1996: 492). The second component refers to the organization’s structural choices, i.e. its hierarchical structure and its control systems, as well as the softer component of internal choice, i.e. its management style and its culture, which, together, make up the organization’s *context*. These are components, which must be known before embarking on strategic development in the areas of IS/IT. Hence, knowing and being well informed about the organization’s strategy is what Earl calls the *clarification process*.

The second domain is the IS strategy and it comprises, as key components, *alignment* and *opportunity*. Alignment is achieved at the level of the strategic business unit, through a variety of techniques, such as critical success factors (Rockart, 1979) or through structural forms such as IS steering committees (Ward and Griffiths, 1996) among others; the objective is to keep IT applications aligned with business needs. Opportunity refers to the search for more innovative uses of the technology, a task, which should be situated at group level. The objective here is to take advantage of the permanent “push” from the business platforms (Zmud, 1988) in order to

identify, in the market-place, new technology-based enablers of business innovation. The process associated with the IS strategy is the *innovation process*.

The IT strategy encompasses two key elements: *scope* and *architecture*. Scope is concerned with the types of technologies, which the organization uses or should use and architecture is concerned with the framework, which shapes and controls the IT infrastructure. The imperative related to scope is the capability or the skills, knowledge and activities needed to exploit the technology competently. As regards architecture, the imperative is the organizational powers needed to implement and control the infrastructure. The process associated with the IT strategy is the *foundation process*, in the sense that the organization's IT architecture lays the technological foundations for all other IT/IS-related activities. This process is a joint consequence of the *inside-out* and of the *bottom-up* approaches to IS strategy discussed by Earl (1989) in an earlier work.

Finally, the information management strategy. Earl (1996:487) argues that the IM strategy is the *keystone* of the information systems strategy framework. This, it is claimed, is due to the fact that not only "IM strategy questions never seem to die, partly perhaps because both technology and organization are constantly changing" but also that "it is through processes of IM that questions of both IS strategy and IT strategy are resolved". The components of IM strategy are *roles* and *relationships*.

The former, according to Earl, refers to who has what formal responsibility and authority in managing IS-related resources; the latter, although not explicitly defined, refers to informal interpersonal relationships among the stakeholders involved in the IS governance process. Associated to the IM strategy domain, we find Earl's *constitution process*, which is explained as follows (1996:498):

The output linkages from the IM strategy domain can be described as the processes of constitution. Instead of organizing and managing IS, people now talk of 'governance' of the IS function, perhaps in recognition of the many stakeholders, including external ones. Constitution is offered as a noun to describe this process. It can influence the setting of the organization's strategy, for example, when tensions or fault-lines in design of the host organization become manifest as IM issues. It can affect the capability and effectiveness of IS strategy-making, for example, in encouraging teamwork and partnership. It can influence the quality of IT strategic decisions, and the subsequent buy-in to them, by education, development and propaganda programmes

We believe that Earl's OFF model is an adequate tool to guide thinking and action on how to integrate information technology with the business. We agree, for example, with the innovative notion of *IS governance*.

Information systems governance is a useful concept because it creates a distinction between daily management of IS-related routines and something with a more profound significance in the organization. In information systems management, there are many internal stakeholders, but at the top level of decision making the key actors are the top management represented by the member

of the board in charge of the information systems or information technology function (in the US sometimes known as the Chief Information Officer), the information systems/technology manager and the senior line managers, who increasingly have functional responsibilities in the area of information systems/technology. Following the notion of corporate governance proposed by Monks and Minow (1995), the corporate governance of information systems can be understood as *the interrelationships and interdependencies among the top management, the information systems/technology manager and the senior line managers in the day-to-day alignment and balancing of responsibilities and authorities.*

We contend, however, with the way that alignment is conceptualized in Earl's OFF model. Alignment or organizational fit cannot be seen as mechanistic notions, but should be regarded as organismic concepts. In other words, alignment is not something that can be planned or charted, neither is it a matter of fitting various types of strategies through linking mechanisms. We agree with the centrality not only of roles and relationships but also of organizational values, in guiding the whole process of alignment, but not confined to an (information management) strategy. The operative word, as suggested by Angell and Smithson (1991), would be an (information management) *disposition*, that is an ethos or a constitutive process, which would bring about the desired alignment. In our view, alignment is achieved not by planning linkages between processes, but by emphasizing action or, to be more precise, *managerial action.*

We believe that IS-related alignment happens as a result of IS-related leadership, through managerial action. It is through action and through the shaping of an overall, IS-related, organizational context that alignment can be achieved. Alignment can only happen if a climate of cooperation exists, which is conducive to the types of relationships needed for the alignment mechanisms to work. Earl himself raises doubts about the appropriateness of the current conceptions of IS alignment:

it is through organizations that strategies are made and thus naïve, mechanistic and simply aligned organization designs may not provide the adaptation, creativity and entrepreneurship that strategy-making requires" (1996:488); "if information flows have to cross internal and external boundaries and information resources be shared by all, should some elements of information strategy be above or somewhat removed from a current conceptualization of alignment? (1996:490)

In spite of such doubts, Earl's argumentation does not show signs of an action orientation. On the contrary, his argumentation is often abstract and locked into a managerial rationality ethos. For example: "IS strategy can influence the organizational strategy by pursuing synergy more aggressively than before" or "IS strategy may prompt questions of IM strategy" (1996:494). What do these statements mean? How can "a strategy" do this or that? Is this not a reification of the concept of strategy? Earl argues that the IM strategy is based on the *constitution process.* While we find the application of the notion of *constitution process* to an IS implementation model very interesting, we disagree with the proposition that we can strategically plan such process (thus, the "IM strategy"). Earl claims that the IM strategy and the *constitution process* are made up of roles and relationships. If roles are strictly confined to their formal aspects, we accept the idea of a strategy, but regarding human relationships, how can they be confined to "a strategy"? And,

above all, what is the role for management in Earl's framework? What guidelines can be offered for the action of managers? Is action important?

On the other hand, as we have stated above, bringing the *constitution process* to a strategy formulation framework is a very positive development, in terms of furthering a managerial action perspective in IS research and practice. Because we regard the constitution process as an important notion, we wish to develop it further, in the light of the theoretical body discussed thus far. This will be carried out in the next chapter.

4.5 Summing up

In this chapter we have started off by discussing IS implementation as a process of learning and change. Based on this discussion, the following concluding remarks can be made about IS organizational implementation as a process of technical innovation:

(1) Given that it is concerned with the introduction of new technologies into the organization, IS organizational implementation can be conceptualized as a process of technical innovation, occurring in sequential stages of change with unprecise contours at first, and gradually getting an improved definition as the process unfolds.

(2) IS implementation can also be conceptualized as a process of IS organizational maturity and learning with special characteristics due to the dual nature of IS/IT in organizations, i.e. the technical nature and the managerial nature. The key ingredients for the facilitation of this process of change are: cooperation, partnership building and the establishment of an organizational climate or context where "management is comfortable managing the use of IT and employees are comfortable using the technology" (Sprague and McNurlin, 1993:43).

In the remainder of the chapter, we build an argument in favour of a new orientation for IS implementation, an orientation based on a managerial action perspective. Such a perspective is an attempt to bridge the gap between the dominant approaches, namely the approaches we have labeled "organizational imperative" and "socio-technical interactionist".

The organizational imperative perspective is accurately summarized by what Mintzberg (1990) has termed the "design school" of strategic management. The ideas of (1) making top management the key actor in strategy formulation, (2) making an axiom of "strategy before structure" and (3) detaching strategy formulation from implementation, sums up the criticisms that Mintzberg makes of the rationalist, top-down view of strategy making. In the information systems literature, the same type of approach became prevalent, especially after the writings of Porter (1980;1985) on competitive advantage. During the 1980s and early 1990s much of the information systems literature was dominated by the notion that strategic planning was the key to success

(Wiseman, 1988; Earl, 1989; Cash et al., 1992; Ward and Griffiths, 1996; Galliers, 1991), including some of the more strategically-oriented IS development literature (e.g. Finkelstein, 1989).

The prevailing view in the IS implementation perspective, which we have called “socio-technical interactionism”, is that the consequences of applying IT to organizational processes are manifold, complex and emergent (Kling, 1980; Markus and Robey, 1988; Orlikowski, 1992). According to this bottom-up view, the long-term success of the introduction of IT applications depends, to a large extent, on how IT-based work tasks are managed at the local level. The “informating” capabilities of IT can only be maximized if the local management style is aware of such capabilities and is willing to take advantage of them for the good of the organization. “Informating”, a new concept coined by Zubboff (1988), has had wide implications in the understanding of the real (i.e. the emergent) impact IT in the work place.

However, both the organizational imperative and the socio-technical interactionist approaches have their shortcomings. The former assumes that all the variables intervening in IS implementation can be investigated and planned for if the right methodological tools are available. The latter tends to overemphasize the enquiry into the emergent consequences of implementation while ignoring or playing down the role of managerial choice. The managerial action perspective offers an alternative route. Embracing the principal tenets from the previous two competing approaches, managerial action offers guidance regarding the HOW question and points to the role of management as the missing link.

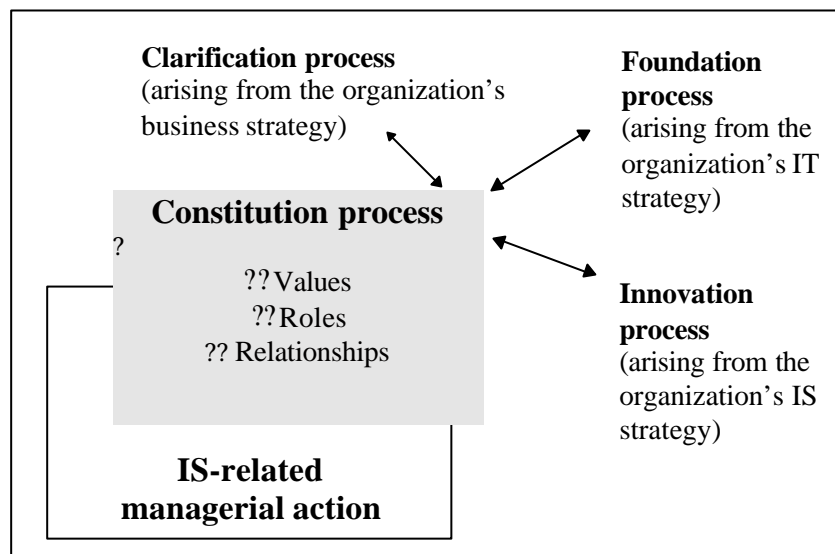
The managerial action framework put forward by Ghoshal and Bartlett (1993;1994;1998) takes a holistic perspective and elects organizational values as being the key tools for organizational intervention and change. This view of organization finds support in autopoietic systems theory (Maturana and Varela, 1980,1987/92) and its application to organization science (von Krogh and Roos, 1995). From such combined conceptual development, we can conclude that at the heart of all organizations there is a process - the *constitution process* - that moulds the identity of the organization and strongly influences all other processes. The constitutive process, which is one of the processes proposed by Earl (1996) as the basis for IS/IT - business alignment, results from the interplay of organizational values, roles and relationships.

Using the managerial action perspective to carry out a critique of Earl’s (1996) framework for IS strategic development was an attempt to show (1) the shortcomings of many of the models representative of mainstream IS research literature strongly influenced by the organizational imperative perspective and (2) how the managerial action perspective can usefully complement such models.

The problem with the formulation of the *constitution process*, made up of formal roles and informal relationships, is that Earl’s (1996) does not articulate how such roles are formed or what influences such relationships. Roles and relationships do not exist in a cultural vacuum. They are guided and shaped by values. IS-related values, roles and relationships are the constitutive forces in the organization, which jointly establish an IS-related climate. Such forces start with the most

basic constitutive forces of any social group - language and languaging (von Krogh and Roos, 1995) and in emotions and emotioning (Maturana, 1988), and find expression in the dyadic relationships embedded in organizational roles.

Figure 4.7 - The IS constitution process as the building block of all other IS-business alignment processes



Source: Modified from Earl (1996)

From the four key processes of the strategy development process described by Earl, the *IS constitution process* should be placed above all the others. Constitution implies that the corresponding process is *a law of all laws* and that, therefore, it should be in a position to influence all other processes. It should not be just one process among four, but should rather be a process in a position capable of producing contexts favourable to IS-related knowledge development, which would include the creation of a *disposition* or *capability for the alignment* of IS and the business. On the basis of this argument, we propose a modified version of Earl's (1996) OFF model, which can be seen in Figure 4.7.

In chapter three, we stated our belief in the fact that the process of formation or constitution of organizational climates or contexts is intimately linked to two types of dimensions: one is attitudinal (stretch, discipline, trust and support) and the other is procedural (structure). In this chapter, we have outlined the key perspectives on IS implementation and have identified the constitution process (Earl, 1996) as the basis of IS corporate governance. In the next chapter (five) we will be looking in some depth at the processes, which lead to the constitution process and will conclude by operationalizing IS corporate governance as a set of organizational climate or context dimensions.

Chapter 5

Operationalizing IS implementation as managerial action

There is a trend at present for the bureaucratic oligarchy to be replaced by a new technological/informatics oligarchy (...) What it means is that informatics or, better, the informatics function also has a tendency to create its own objectives and its own logic that ends up influencing the objectives and the logic of the organization of which it is part, thus becoming a new power with partial autonomy

Translated from MARCELINO, Henrique (1980:10)

Chapter 5 summary

- ? 5.1 Introduction
- ? 5.2 The process of formation or constitution of organizational contexts
 - ? 5.2.1 Organizational values as the shapers of context
 - ? 5.2.2 The role of organizational roles and relationships
- ? 5.3 Conceptualizing IS implementation as a set of managerial roles and processes
 - ? 5.3.1 The changing functional roles in the IS management function
 - ? 5.3.2 IS implementation as an interlocking network of organizational roles
 - ? 5.3.3 Integrating IS roles and process with the managerial action model
- ? 5.4 Operationalizing IS organizational climate or context
 - ? 5.4.1 IS Intent
 - ? 5.4.2 Discipline
 - ? 5.4.3 Trust
 - ? 5.4.4 Support
 - ? 5.4.5 Structural IS-related factors
- ? 5.5 Operationalizing IS organizational learning
- ? 5.6 Summing up

† † †

5.1 Introduction

In this chapter we begin to apply the theories of organizational climates or contexts and managerial action to IS implementation. In the next section we attempt to answer, in some detail, the question “how does the process of formation or constitution of organizational climates or contexts actually work?”.

Still in the wake of Earl’s *constitution process* we carry out, in the following section (5.3), an analysis of IS managerial roles, starting by an analysis of formal roles. IS managerial roles are going through intense and rapid changes, so the analysis is carried out in terms of trends of change, as highlighted in the IS research literature. We will be considering, therefore, future trends in IS corporate governance roles. By IS corporate governance it is meant *the ensemble of the roles played by all the stakeholders intervening in the IS organizational implementation process, the relationships and the interdependencies among such roles*. Hence, IS corporate governance goes far beyond the notion of IS management that, traditionally, revolves around the IS manager.

Section 5.3 ends with an integration of the IS corporate governance roles identified in the analysis of future trends with Ghoshal and Bartlett’s (1993;1994) model of managerial roles and processes discussed in chapter three. In that chapter we have argued that organizational roles have a formal and an informal component. Regarding the formal component, it is a fairly straightforward task to establish a match between IS corporate governance roles and Ghoshal and Bartlett’s three formal roles (top management, middle management and first line management). Regarding the informal roles or processes (in Ghoshal and Bartlett’s terminology) the task is not as clear-cut. However, looking at the three alignment processes suggested by Earl (1996) - Clarification, Foundation and Innovation - we have come to the conclusion that they are also informal roles. So, each of the three processes has been operationalized by a set of roles in a matrix of formal and informal managerial roles, identical to that proposed by Ghoshal and Bartlett (see Table 3.3). This has enabled a new theoretical framework to be established - the IS corporate governance matrix.

Sections 5.4 and 5.5 are an exercise of operationalization, aimed at converting the language of IS corporate governance into the language of organization behaviour. The five dimensions of organizational context, which have been put forward by Ghoshal and Bartlett (1994) and discussed in chapter three (stretch, discipline, trust, support and structural factors) are adapted to the world of IS corporate governance. A similar undertaking is attempted with organizational learning. Based on the theoretical discussion carried out in chapters two and three, the concept of organizational learning (or knowledge development) is also adapted to situations related to IS corporate governance.

5.2 The process of formation or constitution of organizational contexts

The notion of “constitution” is not new in management literature. It has been used by Normann (1985:235) as an equivalent to culture or a “long-term strategic action capability, which determines what can and cannot be done”. But it has also been used by other authors although under different labels. Barnard (1938/1965) talks about the “work ethos”, Burns and Stalker (1961) have identified organizational “codes of conduct” and Ghoshal and Bartlett (1998) discuss the “feel of the place”. Constitution is used in the literature on organizational climate to signify a formation process (of climates or contexts) by means of structuration (Giddens, 1984) and sensemaking (Weick, 1995).

Ashforth (1985), Falcione, Sussman and Herden (1987) and Schneider (1990) have all suggested definitions of organizational climate along such theoretical lines that might be summed up as follows. Organizational climate is *an intersubjective phenomenon that is continuously being structured and restructured by organizational members in an effort to make sense of their organization, its values and their roles in it*. This definition highlights the fact that the organization’s *constitution process* is tied not only to action in the form of organizational roles and relationships, but also to action in the form of organizational values.

As we have seen in chapter two, autopoiesis theory tells us that values and facts are inseparable in the formation of knowledge - “to the extent that we move from an abstract to a fully embodied view of knowledge facts and values become inseparable. To know is to evaluate through our living, in a creative circularity” (Varela, 1992: 260). Autopoiesis defends a “constitutive” ontology (as opposed to “transcendental”) for the construction of reality. Thus, social systems and organizations as part of the reality around us are also “constituted” through the action of their members. Such action takes the form of language or conversations.

Each social system is constituted as a network of co-ordinates of actions or behaviours, that its components realize through their interactions in mutual acceptance”(Maturana, 1988:67) “ as a particular social system is realized and conserved through the participation of its members in the network of conversations that constitute it, [such network] specifies the characteristics and properties that its members must have (ibid, p.69)

However, even before we engage in the use of language and in conversation we are primarily affected by emotions - “our mood or *emotioning* is an ever-present background to our use of language. It conditions our stance or attitude (are we happy or sad, caring or self-concerned, deferential or confident, angry or upset?) and thereby the course of our conversation ” (Mingers, 1995:79, added emphasis).

In the managerial world we tend to think of logic and rationality as something which can be separated from emotions, but as autopoiesis shows, emotions form the background of the

embodiment of our all our knowledge and cannot be separated from logic. To understand the role of emotions or emotioning is also crucial for an understanding of the nature of social (and organizational) systems. Maturana (1988) argues that emotions are *the* ingredient, which makes social phenomena possible, through mutual acceptance (love, in his terminology). Without mutual acceptance cooperation and social action are not possible.

A social system is a closed system that includes as its members all those organisms that operate under the emotion of mutual acceptance in the realization of the network of co-ordinations of actions that realize it. Due to this, the boundaries of social systems are emotional ones (Maturana, 1988:69)

In the management and the organization sciences, we find a similar preoccupation in the seminal writings of Selznick (1957), one of the earliest authors on managerial leadership. In commenting upon how theorists of a positivist theory of administration praise values and moral choice but, at the same time, radically separate facts from values, Selznick states (1957:80) “the importance of values is affirmed but the choice of goals and of character-defining methods is banished from the science of administration”.

5.2.1 Organizational values as the shapers of context

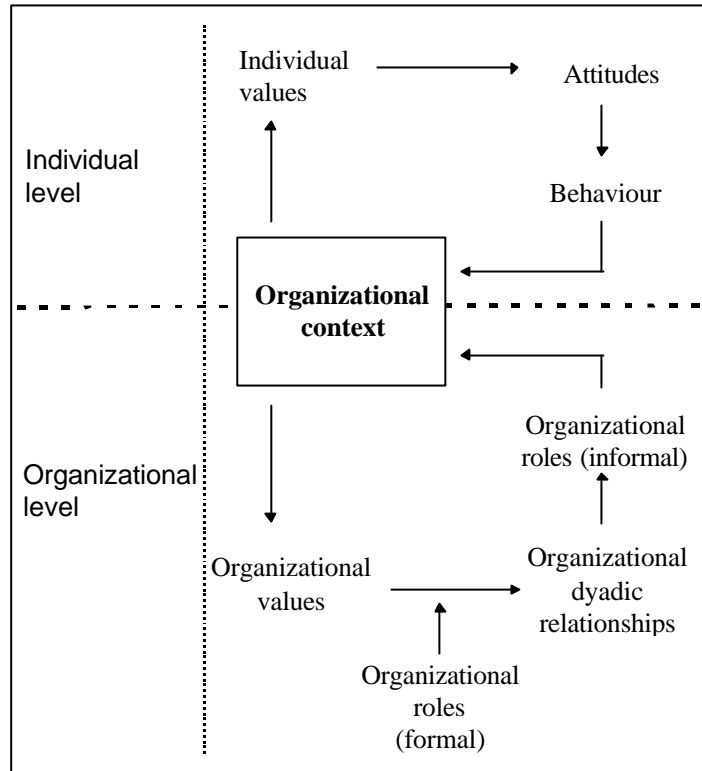
As discussed in chapter three, in their theory building, Bartlett and Ghoshal (1993;1994) defend the notion that improved organizational performance depends, primarily, on the organizational contexts (or climates) that managers are able to build in fulfilling their managerial roles.

we suggest that an organization can create and embed in its context a work ethic that would induce rational yet value-oriented actions on the part of its members in furthering the interests of the organization as an end in itself, not just a means to an end (1994:92).

This is consistent with the tenets of autopoiesis theory, which suggests that change in a social system takes place as a “conversational change”, that is, as a change in the “configuration of the network of co-ordination of actions and emotions” (Maturana, 1988:72) that constitute the system. In other words, in organizations (i.e. the network) one can bring about change by manipulating organizational structures (i.e. actions) or by altering organizational values (i.e. emotions) or both.

Organizational values are crucial elements in Ghoshal and Bartlett's managerial action framework as they are the enablers, through appropriate contexts, of the formation of informal organizational roles, which cut across the organization, horizontally. These horizontal, informal roles are what Ghoshal and Bartlett call the

Figure 5.1 - The constitutive forces of organizational context



“managerial processes” and which we have discussed in chapter three. In Figure 5.1 it is shown how such informal roles are formed at the organizational level, using the formation of behaviour at the individual level, as a comparison.

At both levels (individual and organizational) and for explanatory purposes, the cycle starts with values. At the individual level, values can be defined as ideas, beliefs or principles, which are behind the way individuals think or feel about certain facts, events or other people (Schein, 1992). Values, in turn, affect attitudes and what are viewed as appropriate behaviours in a given situation (Bowditch and Buono, 1997). Attitudes, which include a cognitive and an affective component can be thought of as individual predispositions to respond to a stimulus (i.e. a fact, an event or other people). The cognitive component of attitudes refers to the knowledge derived from a factual evaluation of the stimulus, while the affective component refers to the emotional part of such evaluation. In other words, when talking about attitudes, it is difficult (or impossible) to unscramble facts from emotions (Damasio, 1994). Attitudes also have a behavioural components, which is the inclination that individuals have to behave in certain ways (Bowditch and Buono, 1997).

Moving now to the organizational level, the constitutive process also starts with values, which can appropriately be called organizational values. Although they are values of a social group, ultimately values pertain to individuals, so organizational values might also be termed *socialized*

individual values. Hence, organizational values can be understood as *ideas, beliefs or principles, which have been socialized by organizational members and which are behind the way individuals in the organization think or feel about a given situation and about the way that “things should be done” in that particular organization* (Bowditch and Buono, 1997).

The cycle at the organizational level is similar to that at the individual level, but more restricted because individual behaviour becomes bounded and restrained by norms and procedures imposed by the structure and context(s) of the organization. Formal organizational roles are imposed on the relationships between individual organizational members when they interact, primarily on a dyadic basis. These dyadic relationships are also influenced by the organizational values espoused by each organizational members and infused into the organization by the social context. Finally, informal organizational roles arise from the combination of organizational values, formal organizational roles and dyadic relationships. Informal organizational roles are the equivalent, at the organizational level, to individual behaviour at the individual level. This means that informal roles are what people actually do in the organization, as opposed to what they should do, in accordance with their formal roles. Organizational relationships at the organizational level are the equivalent to attitudes at the individual levels. This, in turn, means that each dyadic relationship has a predisposition, which is related to previous experiences within the same dyadic relationship.

These cycles of context formation seen from either the individual or the organizational view point, should not be confused with a similar diagram used by March and Olsen (1975) to describe the individual cycle of choice. March and Olsen’s objective was to establish a “tight” connection between environmental response and individual learning, in the context of “a theory that intends to predict actual behaviour over time” (p. 163). Our cycles of context formation are of a totally different nature. They do not intend to establish any connection between the environment and the internal workings of either the individual or the organization. They represent closed feedback (or enaction) loops working within single individuals or within the interaction between individuals (i.e. the organizational level).

Organizational roles and relationships are crucial for an understanding of how managerial action is related to organizational performance. Roles are easier to research than values because while the latter are held at a pre-conscious level, the former are more immediately available to consciousness. When questioned, people will easily spell out what their expectations are regarding the behaviour of others. Thus, let us look at organizational roles in a little more depth.

5.2.2 The role of organizational roles and relationships

The concept of organizational role is well established in the management literature. Simon (1945/97:19) in his influential effort to set the agenda for a “science” of administration and in identifying the organization as the prime locus for such undertaking, states that “we are concerned with a role system known as organization”. Katz and Kahn (1966:186) in one of the earliest authoritative texts on organizational behaviour, define human organizations as role systems, giving “the role concept a central place in the theory of organizations”. Roles in

organizations have a formal aspect (i.e. functional roles) usually under the form of a job description, but they also have an informal aspect, which is strongly influenced by the system of values prevalent in the organization. According to Selznick (1957:80) organizational roles are “formal and informal patterns of behaviour associated with a position in the social system to which individuals are expected to conform”.

This is consistent with Fiol’s (1991) notion of *identity* or contextual frames. As we have discussed in chapter three, Fiol has suggested that because it is difficult to establish a one-to-one link between values and behaviour, we need to find mediators between the organizational values, which form organizational contexts and the more overt forms of behaviour. Such mediators, which Fiol has collectively labeled as the *identity* are the organizational roles, which make up the contextual frames, which link organizational values and interpersonal behaviours.

To sum up, let us return to the question put in the Introduction to this chapter, i.e. “how does the process of formation or constitution of organizational climates or contexts actually work?”. The answer to the question is found in the closed loop, which forms the bottom half of the diagram in Figure 5.1.

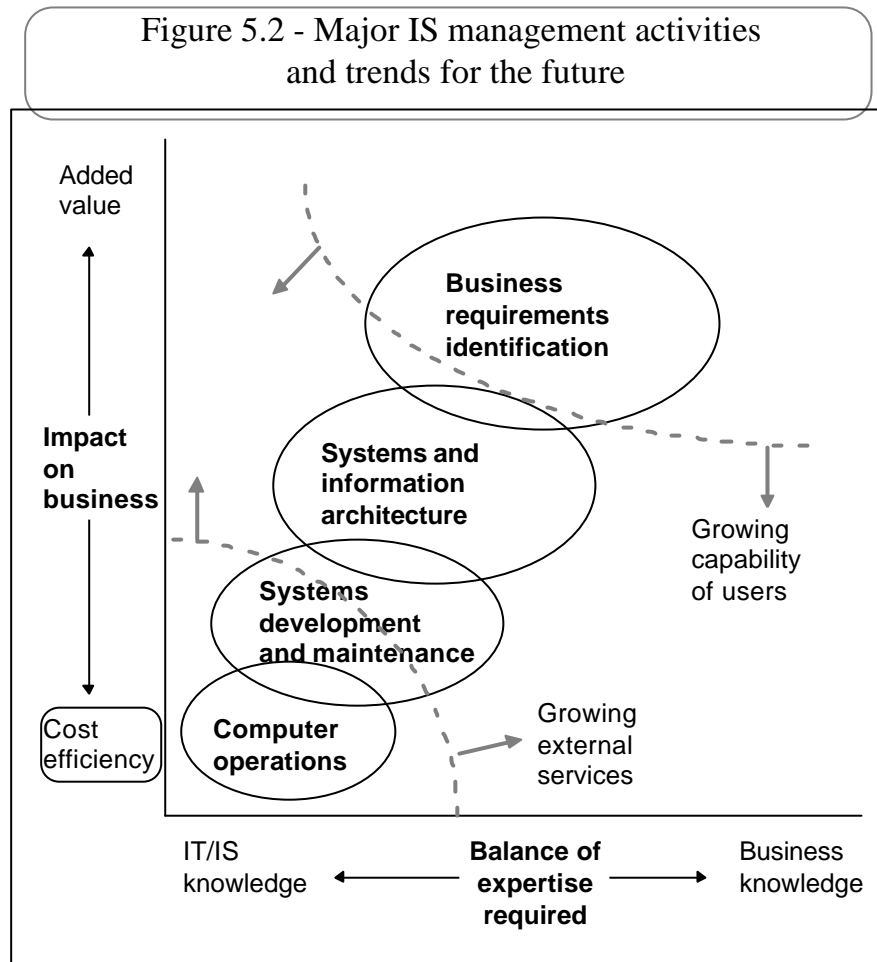
Values influence, through dyadic relationships, the way organizational members interpret or make sense (Weick, 1995) of formal roles, thus opening up the way for the formation of informal roles. But relationships are not visible. They just happen, when two or more people come together in a social setting. What is visible are the roles, which each member of the group plays during the social interaction. Informal roles are, therefore, the behavioural element of this chain of events, expressed in linguistic or non-linguistic behaviour. Such behaviour, in turn, contains values, and it through behaviour that organizational values are confirmed or disconfirmed.

While this gives informal roles a highly situational and emergent character, there is also some stability associated with the notion of informal role. Such stability comes from the self-referential nature of autopoietic systems (von Krogh and Roos, 1995). This means that because organizations set up their own interpretative schemes and become self-referential, they are resistant to change (i.e. they are closed to new information). But, it is not only the relationships, which are self-referential. Because the values-roles-relationships loop is part of the same social system, the whole loop is also self-referential, very resistant to change and acting as a key constitutive force in the organization.

5.3 Conceptualizing IS implementation as a set of managerial roles and processes

5.3.1 The changing functional roles in management of the IS function

With all the changes occurring in the general business environment, in the information technologies available to organizations and in traditional organizational structures, the organization and management of the information systems function is bound to undergo radical change as well.



Source: Sprague and McNurlin (1998)

The information technology/systems function comprises the following four major operational areas, accordingly to Sprague and McNurlin (1998):

- ? Computer operations: running and maintaining computers and networks
- ? Systems development: developing, maintaining and updating systems
- ? Architecture development: providing a framework of policies and standards both for information technologies and for information contents
- ? Business information requirements: helping users to articulate their needs in terms of the systems architecture

As Figure 5.2 suggests, these traditional functions of IS departments are undergoing majors changes, due to a variety of factors, which can be summed into two major categories: (1)

Changes from within the organization, where a combination of more user-friendly technologies and users more knowledgeable about IT can, in some ways, replace the work of traditional IS specialists. (2) Changes from outside the organization, where all kinds of new computer services are being offered and making it more cost-effective for many companies to outsource, rather than insource various types of IT services. All such changes are creating a need for new types of relationships in the organization, in other words, a new “ethos”, which comprises the new technologies and the accompanying new *modus operandi*.

The following passage from Sprague and McNurlin (1998:59) is illustrative of and summarizes accurately the transformations taking place.

We used to do it *to* them - meaning, IS required end users to obey strict rules for getting changes made to the system, submitting job requests, and so on. Next, we did it *for* them - meaning, IS moved to taking a service orientation. Now, we do it *with* them, which reflects partnering. And we are moving toward teaching them how to do it themselves.

In fact, the issue of the organization and management of the IS function is no longer an issue restricted to the role of the IS director. Many of the traditional roles of the IS department are being transferred to the line departments (Sullivan, 1985; Elam et al., 1988; Henderson, 1990; Boynton, Jacobs and Zmud, 1992; Rockart, Earl and Ross, 1996; Ross, Beath and Goodhue, 1996; Sprague and McNurlin, 1998). Many articles have been published about the “transformation”, “imperatives”, “emergence” and “key issues” of the IS function in organizations. In Table 5.1, a summary of five of the most recent articles published in reputable journals is presented.

Table 5.1 - Emerging trends in the organization and management of the IS function

| Beath, Ross & Goodhue (1996) - The three key IS/IT-related business assets | Rockart, Earl & Ross (1996) - The eight imperatives for the IS/IT organization | Cross, Earl & Sampler (1997) - The seven transformations of the IS/IT function at BP | Feeny & Willcocks (1998) - The nine core capabilities of the emergent IS/IT function | Brancheau, Janz & Wetherbe (1996) - The top ten key issues in IS management (ranked) |
|---|---|---|---|---|
| A reusable technical base (the IT platform) ☞ | Building and managing the IT infrastructure ☞ | From business to industry IT standards ☞ | Creating a coherent blueprint for a technology platform responsive to business needs (present and future) ☞ | 1. Building a responsive IT infrastructure ☞ |
| | Delivery and implementation of new systems ☞ | From systems provider to infrastructure planner ☞ | Rapidly achieving technical progress to one means or another ☞ | 2. Facilitating and managing business process redesign ☞ |
| | Building up high performance ☞ | From craftsmen to project managers ☞ | Envisioning the business processes which the technology makes possible ☞ | 3. Developing and managing distributed systems |
| A solid partnership between IS/ IT specialists and the users ☞ | Two-way strategic alignment ☞ | From systems analysts to business consultants ☞ | Integrating IS/IT efforts with business purpose ☞ | 4. Developing and implementing an information architecture |
| | Effective relationships with line management ☞ | | Getting the business constructively engaged in IS/IT issues ☞ | 5. Planning and managing communication networks |
| | Designing and managing the federal IS/IT organization ☞ | From decentralized bias to centralized topsight ☞ | Managing the IS/IT sourcing strategy which meets the interests of the business ☞ | 6. Improving the effectiveness of software development |
| A strong IT workforce ☞ | Reskilling the IS/IT organization ☞ | From large functions to lean teams ☞ | Ensuring the success of existing contracts for IS/IT services ☞ | 7. Making effective use of data resources |
| | Managing vendor partnerships ☞ | From monopoly supplier to mixed sourcing ☞ | Protecting the business's contractual position, current and future ☞ | 8. Recruiting and developing IS human resources ☞ |
| | | | Identifying the potential added value of IS/IT service suppliers ☞ | 9. Aligning the IS organization with the enterprise ☞ |
| | | | | 10. Improving IS strategic planning ☞ |

Note: The numbers in circles in some of the cells are an attempt at grouping the trends presented in the five articles. The definition of each trend or issue varies from author to author, thus it is not possible to establish an exact matching of trends.

From an aggregation of the trends put forward in the five articles summarized in Table 5.1, the following can be said to a representative list of emerging trends in the IS function:

1. *Building and managing the IT infrastructure, i.e. developing a coherent blueprint for a technology platform responsive to present and future business needs*
2. *Building and maintaining partnerships between IT specialists and IT users*
3. *Achieving high performance and rapid technical progress by the IT organization*
4. *Managing the organization's IT sourcing strategy and identifying new technological solutions*
5. *Centralized topsight of the IS function, the need for personal involvement and comitment from top management*
6. *Decentralized implementation of IS through a federal-type IS organization*
7. *IS staff acting more as business consultants and less as technicians*
8. *Improving IS strategic planning, i.e. integrating IS/IT efforts with business purpose*
9. *Developing IS human resources and creating a strong IS/IT workforce*

Regarding the role of the top management in IS management all the signs are that it has become so central to all types of organization that it can no longer be delegated to any other level in the organization. Keen (1991) argues that it is no longer enough for top managers to be aware or have a business vision that links IT and strategic positioning; top managers must now be involved in driving forward the planning of the IT infrastructure. Dutta (1996) reinforces this point by saying that even though IT can be physically outsourced, the management of IT must *always* be insourced and top managers have to be involved in spite of their age or lack of familiarity with IT. However, the question of familiarity or knowledge about IT does not seem to be the issue. Rockart (1995) expresses the view that what the CEO knows about IT is not important; what is important is what she and other members of the top management team *think* about IT, its role in the organization and their roles in planning and managing it.

Schein (1992a:93) in a study of the role of the CEO in the introduction and management of IT concludes that CEOs find themselves lost in the midst of the increased complexity brought about by IT and reports that they “acknowledge that future generations of CEOs may be able to take a much more optimistic and proactive stance towards IT”. Building upon the work of Schein, Feeny et al. (1992:14) suggest that the CEO's attitude towards IT can be changed “through some (planned or unplanned) action, which affects his or her personal experience of IT, his or her perception of the industry relevance of IT and his or her attitude to the needed level of business change”. Thus, it is evident that the role of top management is not only crucial in the management of the IT function, but also that such role depends very much on attitudes and not just on factual knowledge. In this case, *attitudes towards IS or IT*.

With such drastic changes in IS-related roles in organizations occurring over a fairly short period of time, the relationships between the key actors is changing as well. This realization is what has made Keen (1991:214, added emphasis) argue that “the key to [IS strategic] alignment is

relationships, not strategy”. Grindley (1992:57) has identified the culture gap between IT professionals and their business colleagues as being a “key factor in limiting the successful utilization of IT”. Interestingly, in the survey, which served as the basis for Grindley’s article, 52% of the respondents said that it would take four years to solve the culture gap. Given that this survey was carried out in 1990-91, the culture gap should be solved by now, at least in the UK. However, that does not seem to be the case. In 1996, Ward and Peppard published an article entitled *Reconciling the IT-Business Relationship: a troubled marriage in need of guidance*, where it is acknowledged that the IS/IT organization “does not have a harmonious relationship with the rest of the business” (p.38). For an idea of the type of relationship that exists among the key actors involved see Box 5.1.

Box 5.1 - Typical climate of the IS function in large organizations

- ? Separate location of IT specialists - security systems. Elitism due to education and technical mysticism. Overcost/overtime reputation
- ? Rivalry amongst “clients” competing for resources. IT steering committees, which do not work. Financial/budget constraints used to threaten both users and IT departments
- ? Functional thinking - based on the issues involved in managing the delivery of IT systems and technical activities involved
- ? Tight financial control - budgeting, charge out, etc. Measuring the “trees” and losing sight of the “forest”. Internal controls are “secret” in terms of how time and money is spent
- ? Reports on anything, jargon with everything. Slaves to methodology. No acceptance of ambiguity - paralysis by analysis
- ? Large salaries for IT staff. IT staff always on training courses. What for ? The XYZ project was a disaster !
- ? We (IT) are here to serve the business but we do what we think they want, in a way we want to do it. Our systems are too good for you ignorant users !

(Adapted from Ward and Peppard, 1996:57)

Thus, the question of bringing in a *managerial action* frame of reference into the organization and management of the IS function is gaining weight in the IS literature. Brown and Ross (1996:59, added emphasis) state

ultimately, the goal is to have IS-business partnerships and IT infrastructure development so enmeshed in the organization’s *culture* as to be self-sustaining, regardless of the IS organization structure (...) our research suggests that many IS units today are implementing balancing mechanisms in an attempt to move towards *cultural absorption* of these IS goals

Summing up. From what has been said in this section, it is possible to detect three *overriding issues* as regards the emerging trends in the information systems function:

- ? *The development and management of the organization's IT infrastructure*
- ? *The development and management of solid partnerships between IT specialists and users*
- ? *The personal involvement from top management in establishing and maintaining an appropriate climate for the development of the IS function*

The first two issues are at the heart of the hottest debate in IS corporate governance: the debate of centralization versus decentralization of IS corporate resources. The first issue (development and management of the organization's IT infrastructure) is the key argument used by those in favour of centralization. An IS/IT strategy based on IT infrastructure development is very effective as regards use of specialized personnel, investment and maintenance costs and the building up of synergies. Those in favour of decentralization use more business-focused arguments, such as the speed of response from IS/IT to new business initiatives or greater awareness from IS/IT specialists to business issues. The development of partnerships between IT staff and users is the key strategy followed by the later. The third and final overriding issue is concerned with the cultural angle of the problem where the active involvement of top management is an absolute requirement.

5.3.2 IS implementation as an interlocking network of organizational roles

Earl (1996), in the OFF model, which has been analysed in the preceding chapter, uses the expression *corporate governance of IS*. Corporate governance is, by definition, a task involving many stakeholders. According to Monks and Minow (1995) corporate governance is the study of the relationships of all the "constituents" of the corporation, the major players being the board, the shareholders and the management. Likewise, in studying the corporate governance of IS, the interrelationships and the interdependence among top management, the IS management and senior line management are the key components. Senior line managers are the first layer of management just below top managers.

Hence, Earl reminds us that there are at least three kinds of players whose roles and relationships should be taken into account when considering the formulation of an IS strategy: top managers, information systems managers and senior line managers. But these are not the only players that play a vital role in the ultimate success of IS implementation. Middle manager and end-users of IT/IS are just as important. As we have seen in the discussion above, about the "socio-technical interactionist" view of IS implementation, the bottom-up effect of the process of applying computer technology to organization is just as important as the IT/IS planning efforts, and the top-down diffusion of policies and practices. In other words, the IS *constitution process* is not formed only by the interaction of roles and relationships of top managers, information systems managers and line manager, but also by the users of the technology and the more junior managers who have to establish the interface between these and the top managerial layer of the company.

Writers such as Dopson and Stewart (1990), Floyd and Wooldridge (1994) or Nonaka and Takeuchi (1995) claim that far from becoming redundant, middle managers have greater

responsibility for a wider range of duties, both in quality and in quantity, for which they are now more accountable. This is mainly due to the downsizing efforts of the 1980s and early 1990s, which have left organizations with far fewer middle managers than before. Thus, if there are fewer middle managers taking on a wider range of tasks, it seems feasible to think that some of these responsibilities will be related to IS management. In information systems, middle managers have been almost totally neglected, as a research topic. One exception is a fairly limited study on the impact of automated office systems on middle managers and their work, reported by Millman and Hartwick (1987).

In the management of the IS function, the middle manager's job is important as the link between the end users and host of local computing problems on one hand, and the management layer above dealing with planning and policy issues, on the other hand. The management layer above is usually that of senior line management, which increasingly is regarded as being responsible for matters of IS planning and especially IS implementation at department or division level. But implementation on a day-to-day basis is also the job of the middle manager. So, the roles of middle managers and of senior line managers are intimately linked in the sense that they both have to fulfil a *middle-up-down* (Nonaka and Takeuchi, 1995) function between the policy guidelines from the top (what ought to be) and the reality from the front line (what is). In the management literature, this middle level of the organization has been receiving increasing attention in recognition of the fact that in order to maintain and develop organizational knowledge, organizations need middle managers acting as "nerve centres" (Mintzberg, 1973), "horizontal information brokers" and "capability integrators" (Bartlett and Ghoshal, 1993) and "knowledge engineers" (Nonaka and Takeuchi, 1995).

Regarding the end-users of information technology, they come under a topic in the IS literature generally known as "End-User Computing" (EUC). In such literature, much of the discussion has been centered on training and skills development. Although the question of training in computing skills is outside the scope of this work, it is interesting to note the findings of George, Iacono and Kling (1994) on this particular topic. They report that in spite of the effort and money that goes into formal IT training for end-users, office workers learn about computing, primarily, from co-workers on the local computing scene. Furthermore, they have discovered that emergent arrangements, i.e. workers learning not from institutional sources for training and support but from fellow co-workers, were very similar between organizations with highly institutionalised levels of training and those that provided little or no training. The reason for this is the general lack of awareness of the need to develop knowledge (in this case computer-related) not only at individual level but also at organizational level. In the office environment, group learning of Information Technology is also supported by the following observation by Strassman (1985:93)

The use of computers is a technical skill only to a very limited extent. Increasingly, it is a shared organizational capability. I do not know of a better way of speeding up organizational learning than to have people who work together learn together as well

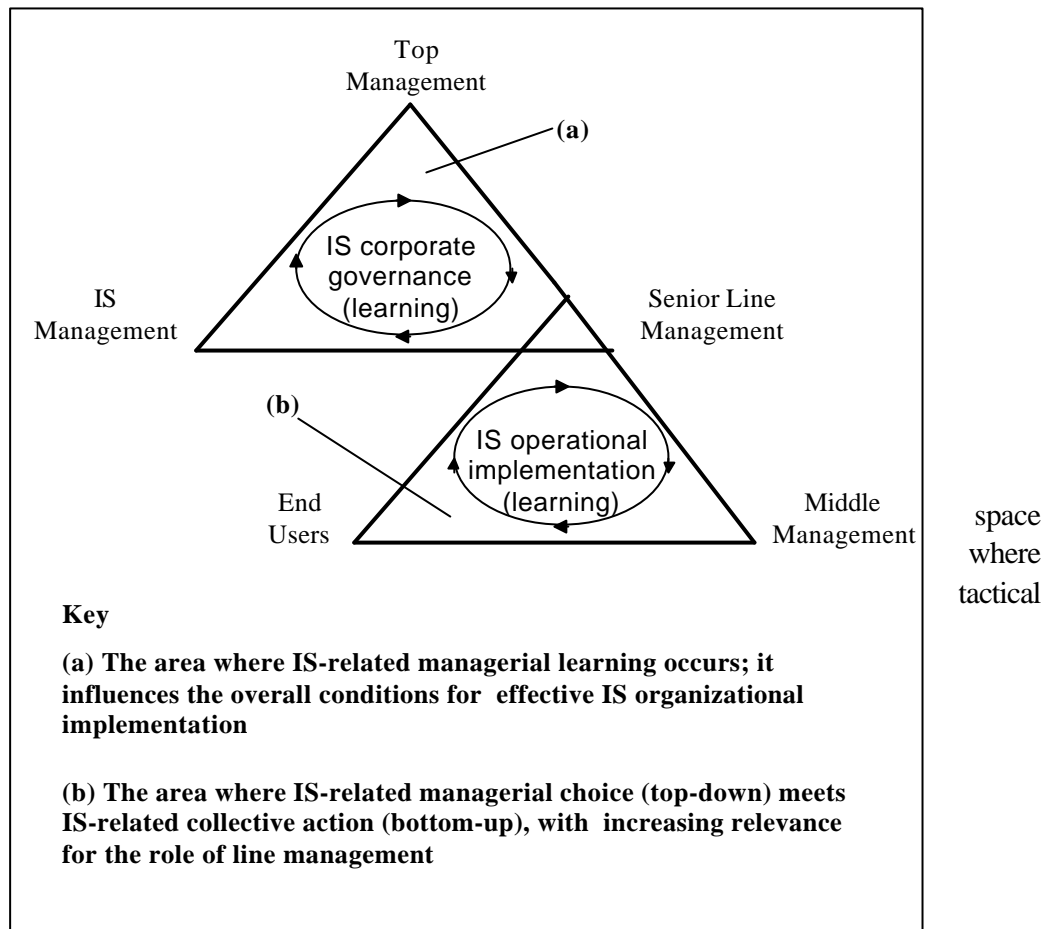
This approach to organizational learning has roots in social psychology and is known as the situated learning approach (Lave and Wenger, 1991). It emphasizes not only that learning must be situated in communities of practice (Orr, 1990; Brown and Duguid, 1991), but also that learning is an integral part of generative social practice in the real world. “Legitimate peripheral participation” is proposed as a construct to explain the incremental nature of engagement in social practice, which entails learning as integral to this process. These views are also consistent with the findings of Thoresen (1996:198) about IT-related learning and with her conclusion that “learning at work is also learning *through* work”.

The bottom-up effect of IS implementation, of which this discussion is part, has already been analysed in the preceding chapter. What is important to emphasize at this point is that the benefits of such localized learning of IT applications are beginning to be recognized by management and are no longer just interesting conclusions in research reports. Rockart, Earl and Ross (1996:53) when arguing that “line leadership is an absolute necessity” in the IS function of the future, include “technology experimentation” as part of the new role of line management. Creating organizational contexts where end users can experiment with and learn the ever-changing supply of standard software packages is also an important new trend in the management of the IS function. Hence, we will add this to the other nine trends identified above:

10. Line management’s new role in the management of and experimentation with IT at the local level

process of organizational maturity and learning. As such, IS organizational implementation could be conceptualized as two overlapping triangles (see Figure 5.3) each with a specific task but both contributing for the whole system to grow in IS-related knowledge. The permanent interaction of the human agents at each corner of the triangles causes a learning effect. The top triangle or the *IS corporate governance triangle* is made up of the interacting roles of the top manager, the information systems manager and senior line managers and the bottom triangle or the *IS operational implementation triangle* is made up of the interacting roles of the senior line managers, the middle managers and the end-users. Senior line managers are the common element between the two triangles because they have a dual role, i.e. they link the top-down managerial choices with the bottom-up efforts for integration of local computing initiatives. As discussed above (see section 4.2.2), IS implementation at the organizational level is also discussed above, the role of middle managers is an extension of the role of senior line managers, in this respect. The IS corporate governance triangle is the conceptual space where managerial learning takes place at the strategic level, thus determining the conditions for the success or failure of the remaining process of organizational implementation of IS. The second triangle contains the

Figure 5.3 - The double-triangle model of IS organizational implementation: the five interlocking roles



operational IS-related learning takes place and where the ultimate criteria for implementation success or failure can be found, in terms of business results.

The notion of IS Organizational Implementation as two overlapping processes has been explored in the Information Systems literature by Lucas, Ginzberg and Schultz (1991). These authors have split up their conceptual model of IS implementation into two sub-models: the manager model and the user model, each sub-model having its own causal variables. Ciborra and Lanzara (1994) suggest that information systems should always be treated at two different levels: the level of routines (old and new) and the level of the formative contexts, that is the cultural level.

In the organizational learning literature we find a similar distinction between lower level and higher level organizational learning. The latter has been defined as “the development of complex rules and associations regarding new actions” (Fiol, 1985:810); it occurs mostly in the upper levels of the organization and can lead to the development of new organizational cultures, through a learning effect that spans the entire organization. In the lower level, learning is more focused and

occurs through repetition at the routine level of operation. It is usually of a short-term nature and capturing only a very small part of the overall organizational picture. In our model the upper triangle is aimed precisely at separating the lower from the higher level of IS-related organizational learning achieved through successive IS implementation projects.

Given that the focus of the present research is upon the top triangle, not much will be said about the bottom one. Two points are worth making, however. Firstly, conceptualizing IS knowledge development as occurring at two levels and making a clear distinction between the two helps to reinforce the point made in chapter four (see section 4.2.1) about the problems connected with IT use as a key indicator of implementation success. In other words, while IT use depends directly upon various factors at the operational level (e.g. user management or the technical quality of the IT application) it also depends, although indirectly, upon a host of other factors at a higher level in the organization.

Secondly, the operational level of IS implementation is where a whole new set of roles needs to be found, both for the senior line managers and for the middle manager under them. The overall management philosophy for such new roles may be found under the concept of “middle-up-down” management (Nonaka and Takeuchi, 1995). This approach involves mainly senior line managers and middle managers in a new joint role. The approach also embodies the concept of “mixed strategies” for IS implementation, which has been described by de Jong (1994) and which has also been briefly discussed in the preceding chapter.

5.3.3 Integrating IS roles and process with the managerial action model

Going back to Bartlett and Ghoshal’s roles and processes model (see Table 3.3) we can see how it also provides an adequate framework for thinking about the governance of the IS corporate function, by replacing the front-line management, the middle management and the top management roles by the three key IS managerial roles - top management, information systems management and senior line management.

Ghoshal and Bartlett’s (1993;1994) notion of managerial processes (the Renewal, the Integration and the Entrepreneurial process) can be applied to IS corporate governance, by taking the three overall emerging trends identified above - (1) the development and management of the organization’s IT infrastructure, (2) the development and management of solid partnerships between IT specialists and users and (3) the personal involvement from top management in establishing and maintaining an appropriate climate for the development of the IS function, and turning them into managerial processes. In fact, something very close to this has already been achieved by Earl (1996) with the three processes we have discussed in chapter four - the Foundation (or Infrastructural), the Innovation and the Clarification processes. Emerging trends numbers (1) and (3) above coincide exactly with Earl’s Foundation and Clarification processes. Emerging trend number (2) contain the key ingredient for the Innovation process to work, i.e. the development and management of solid partnerships between IT specialists and users.

The result is the creation of a new framework of IS corporate governance for the future (see Table 5.2). This innovation, as far as we are aware, has never been proposed or attempted in the IS literature. This framework can be developed further as a translation of Bartlett and Ghoshal's managerial action model in terms of IS corporate governance. As more details emerge about future trends in the IS management function (see Table 5.1), it should be possible to develop a finer framework on the basis of Ghoshal and Bartlett's work. The main idea is to find out how the notions of managerial values, roles and processes can be usefully applied to the corporate governance of IS. This is what we will attempt to achieve in the empirical part of our research (in chapter six).

Table 5.2 - The IS corporate governance matrix:
integrating managerial roles and processes

| Managerial processes | Managerial roles | | |
|--|---|---|---|
| | Front-Line Management | Middle Management | Top Management |
| Renewal process † : <i>creating purpose and challenge</i> | Managing the tension between short-term performance and long-term ambition | Creating and maintaining organizational trust | Shapping and embedding corporate purpose |
| IS corporate governance process † : <i>Clarification</i> | IS Functional Management | Senior Line Management | Top Management (Board member in charge of IS) |
| | Filtering new developments from the external IT market and translating them into the organization's language | Building communication bridges between IS departmental demand and central IT supply | Translating the corporation's intent and purpose into IS corporate objectives |
| Integration process † : <i>linking and leveraging capabilities</i> | Front-Line Management | Middle Management | Top Management |
| | Managing operational interdependencies and personal networks | Linking skills, knowledge and resources | Developing and nurturing organizational values |
| IS corporate governance process † : <i>Infrastructural or Foundation</i> | IS Functional Management | Senior Line Management | Top Management |
| | Managing the corporate IT infrastructure and rapidly achieve technical progress in line with the business | Actively contributing towards the maintenance of an IT infrastructure by having a grasp of the technology-related opportunities and constraints | Embedding an IS ethos into the organization and championing IS/IT issues at Board of Directors' level |
| Entrepreneurial process † : <i>aligning and supporting initiatives</i> | Front-Line Management | Middle Management | Top Management |
| | Creating and pursuing opportunities | Reviewing, developing and supporting initiatives | Establishing strategic mission and performance standards |
| IS corporate governance process † : <i>Innovation</i> | IS Functional Management | Senior Line Management | Top Management |
| | Internal consulting on IS issues (including business process innovation) and work on the building of relationship with the line departments | Searching for IS-based innovative solutions (including those coming out of good local IT initiatives) and linking them with business targets | Facilitating the achievement of a balance in the centralization vs. decentralization issue through personal involvement in the strategic management of IS/ IT |

† - Source: Bartlett and Ghoshal (1993) † - Processes named after Earl (1996)

In the next section we start to adapt the organizational climate dimensions discussed in chapter three to the special case of IS corporate governance, in an attempt to demonstrate and explore how an IS context or ethos might be formed in organizations.

5.4 Operationalizing IS corporate governance climate or context

The IS corporate governance climate or ethos is not a concept which we will attempt to measure quantitatively in this research. As discussed in chapter three, organizational climate is taken to be the same as the context generated or shaped by organizational values such as Discipline, Trust or Support in combination with other more situational variables, such as the type of organizational structuring, which has evolved, historically, with the company. Organizational structure can be evaluated more directly, through an analysis of the company's internal documentation, for example. With organizational values, however, such evaluation is more complicated. Values cannot be investigated directly. Values have to be investigated through organizational roles, i.e. through the expectations that organizational members have regarding the behaviour of other organizational members. Such expectations, in turn, carry different types of values. For example, I expect that my subordinate will submit a given report within the allocated deadline. Such expectation carries a value, which we may label as "discipline", in the sense that I believe my subordinate to be disciplined enough to have the report ready by the due date.

In chapter three, we discussed attitudinal climate dimensions (or values) and we concluded that the four types of dimensions, which Ghoshal and Bartlett (1994) have put forward - stretch, discipline, trust and support - are quite similar, at least in terms of their labelling, to the climate dimensions put forward by other authors from the organizational climate research tradition. The problem we have now is to see how far such general climate dimensions can be applied to a new construct: the IS context or IS ethos. In other words, what types of climate dimensions would be appropriate in such a new construct. In this section we discuss the applicability of four attitudinal dimensions (IS intent, discipline, trust and support) and one non-attitudinal dimension (structural factors) to the IS corporate governance context or climate.

5.4.1 IS Intent

As a starting point, we have assumed that the last three dimensions - discipline, trust and support - are general enough to be applicable to any sub-organizational context. Hence, they should also be applicable to the corporate governance of IS. As regards the fourth dimension - stretch - we do not consider it to be directly applicable to the corporate governance of IS. The reason for this is that stretch is pitched at a very general level, dealing with the personal aspirations of individuals - "stretch is the attribute of an organization's context that induces its members to voluntarily strive for more, rather than less, ambitious objectives" (Ghoshal and Bartlett (1994:100). Although stretch is seen as a way of making individuals "contribute to the overall purpose of the organization" (ibid, p. 100) this dimension lacks, in a more specific environment, e.g. an IS

corporate governance environment, a more positive indication of intent or a feeling of knowing where one wants to be. In other words, by generally building up stretch we may have organizational members who contribute to the overall purpose, but if we are considering the special case of IS corporate governance we need to be sure that such purpose exists, in the first place.

In order to try to define an organizational climate in terms of IS corporate governance, the notion of stretch does not seem to be enough. An explanation of the organization's IS climate or context would need something more positive, more focussed, something more akin to strategy, strategic thinking or strategic intent. Strategic thinking can be thought of as something diffused throughout the organization but with an integrating power - "the outcome of strategic thinking is an integrated perspective of the enterprise, a not-too-precisely articulated vision of direction" (Mintzberg, 1994:108). On the other hand, Hamel and Prahalad (1989) have coined the expression *strategic intent* as a way of overcoming the older and static notion that firms should engage in strategic management in order to obtain "strategic fit" in relation to the environment. They argue that strategic intent "establishes the criterion the organization will use to chart its progress" (p. 64). Thus, strategic intent seems to accommodate also the notion of strategic thinking, while giving it a more precise signification.

Stretch is the behavioural attribute, which complements strategic intent, i.e. to be fully effective intent needs a degree of stretch. But coming back to our argument about the application of this notion to IS corporate governance, our view is that while stretch may be an important dimension of the overall climate in the organization, it does not seem to make sense using stretch as a dimension of the organization's IS climate. Stretch is part of the wider notions of strategic thinking and intent, but in the case of IS corporate governance it is difficult to apply this behavioural attribute. If stretch is present in the organization as a whole, it is likely that it will also be present in IS corporate governance. However, because of the special nature of this newcomer to the corporate governance family, IS needs a special climate dimension, within the arena of strategic thinking and intent. The special nature of IS corporate governance, as it has been mentioned above, has do to, mainly, with its strong technical component. Thus, the special dimension we are talking about should be more attitudinal than behavioural and should reflect a set of attitudes towards this IT-dominated angle of the organization's governance.

The IS function at corporate level has strong strategic implications as it has been recognized by many authors and consensus exists to the effect that the strategic dimension of IS concerns the capability of IS/IT for leveraging the firms's competitive strength (Porter and Millar, 1985; Wiseman, 1988; Galliers, 1991; Cash, McFarlan & McKenney, 1992; Earl, 1989, 1996). But the strategic dimension of IS, in our view, cannot be divorced from the kind of strategic thinking and strategic intent, which exists in the firm, in general. Strategic management theorists say that strategic thinking and intent must be widely diffused throughout the organization. Such thinking and intent include many aspects related to the formulation and implementation of the business' strategy and each of such aspect has its own strategic angle. For example, marketing or human resources management have strategic dimensions, which, while part of the overall strategic

thinking and intent in the firm, also have their own specificities. As information technology applications get more and more diffused throughout the organization and decision making related to IS/IT get ever more decentralized, the strategic thinking and intent, in general, will gradually start to encompass also a new type of thinking or intent: IS strategic thinking or intent. For the sake of brevity, we will use the shorter form - *IS intent*.

Hence, we suggest that for the corporate governance of IS, a degree of *IS intent* is also needed. This means that stakeholders should be very clear about the IS-related criterion that the organization will use to chart its progress. IS intent has to do, above all, with *the awareness, the understanding, the action and the proaction from all the firm's managers regarding the role of IS/IT in helping to achieve their own business objectives and, ultimately, the firm's strategic aims*. According to this definition, in a firm where managers have IS intent, the relationships, which characterize the corporate governance of IS will be different from a firm where managers do not have or have less IS intent. Thus, we suggest that IS intent should be among the key climate dimensions of the organization's IS ethos.

We use intent and not intention because the former has a stronger connotation, in the management literature, with strategy or strategic thinking. However, we do not think that there is much difference in the meaning of intent and intention. Nonaka (1994:17) who takes a more individual-level approach, argues that "intention is concerned with how individuals form their approach to the world and try to make sense of their environment". This is not very far from Hamel and Prahalad's (1989:64) notion that intent "establishes the criterion the organization will use to chart its progress", when applied to the organizational level. What is important is to discover what attributes contribute towards the formation of intent or intention. In their theory of organizational knowledge, Nonaka and Takeuchi (1995: 74-75) have identified three attributes of intention as one of the enabling conditions for the creation of organizational knowledge: (1) "the organization's aspiration to its goals"; (2) "organizational standards or visions" and (3) something capable of fostering "collective commitment".

Intention as a dimension of climate formation has some similarities with Ghoshal and Bartlett's (1994) notion of stretch. According to these authors, stretch is composed of three attributes: shared ambition, collective identity and personal meaning. Shared ambition is similar to Nonaka and Takeuchi's organizational aspiration to the organization's goals. Collective identity has similarities with collective commitment and both dimensions are intimately related to organizational purpose. Purpose creates both identity and commitment around a common cause. However, as it has been explained above, not all such dimensions can be applied to IS corporate governance in a sensible way. It is not realistic to say, for example, that the organization should have a shared ambition or an aspiration in relation to its information technology/systems' goals. So, from the various attributes of intent or intention listed, which ones are applicable to the special case of IS corporate governance? Let us see.

The organization's standards or visions is very relevant in the case of IS corporate governance. As suggested by Keen (1991), a strategic vision of the role of IS/IT and especially of the role of

the IT infrastructure on the part of top management is crucial for the growth of any business today. So, we can say that the IS-related *strategic visions* is an important component of IS intent. The notions of purpose and commitment are also crucial in IS corporate governance. Top and senior management should be very clear about the purpose of IS/IT in their particular business (Rockart, 1988, 1995; Henderson, 1991; Dutta, 1996). Hence, we suggest that IS-related *collective commitment* is also an important attribute of IS intent.

Personal meaning, the third attribute of Ghoshal and Bartlett's notion of stretch is also relevant in the case of IS corporate governance and contributes also towards IS intent. The relative success of the IS function in an organization depends, to some extent, upon the IS-related personal experience and skills of the top managers who happen to be in charge. Some present-day top managers have had previous experience, either as users or as managers, with IT applications and this is usually beneficial to the IS-related responsibilities of the post, which they occupy now. IT-related experience is an important contribution to the development of personal meaning regarding the role of IS/IT in the business, now and in the future. IS/IT is still too new an activity for it to be universally accepted in organizations as an "ordinary" function, i.e. there are still many discrepancies from organization to organization as regards the level of experience and skills that managers and, especially, top managers are expected to have. However, it is clear that there can be no commitment or no strategic vision regarding the role of IS/IT, if there no personal meaning. Thus, IS-related *personal meaning* is the third components of the dimension we have labelled IS intent.

Having made an argument in favour of IS intent, we have to go back now to our starting assumption, i.e. that the other three dimensions - discipline, trust and support - are general enough to be applicable to any sub-organizational context, namely to the IS corporate governance context. We will work towards this by following mainly Ghoshal and Bartlett's (1994) analysis of the attributes of each of the above dimensions and see how far they can be adapted to the case of IS corporate governance. Whenever we feel that it is appropriate, we will bring in the work of the other authors writing on climate dimensions and who have already been referred to.

5.4.2 Discipline

We start with *discipline*. According to Ghoshal and Bartlett the key attributes of discipline are (1) performance measures; (2) fast cycle feedback and (3) consistent sanctions. Fast cycle feedback and consistent sanctions do not seem to be applicable to the special case of IS corporate governance. Consistent sanctions is a generic dimension, which applies to human resources management in a very general way and there is nothing applicable, specifically, to IS corporate governance. Fast cycle feedback also does not apply mainly because there can be no fast cycle feedback on most IS corporate governance decisions. In this area, feedback is usually of long-term nature, but on single IS implementation projects, the questions of feedback are problematic. Establishing useful evaluation criteria for single IS implementation projects is fraught with difficulties (Remenyi and Sherwood-Smith, 1997).

But in trying to apply the “discipline” dimension to the IS corporate governance context, we should first recall what we said in chapter five regarding the three *overriding issues* as regards the emerging trends in the information systems function, i.e.:

- ? *The development and management of the organization’s IT infrastructure*
- ? *The development and management of solid partnerships between IT specialists and users*
- ? *The personal involvement from top management in establishing and maintaining an appropriate climate for the development of the IS function*

In this context, the first point to be made is that for an IT infrastructure to be built up and maintained, “discipline” and “control” seem to be crucial elements. The literature is filled with examples of organizational members resisting standardization for a variety of reasons, e.g. because the IS department is too slow in responding to the business departments needs, because the particular application, which department X wants to purchase does not fit into the company’s IT architectural standards and so on. Thus, the first attribute of the discipline dimension is the *need to respect the standards* (both technical and performance standards) set as part of the organization’s *IT infrastructure*.

The next issue involves also discipline and control and is one of the main sources of conflict between IS personnel and the line departments. It is the issue of the time delays in the development/implementation of IT applications, which all organizations experience or have experienced. This issue is yet another manifestation of the “cultural gap” between IS and business and, as such, is seen from very different perspectives by these two groups of personnel. At this point it is relevant to recall two authors who have written about organizational climates: Litwin and Stringer (1968) and Likert and Likert (1976).

Litwin and Stringer have identified responsibility as one of their eight dimensions of climate. According to these authors, responsibility means “not having to double check all your decisions; when you have a job, knowing that it is *your* job” (1968:81). Thus, in order to achieve discipline, organizational members must first perceive that they have responsibility. According to Ghoshal and Bartlett (1994:97), discipline “represents a way of life, a norm applicable to all tasks, rather than compliance with a well defined set of contracts embodied in a company’s strategic and operational control tools”. Likert and Likert (1976) highlight *control*, a dimension of climate also related to discipline. These authors argue that in organizations where the control functions are widely shared, discipline is more likely to flourish. If, on the other hand, the control functions are concentrated in a few points in the hierarchy, individual responsibility is not fostered and discipline cannot ensue.

In IS corporate governance, the problems of responsibility and control are crucial dimensions of discipline but they are usually on a collision course with each other. Both IS and line personnel have responsibility and control over their respective functions, but the responsibility and control of the IS function often interferes with the responsibility and control of the line departments. This

situation, which explains the conflict mentioned earlier on, is due to the dependence of the line departments upon the performance of the IS department on highly technical issues, such as IS development or maintenance. Thus, for there to be discipline in IS corporate governance, IS personnel have to be highly *aware of the needs of the business units* and the personnel from the business units have to *aware of the constraints and limitations of the technical tasks involved in IS development and maintenance*.

5.4.3 Trust

Moving on to *trust*. Following Ghoshal and Bartlett, they suggest that “individual-level competence is almost as important for creating an environment of mutual trust as the process attributes of fairness and participation” (1994:101). For these authors, the key attributes of trust are (1) equity; (2) involvement and (3) competence. Equity or fairness are attributes, which are related to the “conflict” dimension put forward by Litwin and Stringer (1968:82), i.e. the feeling that problems are dealt with openly and honestly and are not systematically avoided or ignored. Although this is a dimension of climate, which can have a role in the shaping of the IS ethos, there is nothing specific enough to make it an IS ethos dimension. The same is not true of involvement or participation.

Being an organizational function with special characteristics in view of its highly technical nature, the problem of participation is crucial in IS corporate governance. On one hand, participation is seen as important but, on the other hand, participation is difficult because the issues are too technical. Hence, decision making in IS corporate governance is usually easier if there is less participation on the part of all the stakeholders. In other words, opting for not involving managers who do not fully understand all the details involved in an IS-related decision is easier than having to brief and even coach them extensively. Such *involvement* refers especially to those managers who are not directly involved with the planning or operation of IS-related resources, but are indirectly affected by the decisions taken about such resources.

The second trust-related attribute, which is relevant for the shaping of the IS ethos is competence or the perception of competence. In IS corporate governance, we might think of the problem of perception of competence in two parts: (1) the perception on the part of all non-IS managers in relation to the competence of IS managers and IS personnel, on business-related issues and (2) the perception on the part of IS managers and IS personnel in relation to the competence of line managers and line personnel on IS-related issues. As regards the first part, the level of mistrust, which exists in relation to the work of IS personnel is well known in the IS literature (Markus, 1983; Smith and McKeen, 1992; Wang, 1994, Ward and Peppard, 1996), especially regarding the timeliness of provision of IS-related services. As regards the second part, the issue stems from the fact that non-IS staff increasingly have to take IS-related decisions. Because this transfer of functional responsibilities to line managers is a fairly recent development, the degree of trust or mistrust is not yet well documented in the literature, but the preliminary interviews have showed that in fact some mistrust may exist on the part of IS managers. In short, in IS corporate

governance, the issue of competence seems to be a source of mistrust both on the part of non-IS personnel and of IS personnel.

5.4.4 Support

The fourth dimension we propose for the IS ethos construct is *support*. Ghoshal and Bartlett (1994:103) define this dimension as a managerial value that “induces [organizational] members to lend assistance and countenance to others” and explain that the mechanisms through which such value is achieved are (1) access to resources available to other organizational actors; (2) freedom of initiative at lower levels and (3) personal orientation from senior managers that “gives priority to providing guidance and help over exercising authority”. Thus, according to the first two attributes, support seems to depend mostly on the autonomy that the organization gives to individual organizational members. This is consistent with Nonaka and Takeuchi’s (1995) notion of autonomy as one of the key factors behind the development of individual commitment and also with autonomy as one of the four psychological “cues” identified by Falcione, Sussman and Herden (1987) in the formation of the organizations’ communication climate. Nonaka and Takeuchi (1995:75) argue that autonomy “increases the possibility that individuals will motivate themselves to create new knowledge” and also that “by allowing them to act autonomously, the organization may increase the chance of introducing unexpected opportunities”.

As regards the formation of an IS climate or ethos, autonomy may be an important attribute but only in a limited way. There is no difference between the level of autonomy required by the stakeholders in IS corporate governance and the level of autonomy required by the stakeholders in any other organizational function, i.e. the IS manager needs autonomy, just as much as the marketing manager needs autonomy. However, there may be a special case as regards one of the stakeholders in IS corporate governance: the line managers. In view of the changing trends, which have been reviewed in chapter five, many of the traditional tasks of the IS function are moving on to the job descriptions of line managers. But transferring responsibilities and autonomy also means transferring power and influence and such processes are never without difficulties, i.e. conflict. The struggle for power and influence over IS-related resources is intimately linked to the autonomy of line managers in relation to those resources. Hence, the degree of *autonomy that line managers have* in IS-related decision making must be an important attribute of IS-related support.

Ghoshal and Bartlett’s definition of support has much in common with Litwin and Stringer’s (1968) climate dimension, also titled support. For the later, support is “the perceived helpfulness of the managers and other employees in the group; emphasis on mutual support from above and below” (p.81). Thus, help and guidance are key components of the support construct, at the general organizational level, but not only. Help and guidance are also fundamental attributes in the formation of the IS context. The reason for this is the same often given throughout this text, i.e. the highly technical nature of the IS function. Top managers need guidance in understanding the policy implications of new IT applications, middle managers need support in deciding which are the best applications to install and end users need coaching in using new software tools. Such

guidance and assistance must come, of course, from information systems managers and staff, but this is not all. As Earl (1996) has argued, *clarification* of the organization's strategy is one of the key processes in the governance of the IS function. Such clarification, which is an important form of help and guidance, must come from the top of the organization to the information systems manager, as well as to the line managers so as to enable them to formulate IS-related strategies.

The new role of the information systems managers as "internal consultants" (Cross, Earl & Sampler, 1997) has already been identified and discussed in chapter five. Included in this trend is the need for information systems managers and personnel to acquire better interpersonal skills (Brown and Ross, 1996) so that such role of internal guidance and coaching can be fulfilled successfully. It must be noted that when identifying dimensions of a particular climate or sub-climate in organizations (the IS sub-climate), such dimensions are not static, i.e. they change as the trends in the management of that particular sector change. So, while the trends in the management of the IS function are changing due to changes in the technology and in the organizational processes, a new need for a more supportive ethos is arising. This means that if a truly *service orientation* of the IS function was not a particularly important dimension of the IS ethos before, in the future it will be one of its key attributes.

5.4.5 Structural IS-related factors

In developing the topic of organizational learning at the strategic management level, Normann (1985: 222) asks a fundamental question:

are there any basic overall properties of organizational structure and management that increase the likelihood of an effective strategic action process?

The process of strategic action can be paralleled with the process of IS *organizational* implementation, which, in accordance with our definition, is a process of IS-related organizational learning. Interpreted in terms of IS corporate governance, what Normann is saying is that IS-related organizational learning must also be related to IS structural features in the organization. Nordhaug (1993) has taken up Normann's question and investigated the structural conditions determined by historical factors, which facilitate or inhibit learning in organizations.

Nordhaug (1993) makes a distinction between macro and micro level barriers to learning in organizations. Micro level barriers "comprise intrapersonal and interpersonal factors" (p.198) and they are grouped into issues such as current competence, practice opportunities, individual opportunism, relationships between employees and the functioning of groups. All of these issues reflect the attributes of organizational climate or context, which we have discussed above and, in one way or another, they are all embedded in the four IS context dimensions, which we have labelled as "attitudinal". What Nordhaug calls the macro level barriers are the structural dimensions of organizational climate, which authors such as Litwin and Stringer (1968), Likert and

Likert (1976), Falcione, Sussman and Herden (1987) and Nonaka and Takeuchi (1995) have discussed.

Nordhaug's first structural factor is the work system. This factor includes job design, job development, the rigidity/flexibility of job boundaries, mobility of jobs across organizational units and the opportunities for the development of multi-skills. Related to the work system is the organizational structure as an important dimension of organizational climate, especially in what concerns the way that structure "allows for contact and interaction across jobs, professions, teams and subunits" (1993: 219). All such considerations regarding the way that the work is organized can be synthesized into one concern: does the organizational structure contain good communication mechanisms? Communication as a dimension of climate had already been supported by Likert and Likert (1976), Falcione, Sussman and Herden (1987) and Nonaka and Takeuchi (1995). Thus, as the most horizontal of all functional areas, IS corporate governance needs a variety of *structural overlays* (e.g. IT advisory committee, cross-functional job transfers, joint project management) in order to improve *communication* and achieve *integration* between the needs of the IT platform and the needs of the business platform (Zmud, 1988; Brown and Ross, 1996).

Other important structural factors, according to Nordhaug (1993), are the priorities for human resources development and the incentives system. Both factors are crucial in terms of IS corporate governance. Being an area with a strong technological slant, the IS function needs to give special attention to the issue of *human resources development*, not necessarily regarding purely technological skills, but regarding hybrid skills in the technology-business interface (Earl, 1989). In relation to the incentives system, Nordhaug (1993:213) argues that "in addition to the career system, the compensation system plays a central part concerning acquisition, exchange and application of individually held competencies". The *incentives system* too is a special problem for IS corporate governance, again in view of the fact that the IS function has a strong technological slant. Although there may be a trend for this to be less and less a "special problem", historically IS staff have earned more than other staff in comparable hierarchical positions and, in fact, this situation has contributed towards the "cultural gap", which we have discussed in the previous chapter (Ward and Peppard, 1996). However, because the incentives system has been a dividing factor, the IS corporate governance in many organizations has tried to revert this situations putting a "freeze" on the salaries of IS staff. Clearly, this has had both positive and negative consequences in terms of the formation of the IS organizational ethos.

Finally, Nordhaug (1993) includes as a structural factor the organization's culture. While this inclusion may be debatable because culture can be thought of as the consequence and not the cause of these macro level barriers, Nordhaug makes a point, which can be crucial when translated into IS corporate governance terms. He argues "[culture] is itself a repository of past learning and a means through which this learning as well as new knowledge are communicated between individual employees" (p.216). This is perhaps more a situational factor than a structural one, but the point, which Nordhaug is trying to make is that situational factors can become structural with the passing of time. Turning now to IS corporate governance, Land (1992) argues

that the perceptions in the organization about the technical quality of an IT application is a key factor for the successful outcome of its implementation. Land is referring to a single IT implementation project, but as time passes and the organization builds up knowledge about the “usual” technical quality (or lack of it) of successive implementation projects, such collective perceptions become part of the organization’s culture. Hence, we may say that the *technical quality of IT applications* is a structural factor contributing to the organization’s IS ethos, which at first may be situational but, eventually, becomes structural. The table below summarizes the key attributes of the five factors, which contribute towards the organization’s IS context or IS ethos.

Table 5.3- Key attributes of IS corporate governance climate dimensions

| IS context or IS ethos | Support from the literature | |
|---|--|--|
| 1. IS Intent ? IS-related strategic visions ? IS-related collective comitment ? Personal meaning of IS-related issues | Stretch Ghoshal and Bartlett ('94) ? Shared ambition ? Collective identity ? Personal meaning | Intention Nonaka and Takeuchi ('95) ? Organization's aspirations ? Standards or visions ? Collective commitment |
| 2. Discipline ? Need to respect IT platform standards ? An understanding of business platform needs ? An understanding of IS development constraints | Discipline Ghoshal and Bartlett's ('94) ? Performance measures ? Fast cycle feedback ? Consistent sanctions | Responsibility Litwin and Stringer ('68) ? The feeling of being "your own boss" Control Likert and Likert ('76) ? How concentrated are the control functions? |
| 3. Trust ? IS track record in the organization ? IS skills and competencies ? Involvement in IS policy making | Trust Ghoshal and Bartlett's ('94) ? Equity ? Involvement ? Competence | Conflict Litwin and Stringer ('68) ? The emphasis placed on getting problems out in the open |
| 4. Support ? Autonomy in the use of IS resources ? Need for coherent clarification on policy-related issues ? Need for service orientation on technology-related issues | Support Ghoshal and Bartlett's ('94) ? Access to resources ? Autonomy ? Guidance and help | Autonomy Nonaka and Takeuchi ('95) Autonomy Falcione, Sussman and Herden ('87) |
| 5. Structural factors ? IS-business integrating mechanisms ? IS-related priorities for human resources development ? IS-related incentive system ? Historical technical quality of IT applications | Macro level barriers Nordhaug ('93) ? Work system ? Incentives system ? Human Resources Development priority ? Organizational structure ? Organizational culture | Redundancy Nonaka and Takeuchi ('95) ? Sharing redundant information Communication Likert and Likert ('76) |

5.5 Operationalizing IS organizational learning

In order to operationalize organizational learning in the context of IS corporate governance we must firstly recap the approach to IS implementation, organizational learning and organizational contexts we have been developing since chapter two. This is presented in summary form in Box 5.2.

Box 5.2

- ? IS organizational implementation is an all-encompassing process of organizational learning shaped by IS-related managerial action and organizational contexts
- ? The outcome of IS implementation is the effects of the ultimate integration of IT artefacts into the social processes of the organization expressed in terms of organizational effectiveness, *inter alia*
- ? Organizational learning is the collective capability that organizations have acquired and which enables them to develop new knowledge, i.e. to make new conceptual distinctions and value judgements (von Krogh and Roos, 1995)
- ? Such collective capability can be understood as a set of organizational and managerial skills, which can be developed and which allow the organization not only to adapt more effectively to the course of events but actually increases the organization's capacity to innovate, in terms of both process and outcome (Normann, 1985)
- ? Organizational and managerial skills can be task-related or value-related. Task-related and value-related managerial action shape organizational contexts, which are characterized by being more or less oriented towards an individual predisposition to initiative, creativity, collaboration and learning (Ghoshal and Bartlett, 1993,1994)
- ? Organizational learning is both an organizational *process* and an organizational *outcome*. As a process, learning is about communication, ephemeral and difficult to "freeze" in time, to measure or to analyse. But as an outcome, learning can be analysed as a phenomenon of change over time in the existing stock of collective knowledge
- ? Hence, the concept of organizational learning can be operationalized by saying that *organizational learning as knowledge development occurs when the capacity to enhance organizational action is achieved **over time**. Such capacity to enhance organizational action can be regarded as the organization's collective stock of knowledge or organizational knowledge*

Having established, hypothetically, some key relationships between IS organizational learning and other organizational conditions and having defined IS organizational learning as a phenomenon of

change, our next task is to find key attributes or indicators of IS organizational learning. By drawing on the relevant literature we will try to find and signal attributes, which are embedded in the above conception of organizational learning and which, at the same time, might be adaptable to the case of IS corporate governance.

In chapter four we stated that IS implementation is a process of IS organizational maturity and that the key ingredients for the facilitation of such process of change are cooperation, partnership building and the establishment of an appropriate organizational climate or context. IS maturity is achieved when “management is comfortable *managing* the use of IT and employees are comfortable *using* the technology” (Sprague and McNurlin, 1993:43). However, to talk of cooperation implies also to talk of the opposite notion to cooperation, i.e. insularity or isolation. Regarding this particular IS corporate governance issue, Keen (1988:41) makes the following argument:

The goals of any information services organization must be to create a management process for using information technologies, as a coordinated business resource. The barriers to achieving this are generally not knowledge or budgets or technology, but the politics of ambiguity, [i.e.]the lack of clarity about the new role of IS given its historical role and its distance from centrality in the organization [and]the insularity of IS in its relationships and contacts across the organization, and the insularity of management in its handling of the business implications of IT.

Insularity of IS personnel versus the need for cooperation can also be seen against the background of the “push-pull” dynamics as suggested by Zmud (1988) and discussed in chapter four. In order to facilitate technological innovation in the business platform “need pull” and “technology push” are required and in order to facilitate technological innovation in the technology platform, “technology pull” and “need push” are equally required.

This is perhaps the central issue and the main source of tension and conflict in IS corporate governance, which can only be overcome by purposeful managerial action and an IS ethos conducive to the lessening of such tension and conflict. Brown and Ross (1996:59) suggest that “ultimately, the goal is to have IS-business partnership and IT infrastructure development thinking so enmeshed in the organization's culture as to be self-sustaining regardless of the IS organizational structure”. In other words, we might say that IS organizational learning as an outcome can be defined as *the change in the level of cooperation achieved among the major managerial stakeholders in IS corporate governance characterized by the achievement of an ideal state of balance between the standardization required by the IT platform and the innovation sought after by the business platform.*

Table 5.4

| Organizations which rely on IS organizational structure | Organizations where IS corporate governance goals have been absorbed into culture |
|--|--|
| IS determines service levels | Constant negotiation takes place in order to determine effective level of support |
| Users are involved mostly at the “requirements” stage in the planning of new information systems | Shared goals are present through the planning of new information systems |
| Formal communication paths between IS and line departments staff | There is mutual understanding of each others’ roles |
| Individual IS projects are justified in terms of return on investment criteria (ROI) | IS/IT planning is incorporated into the firm’s strategic planning |
| Multiple IT standards. IT infrastructure is built up piecemeal | Firm-wide commitment to an IT infrastructure, which increases flexibility and decreases cycle time |
| Pockets of IT expertise | Learning approach to IS corporate governance |

Table 5.4 shows a number of attributes typical of such ideal state of balance or “enmeshing” of organizational objectives, as suggested by Brown and Ross (1996). The opposite attributes listed in the two columns highlight the changes, which would be needed in the collective stock of knowledge of organization **X** in order to enable us to say that IS-related organizational learning has occurred in organization **X**. This position finds support in the management and information systems literatures, as follows.

Cohen and Levinthal (1990) argue that cross-functional absorptive (i.e. learning) capacities are a crucial part of the overall organizational effort to build more and better learning capabilities. Using, as examples, the relationships between design and manufacturing departments or R&D and marketing departments, they state that “it has become generally accepted that complementary functions within the organization ought to be tightly intermeshed, recognizing that some amount of redundancy in expertise may be desirable” (p.134). This is in line with Ghoshal and Bartlett’s (1994:107) proposition that collective learning is “a result of the combination of distributed initiative and mutual cooperation” and also behind Nonaka and Takeuchi’s (1995) notion of “networking knowledge” as the final stage of their process for creating organizational knowledge.

In the information systems field, Henderson (1990) has advanced the notion of networking IS-related knowledge and Boynton, Zmud and Jacobs (1994) have described the concept of IT absorptive capacity as embodying concepts such as managerial IT knowledge and IT management process effectiveness. In both cases, although using different terminology and different research approaches the notions used by those authors are similar to our notion of IS organizational learning (see Table 5.5). We will return to these authors and to the relevant information systems literature in the final chapter, when we discuss the conclusions of the empirical research.

Table 5.5

| Key attributes of IS organizational learning | Support from the literature |
|--|--|
| <p>Changes, over time, in the effectiveness of IS organizational implementation reflected in the following IS corporate governance characteristics:</p> <ul style="list-style-type: none"> ? Cooperation between IS and line managers instead of isolation ? Relationship building instead of conflict generation ? Integration of IT into formal business planning mechanisms ? Integration of IT into business platform through informal top management action | <p>(Normann, 1985); Keen (1988); Zmud (1988); Cohen and Levinthal (1990); Henderson (1990); Prahalad and Hamel (1990); Ghoshal and Bartlett (1993, 1994); Boynton, Zmud and Jacobs (1994); Nonaka and Takeuchi (1995); (von Krogh and Roos, 1995); Brown and Ross (1996)</p> |

5.6 Summing up

In this chapter we have taken Earl's (1996) propositions, discussed in chapter four, regarding the *constitution process*, and have enlarged them by bringing in managerial action and organizational values. From the discussion in chapter four, it has emerged that the *constitution process* has a much more central and decisive role in the whole process of IS implementation than that author has given it credit for. This is due to the fact that managerial roles and relationships are not just ordinary components or imperatives of an overall IS strategy framework. Together with managerial values, they are *the* constitutive components. Furthermore, they are not just planning components but they are mostly action components, which have to be lived rather than planned. Managerial values have an influence on the establishment of organizational roles and these, in turn, characterize the dyadic relationships between the stakeholders involved in IS governance.

In this chapter we have attempted to bring the theories and the language of organization behaviour to information systems. We have taken concepts as such stretch, discipline, trust, support, structural factors and organizational learning and have given them a new reading. Our aim is to prepare the ground for the empirical work, which is described in the next chapter. In chapter six we build these theoretical notions into a causal model, which served as the basis for both the data gathering activities and the data analysis procedures.

Chapter 6

The Empirical Research: exploring the managerial action framework in IS corporate governance

The intellectual disease of analysing data to the exclusion of the situation may be called *data fixation*. Its principal symptom is a certain obsesiveness with arithmetic (...) I must confess that I regard the invention of statistical pseudo-quantities like the coefficient of correlation as one the minor intellectual disasters of our time; it has provided legions of students and investigators with opportunities to substitute arithmetic for thought on a grand scale

K. Boulding, *Administrative Science Quarterly* 3(1) 1958:16

Chapter 6 summary

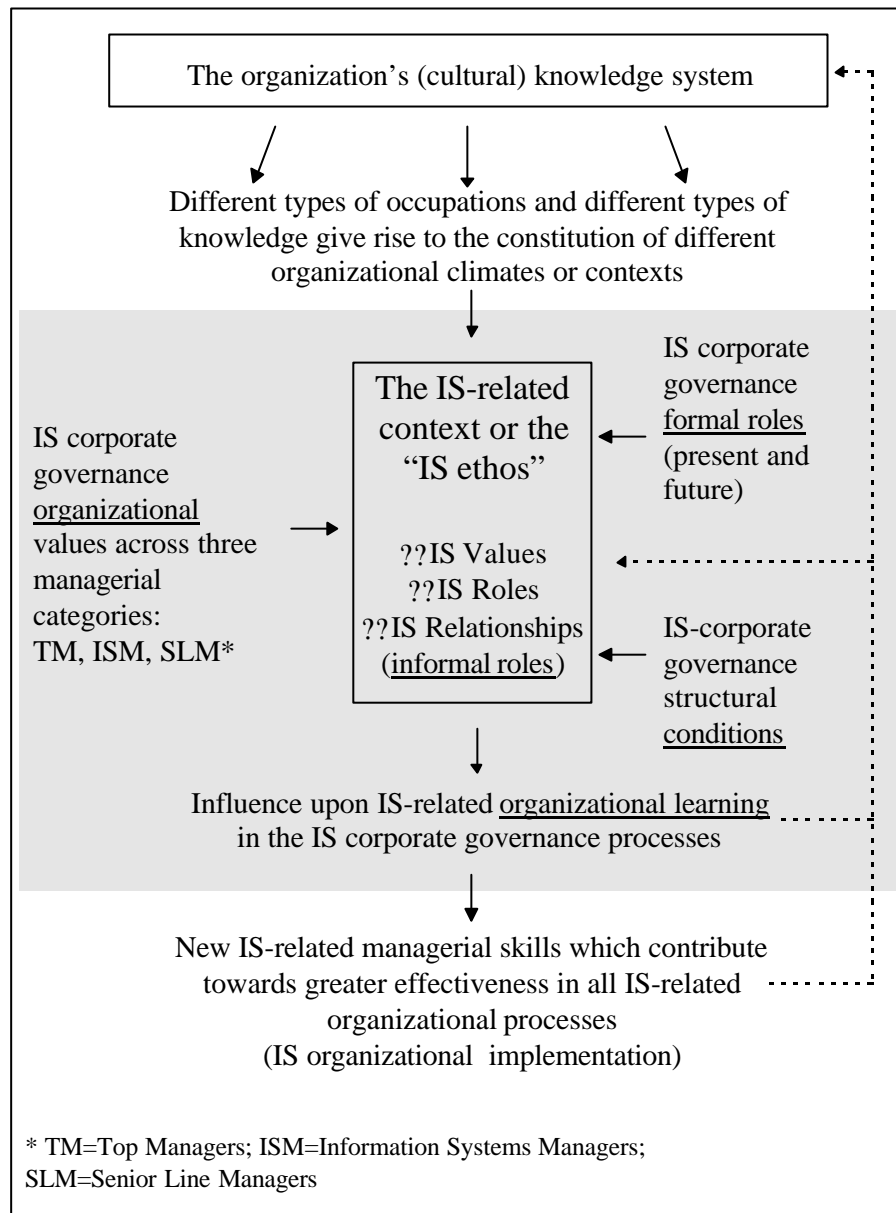
- ? 6.1 Introduction
- ? 6.2 Methodology
- ? 6.3 The empirical research design
 - ? 6.3.1 Objectives of the empirical research
 - ? 6.3.2 The empirical research question
 - ? 6.3.3 Stages of the empirical work
- ? 6.4 Defining the empirical research model
 - ? 6.4.1 The type and level of analysis
 - ? 6.4.2 The research model
 - ? 6.4.3 The survey questionnaire
- ? 6.5 Data collection
 - ? 6.5.1 The first interviews
 - ? 6.5.2 The postal survey
 - ? 6.5.3 The second interviews (leading to five short case studies)
- ? 6.6 The short case studies

† † †

6.1 Introduction

The figure below sums up the key points made in this dissertation so far and encapsulates the assumptions behind the design of the empirical part of the research.

Figure 6.1 - Overview of the empirical research model



Rapidly going through the figure, we can see that the organization is seen as an autopoietic (i.e. living) entity with its own knowledge system that, in addition to factual knowledge, contains also cultural knowledge. Because facts and values are difficult to disentangle in terms of individual as well as social cognition we assume that organizational knowledge is also cultural. Often the

cultural dimension of organizational knowledge is just taken for granted, that is, its existence is acknowledged but authors do not bother to emphasize it. This is why we have left the word *cultural* in brackets. The organization's knowledge can be analysed from many different view points.

It can be analysed from the view point of sub-cultures, associated with the existence of different occupational groups and different organizational levels in the same organization. Or it can be analysed from the point of view of organizational climates or contexts that exist in the same organization. Climates or contexts have a more transient signification than culture and can be thought of as being made up of shared perceptions by individuals or groups about psychologically important and enduring (molar) factors in the organization. Among many of the sub-climates or sub-contexts in the organization, we may find an IS-related climate or context.

The organization's IS-related climate or context is constituted by means of an interplay of IS-related structural conditions, values, roles and relationships (informal roles). Such climate or context, in turn, has a major influence upon the level of IS-related knowledge development (or learning) that the organization can muster. Organizational learning, as an outcome of the new social processes associated with the introduction of new IT artifacts, can be evaluated in terms of the changes, which occur, in time, to the effectiveness of all the organizational processes related to the introduction of such artifacts. Hence, the organization's IS-related climate or context is related to the level of improvement (or change), which the organization can achieve in the effectiveness of its IS-related processes. Finally, new IS-related learning contributes towards the organization's knowledge system and, of course, to all the sub-cultures, sub-climates or sub-contexts, which make up such knowledge system.

The challenge we have set ourselves in the empirical part of this research is *to find out more about the typical components or characteristics of IS-related contexts or climates in large organizations*. IS-related contexts in different organizations share many characteristics, which are commonly known in the world of practice as, for example, the cultural differences between IS and business personnel highlighted in Box 5.1, which characterize the organizational context in many firms.

Our research design is, therefore, cross-sectional. We use data from many companies, in an attempt to discover common patterns or characteristics, which may help us better understand the key ingredients of what we have called the IS-related context or IS ethos. Because different companies will have different IS-related contexts, our findings will be of a general nature. So, it must be clear that our aim is not to uncover the best or the most appropriate characteristics of such contexts, but simply to find out whether there are any characteristics, which we might say are typical of such contexts. If successful, this effort may prove to be of use, especially as a stepping stone for further research.

The shaded part of Figure 6.1 corresponds to the focus of the empirical part of this research. In the sections that follow we will explain the methodology, the research design and the various

stages of the empirical work. The chapter ends with the presentation but not the discussion of the results of the second round of interviews, i.e. the short case studies. The discussion will be left for the final chapter, along with an evaluation of the empirical research methods, some practical guidelines for the organizational implementation of IS and suggestions for further research.

6.2 Methodology

With the words of Kenneth Boulding in mind (see quotation at the outset of this chapter), we will set out, in this section, the methodological basis upon which our empirical research design rests.

In the information systems discipline, the question of which research methodology is most appropriate has been a concern for some time. Orlikowski and Baroudi (1991) have identified three broad research paradigms - *positivist*, *interpretivist* and *critical*. Those authors found that about 97% of IS research articles fall under the positivist paradigm. A research paradigm can be considered as *positivist* when formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomena from a representative sample to a stated population are used.

IS research may be categorised as *critical* when the main task of the researcher is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light. In critical research the investigation seeks to be emancipatory in that it aims to help eliminate the causes of alienation and domination and thereby enhance the opportunities for realising human potential (Myers, 1998). This school of thought in IS research is strongly influenced by the philosophy of Jurgen Habermas and is especially prevalent in the work of Rudy Hirschheim and colleagues (see, for example, Hirschheim, Klein and Lyytinen, 1996)

IS research can be classified as *interpretive* research, when there are no predefined dependent and independent variables but the focus is on the complexity of human sense making as the situation emerge. Interpretive research attempts to understand the phenomena through the meanings that people attribute to them, enabling an understanding of the social and organisational issues related to the adoption and integration of IS/IT in organizations. Examples of this type of research paradigm in IS can be found in the work of Boland (1987, 1994), Orlikowski (1991, 1994) or Walsham (1993).

In chapter one we stated that our overall research methodology was interpretive. This means that the overall background of the research described in this dissertation is influenced by an interpretivist epistemology. It means that organizational phenomena, such as the organizational implementation of information systems, are regarded not as being objective reality but as being the result of interpretations or sensemaking by organizational members of the reality around them.

Against this background, we have worked on the conceptual part of the research (chapters two to five).

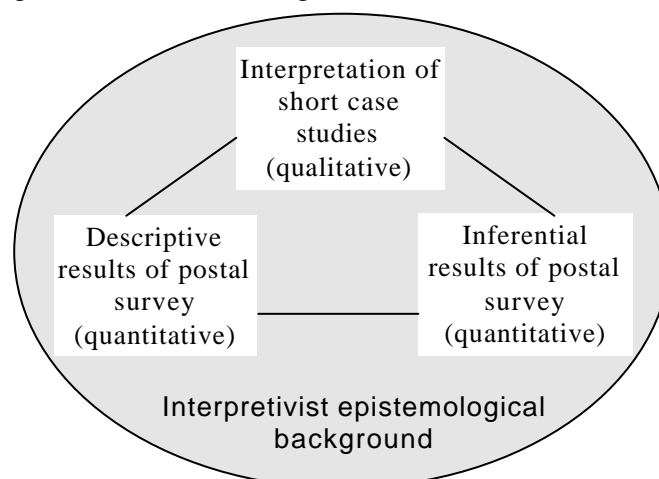
For the empirical part of the research, described in this chapter, we use a combination of interpretivist and positivist methodologies in a multi-methodological approach, as suggested by Mingers (1997). That author argues that the traditional attitude of isolationism by IS researchers in defending their own paradigm as the “correct one” is pointless. He maintains that

Each research approach focuses on different aspects of reality and, therefore, it is best to try to combine several together in a single piece of research or intervention in order to gain the richest appreciation of the situation (p. 761)

We agree with Mingers’ position, especially because in an applied field such as IS, it is important to achieve a balance between rigour and relevance (Myers, 1997) and often the best way to achieve such a balance is to use a multi-paradigm design. Such a view is also consistent with Lee’s (1991) when he argues that positivist and interpretivist designs are not only mutually supportive, but they are mutually supportive *within the same study*.

Another important distinction regarding the research methodology is between qualitative and quantitative methods. Quantitative methods rely on formal methods, which try to reduce the complexity of a given organizational set up to a simpler model, measurable by means of numerical designations. Qualitative methods use sources such as interviews, documents, texts or participant observation as well as the researcher’s own impressions and reactions. Both quantitative and qualitative research designs can be positivist or interpretivist, depending upon the researcher’s epistemological foundations. In the present dissertation, both types of methods have been used under an interpretivist epistemological background (see Figure 6.2).

Figure 6.2 - The triangulation of research methods



The postal survey we have carried out produced quantitative data, which was analysed both as descriptive statistics (i.e. comparing average scores between different groups of respondents) and as inferential statistics (i.e. testing the hypotheses of correlation between variables). These two methods, in turn, were used in triangulation with a third type of method - the interpretation of 16 interviews compiled and summarized into five short case studies. Triangulating means comparing and cross-checking results obtained through different methods of analysis.

6.3 The research design

6.3.1 Objectives of the empirical research

In thinking about the empirical part of the research, it has always remained clear in our mind that our key objective in this dissertation was to build up a conceptual argument in favour of a new approach to the implementation of information systems - the *organizational* approach. The work on the empirical data has always been perceived by us as complementary to our key objective and also as exploratory of only a part of the ground we have tried to cover in the work on conceptual development.

Thus, the objective of the empirical work is to explore the managerial action framework as outlined in chapter three and applied to information systems governance in chapter five. For such exploration we have made use of the dimensions of climates or contexts we have been able to identify in chapters three (see Tables 3.5 and 3.6) as well as of the hypothetical relationship between the constructs of climate/context and organizational learning proposed by Ghoshal and Bartlett (1993;1994) (see section 3.4.5).

6.3.2 The research question

In general terms, our research question is *what can we find out about IS-related context or “IS ethos”, which may improve the level of IS-related organizational learning* ? From our previous discussion, we know that the IS-related context or “IS ethos” is made up of IS-related values, formal and roles and structural conditions. So, we may rephrase our research question and formulated it as follows: *what can we find out about IS-related values, formal roles, informal roles and structural conditions, which may improve the level of IS-related organizational learning* ?

With this research question in mind we set out to design our empirical work.

6.3.3 Stages of the empirical work

Stage 1 - Listing the key managerial roles according to the emerging trends in IS corporate governance (carried out in chapter five)

Stage 2 - Adapting such managerial roles to Ghoshal and Bartlett's (1993;1994) managerial action framework (carried out in chapter five)

Stage 3 - Operationalizing organizational climate or context and organizational learning in terms of IS corporate governance (carried out in chapter five)

Stage 4 - Determining the attributes of IS corporate governance values, structural factors (facilitation/inhibition of organizational learning), IS organizational learning and (carried out in chapter five)

Stage 5 - Defining the empirical research model and translating the emerging IS corporate governance roles combined with the above mentioned IS corporate governance attributes into a survey questionnaire (to be carried out in chapter six)

Stage 6 - Validating the questionnaire items (derived from US-biased literature) with 10 IS lecturers/researchers in the UK and with 20 IS managers in Portugal (the first set of interviews, in May-June 1997)

Stage 7 - Adjusting the questionnaire items in the light of the first interviews, giving the postal survey its final form and applying it (from July to September 1997)

Stage 8 - Chasing non-respondents, receiving the questionnaires, setting a final deadline for receipt of questionnaires (February 1998) and analysing the data (until July 1998). Drawing preliminary conclusions from the postal survey.

Stage 9 - Preparing second round of interviews and interviewing 16 managers (top managers, IS managers and senior line managers) from five of the responding companies (from September 1998 to January 1999).

Stage 10 - Transcribing and summarizing interviews (from January to March 1999). Final analysis of the data and conclusions of the empirical research

6.4 Defining the empirical research model

6.4.1 The type and level of analysis

As we had indicated in chapter four, we see the issue of the organizational implementation of IS as relevant at two levels: the strategic or corporate governance level and the operational level. In our "double triangle" model, we suggest that IS-related organizational learning takes place at the corporate governance level, with three major stakeholders - the top manager in charge of the IS function (TM), the information systems manager (ISM) and the senior line managers (SLM) and

at the operational implementation level, also with three major players - the senior line managers (as link-pins with the top triangle), the middle managers and the end users. Both levels are very interesting in terms of IS research, but due to the complexity and the size of the problem we felt we could only tackle the top one in this dissertation. Thus, in terms of level in the organization, our research will focus on the strategic or the corporate governance level.

The type of analysis, which we have used has been inspired in the tradition of organizational climate research. Schneider (1990:384) defines climate as

the incumbents' perceptions of the events, practices and procedures and the kinds of behaviour that get rewarded, supported and expected in a setting

Events, practices and procedures are the routines of the setting. The setting can be the whole organization or it can be particular aspects of the organization. In the research described by Schneider (1990), the setting was the ensemble of the routines, which made up the "service" component in a bank. In other words, climate research "presents the challenge of identifying the routines and rewards related to a particular criterion of interest" (p.386). In Schneider's case, service was the criterion of interest. In our case, IS corporate governance is the criterion of interest. Furthermore, that author has an instrumental approach to climate research, which we also support. He states:

Once the routines and rewards that are conceptually likely to facilitate the accomplishment of the specific goal of interest are identified, their status in organizations can be assessed and attempts to change the way they function can be made (p. 386)

Two important issues should be considered in climate research, according to Schneider (1990). The first is perceptions and the second is aggregation. The perceptions of the people who work in a setting are the basic diagnostic tool in this type of analysis because it is the "perception of multiple routines and rewards that is assumed to communicate the meaning of what is important in a setting" (p. 386). Aggregation is also an important consideration in view of the fact that in order to draw any conclusions about the climate of a setting, the perceptions of many individual participants must be aggregated. Schneider cites examples of studies where individual's perceptions have been aggregated to produce data about climate across different positions, different levels and different branches of banks. He observes:

perceptions will always come from individuals, but the analysis of individual's perceptions may occur at any meaningful level. That is, perceptions collected from individuals must be such that the level to which they are aggregated makes conceptual sense. This is accomplished by providing respondents with the frame of reference appropriate for the level of analysis for which data will be used (p. 388)

In our empirical work we have also had a frame of reference, which was consistently used throughout the various data-gathering procedures. The common theme running through the empirical data gathering activities were the actions (i.e. situations, behaviours or attitudes) of the three main IS corporate governance stakeholders.

In the first set of interviews and in the survey questions, the respondents were given the following frame of reference: *a list of sentences describing IS corporate governance situations, behaviours or attitudes in the daily life of the company presented from the perspective of one of the three key stakeholders - the top manager (TM), the information systems manager (ISM) or the senior line managers (SLM)*. Respondents were then asked to choose, on a six-point Likert scale, the degree to which they agreed or disagreed with the sentence. In the second set of interviews the respondents were given another frame of reference: *the main reasons for the success or failure of the key information system(s), which have been implemented in the company in the last five years, taking into considerations the actions of three leading actors - the top manager (TM), the information systems manager (ISM) or the senior line managers (SLM) - insofar as they were involved in such implementation(s)*. In this case respondents were asked to comment freely upon their perceptions of the reasons behind such successes or failures.

The level of analysis, in our empirical research, is inter-organizational. The interviews and the postal survey are cross-sectional in the sense that they cut across a universe made of the largest companies in Portugal. In chapter two we have made the following statement, after Weick (1995):

We can talk of sensemaking as a mechanism operating at individual, organizational and extra-organizational level to create knowledge systems. In the case of organizations, the knowledge system is the result of a cumulative process of individual and collective construction of organizational reality, through a continuous interpretation and re-interpretation of the environment (internal and external).

Thus, we believe that the knowledge system, which governs IS thinking within each organization cannot be divorced from the knowledge system, which is prevalent in the institutional environment, regarding IS corporate governance in general (i.e. at the extra-organizational level).

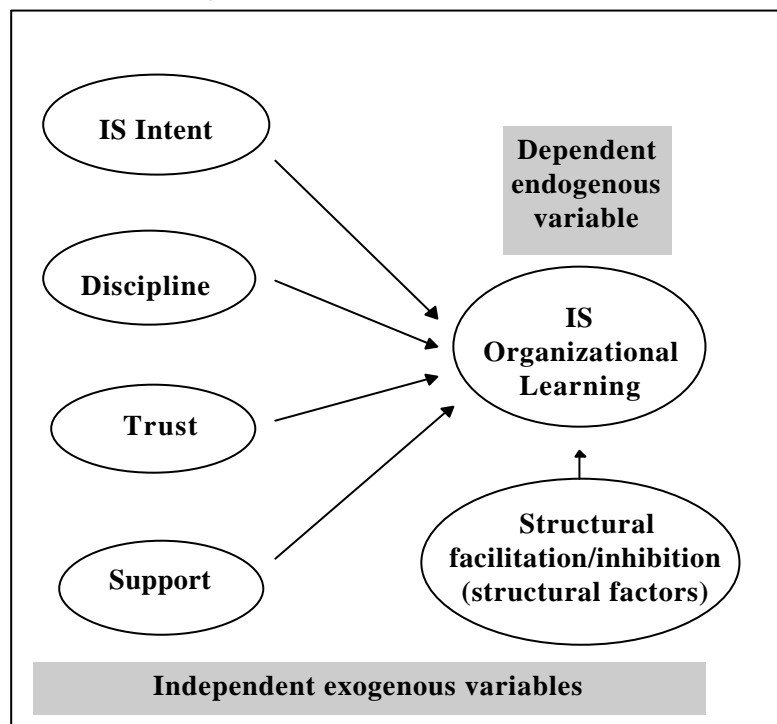
From our research effort we do not presume to take conclusions, which can be generalized across the universe of the largest Portuguese companies because the situation regarding IS corporate governance is so varied. IS governance varies according to the size of company, to the type of business and also to the general managerial style. But in view of the extra-organizational influence upon the internal settings in each individual organization, we may assume that there are common trends or characteristics across organizations (in our case, only large organizations), which define what we might call an *institutional* IS organizational context or ethos.

Hence, we are able, at this point, to detail our research question further. In addition to being concerned with *what we can find out about IS-related context or "IS ethos", which may improve the level of IS-related organizational learning* we are further concerned with *detecting trends or patterns in IS corporate governance in large companies in Portugal, regarding IS-related values (stretch, discipline, trust and support) and IS-related structural conditions*, as discussed in chapter five.

6.4.2 The research model

On the basis of the discussion so far, the conceptual model shown in Figure 6.3 was put forward. This model, which is aimed at being evaluated quantitatively and qualitatively, has six constructs or latent variables. Five of the constructs are independent and the sixth construct is the dependent or endogenous variable, i.e. *IS organizational learning*. From the five independent constructs four are attitudinal or value-oriented - *IS Intent*, *Discipline*, *Trust* and *Support* and the fifth is structural - *Facilitation/Inhibition of IS organizational learning*. For the purposes of the quantitative evaluation of the model, the six latent variables are not measured by direct observation but are measured indirectly through a number of manifest or observed variables.

Figure 6.3 - The research model



Each latent variable is made up of a number of observed variables, which, in turn, correspond roughly to the dimensions of climate or context applied to IS corporate governance and discussed in chapter five. In order to measure each variable a questionnaire item was developed. Hence, a survey questionnaire was built, where the questionnaire items are the observed variables.

The conceptual model is not causal, that is, we do not believe that the dependent variable is *caused by* the independent variables, but it *depends* on them to a certain extent. Such dependence is measured by the degree of correlation between the model's latent variables or constructs. In turn, this means that within each construct there has to be a certain degree of

coherence and homogeneity among the manifest variables, which constitute it. Such internal coherence is validated by the theoretical argumentation presented so far and is inferred from the correlation among such manifest variables. The statistical test used to validate the internal coherence of a construct is the Cronbach's alfa test (Cronbach, 1951).

As explained above, the manifest variables associated with each of the six constructs were derived from the dimensions and attributes of IS organizational context and of IS organizational learning, which have been discussed in chapter five. Such items took the form of statements about daily IS-related managerial behaviours, attitudes and outcomes and reflected the IS organizational context and IS organizational learning dimensions and attributes. The five independent constructs were built as a model of the IS corporate governance context or climate of a typical large organization. The sixth construct - IS organizational learning - was built as the outcome of such IS corporate governance and hence of the outcome of organizational implementation of IS.

This conceptual model has also served as the basis for a qualitative evaluation exercise, by means of the second set of interviews. After the work on the postal survey was concluded it was decided to explore the model further by means of a series of in-depth interviews with the same groups of managers as those featured in the survey (i.e. a top manager, the IS manager and a senior line manager). Five companies were selected from the group, which responded to the questionnaire and in each company at least one manager from each group was interviewed.

6.4.3 The survey questionnaire

The generation of the survey questionnaire items was carried out as follows. Firstly, the dimensions and attributes related to values and attitudes (*IS Intent, Discipline, Trust and Support*) were cross-checked with the IS corporate governance trends identified in chapter five. This had to be carried out because managerial values cannot be divorced from managerial action and in order to investigate IS-related values by means of a questionnaire, meaningful questions had to be related to the daily IS-related activities of managers. From the matrix obtained (see Table 6.1), it was possible to identify which attributes were associated with which IS corporate governance trends and also who was involved, from the three key stakeholders: the top manager, the IS manager and the senior line managers.

Table 6.1 - IS corporate governance trends associated with IS context dimensions (values and attributes) and key players involved

| | | Values and Attributes | | | | | | | | | | | |
|--|-----|------------------------------|----------------------------------|---------------------------------------|---------------------------------------|---|--|-------------------------------------|----------------------------|---------------------------------|-------------------------------------|--|---|
| | | IS Intent | | | Discipline | | | Trust | | | Support | | |
| | | IS-related strategic visions | IS-related collective commitment | Personal meaning of IS-related issues | Need to respect IT platform standards | An understanding of business platform needs | An understanding of IS development constraints | IS track record in the organization | IS skills and competencies | Involvement in IS policy making | Autonomy in the use of IS resources | Need for coherent clarification on policy-related issues | Need for service orientation on technology-related issues |
| IS corporate governance trends | | TM, ISM | TM, ISM, SLM | TM | TM, SLM | ISM | SLM | ISM | ISM, SLM | TM/SLM | SLM | TM | ISM |
| Key players involved | | | | | | | | | | | | | |
| 1. Building and managing the IT infrastructure, i. e. a coherent blueprint for a technology platform responsive to present and future business needs | Q 1 | | | | Q 7 | Q 8 | | | | | | | |
| 2. Building and maintaining partnerships between IT specialists and IT users | | | | | | | | | Q 11 | Q 12 | Q 13 | | |
| 3. Achieving high performance and rapid technical progress by the IT organization | | | | | | | | Q 10 | | | | | |
| 4. Managing the organization's IT sourcing strategy and identifying new technological solutions | | Q 6 | | | | | | | | | | | |
| 5. Centralized topsight of the IS function with personal involvement and commitment from top management | | | | Q 3 | | | | | | | | Q 14 | |
| 6. Decentralized implementation of IS through a federal-type IS organization | | Q 4 | | | | | Q 9 | | | | | | |
| 7. IS staff acting more as business consultants and less as technicians | | | | | | | | | | | | | Q 15 |
| 8. Improving IS strategic planning, i.e. integrating IS/IT efforts with business purpose | Q 2 | | | | | | | | | | | | |
| 9. Developing IS human resources and creating a strong IS/IT workforce | | | | | | | | | | | | | |
| 10. Line management's new role in the management of and experimentation with IT at the local level | | | | Q 5 | | | | | | | | | |

Note : The shadings indicate the areas where there is likely to be an impact between the trend and the context dimension. The letters Q indicate the areas chosen to formulate survey questions. The numbers indicate question numbers.

From here, it was possible to articulate a set of statements, which contained both the activities and the relationships involved in the daily performance of IS corporate governance tasks. Some stakeholders, namely the IS managers, appear more frequently than others as it would be expected. But when developing the questionnaire attention was paid to the need of keeping a balance among the three players. This has led to a choice of questionnaire items, which included the same number of mentions to each of the three players involved. Hence, in the 15 items dealing with managerial values and attitudes, there were five mentions to each of the three players.

Hence, the statements which constitute the questionnaire items reflect formal roles loaded or associated with organizational values, all in the context of IS corporate governance. One example: question 7 - “The Top Manager recognizes the importance of the development of an information architecture in the company [role] and of the need to respect [value] the standardization of processes, which follows”. Another example: question ten - “The Information Systems Manager and his/her staff are seen to have a credible [value] track record regarding the provision of timely and appropriate IT services [role], i.e. they have the trust [value] of the line departments”.

Furthermore, by having the same questionnaire replied to by the three groups of managers, the results were intended to reflect a balanced and aggregated view of the key stakeholders in the IS corporate governance process, in these companies. The results were also intended to give an indication of the types of relationships, which typically exist among the three groups of managers. Such indications were investigated by looking at the differences in the aggregate scores for each group.

The full list of survey questionnaire items follows.

The IS Intent construct

| Variable name | Variable description |
|-------------------|--|
| ISM-VISION | 1. The Information Systems Manager has a clear idea about how the IS/IT infrastructures relates to the business strategy now and in the future |
| TM-VISION | 2. The Top Manager has a personal vision regarding the growing strategic importance of IS/IT for the business and is involved in the major decisions regarding IS at corporate level |
| TM-INFLU | 3. The Top Manager is capable of influencing favourably the company’s Board of Directors in key issues for the long-term development of IS/IT |
| SLM-ROLE | 4. The Senior Line Managers have a relevant role regarding the planning and implementing of short and long-term strategies for the development of IT applications in their own departments/divisions |
| SLM-EUC | 5. Senior Line Managers understand that a large proportion of IT learning by end-users is local and informal and that for such learning to occur conditions need to be created and managed |
| ISMSCANN | 6. The Information Systems Manager is aware of the need to look outside the company in the search for new technological solutions, either in the form of outsourcing IT services or find new technological tools |

The Discipline construct

| Variable name | Variable description |
|-----------------|---|
| TM-STAND | 7. The Top Manager recognizes the importance of the development of an information |

| | |
|------------------|--|
| | architecture in the company (i.e. an infrastructure, which enables the management of data through the use of common definitions, essential for avoiding duplications, inconsistencies, etc) and of the need to respect the standardization of processes, which follows |
| ISM-PERFC | 8. The Information Systems Manager understands the need to keep a balance between “technological perfectionism” and business performance (e.g. a system performing at 100% efficiency but taking 6 months to deliver versus an urgently required system performing at 60% efficiency but delivered in two weeks) |
| SLM-ALTER | 9. Senior Line Managers understand the need to respect what has been agreed in terms of IT development projects and to resist the temptation of “last minute” alterations |

The Trust construct

| Variable name | Variable description |
|------------------|--|
| ISM-TRACK | 10. The Information Systems Manager and his/her staff are seen to have a credible track record regarding the provision of timely and appropriate IT services, i.e. they have the trust of the line departments |
| SLM-SKILL | 11. Senior Line Managers do not have the necessary technical and managerial skills in IS/IT to take over new responsibilities, at departmental level, in a more decentralized management of information systems in the company |
| TM-HORIZ | 12. The Top Manager understands that IS management at corporate level is an increasingly horizontal responsibility and that a greater involvement of the line departments is indispensable |

The Support construct

| Variable name | Variable description |
|-------------------|---|
| SLM-AUTON | 13. Senior Line Managers have autonomy both in the planning and in the use of IS-related resources at departmental/divisional level |
| TM-CLARIF | 14. The Top Manager plays an important role in supporting the management of information systems at corporate level by means of a clarification of the boundaries between the Information Systems Manager’s and the Senior Line Managers’ areas of responsibility |
| ISM-CONSUL | 15. The Information Systems Manager is aware of his new role of “internal consulting” (i.e. acting as “consultants” to the line departments on IS/IT-related issues) as well as of the need for IS staff to acquire good negotiation, coaching and inter-personal skills in general |

The Facilitation/Inhibition construct

| Variable name | Variable description |
|----------------|---|
| INTEGR | 16. The company has explicit mechanisms, that work, for integrating IS Management and line management on IT/IS issues (e.g. IT advisory committee, cross-functional job transfers, joint project management, etc) |
| HRMPOL | 17. The existing policy for the development of human resources in the company is favourable to the development of IS-related skills (managerial and technical) |
| TECQUAL | 18. The technical quality of most IT applications is seen as adequate in relation to the purposes for which they were developed, i.e. the technology works when and where it is supposed to work |
| INCENT | 19. The company has an incentive system (salaries and other benefits), which is appropriate to deal with the existing demand on staff with appropriate IS/IT skills (all areas) |

The IS Organizational Learning construct

| Variable name | Variable description |
|----------------|---|
| NEGOTIA | 20. In the last five years there has been a move from IT service levels determined by the IS Department to IT service levels determined by negotiation between the Information Systems Manager and Senior Line Managers (i.e. service level agreements) |
| ISOLAT | 21. In the last five years there has been a move in the relationship between the Information Systems Manager and Senior Line Managers from a degree of isolation of the first to a better mutual understanding of each other's roles |
| PLANN | 22. In the last five years there has been a move from IT/IS planning carried out as a separate exercise to a greater integration of IT planning into business planning |
| COOPER | 23. In the last five years there has been a move from unilateral attempts to build a corporate-wide IT infrastructure to a situation of more active and committed participation from Senior Line Managers, in the building/ maintenance of such an infrastructure |
| INFRAST | 24. In the last five years there has been a move from an IT infrastructure, which is inflexible and restrictive of business initiatives to an IT infrastructure, which is flexible and facilitatory of new business initiatives |
| BOARD | 25. In the last five years there has been a change in the stance of the Board of Directors in relation to IT/IS matters, from one of distance to one of more involvement |

The following are the propositions, which the research model was designed to explore, quantitatively.

Proposition 1 - The sample of large companies shows that the IS context or IS ethos is characterized by marked sub-cultural differences between the views of the three groups of managers on IS corporate governance issues.

Proposition 2 - The sample of large companies shows that the level of IS organizational learning is positively correlated with the organization's perceived level of Facilitation/Inhibition associated with its IS-related structural conditions as well as the presence of four basic organizational values - IS Intent, Discipline, Trust and Support - associated with IS corporate governance.

6.5 The data collection

6.5.1 The first set of interviews

The first set of interviews were aimed at validating and adjusting the initial list of activities and events, which make up typical IS corporate governance activities. They were carried out with a group of 30 persons, from which ten were IS lecturers and researchers in the UK and twenty were IS managers in Portugal.

The interviewees received a copy of the proposed questionnaire (see Appendix 1) in advance and two types of questions were asked at these interviews: (1) *In the light of the latest known developments in the governance of the IS function, do these statements accurately reflect the priorities, activities, behaviours and relationships of the three major stakeholders, i.e. the Top Manager in charge of the IS function, the IS Manager and Senior Line Managers?*

(2) *Do these statements represent a feasible/ sensible scenario of IS corporate governance in large organization, in the late 1990s?* To the IS managers, the same question was asked, but adding the geographical qualifier *in Portugal*.

Interviewees were free to agree, disagree and make changes to the initial statements, as they were presented to them. From these discussions, the final list of 25 statements shown above was drawn up to be used in the postal survey. As expected, the statements have a bias towards the situation in Portuguese companies

6.5.2 The postal survey

The postal survey was carried as a joint project London School of Economics - Universidade Católica Portuguesa (UCP) with the assistance of an MBA student from UCP. It was also sponsored by the Luso-American Development Foundation (Fundação Luso-Americana para a Desenvolvimento - FLAD) in Portugal, with a small contribution towards the logistics of the survey.

From the point of view of the sponsor, the project's main objective was to evaluate the state of IS management in large companies in Portugal, with regard to the relationships among the key stakeholders: top managers, IS managers and senior line managers. In order to achieve the project's objectives (from the point of view of FLAD) only the first 15 items from the survey questionnaire were necessary, i.e. the items needed to draw conclusions about our Proposition 1. The remaining ten questionnaire items were needed to draw conclusions about our Proposition 2. Each statement was intended to be answered on a six-point Likert scale ranging from "strongly agree" to "strongly disagree".

The sample of companies to be surveyed was taken from Dun and Bradstreet's listing of the largest 7500 companies in Portugal (Duns PEP, 1996) by sales volume. The sample was made up of the following types of companies:

- ? the largest 235 companies with over 100 employees from the general listing
- ? the largest 34 banks with over 100 employees from the financial sector listing
- ? the largest 31 insurance companies with over 100 employees from the financial sector listing

Prior to the survey, a letter from the Dean of the Management School of Universidade Católica Portuguesa in Lisbon was sent to the Presidents or Director Generals of those companies asking for their cooperation. In September 1997, each company received five copies of the questionnaire accompanied by a letter from the present author addressed by name to its President or Director General. The letter explained the objectives of the study and requested that the questionnaires be distributed to (i) the member of the Board of Directors in charge of IS policy and management; (ii) the IS Manager; (iii) three senior line managers whose work involves the management of departments or divisions with a reasonable number of IT end users.

In addition to the questionnaire itself for each of the five respondents, an additional circular letter was enclosed explaining the objectives of the study and giving some instructions and guidelines for completion. Such instructions and guidelines were very similar to those to be found in the initial questionnaire used in the preliminary interviews and shown in Appendix 1. The introductory letter was two pages long and the questionnaire was two pages long (four sides of A4). Respondent were asked to mail the questionnaire directly to the present author in a self-addressed envelope with postage paid. The five questionnaires sent to each company were marked so that it was possible to reunite them upon receipt. The 1500 questionnaires were printed in three different colours, one for each group of managers, so that they could be distinguished and sorted quickly. There was also an additional one-page questionnaire for the IS Manager aimed at collecting some factual data to be used exclusively in the FLAD project.

6.5.3 The second set of interviews (leading to five short case studies)

The set of interviews were semi-structured. The structured interview method was based on the general principles as suggested by Kvale (1996) and Denzin and Lincoln (1998). In IS research this interview technique has been used extensively but in the area of IS corporate governance it has been used by Clark (1994) for purposes very similar to ours. Clark's objective was to surface key issues on corporate systems management outside services management and management of the technology development process. To this end, he interviewed 30 senior executives from as many companies selected from a list of 300 from the South East of the USA. He structured his interviews around key topics identified by previous IS research such as, for example, end-user computing, IS planning, IS management infrastructure, etc.

The rationale behind our interviews was to start from the final outcome of IS organizational implementation (i.e. the success or failure of individual information systems implemented in the organization) and to work back from that to the perceived reasons for such outcome. Success or failure was not defined *à priori* and was left entirely up to the judgement of the interviewees. However, given that the explicit objective of the interview was not to evaluate the implementation of individual information system, but to discuss the relationships between the three key stakeholders, it is not too relevant whether the information systems were successful or not. Furthermore, it is reasonable to assume that the interviewees have reacted honestly in assigning success or failure simply because their mind was not focussed on evaluating systems, but on the evaluating the relationships between people. As regards the time span covering the events discussed at the interviews it was also left up to the judgement of the interviewees, but up to five years back was advanced as a suggestion.

The focus proposed to each interviewee was as follows: *please discuss the main reasons for the success or failure of the key information system(s), which have been implemented in the company in the last five years, taking into consideration the actions of and the relationships between three leading actors - the top manager (TM), the information systems manager*

(ISM) and the senior line managers (SLM) - insofar as they were involved in such implementation(s).

Five companies were selected from the group which responded to the questionnaire and in each of the selected companies one manager (some times two) from each group was interviewed. The contents of these interviews were then compiled into five short case studies.

6.6 The short case studies

Case 1 - The electricity company (EDP)

Background

EDP is the largest company in Portugal in terms of number of staff. It is a publicly owned company formed in 1975 after a merger of several smaller companies providing power-related services throughout the country, mainly based on municipalities (local government). In 1994, the EDP Group of companies was formed. The IS/IT function remained totally decentralized after the merger with six different IS/IT departments, until 1989. In 1989 when there was an effort to centralize the IS/IT function under one unit in Lisbon (Gabinete de Sistemas de Informação - GSI). This long tradition of decentralization together with some hesitation at the political level regarding the privatization process in the last few years, has created many difficulties for this effort to centralize the IS/IT function.

Shortly after the creation of the new central IS/IT department in Lisbon, the bulk of the IS/IT function was outsourced to a new company specializing in IT services and owned in its totally by the EDP Group. Most of the existing IS/IT resources (including about 200 staff) were transferred to this new company (EDINFOR) whose aim was to provide IS/IT services to the whole Group. The IS/IT function of the main company - EDP - was then reduced to a small IS/IT coordinating unit (10 staff), which has the job of ensuring the standardization of the main IT platform across the whole Group of companies.

The interviewees

The interviewees were as follows: the ISM (head of the centralized coordinating unit after the outsourcing), one SLM (Director of the Commercial Division) and one of the Directors of the outsourcing firm - EDINFOR. The third interviewee was suggested by the TM in charge of IS from EDP, who is also the CEO at EDINFOR. We assume, therefore, that there are similarities in the points of view of these two persons.

ISM

It should be noted that this interview was the only one where permission was not obtained for tape recording. For this reason it was not possible to capture all the details, which may have been present during the conversation.

The ISM is the head of EDP's central information systems unit (GSI). GSI's main job is to develop and to monitor the IS/IT Plan for the whole EDP Group and oversee the process of standardization of the IT platform. Thus, GSI has to deal with requests from users throughout the

Group. Such users are usually senior line managers but they could also be top managers when speaking on behalf of line managers. This interviewee did not focus on any particular IS implementation project; instead, he focussed on the relationships between IS personnel and users in general. The ISM's views about the users are as follows.

In general, users have only a very faint idea of what they want. They keep coming up with requests of the type "could I have that too" throughout the IS development projects. By the time the projects reaches its end the original specifications have been totally modified. The main reason for the lack of success in IS/IT projects is the way that such projects are managed. Users ask for certain IT applications because they have read about them in a computer magazine or because they "have been told" about them. Having the IS development function outsourced to EDINFOR has had a positive effect, which is to make users more aware of the costs involved and therefore to make them less inclined to make "could I have that too" type of requests.

Users want to be very innovative but they do not want to change the way they work and the IS people rarely have the patience or the knowledge to suggest to users alternative ways for organizing their work. It should be up to the users to look outside the company for new IT-based tools that would help them to achieve their business objectives, but this is not what happens. From the point of the business, IS/IT projects are usually not successful in the EDP Group.

Regarding the role of top managers in IS implementation, there is a certain amount of distance between them and the actual problems on the ground, according to the ISM. Top managers in general are quite helpful, but they have little information upon which to take decisions. Even worse, they have distorted information from line managers about IS implementation proposals. The line managers tend to think in local terms only and not in terms of business-wide processes, so when they take new proposals to top managers, such proposals reflect only a functional concern and the top manager is shown only a small part of the problem. Top managers do not have a way of filtering these proposals, so their role tends not to be very effective.

SLM

The SLM elected the sales/invoicing system as the most significant IS implementation project in the last few years at EDP. The integrated sales/invoicing computer-based system (SEGEC) was set up in 1989 and it became the backbone of the Commercial Division of the company, which had country-wide responsibilities. The software was build around a package developed by a Spanish firm but was extensively modified by EDP. The decision to modify the core system of this package instead of leaving it untouched and just adding on new functionalities, was pointed out as an implementation problem. This was seen as a problem because the core system will no longer be updated by its original developers and all the maintenance has to be done by EDINFOR, EDP's provider of IT services. When asked "why or how was this decided", the interviewee answered "nobody really thought about it; the computer people just took the decision to modify the core system".

At the same time as this new system was introduced the whole sales/marketing function was re-organized in order to give the company a more “client-oriented” stance in the market. “Besides being very inefficient, the whole process of invoicing the customers and receiving the money was very †user-unfriendly†, so new system gave us an opportunity to revamp the commercial side of the company”, said the SLM. But when asked if the planning of the new sales/invoicing system had been carried out as part of the broader plan to re-organize the sales/marketing function, the interviewee said no. In fact, he said, such re-organization was itself led by the introduction of the new computer system and the two were carried out as parallel projects, i.e. there was no concern about integrating the IS and the business development projects.

Director - EDINFOR

The main objective behind the creation of EDINFOR was the rationalization of the provision of IT services to the EDP Group. Hence, cost reduction was the key motive for the creation of EDINFOR. The relationship between the EDP companies and EDINFOR is strictly a client-supplier relationship, based on budgeted costs, invoicing of services provided and service-level agreements. A sub-objective behind the creation of EDINFOR was a need felt by the Group’s top management to diversify the business portfolio of EDP. Thus, EDINFOR is seen as separate business unit run with business targets and seeking to find new clients, for the provision of IT outsourcing services. This is the main reason why EDINFOR does not play a direct role in IS corporate governance at EDP. Such coordinating role is played by the central information systems unit, the GSI (whose head was interviewed as the ISM), which serves as a bridge between EDINFOR and the companies from the EDP Group.

Although EDINFOR is a separate business unit, it plays an advisory role in the development of EDP’s IT Plan and it has many dealings with EDP’s line managers. Regarding the line managers’ role in leading the process of formulation of IS strategy (i.e. taking initiatives regarding new information systems’ proposals), this interviewee said “line managers usually do not have the strategic vision, which leads to IT-related innovation”. Moreover, he added, “such initiatives only occur when there is pressure conveyed from the top, which is usually related to crisis situations, for example, the privatization of the company, the reduction of rates to the consumers, etc”.

Regarding the SEGEC (sales/invoicing) system mentioned above, this interviewee was asked why there has been no attempt at integrating the information system and the business development projects, which led to the decision to purchase the ready-made package from the Spanish company. The answer was that the staff involved in producing the specifications for the system could not come up with anything after several years, so the only thing left to do was to buy the package and modify it, as the re-organization of the Commercial Division evolved.

EDP case summary

The most striking feature at EDP is that there is no IS Intent. This is strongly reflected in a lack of clarity and direction at various levels. Firstly, there is a very unclear vision of the role of IS/IT

in the business, reflected in very poor integration of IS and business planning. Secondly, a large cultural gap between users and IS personnel could be detected and perhaps even a certain degree of conflict between the two groups. Thirdly, the relationship between EDP and EDINFOR is also not very clear, i.e. although it was referred to as a client-supplier/outsourcing relationship, the contractual arrangements were not apparent. And lastly, the role of EDINFOR is also quite unclear. The great majority of EDP's IS/IT resources were transferred to EDINFOR, which is, at the same time, the sole provider of IT services to the Group and a company trying to compete in the Portuguese IT outsourcing market. On one hand, there seems to be no real commitment on the part of EDINFOR in supporting EDP's IS/IT strategies (because EDINFOR is split between the two above mentioned roles). On the other hand, EDP's coordination unit (GSI) seems to be fragile and under-resourced for the size of the task, which they face, i.e. coordinating the whole of EDP's IS corporate governance process.



Case 2 - The oil company (PETROGAL)

Background

Petrogal is the largest company in Portugal in terms of volume of sales. In January 1998, a contract for total outsourcing of the IS/IT function started to operate in this company. The data for this short case was gathered only 12 months afterwards. So, although it was still very early for any concrete results to emerge from this major structural move, inevitably the interviews revolved very much around this new development. Also, as a result of the decision to outsource the IS/IT function, the post of information systems manager was extinguished. From a total of about 120, the IS/IT staff were reduced to four persons, all working in a unit called the IS Coordinating Unit (GCSI). The head of this unit was interviewed instead of the traditional IS manager.

Petrogal is the Portuguese national oil company and it was privatized five years ago. Shortly after that, in 1995, a new CEO was appointed who initiated a large scale process of change in the company. With a more entrepreneurial style and very clear cost-cutting aims, the new appointee introduced a divisional structure and novel concepts such as the Petrogal "Group of companies" or the concept of "internal client". Different business units started to invoice each other for services rendered and this has made managers much more aware of cost-benefit considerations. Thus, the decision to undertake the total outsourcing of IS/IT comes as a consequence of these wide ranging changes initiated by the new CEO.

But cutting costs was not the only motive for the outsourcing decision. There was another reason, which had a determining effect: the IS department had reached a state of near chaos and was unable to respond to normal operational requirements of the company. Several explanation were given for this situation: (1) The company's old fashioned and rigid salary scales, which were

unable to attract or to retain high calibre IS staff. (2) The company's tradition of promoting staff only from within which created an anti-IS feeling towards the few IS staff recruited from the outside directly to managerial positions. (3) The increasing difficulties in establishing a productive dialogue between IS and non-IS staff; about this, the head of GCSI commented "the IS people got so entangled into technical problems that they had isolated themselves completely". (4) Ad-hoc use of external consultant to develop, maintain and update IT applications, giving rise to an uncoordinated proliferation of information systems throughout the company, which, in turn, often resulted in inconsistent reporting from different departments about the same operation.

The US-based company EDS won the outsourcing contract, which is the largest ever signed in Portugal. In the negotiations leading to the contract (which lasted for about one year) it was decided that all IT-related assets would be taken over by EDS, but Petrogal demanded that such assets be accounted for separately. As a result, EDS decided to create a new company - EDS-PETRO - just for the purposes of fulfilling this contract. Some IS staff decided to join the outsourcer, but the majority decided to stay with Petrogal. Some of these members of staff were given new jobs, some got early retirement and a few were posted in the business units as liaison officers with EDS on new IS development projects. As part of the contract, EDS drew up an "IT Plan", which includes a migration methodology from the old IT application to the new IT applications based on SAP-R3 software. SAP has a special release for the oil industry, from which a few modules were selected for implementation and included in the contract.

The interviewees

The interviewees were as follows: the TM (member of the Board of Directors in charge of IS), the ISM (head of the IS Coordinating Unit - GCSI) and one SLM (Director of the Lubricants Division).

TM

Regarding the pre-EDS situation, the TM reported a complete information systems implementation failure. In 1996 a new consumer card - Galp-Frota - was introduced and, as a result, the volume of invoicing went up sharply. But the IS manager was unable to estimate and make provisions for such expected increase in invoicing (in terms of systems capacity) and the whole invoicing system came to a stand-still for several weeks. When asked if top management could not see this coming (although he was not a TM then), the interviewee said that top management must have seen that the situation of the IS staff was getting progressively worse but there was not very much they could do about it. Being a publicly owned company, top management had little freedom to change the incentives scheme for IS staff, which was the key reason behind the downfall.

Addressing the present EDS situation, the TM was very optimistic. He admitted, however, that some problems existed, such as the help-desk. This facility in the beginning operated on a "first come first serve" basis and there was no attempt, on the part of EDS at assigning priorities to

different requests. Another problem was the fact that at the time of negotiating the contract, several IT applications were left out and, as a result, EDS will not maintain such applications without charging an additional fee. However, overall the expectations were very high. When asked if the IT Plan produced by EDS was, in any way, part of Petrogal's strategic plan, the answer was "We have no strategy for IT systems; what we expect from IT systems is full support to the company's strategy. Finally, when asked what he thought his role was in the present outsourcing situation, the interviewee said "I hope I never have to worry about IT systems again".

ISM

The ISM had only been in his new post (as head of GCSI) for less than 12 months. Before, he had held several senior posts at Petrogal and, therefore he had been an IS user. So, he was asked to express his views firstly as an IS user. In that role, he confirmed the near chaos situation described above, but in his view the main reason for such a situation to have occurred was the fact that Petrogal never had a strategic plan for IS/IT.

In his new position, the ISM's role is to manage the outsourcing contract with EDS. He is not involved on a daily basis with the execution of the contract; the line managers liaise directly with EDS and the ISM should only be involved when there is a doubt about the letter of the contract or when something extra-contract arises. In reality, however, the ISM has to become involved much more often in order to help EDS establish priorities, when requests come in from the line departments.

The ISM recognizes that the outsourcing contract has problems. The IT Plan (which is part of the contract) was drafted by the outsourcer and, as such, is biased towards "solutions", which the outsourcer had already developed in other contexts and were ready for implementation. Also, because the survey of the current IT applications was not thoroughly carried out, the outsourcer can easily find ways of charging extra for maintenance or other work not foreseen in the contract. The ISM has to spend a considerable amount of time explaining to EDS that they should not lose sight of the magnitude of this contract and should, therefore, be more flexible in interpreting it. His key challenge, in his own words, is "to demonstrate to EDS that Petrogal is not in its hands"

SLM

The SLM who was interviewed is the head of the lubricants division. She described firstly a case of successful IS implementation and then two cases of lack of success, still at the proposal stage.

The first case, which took place before the outsourcing contract, has to do with a new information systems, which the SLM felt was badly needed in her division, in order to support the sales of lubricants. Selling lubricants is different from selling oil or petrol in bulk. Whereas selling oil or petrol involves managing sales volumes of four or five products, selling lubricants involves

managing profit margins of up to 400 products. Also, the numbers and types of clients in lubricants are vastly greater than the numbers and types of clients in oil and petrol. Thus, the lubricants division needed a different type of information system. The raw data already existed in the central system and it was just a matter of extracting it. So, in 1996 a request was made to top management for the new system to be developed outside Petrogal (because the IS department could not cope with it), authorization was granted and the new system (SIC - Sistema de Informação Comercial) was built and implemented successfully. In fact, it was so successful that it has changed the way that the division works; it has become the basis for the annual staff appraisal exercise and it has changed the staff's attitude towards the sales of lubricants.

The two examples, which follow took place after the move to total outsourcing of IS and are both about information systems requested by the SLM. The first example is about a system containing customer information (e.g. information about contracts, customer preferences, etc), ultimately aimed at evaluating customer satisfaction and at developing customer loyalty. The second example is about a system to support the production of lubricants, thus establishing a link between the sales and the manufacturing of such products. This system's key objective was to reduce the stocks held at the lubricants division to a minimum and also allowing for changes to be introduced to the manufacturing process at short notice. At present, the programming of the manufacture of lubricants relies on the individual knowledge of two product managers. The justification for both requests was the same justification given by the SLM for the sales information system (SIC) described above, i.e. they were both seen as a necessity for a more effective competitive positioning of the lubricants business.

Regarding the customer information system, a prototype was built and demonstrated to a meeting of top and senior managers. Some managers were in favour and some were against but after some discussion top management decided not to go ahead on the grounds that the system was too costly. EDS who was not involved in building the prototype was also not very favourable to the idea.

Regarding the second example - the systems to support the manufacturing of lubricants - it did not even get to the prototype stage. In this case, EDS were more involved because the SAP-OIL package does have a module (or set of modules), which links the manufacturing and the sales functions along the lines as specified by the SLM. However, because such application was not included in the outsourcing contract, "EDS was not too keen on talking about it" said the interviewee. Furthermore, the SLM explained that the main difficulty behind these two examples of failed requests for IS implementation was the company's traditional culture. Traditionally, the emphasis on IS planning was on accounting systems and not on systems aimed at supporting the commercial side of the operation. Such traditional culture seems to have been reinforced by the presence of the outsourcing company.

Petrogal case summary

The key issue in Petrogal's IS corporate governance is a structural one, i.e. outsourcing. Every discussion about IS in this company revolves around the large outsourcing contract signed in late 1997, which has caused a major upheaval in the way that information systems are used, managed and perceived. Interesting points to note are the key reasons behind the decision to outsource completely the IS function, i.e. (1) the very poor technical quality of IT applications, (2) the poor management of human resources related to IS and (3) the lack of strategic planning of IS/IT, over the years. Also interesting is how the outsourcing move is helping to solve problems (1) and (2) but has done nothing to help solve problem (3). In fact, the outsourcing contract may be contributing towards the maintenance of the status-quo and the traditional managerial culture. As the SLM explained, such culture emphasizes accounting and financial control systems to the detriment of market-oriented systems. Given that the spirit of the outsourcing contract was based on the prevailing cultural orientation, it may become a significant obstacle to a change in the culture.

On the positive side, there are signs that the unit in charge of managing the outsourcing contract will push for the strategic planning of IS/IT (i.e. the IT Plan) to become the responsibility of Petrogal (and not the outsourcer's) in a manner increasingly integrated with the company's strategic planning process. There are also signs that there is mounting pressure on the part of SLMs for them to take on a different role in the planning of innovative information systems.



Case 3 - The brewery (Centralcer)

Background

Centralcer was founded in 1934. In 1975 it was nationalized and in 1990 it was returned to the private sector under the leadership of the Bavaria Group, which is dominated by Colombian capital. Shortly after the privatization a systems engineer was brought in from Colombia to review the whole IS operation and make recommendations for modernization and restructuring. In 1995 the SAP software package was purchased to replace an old tailor-made suite of applications and its implementation has been a success, at least according to the "success story" leaflets issued by SAP as part of its publicity campaign in Portugal. In June of 1998 a decision was taken by the top management to outsource totally the IS function. The Colombian systems engineer stayed on as head of the new Unit for Organization and IS Planning and Control reporting initially to the Finance Director and now reporting directly to the CEO.

The outsourcing company, EDS - Electronic Data Systems, took over all the IS-related assets, including personnel. The few IS staff who remained in the employ of Centralcer are now in charge of controlling the outsourcing contract, internal standards, procedures and communication as well as drafting and updating the company's IT Plan. One of the key differences between the outsourcing arrangements in Centralcer and Petrogal is that in Centralcer the IT Plan is the responsibility of the company, not of the outsourcer. Another difference is in the contractual

relationship. In the case of Centralcer, the role of EDS is more limited in the sense that they are not the sole contractor, but only the prime contractor.

The interviewees

The interviewees were as follows: the TM (member of the Board of Directors in charge of Finance and until recently also in charge of IS), the ISM (head of the Unit for Organization and IS Planning and Control) and one SLM (head of the Commercial Division).

TM

The TM addressed himself firstly to the situation before the purchase of the SAP package, that is, the information systems, which had been based on the old tailor-made software. In this respect he expressed the view that the implementation of such information systems had been a failure. The problem was that the applications had been developed by a small software house, which did not have the competencies required to build software powerful enough to respond to the needs of a large company. As a result, the information systems based on such applications were patchy in terms of performance, badly integrated in terms of architecture and, as a result, often produced inconsistent data. In spite of large investments in hardware, there was never enough processing capacity and more hardware had to be purchased all the time. On the other hand, the central IS department had lost control of the situation and users were making requests directly to the software provider. So, in 1993 it was decided that the situation was very serious and that new directions were urgently needed in the IS arena. When asked why the company had reached such state of affairs, the TM said “there was no clear idea regarding what to do with our information systems; there was no planning”.

The implementation of the SAP package, however, is seen as a success story by the TM. Such implementation started with the appointment of a committee headed by this interviewee, which was given wide powers of decision by the Board of Directors. The committee’s first task was to survey the existing manual processes. “With no knowledge and control of the manual processes there is no point in automating” - said the TM. Its second task was to decide on the software to be purchased. The two tasks were carried out in parallel, and the decision to purchase SAP was taken. But it was only after some restructuring (i.e. minor reengineering) of the manual processes that the implementation of SAP went ahead. Also, there was “not a lot of consultation” in the process because “we needed the new system to be operational very quickly”. In the beginning there was some resistance and comments such as “this system is too advanced for us” or “this system is good for the Germans but not for us” were heard. However, almost two years after this implementation has started the views from the users seem to be very positive, according to the TM. Staff recognize that the new information system has brought many advantages over the old one. Furthermore, there is a clear relationship between the new IS and the corporate business results, which have been improving steadily since 1996.

The main reason behind this success story, according to the TM, is that there was a “strategic decision” on the part of top management, regarding the need to re-think all the information systems at Centralcer. In the decision leading to this large investment the strategic thinking was summed up as follows: “how much does it cost” was not the main concern; the main concern was “how much is it worth to know”. Another important issue behind the success was the total support, which top management gave to the committee in charge of the IS restructuring project.

ISM

The ISM confirmed the supporting role of the company’s top management in the success of the new information systems. He also emphasized the fact that the project was carried out in a less than orthodox fashion, in the sense that there was not a great deal of participation in the decision making process. However, there was a fair amount of consultation. The IS restructuring committee did put forward proposals for discussion and had prototypes developed for users to test and comment on. But after the users had been heard, top management pressed on and took the decisions. There were some dissenting voices, because the user interfaces were not too friendly or because the system did not seem flexible enough, but after the decision was taken, people had to go along with the new system. The fact that top management gave its full support to the IS restructuring committee did prevent the dissent from lingering on, according to the ISM.

When discussing the reasons why the old information system had failed, the interviewee put forward two explanations: (1) the prevailing organizational culture and (2) the lack of qualified manpower. The organizational culture was typical of a state-owned enterprise characterized by a lack of balance between the top and the bottom layers of the hierarchy (i.e. “there were many chiefs and few indians”). This created a situation of water-tight departments, each building its own empire and making its own individual requests for IS support. The second explanation is closely linked to the first. Obsolete and rigid salary conditions made it impossible for the company to renew its IS cadre or to offer special conditions to better qualified IS staff. But the fact that IS management is a new profession in Portugal also contributed to the development of poor IS-related competencies at Centralcer, according to the ISM. He explained that Centralcer also suffered from a labour market with a poor supply of well qualified IS graduates.

SLM

The interview with the SLM also became mainly focused on the implementation of the SAP software. The interviewee selected two factors which, in his view, were the main contributors to the success achieved so far.

The first was the implementation style, i.e. consultation followed by a resolute decision to go ahead with SAP. The whole process was carried out very pragmatically by the IS committee and with very clear guidelines from top management. SAP created a “small revolution” at Centralcer and those who did not join the revolution were left behind. The second factor was the fact that an outsider was brought in to lead the IS department, i.e. the new ISM. The old IS department was

filled with bad working habits as it has already been referred to, and it was not possible to achieve any renovation from within. So, a new person was needed to bring a fresh approach not compromised with the past. Moreover, the fact that this person was of the same nationality as the owners of the company also helped.

When asked to focus on the less successful aspects of the implementation of SAP the interviewee said that it was probably still too early to analyse these. However, based on his past experience, he put forward one cause which, in the future, may lead to difficulties in the implementation of information systems at Centralcer. Such a cause has to do with a lack of strategic vision in the decision making process leading to the implementation of new information systems. He supplied three examples of requests for new applications or new modules of SAP, which he had submitted over the last two years and for which he still did not have a positive answer. The examples were (1) an application to support budget control in the commercial division; (2) an enhancement of sales module of SAP to provide individual client information on daily pre-sales results and (3) an application to link Centralcer's sales control system to the sales control systems of the major distributors of Centralcer's products.

In all three cases, the SLM felt that there was not sufficient vision of the strategic relevance of his requests and that was probably the reason for the delay he was experiencing in the decision from top management. Behind this lack of strategic vision, according to the SLM, was the fact that, until very recently, the IS function reported hierarchically to the Finance Director. As a result, financial criteria still weighed too heavily on the decision making process. In order to overcome this, the IS function had to gain real autonomy in relation to the Finance function.

Centralcer case summary

The key issue in Centralcer's IS corporate governance context is also a structural one, but unlike Petrogal it is not outsourcing, which dominates. What dominates the context at Centralcer is the SAP software package and the internal changes, which have accompanied its introduction. Also unlike Petrogal, the level of IS Intent is high. This is the result of the managerial action by two players - the TM and the ISM - who have very clear ideas about how the software should be implemented and about what should be achieved through such implementation. There is, however, a marked gap between the discourse of these two players and the discourse of the SLM. The SLM's attitude is more like "let's wait and see" although he recognizes that the adoption of SAP is a very important step forward. It will not be difficult to understand such a (cultural) gap if we keep in mind the recent history of the company, i.e. the fact that it stayed nationalized for about 15 years (until 1990) and that it is still suffering the effects of an internal environment where organizational effectiveness was not a concern.



Case 4 - The commercial bank (Finibanco)

Background

Finibanco, S.A. started in 1989 as an investment company - Finindustria - with the aim of becoming a bank. In 1993 it was constituted as a bank, bringing together 13 different companies, of which some are simply accounting centres. It operates as a financial conglomerate aimed at all sectors of the banking market, i.e. personal accounts, business accounts, investment and asset management. It employs about 750 people and in January 1999 it opened its 67th branch. Its objective is not to go beyond a network of 100 branches, but plans exist for its supply of services to be complemented by the development of alternative networks, such as homebanking via the Internet, phone banking and a network of financial agents, all to be launched in 1999. Its business results in 1998 were 215 million “contos” (one “conto” = 1,000 Portuguese Escudo) in net assets (up 16.2% on the previous year), 155 million “contos” in loans granted (up 25%) and 178 million “contos” in deposits (up 17%). It is a small bank whose growth and development is closely monitored by a majority shareholder who holds about 70% of the shares.

The main shareholder took over as CEO in 1997 and some changes were introduced then. One of them was the recruitment of a full-time information systems manager with wide experience on this job. Before, the bank’s information systems were run by a part-time consultant whose performance was less than satisfactory. Another change was the member of the Board of Directors in charge of IS. This person, who is an extraordinary example of IS leadership from the top, was already a member of the Board but after 1997 was given the IS function portfolio.

The interviewees

The interviewees were as follows: the TM (member of the Board of Directors in charge IS, Planning and Risk Management), the ISM and two SLMs (the Supervising Manager of Operations and the Operations Manager for the South of Portugal).

TM

The TM has about 16 years’ experience in the top management of the banking sector in Portugal. He is an economist by training and started off the interview by stating that his knowledge of IT was “very limited”. Having said this, he went on to reveal that since the old CEO and the part-time information systems manager had left and until the new ISM joined the bank, he personally led 13 priority IS projects with the help of a young systems engineer. By the time that the new ISM took office, in January 1998, most of these projects were either completed or near completion. The fact that the projects were being led from the top, made their implementation easier as regards possible resistance from line managers. In general, line managers accept things better if they come directly from a member of the Board. The TM believes that it is essential that

he is personally involved with IS implementation projects, not dealings with micro issues but making sure that the broad guidelines are being followed.

Another example of such personal involvement was in the design of the bank's intranet. The TM himself specified that the intranet should be designed in such a way as to take into account the specific information needs of the various functions at different hierarchical levels in the bank. That is, its design should be preceded by a thorough survey of information needs. Moreover, the intranet should not be just a general tool for facilitating information exchange, but it should be a tool for integrating the bank's various types of information systems (transactional, support and management information) by means of a common interface. This TM believes that the intranet will have serious repercussions in the bank's present organizational form and that it is almost certain that such form will have to be rethought after the intranet is operational.

The TM understands that it is important to keep up-to-date with new development in IT, and puts this into practice by reading the relevant literature and attending seminars, whenever possible. In line with this thinking, Finibanco is supporting a joint project with the software producer SAS in order to explore the possibilities of datawarehousing techniques in the bank. Furthermore, the TM carries out benchmarking exercises in order to find out what other banks are doing, as regards IT applications.

In the area of IS/IT strategy, the TM's thinking is also very clear. He explained that the purpose of investing in computer and information systems is "to bring more customers into the bank", so whatever is done in the area of IS/IT must be closely aligned to the business strategies set out by the bank's top management. Thus, the bank has an IS/IT Plan, which flows from the bank's strategic planning exercise. But he also recognizes that it is not possible to plan IT with a 12 months time frame. So, while the key guidelines of the bank's IT architectural plan are formally spelled out and updated every year, many of the detailed implementation plans have to be carried informally. In turn, this can only work if there is a very close relationship between the TM, the ISM and the line managers.

For a person whose knowledge of IT is "very limited", this TM's exposition was a surprising and excellent example of a forward looking top manager's role in the management of IS/IT resources at corporate level.

ISM

From the views above, expounded by Finibanco's TM, it is easy to imagine that this bank has a climate conducive to the building of good relationships between the ISM and the other stakeholders involved in the IS implementation process. The interview with the ISM confirms this.

The ISM also has a long experience in IS-related functions, both in a technical and a managerial role - 28 years in all. He holds that the involvement of the TM in IS projects is one of the keys to the success of the IS function. The reason for this is that in companies there are competing political interests and the implementation of information systems often upsets the established political balance. So, the involvement of top management is needed to ensure that the “political games” do not interfere unduly with the IS implementation process. In relation to his TM, the ISM stated “he is perfectly aligned with an IT culture”. Furthermore, he said that the TM is very supportive, understands the technology but does not get involved with the details of managing the IS/IT function.

This interviewee’s opinion of a good relationship between the information systems manager and the line managers is twofold. Firstly, he believes that the ISM should not be just a provider of services to the organization; the ISM should not just give the line managers everything that they ask for. If he does so, the ISM is not adding any value to his function. Instead, the ISM should concern himself with matters, which are of no concern to the line managers but which are crucial for the business, for example, systems integration. But, at the same time, the ISM should know the business very well so that his views do not hinder the business development process. Secondly, the ISM should devote a great deal of time talking to the users in order to understand their point of view and always use plenty of common sense in building up these relationships. When asked to clarify what he meant by “common sense” he explained that in order to be a good IS manager one must have a “trade-off” style of management. Such a style is essential because trade-off decisions must be taken all the time in the IS management business. And he added “success or lack of success in IS implementation usually stems not from macro decisions but from micro decisions, which are taken 18 times a day”. The micro decisions are those where the “trade-off” style is exercised, i.e. where compromises have to be reached.

For example, the Marketing Department asked for an information system whose standards were outside the standards set for the bank and the person in charge of microcomputing (within the IS Department) was immediately against. However, after some discussion involving people from the two departments it was clear that the request from Marketing was more than justified, so the decision to sacrifice the standards was taken with no difficulty, in that instance. But in order to understand the needs of the users a certain degree of operational involvement with the users is essential. To sum up, according to this interviewee, support from the TM, common sense, a readiness to reach compromises and a degree of involvement with the daily running of the business on the part of the ISM are some of the key factors which have contributed to the success of various IS implementation projects at Finibanco.

SLMs

The two SLMs interviewed jointly at Finibanco were the Supervising Manager of Operations and the Operations Manager for the South of Portugal. The first is the person in charge of the

operational side of all the banking sectors; he is directly in charge of two Operations Managers - the Operations Manager for the North of Portugal and the Operations Manager for the South of Portugal.

The interviews with these two senior managers stressed a clear demarcation line between the strategies for IS and IT, which exists at Finibanco. The line managers are in charge of the IS strategy, in the sense that they have to scan the market for new IT-based solution, carry out their benchmarking, and argue for them in the bank's annual planning exercise. The IT strategy, i.e. everything concerned with the bank's IT infrastructure, is the responsibility of the IS Department. The bank has no formal IS/IT Committee, but the articulation of the two strategies did not seem to be a problem, according to these interviewees. "There is no IS/IT Committee but, informally, the relevant people work together as if they were, in fact, a Committee" - said one of the interviewees. Once more, this was in line with the action-oriented views expressed by the bank's TM.

When questioned about the main reasons for the success or failure of key IS implementation projects, these interviewees elected two reasons: The bottom-up involvement of the stakeholders and good project management. Regarding the later, the key idea was that good projects had failed in the past because they did not have a clearly designated leader, which caused the project to drag on and eventually die. In the banking sector, the time frame for an IS project to be implemented is often very narrow and if the project is not rigorously managed, it will not survive. The bottom-up involvement of the stakeholders was the other reason put forward. By bottom-up, it was meant the involvement of all the parties who might be affected by a new proposed information system. For example, a line manager could stumble on a very good IT-based solution and put it forward in the form of a proposal to top management, but neglect the necessary consultation with other colleagues who might also be affected by the introduction of such a solution. If top management did approve the proposal (and there were a couple of instances when it did), this sometimes caused serious problems involving many people, at various levels.

A concrete example, which took place a few years ago, before the new CEO was in office, was given. At the time, the SLM (the Supervising Manager of Operations) was still a line manager and one day the Board of Directors tried to "sell" him an IT-based solution, which had been proposed by another line manager without prior consultation of the stakeholders. The interviewee, whose work would be affected by the new information system, did not accept the proposal because he did not see that IT-based solution as the most appropriate. The proposal was not withdrawn and an internal conflict ensued, which resulted in the interviewee being transferred to another sector where he did not have any dealings with the new IT-based solution. Two years later, the misgivings of the interviewee were confirmed, i.e. the information system proved not to be the most appropriate and the whole project was folded. The conclusions drawn from this example, by the interviewees, were not only that the involvement of stakeholders was essential, but also that sometimes top management is too easily persuaded by proposals, which "look good". In this case, top management did not understand the implications that the new information system would have

and, what is worse, they did not bother to consult the stakeholders after the proposal was received.

That type of situation, it was stressed, has not occurred since the new CEO took over, in 1997.

Finibanco case summary

The most striking feature at Finibanco is that there no perceivable cultural gap between IS and the rest of the organization. Even though the discussion around cultural differences was elicited during the interviews, it was not possible to detect any signs of a disconnection between the two groups. The other striking feature was the deep insight of the ISM when talking about his relationship with the line managers. His sentence “success or lack of success in IS implementation usually stems not from macro decisions but from micro decisions, which are taken 18 times a day” is remarkable and contains more tacit knowledge of IS corporate governance than a whole textbook. The clear demarcation of IS-related functional roles at Finibanco is also worth noting, i.e. throughout the interviews there never seemed to be any doubt about “who does what”. The proactive attitude and the informal internal communication networks set up by the TM seem to be the main reason behind the quality of the IS corporate governance context in this bank. Also significant, is the fact that structural factors do not seem to affect the overall context.

† † †

Case 5 - The investment bank (Banco Cif - member of the BCP Atlântico Group)

Background

BCP – Banco Comercial Portugues has been the object of research by academics from INSEAD (Dutta and Doz, 1995; Dutta, 1996). The following are excerpts from such research articles.

BCP recruited over 100 talented employees and opened its doors on time in May 1986 with an aggressive marketing and pricing campaign. By the end of 1988 BCP was well established in Portugal with total assets of \$2.02 billion and a network of 19 individual and corporate branches ... BCP's Board participated actively in the initial IT decisions concerning the appropriate hardware and software infrastructures. If BCP were to opt for a mid-size solution such as the (then) commonly used IBM system 38, the bank's ability to grow quickly might be stifled. The other choice was a large mainframe in the IBM 43xx series ... The Board deliberated upon the choices and decided upon the large mainframe alternative. A senior manager commented on the outcome: "the industry and some shareholders thought we were crazy putting one third of our start up capital into a mainframe computer while opening only two branches" (Dutta, 1996:257)

BCP's extraordinary growth has been market by a series of innovations (remarkable for the Portuguese banking environment in the 1980s) ... BCP is in many ways a leader in the strategic use of information technology (IT) among European banks. However, its leadership position arises less from the use of cutting-edge technology as from a deliberate attempt to link IT to its business strategy and build a competence in the business use of IT. (Dutta and Doz, 1995: 89)

Mr. Jardim Gonçalves, Chairman of the Board of BCP described the role of the users in IT planning as follows: "in other banks it is the data processing department that defines the information system. IN BCP it's the users that decide it" (Dutta, 1996:259)

In the present short case we will not attempt to update the existing information about BCP. This case, along with the other four, simply tries to present the views from managers about the reasons for perceived success or failure of information systems implemented within the last few years, in their organizations. It is interesting, however, to compare the outcome from the interviews carried out now with some of the background information from the academic research mentioned above.

The Group, recently renamed BCP Atlântico, encompasses commercial banking, insurance, investment banking, specialized credit (including housing, leasing, etc.), asset management and banks abroad (as far afield as Macau and Mozambique). Being a very large group of companies with different type of information systems so widely disseminated throughout them, it would be difficult to present an overall IS view of the Group. So, it was decided to focus the attention on one of the Group's companies - Banco Cif - an investment bank. Banco Cif was also chosen due to its similarity, in terms of size, with Finibanco discussed above. However, in order to understand the situation in Banco Cif it was necessary to find out first about the situation of the BCP Group, in terms of IS governance. For this reason, an interview with a member of the Board

of Directors of Servibanca was also requested and granted. Servibanca is the company in charge of service support (including IS) to the whole BCP Group of companies.

The interviewees

The interviewees were as follows: two top managers (in separate interviews) TM - Servibanca (member of the Board of Directors in charge of IS in Servibanca) and TM - Banco Cif (member of the Board of Directors in charge of IS in Banco Cif), the ISM - Banco Cif and one SLM - Banco Cif (head of the Credit Analysis Department).

TM - Servibanca

Servibanca was created in 1995 when BCP took over one of the largest Portuguese banks - Banco Portugues do Atlantico (BPA). The aim behind the creation of Servibanca was not only to create synergies between the operating areas of the two banks but also to support all the horizontal processes across the entire Group. Purchasing, legal support and information systems are some of the areas where Servibanca provides services.

Within IS, Servibanca is charged with planning and overseeing the IT infrastructure, to include all the hardware, software and communications standardization and compatibility issues. Regarding the portfolio of IT applications, Servibanca is responsible for the systems, which support the key banking operations across the Group (i.e. transaction systems containing data about clients, products and routine accounting). As it concerns more specific applications, for example systems supporting leasing or factoring operations, the situation varies. In some cases, Servibanca is directly in charge of such systems and in others the individual companies are in charge. In the case of Banco Cif, many of the existing applications are run locally, although maintenance, upgrading and standardization are the responsibility of Servibanca.

The interview with TM - Servibanca, which was initially aimed at finding the key facts about the structure behind the corporate governance of IS at the BCP Group, went far beyond the original aim. As it happened, it provided vital information for an understanding of the IS-related climate in the Group, which, in turn, helped to clarify some of the issues raised in the interviews at Banco Cif.

The manifestations of the IS-related climate at the BCP Group brought up in this interview were manifold. At one point, the discussion focussed upon the bank's attitude towards the management of the IT infrastructure. When asked about how Servibanca solved the problem of the "push-pull" dilemma (i.e. the dilemma between the need to control IT-related costs and the need to provide maximum flexibility for the business managers), the TM-Servibanca answered as follows: "The investments in the IT infrastructure must be measured in terms of benefits, not just in terms of costs. There is a lot of benchmarking of costs going on, but there is no benchmarking of benefits". Two examples were given.

First, the example of the application of a workflow system to support credit decisions. Before, credit decisions could take anything up to one month. Now, a credit decision takes one or two days. The request for credit is input directly on an electronic form by the clerk who receives it. The system then automatically gathers all the relevant information for the decision process and routes it the decision maker. The credit decision maker works through all the queued up requests, takes the decision and sends the electronic form back to its originator. The new credit systems meant a very heavy investment in IT but the benefits, in the view of TM-Servibanca, outweigh the costs. The problem is: “how does one measure such benefits” ?

The second example was about the launch of Banco Internacional de Moçambique (BIM), the BCP Group’s first presence in Mozambique. When BIM was launched in 1995 there were no ATM machines at all, in Mozambique. The number of potential users of ATMs was still very low and there was no cost justification for an ATM network in the Mozambican market as yet. However, the BCP Group decided to go ahead with the installation of the ATM network anyway. Shortly after the launch BIM became the market leader. Today there are more banks offering ATM-based services, but BIM was the first. “We won the market for the innovation we took to Mozambique” was the comment made by the interviewee.

Innovation was mentioned several times during the interview, e.g. “the vision of IS/IT as the driver of innovation in the BCP Group is totally shared by the whole top management team. It is part of the culture”. Also part of the BCP culture is the attitude regarding the formalization of strategy. There are no formal documents about IS or IT strategy. “We do not bother producing such documents because they become obsolete very quickly”. But, on the other hand, there is a great deal of emphasis on committees and meetings. At Group level there is an IT Council, which decides upon the key directions and priorities. Such guidelines on directions and priorities are then passed on to the sectional IS/IT Committees. These Committees, which are grouped by operational sectors (e.g. the “Cards Committee”) are led by senior line managers and include at least one senior officer from Servibanca. They meet whenever is necessary to take decisions about requests for new applications (i.e. they evaluate requests, establish implementation priorities, etc) and meet quarterly with TM-Servibanca.

At another point, the discussion focussed upon the bank’s attitude towards the role of line departments vis-à-vis the IS departments. It is the responsibility of the line departments to search for and to propose IT applications, which will enable the business targets to be reached. Decentralization is a keyword in IS corporate governance at BCP. The role of the IS departments, on the other hand, is to ascertain that the applications fit in with the established IT architecture, i.e. to manage the infrastructure. Furthermore, the IS departments also have a role in scanning the market for IT trends in more technical areas, which are not of direct interest to the line departments.

Another keyword in this interview was involvement, especially involvement from the top of the organization on IS/IT management issues. An example was given to illustrate how the lack of involvement from the top can result in IS implementation failure. About 10 years ago an e-mail

system was launched but after a few months of operation the level of use was very low indeed. When the reasons for the lack of success were analysed it was discovered that people did not use the e-mail system simply because they had not heard about it. The system had been implemented with no involvement from top management. A second launch of the e-mail was then attempted, but that time the IS people made sure that everybody was involved, starting with the CEO. After a series of presentations with the presence of top management, the e-mail system took off and is now very widely used throughout the Group. Involvement of senior management in the management of IS/IT is also highlighted by Dutta (1996) as the key to the success of IS corporate governance at BCP.

TM - Banco Cif

The interview with TM - Banco Cif was short and to the point. From all the interviews carried out, this was the one where a culture gap between IS and the business was most evident. Before proceeding further, however, it is important to point out that this interviewee spent about 15 years of his banking career working abroad, in the employ of Banco Português do Atlântico. He moved to Banco Cif in March 1997. In the interview, two “problems” with IS people were singled out: (1) in Portugal (unlike other countries, especially those of an Anglo-Saxon cultural background) IS people do not like to adopt ready-made software solution; instead, they like to invent new solutions; (2) IS people, in general, have a strong tendency to impose their solutions upon the users and, due to this, users tend not to involve themselves in IS implementation projects. This, in turn, leads to failure in IS implementation.

Regarding IS projects in Banco Cif, this interviewee had not yet experienced any projects of significant dimension and, for this reason, he could not put his finger on any reasons for success or failure of IS implementation. However, he expressed his views about two ongoing projects as well as one project still in the planning stage. Regarding the ongoing projects, the first was the e-mail system, part of the bank’s intranet. The e-mail system was rated as a success especially because of its strong impact on the dissemination of Banco Cif’s research reports (about investment opportunities, etc) produced daily and made available each morning to the entire bank. The system is successful because it works and is directly relevant to the needs of the users. The second ongoing project was the bank’s database of company information, annual reports and assorted research papers (known as the “database project”). Unlike the e-mail system, this project was seen with some scepticism. Although the TM did not wish to say much about this as it had already been running for a number of years before he joined Banco Cif he did make the following comment “when you give IS people freedom of movement, they have solutions for everything”.

Following on from the preceding example, the interviewee expressed his views about the third project, a project still in the planning stage. It involves preparing a disaster recovery plan for the bank’s information systems and the TM had asked the ISM to think about the problem and present a proposal. The TM’s reaction to the ISM’s proposal was as follows: “His solution was very expensive and difficult to implement. We do not have to go from having nothing to having everything. There are intermediate solutions, which are better for us. So, I told him he had to re-

do everything. I have a lot of experience in these things and I have a very clear idea of what is needed”

ISM - Banco Cif

The ISM has been with BCP since its inauguration and came to Banco Cif in the early 1990s to help set up the local area network. He has remained in Banco Cif since then acting as the ISM, although much of the IS-related work is carried out directly by Servibanca. He was very involved in the planning and implementation of the “database project” (mentioned above), which was initiated and championed by a TM who is no longer at Banco Cif. This project, where the present author was also involved (as a consultant) in the very early stages, was discussed at some length. About six years after its launch, the ISM’s view was that the “database project” was more a failure than a success. The main reason for this was the fact the project grew out of a “good idea” from the top but with little support from the bottom of the organization, i.e. the project was like a house, which started to be built from the ceiling. The ISM’s feeling is one of frustration because the “database project” meant a large investment, which is now fully operational but which is greatly under-utilised. The ISM’s conclusion was that, to be successful, IS implementation projects need to address the real needs that people have.

The ISM explained that with the mergers and acquisitions (especially the takeover of the large Banco Português do Atlântico) and a policy of frequent rotation of personnel, the BCP Group is losing its “technology culture”. As an example of this, the ISM mentioned his TM. According to the ISM, the TM is not involved and does not keep up with the concerns from the IS unit. The Help Desk, for example, is staffed by one person, which is clearly insufficient for the needs of Banco Cif.

SLM - Banco Cif

The SLM is the head of the Credit Analysis department. She had been with Banco Cif for about one year and had also come from Banco Português do Atlântico (BPA). So, in addition to giving her views about her present experience she was also able to compare them to her previous experience, in what concerns her dealings with the IS department.

She had recently been involved in an IS project regarding the implementation of a database containing customer information. The project had passed quick and efficiently through the IS/IT Committee at Servibanca (in the process explained above), was carried out by three persons – one team leader and two consultants and was completed in record time. The system works and the implementation was rated as very successful. The reasons for the success were as follows: (a) the IS person (i.e. the team leader) was able to understand the request with all of its implications; (b) the project team had a very clear notion of *the client* and its work was well focussed on *the client*; (c) the guidelines from top management were simple and pragmatic; (d) the project deadlines were strictly adhered to. In addition to these, there were some other factors, which contributed to the good outcome, for example, the simplified procedures for communicating

with the user (i.e. through standard forms) and the mechanisms for providing frequent feedback to the user-client.

This interviewee also talked about the general climate of cooperation and support, which exists at Banco Cisf as an enabler of IS implementation. Such climate was characterized by expressions such as “what matters is that the Group wins” and “the interest of the Group is stronger than the strategy of and Mr. A, B or C”. Furthermore, the interviewee explained that there is a climate of competition, but a healthy one and that there is also a serious concern with the employees. Regarding her previous employer (BPA under the old management), all of these characteristics were very different. There was a great deal of in-fighting between departments, and cooperation in projects, such as IS implementation, was very difficult to achieve.

Banco Cisf/BCP case summary

The case of Banco Cisf/BCP is very interesting because it has some unique characteristics, as it has been recognized by the researchers from INSEAD. Its most remarkable characteristic is the very high commitment to IS/IT, which can be translated as high IS Intent, in terms of our climate dimensions. Indeed, such characteristic, which revealed itself in several ways in our interviews, is not just a feature of the IS context but it is still an important feature of the Group’s culture. At BCP Atlântico there is a state very close to “the cognition of strategy being driven by technology”, after the notion developed by Itami and Numagami (1992). Such proximity between strategy and technology (i.e. IS/IT) finds expression in the strong emphasis in the continuous search for business innovation, through IT applications, one of the tenets of the Group’s strategic posture. Another tenet is decentralization and local autonomy. In terms of IS corporate governance, sometimes this is a positive factor but other times it is not so positive as, for example, in the case of the “database project”, which seems to be an example of a less successful implementation of IS. Finally, the fast growth of the Group seems to be creating a context where diffusion of the original “IT culture” is becoming more difficult and where a cultural gap between IS and the rest of the organization can become more noticeable. The differences between Banco Cisf and Finibanco were evident, in this respect.

Chapter 7

Discussion of the empirical research findings and conclusions about the new theoretical approach to IS *organizational* implementation

Whilst a great deal of effort has gone into devising standard ways of designing and developing information systems from analysis through to delivery of the system to the user, the process of systems implementation has been somewhat neglected (...) Given the importance, for the ultimate success of the system, of having a good implementation process, the lack of research effort in this area has to be regretted.
F. LAND (1992:145)

Chapter 7 summary

- ? 7.1 Introduction
- ? 7.2 Discussion of the empirical research
 - ? 7.2.1 Descriptive analysis of the survey results
 - ? 7.2.2 Inferential analysis of the survey results
 - ? 7.2.1 Interpretive analysis of the short case studies
 - ? 7.2.1.1 IS Infusion and Diffusion as an interpretive framework
 - ? 7.2.1.2 Some conclusions about IS corporate governance in the five cases
 - ? 7.2.1.3 Conclusions about IS Infusion and IS Diffusion
- ? 7.3 Some conclusions about the research methodology
 - ? 7.3.1 Conclusions about the empirical research
 - ? 7.3.2 Conclusions about the conceptual research
- ? 7.4 Towards a new theory (and practice) of IS organizational implementation
 - ? 7.4.1 IS implementation must be framed within a new concept of organization
 - ? 7.4.2 The role of the organization's languaging
 - ? 7.4.3 A new perspective on IS strategic alignment
- ? 7.5 The contribution of this dissertation to the LSE school of thought in IS research and suggestions for further research

† † †

7.1 Introduction

In this chapter, which concludes the dissertation, our aim is to bring together the two types of research probes we have launched: the conceptual and the empirical. The conceptual probes, which account for the largest proportion, by far, of the overall research effort, are the theoretical propositions we put forward in support of the new organizational approach to IS implementation. The empirical probes are an exercise in academic fieldwork aimed at finding out more about the organizational “reality”, which underlies both the processes and the outcomes of the implementation of IT artifacts in organizations.

The research method we have adopted in this dissertation is similar to what Itami and Numagami (1992) call “logical compound synthesis”. This method, which the authors claim to be often used by researchers in spite of not having an “official” designation, is presented as an alternative to the three more conventional research methodologies - mathematical model analysis, statistical data analysis and in-depth case analysis. Logical compound synthesis is inspired by the chemical sciences, where researchers synthesize various materials into a compound, which is new to the world. Likewise, in management and organization science, researchers “pick up various theoretical concepts and empirical findings as materials and synthesize them into a plausible logical story. This approach derives its plausibility from the robust coherence among its components and reveals logical connections among conceptual constructs” (p. 133). As the authors explain, the appeal of this methodology is logic and logical argumentation.

In this dissertation, we must emphasize once again that our key objective, as evidenced in the subtitle - *towards a new theory* - is to contribute towards new ways of perceiving and handling the IS implementation phenomenon, in practice. We have set ourselves an objective, which is only attainable in very small steps and which cannot yield comprehensive and robust methodologies in the short term. We acknowledge that the initial impact of our approach is abstract and conjectural in nature. However, as Lundberg (1984) observed

even speculative reasoning, which is carefully done and which probes the pragmatic dimension of a major, increasingly crucial phenomenon, has utility, for it begins to inform and guide practice and to stimulate enquiry (quoted in Stickland, 1998:28)

In this chapter we will firstly discuss the results of the empirical research. This will be carried out under three headings: (1) Descriptive analysis of the survey results; (2) Inferential analysis of the survey results; (3) Interpretive analysis of the short case studies. Regarding the first point, we have been able to conclude that, in all, the three groups of managers do have different attitudes towards IS corporate governance issues. Concerning point number two, the conclusions are somewhat meagre. We have only been able to establish a vague correlation between the variables in the conceptual model and perhaps the most interesting conclusion is the internal validity we were able to compute regarding four variables (IS Intent, Discipline/Trust/Support, Facilitation/Inhibition and IS Organizational Learning).

The most useful conclusions are arrived at through the third method of analysis, i.e. the interpretive method. Here, the five short case studies are analysed in accordance with the model which served as the basis for the survey questionnaire synthesized into a new framework. This framework is made up of two key implementation dimensions: IS Infusion and IS Diffusion. The first is related to managerial choice in what concerns strategy and strategic intent. The second is related to collective action, as a result not only of the strategic input but also the input of the system of interactions, which makes up the organization. All the short case studies are analysed according to these two dimensions.

The next section contains a brief evaluation of the research methodology we have used (conceptual and empirical). Flowing from this discussion, we will draw some conclusions about the new theoretical approach to IS *organizational* implementation, the key theme of the dissertation. Here, we go back to our introductory chapter on organizations and organizational knowledge and argue that the approach we defend must be founded upon a new concept of organization. Autopoiesis theory and its novel insights into organizational phenomena is brought in to underpin our view that IS implementation must be understood within other and more powerful generative forces made up of ever changing organizational action. The metaphor of the whirlpool in the river suggested by Morgan (1997) is used in order to better explain our view.

The most basic element of organizational action, that is, the basic *glue* that holds organizations together is language and languaging. In management, an increasing number of authors (Eccles and Nohria, 1992; von Krogh and Roos, 1995a; van der Heijden, 1996; Czerniawsk, 1997, Grant et al, 1998) argue that languaging or conversations in organizations can and must be managed as the way of materializing the organization's strategic intent. In IS corporate governance, languaging and strategic conversations are also the key to materializing the organization's ultimate IS-related intent, i.e. aligning IS/IT and the business. The *organizational* implementation of IS is really the ongoing outcome of such materializing. Section 7.4 ends with a discussion on the concept of IS alignment and the implications of the organizational approach to the understanding of such concept.

For the *finale*, we highlight our perception of what our contribution to the IS discipline might be. At the outset of this chapter we have quoted Prof. Frank Land (1992), the first Head of the IS Department at the London School of Economics, saying that "the lack of research effort" in the area of IS implementation "has to be regretted". In his search for an answer to the lack of research effort, Land touched on several occasions (1983, 1983a, 1989, 1992) upon the issues of organizational culture and climate as key factors behind the success of IS implementation. But although he felt the need for a more aggregate level of discourse, organizational culture and climate were never treated in any depth in his research. Thus, we see this dissertation as feeding directly into the gap identified by Land but also extending some of the work initiated by other members of the Department, such as Angell and Smithson (1991), Introna (1997) and Ciborra (1989, 1994, 1997) a new arrival in the Department as Visiting Professor.

7.2 Discussion of the empirical research

7.2.1 Descriptive analysis of the survey results

The analysis of the survey results using only descriptive statistics - number of responses, percentages, averages, standard deviations and variation coefficients - can be found in Appendix 2. The body of this appendix is the preliminary report submitted to FLAD in August 1998. It is called preliminary because a more in-depth treatment of the results was promised for a later date, i.e. after the completion of this dissertation. The definitive report to FLAD will contain a summary of the overall conclusions from our empirical work.

The reader is therefore invited to peruse Appendix 2. Given that the results of the postal survey are described therein, they will not be repeated here. What we propose for the main body of the dissertation is to carry out a brief review of the general characteristics of what we may call the *typical* IS corporate governance context in large Portuguese companies, based on an interpretation of these results. Before starting, however, it is important to point out that the questionnaire items already reflect the key issues prevalent in such context, in accordance with the views gathered from Portuguese IS managers, in the first round of interviews.

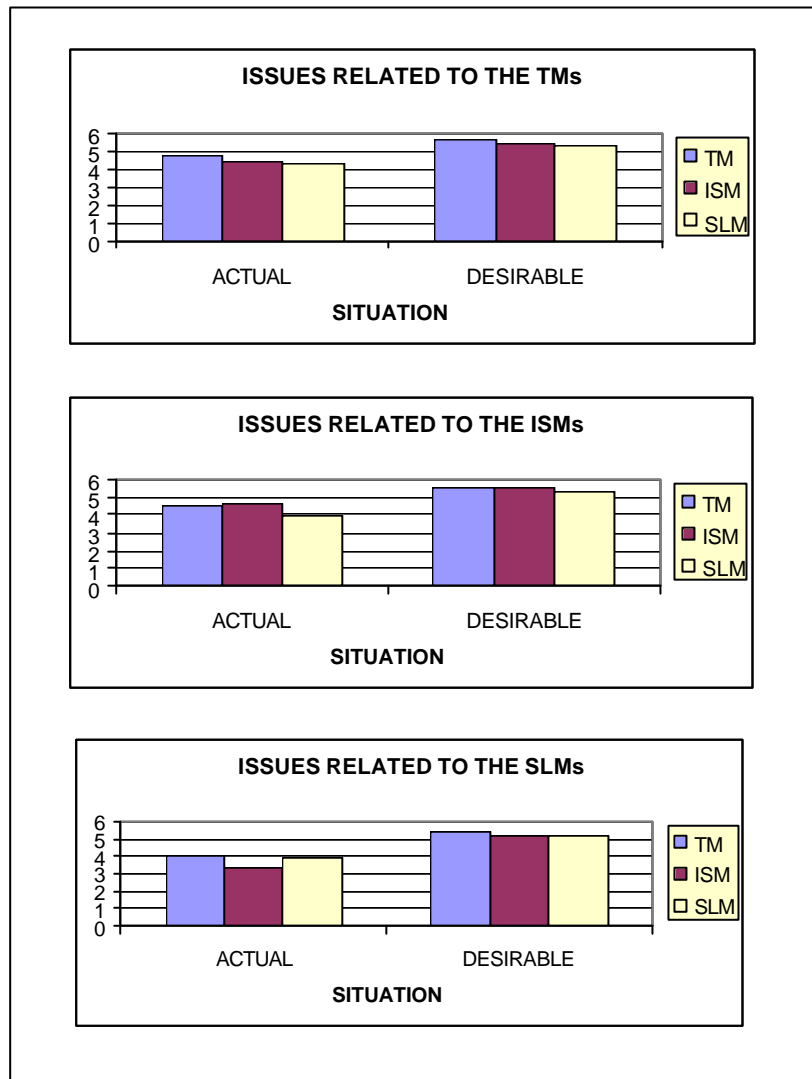
The key issues that have come out of these interviews and which can be said to be somewhat different in Portuguese companies from the general IS corporate governance trends identified in chapter five (Table 5.1) are as follows:

- ? The centralized supervision of the IS function from the top is usually very diluted and diffuse in view of the fact that there is not any one person with exclusive responsibility for such function, in the Boards of Directors (i.e. a type of Chief Information Officer)
- ? The so-called federal system of IS corporate governance, i.e. a highly decentralized system with a “mini” IS department in each business unit and an IS coordinating body at corporate level has not been adopted, in general
- ? Line managers are usually considered not to be “up to the job” of co-managing information systems, therefore this is still very much the “crusade” of IS managers. Hence, there is yet no role for IS managers as business consultants, for example.

The main conclusion that can be drawn from a comparison of the mean scores achieved by each of the three groups of respondents is that a cultural gap does exist in the perceptions of the various issues at stake. The analysis of the responses to each questionnaire item reveals this, and the analysis of the overall mean scores organized by issues related to each of the stakeholder groups confirms it. In the graphs shown in Figure 7.1 the differences in perception by each of the groups can be visually detected. The results show that when confronted with issues, which concern them, each of the stakeholder groups score consistently higher than the other two (meaning that the level of “agreement” about the presence of the issue in their organization is

higher). Interestingly, the largest differences are found in the scores of the IS managers versus the scores of the senior line managers. Thus, it is plausible to guess that a quite difficult relationship exists between ISMs and SLMs.

Figure 7.1 Overall average scores grouped by questionnaire items related to each of the three groups of managers (showing the responses obtained from each of the groups)



Other interesting conclusions resulting from an interpretations of the descriptive analysis and which help to characterize the IS corporate governance context in large Portuguese companies, are as follows:

- ? Top Managers (TMs) are the most optimistic of the three groups, showing optimism (in terms of scores differences) even in issues where TMs are not directly involved. In relation to the Information Systems Managers (ISMs) there seems to be some consensus of views between the two groups, but consensus is higher between the views of TMs and of Senior Line Managers (SLMs), which may indicate a degree of allegiance between these two groups

- ? The ISMs are the most defensive of the three groups, showing consistently higher scores than the other two groups in issues affecting their status. The consensus of views between them and the TMs may be indicative of some support from the ISMs in relation to the TMs, in spite of the relative lack of knowledge of TMs in relation to various operational issues. ISMs consider more autonomy for SLM an unlikely (undesirable?) possibility and they also show a degree of pessimism in relation to human resources management related to the IS function

- ? SLMs are the group who show the least involvement in IS corporate governance issues. Their pessimism shows through their consistently lower scoring, in relation to the other two groups and when expressing their views about either actual or desirable situations, even in issues, which affect them directly (see, for example, Question 12)

7.2.2 Inferential analysis of the survey results

As part of the quantitative analysis of the survey results we had proposed to establish some correlations between the latent constructs (see Figure 6.3). Our proposition was as follows:

The sample of large companies shows that the level of IS organizational learning is positively correlated with the organization's perceived level of Facilitation/Inhibition associated with its IS-related structural conditions as well as the presence of four basic organizational values - IS Intent, Discipline, Trust and Support- associated with IS corporate governance.

Before going into the correlations between the model's latent variables, however, we had to verify the internal validity of each of the latent variables. As it is explained in Appendix 2, an initial analysis of the responses to the questionnaires showed that there were problems regarding the wording of Questions 11, 13 and 21 and that it had been decided to drop these questionnaire items from further analysis. Thus, the Trust and the Support constructs were reduced to two questionnaire items each. The computation of the reliability coefficients on these two variables showed values of 0.52 for Trust and 0.57 for Support. The coefficient for the Discipline construct, in spite of having three items (Questions 7, 8 and 9), was also quite low: 0.43.

Van de Ven and Ferry (1980) suggest a range between 0.55 and 0.90 for constructs with broad conceptual scope, in business settings, but Fornell and Larcker (1981) recommend a threshold of 0.70 for acceptable reliability. So we have decided to adopt, for our analysis, a value of around 0.65 as the minimum coefficient for a latent variable to be considered as reliable and valid. In the light of this, we had to decide what to do about the Discipline, the Trust and the Support variables

before we could only carry on with the estimation of the correlations between the variables in the model. Given that discipline, trust and support are very close to individual attitudinal values (in spite of featuring as *organizational* values in this discussion) we took the decision to join them together into one single variable: Discipline/Trust/Support.

Thus, the reliability coefficients obtained were as follows (see also Appendix 3):

IS Intent - 0.73
 Facilitation/Inhibition (structural factors) - 0.68
 Discipline/Trust/Support - 0.77
 IS Organizational Learning - 0.70

The next step was to compute the correlation coefficients between the latent variable. This was carried out, using factor analysis and has resulted in the values shown in the table below

Table 7.1 - Correlations between the latent variables

| | | IS Intent | Discipline/ Trust/ Support | Facilitation/ Inhibition | IS Organizational Learning |
|-------------------------------|--------------|-----------|----------------------------------|-----------------------------|----------------------------------|
| IS Intent | Coefficient | 1.000 | 0.710** | 0.461** | 0.509** |
| | No. of cases | 251 | 247 | 243 | 248 |
| Discipline/Trust/ Support | Coefficient | 0.710** | 1.000 | 0.417** | 0.553 |
| | No. of cases | 247 | 250 | 242 | 247 |
| Facilitation/ Inhibition | Coefficient | 0.461** | 0.417** | 1.000 | 0.538** |
| | No. of cases | 243 | 242 | 247 | 245 |
| IS Organizational Learning | Coefficient | 0.509** | 0.553 | 0.538** | 1.000 |
| | No. of cases | 248 | 247 | 245 | 252 |

** Correlation is significant at the 0.01 level (two-tailed)

The results obtained from the quantitative analysis above are disappointing. Although all the correlations between the independent variables (IS Intent, Discipline/ Trust/Support and Facilitation/Inhibition) and the dependent variable (IS Organizational Learning) are significant, the coefficients are too close to the threshold of 0.50 (Johnson, 1998) to allow any inferences to be made. This does not mean, of course, that these dimensions are not positively related. It simply means that with the instrument we have used for measurement a strong correlation cannot be established.

In view of the relatively uninteresting nature of the results from this quantitative analysis we decided not to pursue it further and concentrate on the qualitative analysis. However, there may be some interesting conclusions to be drawn from the inferential analysis, about the IS climate or context dimensions we have identified. We will comment further on this aspect in section 7.3.

7.2.1 Interpretive analysis of the short case studies

The second set of interviews have proved to be much more interesting in terms of research results. The objective of these interviews was the same as the objective of the quantitative part of the empirical research, i.e. *detecting trends or patterns in IS corporate governance (in large Portuguese companies), regarding IS-related values (IS intent, discipline, trust and support) and IS-related structural conditions, which may enable a better understanding of the conditions for improved IS-related organizational learning.*

The interviews are presented in the form of five short case studies (in chapter six), so as to give the reader a contextualized view of each group of three interviews (four in the case of Banco Cif/BCP). Hence, the case studies already represent our interpretation of the 16 interviews granted to us. The managerial action framework applied to IS corporate governance and discussed in chapter five has served as the initial basis for the qualitative analysis of the case studies. Table 7.2 shows our analysis in terms of the same 19 attributes of IS-related context, which served as the basis for the questionnaire in the postal survey.

The scoring system reflects the presence of dimate/context attributes in the interview. Such presence can be positive or negative. A positive presence means that the particular attribute has contributed towards the relative success of the IS implementation under discussion. A negative presence means the opposite. For example, in the case of Petrogal *IS-related priorities for human resources development* and *IS-related incentive systems* (under structural factors in Table 7.2) have both contributed negatively towards the success of IS implementation and of the invoicing system intended to support the new consumer card (Galp Frota), in particular. However, such negative contribution was not the same regarding the two attributes. It was stronger in the case of *IS-related incentive systems*, in relation to the interview by Petrogal's TM.

Hence, we have established a distinction between strong presence (scored by means of 2 or -2) and weak presence (scored by means of 1 or -1).

Table 7.2 - A qualitative evaluation of the IS corporate governance context dimensions (values and structural factors) in the five companies

| | EDP | | | Petrogal | | | Centralcer | | | Finibanco | | | Banco Cif/BCP | | | |
|---|-----|-----|-----|----------|-----|-----|------------|-----|-----|-----------|-----|-----|---------------|--------|-----|-----|
| | TM | ISM | SLM | TM | ISM | SLM | TM | ISM | SLM | TM | ISM | SLM | TM (1) | TM (2) | ISM | SLM |
| IS Intent | | | | | | | | | | | | | | | | |
| IS-related strategic visions, by the TM | | -1 | | -2 | 1 | | 2 | 2 | -2 | 2 | | | 2 | 1 | | |
| IS-related strategic visions, by the ISM | | | | | | | | 1 | | | | 2 | | | 2 | 2 |
| IS-related collective comitment, by the ISM , in looking outside the company in the search for new technological solutions | | | | | | | | | | | 2 | | | | 2 | |
| IS-related collective comitment, by the SLMs , in their planning/ implementation role of IS strategies at department/division level | -1 | -1 | | | | 2 | | | | | | 2 | 2 | | | 2 |
| Personal meaning of IS-related issues, by the TM , in influencing the company's Board in key issues for the long-term development of IS/IT | | | | | | -1 | 2 | 2 | | 2 | | | 2 | | | |
| Personal meaning of IS-related issues by the SLMs , in understanding and managing IT learning by end-users at the local leval | | | | | | | | | | | | | | | | 1 |
| Discipline | | | | | | | | | | | | | | | | |
| Need to respect IT platform standards, by the TM , by recognizing the importance of the company's information architecture | | | | | | | | | | 2 | | | | | | |
| An understanding of business platform needs, by the ISM | | -1 | -1 | | | | | 2 | | | 2 | | | -2 | | |
| An understanding of IS development constraints, by the SLMs | | -2 | | | | | | | | | | 1 | | | | 2 |
| Trust | | | | | | | | | | | | | | | | |
| The ISM's track record in the organization on IS/IT issues | | | | | | | | | | 1 | | | | -1 | | |
| The SLMs' IS skills and competencies for taking over new IS management responsibilities | | | | | | | | | | | | 1 | | | | |
| An understanding on the part of the TM of the need for SLMs to get involved in IS management and policy making | | | | | | | | | | 1 | | | | | | |
| Support | | | | | | | | | | | | | | | | |
| The SLMs' autonomy in the use of IS resources | | | | | | -2 | | | -1 | | | 2 | | | | |
| The need for coherent clarification on policy-related issues, from the TM | | | | | | | | | | 2 | | | | | | |
| The need for a new service orientation on IS/IT-related issues, by the ISM | | | | | | | | | | | 2 | | | | | |
| Structural factors | | | | | | | | | | | | | | | | |
| IS-business integrating mechanisms | -2 | | -1 | | -2 | | | | | | | | 2 | | | 2 |
| IS-related priorities for human resources development | | | | -1 | | | | -2 | | | | | | | | |
| IS-related incentive system | | | | -2 | | | | -1 | | | | | | | | |
| Historical technical quality of IT applications | -1 | | | -2 | | | -2 | | | | | | | 1 | 2 | 2 |

Key: Presence of dimension in the interviews 2 = strong; 1 = weak; plus or minus signs indicate a positive or negative implication

7.2.1.1 IS Infusion and Diffusion as an interpretive framework

In order to develop our qualitative analysis further and draw conclusions, which might be of some use to IS research and practice we needed to find a tool, which would bring together the various attributes and dimensions into a more general dimension. At the same time, the general dimension should also establish a link between IS corporate governance and overall corporate management. We have found such a tool in the form of two little explored strategic dimensions of IS implementation: IS Infusion and IS Diffusion (Sullivan, 1985). These two dimensions have allowed us a new reading of the empirical research results and, at the same time, have provided us with a new link between three elements identified in our conceptual research: *managerial (strategic) choice, managerial action and collective learning*.

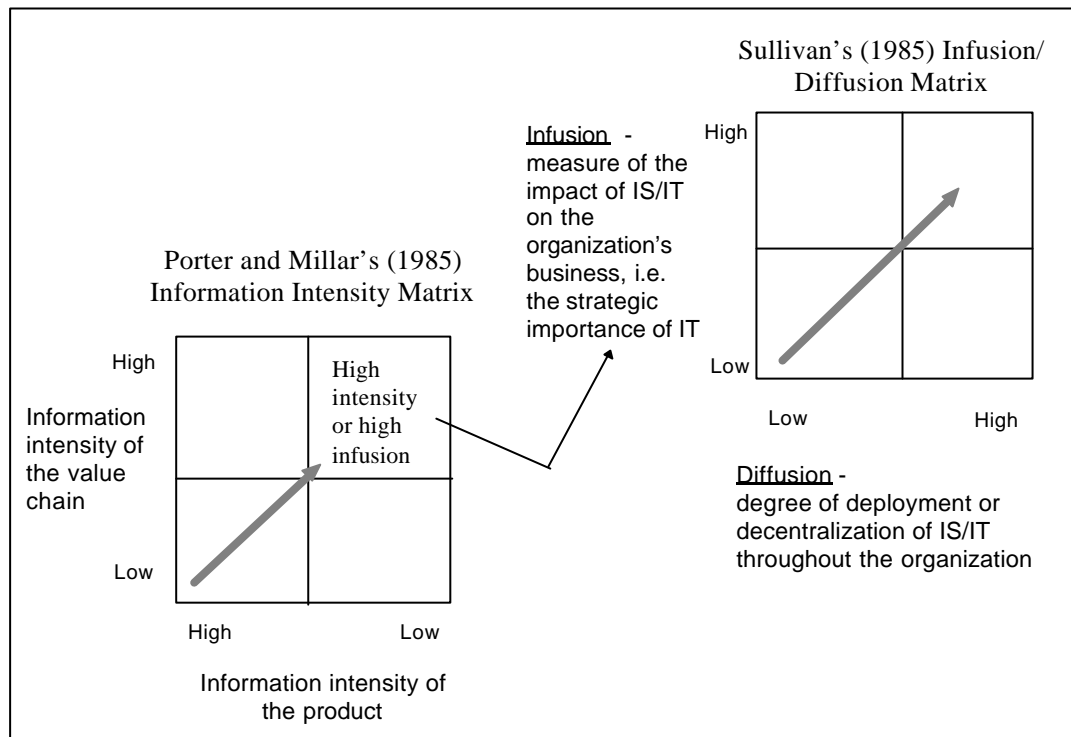
An organization's positioning on the competitive market determines, to a certain extent, the level of investment of that organization in IS/IT. For example, it is not possible for a bank nowadays to invest significantly less than all the other competing banks and still stay in business. The notion of IT intensity was first suggested by Porter and Millar (1985) through the analytical tool called the "IT intensity matrix". The matrix is useful for positioning a company or industrial sector in relation to two factors: (1) the amount of information processing required throughout the company's value chain and (2) the amount of information content of the company's products or services. On both counts the level of IT intensity tends to increase. In other words, the pervasive and ever increasing penetration of IT artifacts in organizations means that both in terms of the value chain and in terms of the content of the product itself, the intensity of IS/IT is always mounting.

Sullivan (1985) suggested two other measures of IS/IT intensity: (1) infusion, or the degree of strategic relevance of IS/IT for a particular company's business and (2) diffusion or the level of deployment of IS/IT throughout the organization. The concepts of infusion and diffusion create an important distinction, which was missed out in Porter and Millar's IT intensity matrix. While the concept of infusion addresses the problem of strategic positioning (which is the focus of the Intensity Matrix), the concept of diffusion addresses the problem of the internal use and management of the investments made in IS/IT. In other words, while the needs imposed by strategic positioning may lead companies in the same sector to carry out similar levels of investment in IT (i.e. similar levels of infusion), the management of those investments within the companies may be different (and it very often is). While infusion depends largely upon market forces, diffusion depends mainly upon the effectiveness of the organization's IS corporate governance processes.

Thus, we may argue that while the competitive pressures of the market inevitably push the level of infusion up, the level of diffusion may remain more stagnant for some time. However, sooner or later, the company's cost accounting system will start to show that the investments made in IS/IT are not being effective in terms of expected benefits. On the other hand, internal forces in the organization exert constant pressure for IT artifacts and applications to be more widely diffused and their management to become ever more decentralized. Hence, as Sullivan (1985) argues, the trend for both IS infusion and IS diffusion is upward (see Figure 7.2), there being three

consequences from such movement: (1) IS planning methodologies becoming more eclectic; (2) a new emphasis on IT architectures and (3) the recognition that human networking and organizational communication are also key ingredients of the management of information at corporate level.

Figure 7.2 - The upward trend of IS infusion and diffusion in organizations



Going back to our qualitative analysis of the case studies (Table 7.2), the next question was *what are the relationships between our IS corporate governance context attributes and dimensions and the IS Infusion - Diffusion dimensions*? Let us start with Infusion.

IS Infusion is related to managerial strategic choice. Porter and Millar's (1985) IT Intensity Matrix highlights this fact rather well, i.e. the company's strategic requirements regarding either its value chain processes or its product contents determine its levels of investment in IS/IT. However, the company's attitude towards such strategic requirements can be more proactive or more reactive and the degree of proactivity or reactivity will be related to the level of *IS Intent* that the company is able to generate. In other words, in order to stay ahead of the competition, companies cannot just follow the trends, but they have to embed in their collective strategic knowledge a set of values related to the strategic role of IS in their business development.

Itami and Numagami (1992) explain the relationships between technology and strategy and although they are concerned mainly with industrial technology, their thinking may be applicable to IS/IT. These authors put forward three stages in the formation of the technology-strategy

relationship: (1) strategy capitalizes on technology; (2) strategy cultivates technology and (3) technology drives cognition of strategy.

In the first stage, the “basic premise is that current strategy should make the best use of current technology” (p. 120), that is, technology is made to fit strategy contemporaneously. A typical question asked in the strategy formulation process, at this stage, is: how should technology be used as a tool to differentiate the company from its competition?

In the second stage, the case of strategy cultivating technology can be summed up as follows “pursuit of contemporaneous fit between technology and current strategy can lead to technology accumulation with much greater future potentials than necessary to met current needs” (p. 122). This line of thought in management research is supported by the resource-based approach to strategy, where the major tenet is that current strategy should be formulated with the accumulation of invisible assets and core competencies as basic goals. Hence, current strategy cultivates future technology.

The third stage in conceptualizing the interaction between technology and strategy is focussed on the effects of current technology upon the collective perception of future strategy. At this stage, “to try to imagine its future, the firm needs some common lens, which is shared by many members; technology works as such a lens” (p. 128). In this perspective, strategy cannot be separated from the organizational learning and the cognitive processes induced by the technology. At this third stage “technology is all important; it not only constrains what the firm can do technically, but frames and drives the way people think” (Itami and Numagami, 1992:131).

It can be argued that this reasoning makes sense for industrial technology but not for information technology. The reason for this is that industrial technology is endogenous to the firm and information technology is not. Industrial technology grows within the company through its R&D and market intelligence efforts. Information technology, however, can never be totally endogenous because it is developed outside and is imported into the company in a piecemeal fashion. In other words, companies increasingly buy ready-made software applications as and when they are needed. Nevertheless, there is also a degree of endogeneity in software applications because they are so intimately linked to the organization’s internal routines and processes. This is the case, for example, with the so-called ERP (Enterprise Resource Planning) software packages, such as SAP R/3, which are known for imposing drastic changes to the firms’ routines and processes and even changing the corporate culture (Davenport, 1998).

Although Itami and Numagami’s framework cannot be directly carried over to IS corporate governance, the three stages of the technology-strategy relationship make sense and are reminiscent (albeit conceptually very different) of the evolutionary path suggested for IT-induced organizational change by Venkatraman (1991). That author suggests the following stages of change: (1) localized exploitation; (2) internal integration; (3) business process redesign; (4) business network redesign and (5) business scope redefinition. However, the two conceptions of IS/IT-related evolution are quite different. While Venkatraman’s is prescriptive and deterministic,

Itami and Numagami's model is analytical, inspired on organizational culture and aimed at capturing the relationship between technology and the collective learning capability of the organization.

As we have suggested above, Itami and Numagami's stages can be used to give some additional substance to the IS Infusion dimension. In the light of this evolutionary scale, IS Infusion can be redefined as being not just *the degree of strategic relevance of IT for a particular company's business* (Sullivan, 1985) but also *the degree to which the organizational knowledge (cognition) related to IS/IT and to the business' strategy are intertwined*. Redefined in this way, IS Infusion becomes the key consequence of our first IS corporate governance context dimension: *IS Intent*. We recall the definition provided in chapter five for this dimension: *the awareness, the understanding, the action and the proaction from all the firm's managers regarding the role of IS/IT in helping to achieve their own business objectives and, ultimately, the firm's strategic aims*.

So, we suggest that IS Infusion can usefully be further sub-divided into three analytical categories: **(1) strategy capitalizes on IS/IT; (2) strategy cultivates IS/IT; (3) IS/IT drives cognition of strategy**.

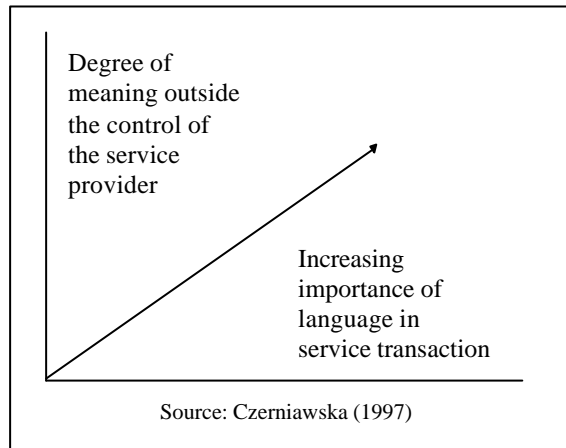
The next dimension we wish to approach is IS Diffusion. Sullivan (1985:6) argues that

Diffusion may take place in organizational terms, as companies use more IT in support of more and more functions and business units. Diffusion may occur in physical terms, as companies install minicomputers, wordprocessors, etc. Diffusion may also take place in terms of responsibility, as line managers take more control of systems design, development and operations

In other words, Diffusion encapsulates all the organizational consequences, including structural arrangements, procedures, routines and managerial action, which flow from the strategic choices, regarding IT investments in the face of competitive pressures. Although Sullivan argues that Diffusion has in it elements of a physical nature, such as IT components installed in a more or less centralized fashion, in the main Diffusion is about organizational structures and relationships between people. Ultimately, even the decisions to install the physical components are reduced to negotiation and communication between people. As organizations approach the high Infusion and high Diffusion quadrant, "processing and data, which had been viewed as central, begin to look peripheral and (organizational) communication, which had been peripheral begins to look central" (Sullivan, 1985:9).

Hence, Diffusion and organizational communication can be said to go hand in hand. Organizational communication is analysed by Czerniawska (1997) in the book *Corporate Speak*. As the author

Figure 7.3 - The relationship between service provision and the importance of language in organizations



explains, “corporate speak is not simply jargon and buzz words; corporate speak is about the use of language for its own sake” (p.24). In talking about the role of language in service provision, Czerniawska makes some comments, which are germane to IS corporate governance and which help to understand the relevance of the IS Diffusion dimension. She observes “as the proportion of language associated with a service (i.e. the service component) increases, so does the extent to which the meaning of that service lie outside the control of the service provider” (p.96) and “ownership of meaning empowers the

customer - language is therefore the prime means by which the customers exert control over their service purchases” (p.97). Czerniawska supplements her observations with the illustration in Figure 7.3

Applied to IS governance this means that as IS/IT become more “infused” into the organization, both internal and external IS/IT service providers gradually loose control over the meaning of IS/IT-related services. At the same time, as “diffusion” progresses, stakeholders are better able to use and control IS/IT-related language. In other words, the more IS implementation is outside the control of the IS/IT experts, the more important IS-related language (i.e. IS Diffusion) becomes.

Furthermore, Czerniawska establishes an interesting parallel between language use and three types of corporate culture as suggested by Meyerson and Martin (1987). Meyerson and Martin put forward three paradigms or ways of thinking about corporate culture: (1) Integration; (2) Differentiation; (3) Ambiguity. The main differences among the three paradigms are explained in Table 7.3.

Table 7.3 - Three paradigms of corporate culture

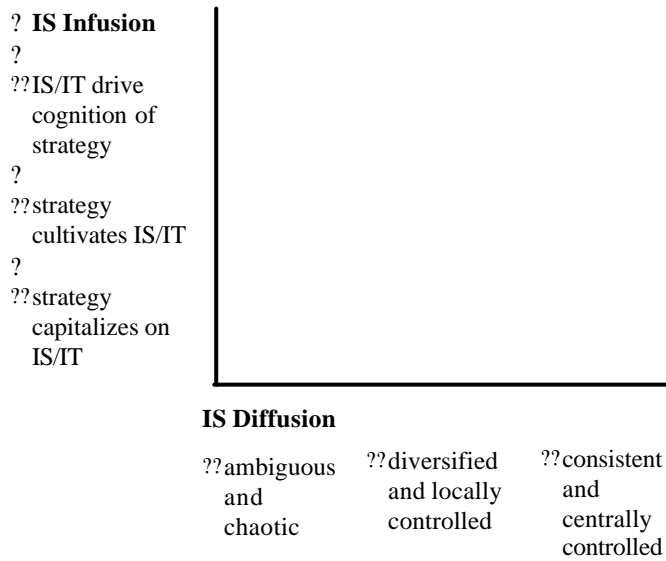
| Characteristics | Integration paradigm | Differentiation paradigm | Ambiguity paradigm |
|---|----------------------|-------------------------------------|--|
| Degree of consistency of the cultural manifestations among organizational members | Consistency | Consistency and Inconsistency | Lack of clarity and irreconcilable inconsistencies |
| Degree of consensus among organizational members | Organization-wide | Within but not between sub-cultures | Issue specific consensus, |

| | | | |
|--------------------------------|------------------------------|---------------------------------------|---|
| | | | dissensus and confusion among individuals |
| Key sources of cultural change | Often centered on the leader | Various internal and external sources | Often centered on individuals |

Source: Meyerson and Martin (1987)

In line with these three paradigms, Czerniawska (1997) argues that we can think of three types of language environments in organizations: (1) consistent and centrally controlled; (2) diversified and locally controlled and (3) ambiguous and chaotic. In the first type, language is usually controlled

Figure 7.4 - The categories of IS Infusion and IS Diffusion



from the top and change is easier to achieve. However groupthink can set in just as easily as individual organizational members may have a tendency to be uncritical of the leader. In the second type, the group's or the business unit's own language are the most important, so conditions for innovation to flourish may be better for the individual organizational member. The drawback is the difficulty in getting corporate-wide strategies adopted by the

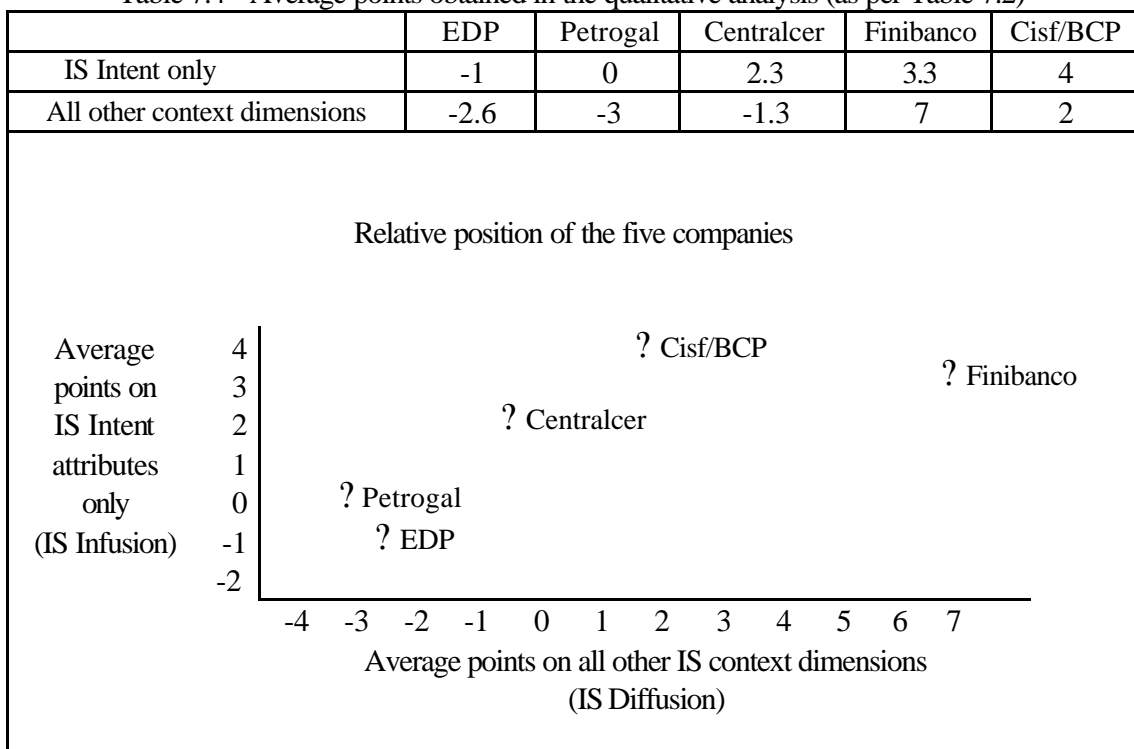
group or the business unit. In the last type of environment, language (or strategy) have no role. Individual organizational members have no guidance and the language environment has no consistency of any sort.

We believe that the three cultural paradigms or language environments may be applicable as sub-categories of IS Diffusion. Communication and language use is dependent upon the relationships between organizational members. Relationships, in turn, are related to the types of prevailing organizational values, in the organization. But communication is also dependent upon the facilitatory or inhibitory conditions created by the organization's structural conditions. Thus, we may conclude that Diffusion is the end result of the attributes of IS-related organizational values, such as discipline, trust and support and also of IS-related structural conditions, as described in Tables 6.1 and 7.2.

As we have done regarding IS Infusion, in the case of IS Diffusion we also suggest that it can be usefully sub-divided into three categories: **(1) ambiguous and chaotic; (2) diversified and locally controlled; (3) consistent and centrally controlled.** The two dimensions and the categories we have assigned to them can be seen in Figure 7.4.

Based on our interpretation of IS Infusion and IS Diffusion, we have created an analytical tool for the five short case studies. The next step was to assign the characteristics detected in the five companies in relation to IS Infusion and Diffusion. This was achieved by means of finding the average qualitative scores (from Table 7.2) for each of the five companies, according to the two new dimensions discussed above. For IS Infusion, we have used the average scores obtained for IS Intent and for IS Diffusion, we have used the average scores obtained for all the other IS-related context dimensions. Thus, we are assuming, at this stage, that both dimensions are continua, whose level increase as the numerical values (average scores) go up. The values, as well as their plotting along the two axis, can be seen in Table 7.4.

Table 7.4 - Average points obtained in the qualitative analysis (as per Table 7.2)



7.2.1.2 Some conclusions about IS corporate governance in the five cases

Looking at Table 7.2 we can see that there are fewer scores related to the attitudinal dimensions - Discipline, Trust and Support - than to the other two types of dimensions - IS Intent and structural factors. This is consistent with the results obtained from the inferential analysis, i.e. the lack of internal validity obtained from the same attitudinal dimensions. The only exception is with Finibanco where there are quite a few scores associated with the three attitudinal dimensions and only one score associated with the structural factors. This is interesting as it seems to validate the notion that the more IS corporate governance is embedded in the company's culture, the less the company has to rely on structural mechanisms (Brown and Ross, 1996).

EDP and Petrogal are typical cases of publicly own companies in Portugal, in situations of monopoly or near-monopoly, at least until very recently. Such situations are usually conducive to poor management in general and to the management of IS resources, in particular, given the lack of competitive pressures. In both cases the number of negative scores is high, indicating a number of situations where the implementation of information systems was adversely affected either by IS-related values or structural factors. The situation is changing at Petrogal in view of the managerial decision to outsource the whole IS infrastructure, but at the time of the interviews it was still too early for any real effects to be felt. EDP, on the other hand, has also gone through an outsourcing experience, although not as radical as Petrogal's (EDP's outsourcer is part of the EDP Group) and not as recent as Petrogal's. This may explain the lower level of IS Diffusion at Petrogal then at EDP. However, both organizations are in the low IS Infusion and IS Diffusion quadrant, which means that IS is perceived neither as a strategic issue nor have these organizations been able to develop (managerial) action conducive to the creation of effective IS corporate governance communication flows.

Centralcer is also a company that, until quite recently, was publicly owned although it was not in a monopoly situation. However, its privatization followed by the decision to implement the SAP software package have produced quite dramatic effects regarding the company's strategic thinking. This can be seen from the fairly high level of IS Infusion, which Centralcer shows in Table 7.3. This company is clearly in a state of transition from an old fashioned and bureaucratic style of management to a more strategically oriented style. However, strategic (IS) intent is one thing and the diffusion of such intent throughout the organization is something else. In other words, the temporal gap between managerial choice and collective learning is considerably large. This can be seen by looking at Table 7.2, where quite a few negative scores appear under Centralcer's structural factors (i.e. those which take longer to change) while some positive scores appear under the company's attitudinal IS-related values. This may show that this area (i.e. attitudinal values) is quicker to change, through managerial action, than the structural factors. In turn, this may be the explanation for Centralcer's relatively low level of IS Diffusion in relation to the two banks, but relatively high in comparison, for example, with Petrogal.

IS Infusion is also revealed through the different attitudes towards outsourcing. It is interesting to compare such attitudes at Centralcer and Petrogal. At Centralcer, the IS/IT planning function has stayed firmly in the hands of the remaining IS staff and has not been taken over by the outsourcing company, whereas in Petrogal, they have lost such control to the outsourcer. As regards IS Infusion, Petrogal is still at the stage of "strategy capitalizing on technology", i.e. Petrogal's thinking about IS is still dominated solely by cost reduction concerns and information technology is seen as a mere tool with no connection with strategy. Hence, the precipitate move towards total outsourcing. At Centralcer, however, outsourcing was more gradual and better controlled. More importantly, at Centralcer there was a concern with learning about the new software package as well as with the organizational changes needed to implement it, before embarking on outsourcing. Thus, in this company IS Infusion seems to be moving in the direction of the second stage - "strategy cultivating technology" - as proposed by Itami and Numagami

(1992). This means that at Centralcer there is a clearly strategic stance towards IS and the need to grow with the technology in order to stay competitive is recognized by the company.

The relative position of the two banks (see Table 7.3) confirms, once more, that companies in the financial services sector are the heaviest users of IT showing, therefore, the highest levels of IS Infusion as well as IS Diffusion. Although both banks appear in the high Infusion/high Diffusion quadrant, there are some interesting conclusions to be drawn from a comparison between Finibanco and Cisl/BCP.

Starting with IS Diffusion. The distinctions between the three sub-categories - ambiguous and chaotic, diversified and locally controlled and consistent and centrally controlled - become more evident when we compare the results obtained from the two banks. Finibanco is a small bank managed with a proactive and collaborative style of leadership, which is reflected in the IS Diffusion dimension. As we have suggested above, IS corporate governance at Finibanco does not need complicated structural mechanisms as much of the coordination is embedded in the informality of the bank's corporate culture. The following sentence by the information systems manager illustrates this point well: "success or lack of success in IS implementation usually stems not from macro decisions but from micro decisions, which are taken 18 times a day". In other words, Finibanco's information systems manager relies on a communications environment where negotiation and interpersonal relations are the key to the success of IS corporate governance, as opposed to rules, procedures or service level agreements. Such communications environment is consistent and is centrally controlled by the invisible hand of the bank's corporate culture.

Cisl/BCP, on the other hand, show a level of IS Diffusion lower than Finibanco. This becomes clearer when looking at the interviews and noting the degree of dissension between the top manager and the information systems manager on a number of issues. The BCP Group has experienced exponential growth over the last five years, especially after the takeover of the Banco Portugues do Atlantico (thus becoming the BCP-Atlantico Group). Between 1993 and 1998 the Group has grown 236 percent in terms of total assets, from 1.9 to 6.4 million "contos" (1 conto=1,000 Portuguese Escudos) and 200 percent in terms of staff, from 4,000 to 12,000. With a policy of high rotation of personnel within the Group, such growth has meant that the organizational climates within Group's companies have also undergone many changes, over the same period of time. This includes, of course, the IS corporate governance climate in Banco Cisl, one of the Group's companies. This, in our view, accounts for the lower level of IS Diffusion, in relation to Finibanco. At Cisl/BCP, IS Diffusion is closer to the "diversified and locally controlled" position than to the "consistent and centrally controlled" category. IS-related communication at Cisl is not homogeneous, probably meaning that IS-related communication at Group level is also not homogeneous.

Although Cisl is a very small part of the BCP-Atlantico Group (Cisl has about 130 staff), the conclusions that can be drawn from the interviews are probably representative of the whole Group. Also, because the interviews included a top manager with a key position in IS corporate governance at Group level. From these interviews, the most striking feature regarding IS Infusion

was the strategic stance on IS/IT, shared by all the interviewees. At Cif/BCP, the key strategic intent may be summed as follows: *IS/IT is to be used in very pragmatic fashion to achieve business objectives with a permanent focus on innovation.* At Finibanco the strategic intent is similar, insofar as the approach to IS/IT is also very pragmatic, but the emphasis on the permanent search for innovation is not as evident.

From the comparative analysis of Cif/BCP and Finibanco an interesting set of IS corporate governance issues stand out. (1) Is it possible to maintain both dimensions - IS Infusion and IS Diffusion - in the high/high quadrant as the organization grows and becomes more complex? (2) Is it important for organizations to achieve a situation of “consistent and centrally controlled” position on IS Diffusion? (3) How far should IS/IT drive the cognition of future strategy in companies? (4) If there is a need for a trade-off between the two dimensions what are the guidelines for a such trade-off? We will not attempt to answer these questions in any detail here and we believe that they will make good topics for further research, but it is worth making a brief comment about the two dimensions we have created - IS Infusion and IS Diffusion.

7.2.1.3 Conclusions about IS Infusion and IS Diffusion

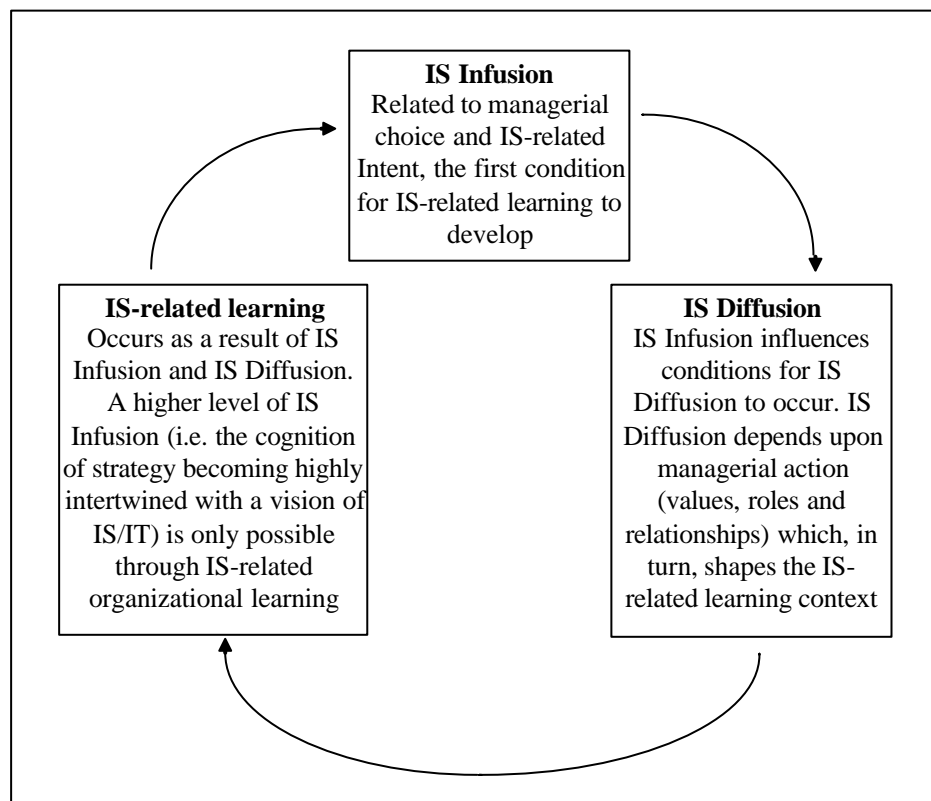
As companies invest more and more in IT artifacts IS and IT are progressively perceived as increasingly relevant as strategic factors. Thus, IS Infusion is a continuum in the sense that on a scale from not strategically relevant to highly strategically, the level of IS Infusion shows a trend of continuous growth. The question about IS Infusion, however, are the categories we have chosen to characterize such a growth - (1) strategy capitalizes on IS/IT; (2) strategy cultivates IS/IT; (3) IS/IT drives cognition of strategy. We do not have many doubts about the natural evolution from stage one to stage two, but the evolution from stages two to three seems more problematic. This is why we have formulated the question - how far should IS/IT drive the cognition of future strategy in companies? - above. In some sectors (e.g. financial services) we do not have many doubts that IS/IT will increasingly drive the cognition of future strategy, but that may not be the case in all sectors.

Regarding IS Diffusion, the problems are more complex. The reason for this is that in IS Diffusion we are not only dealing with managerial choice and strategic (IS) intent, but we are dealing, mainly, with collective (organizational) action. And collective action is more difficult to predict. IS Diffusion cannot help but to follow the general trends set by the company's overall culture, which is greatly varied and multi-faceted. As far as IS corporate governance is concerned, some companies will show a greater tendency towards a more centralized style of culture while others will favour a more diversified and locally controlled style. This may be related to size, although we do not believe that company size is the only factor. Either style may be appropriate, although it is difficult to foresee business success with no attempt at some unification or uniformization of corporate culture. So, we may say that from the two categories - diversified and locally controlled and consistent and centrally controlled - we still do not know which pattern of development might be most effective as far as IS corporate governance is concerned. However what seems sure is that IS Diffusion cannot stay in the ambiguous and chaotic category. As Earl (1996) has pointed

out, IS corporate governance needs *clarification* from the top of the organization and in an ambiguous and chaotic cultural environment, clarification is virtually impossible.

Summing up. From the qualitative analysis of the five cases we can draw the following overall conclusion. IS Infusion is related to managerial choice and to *IS Intent*, and it is the first condition for IS-related learning to develop. IS Infusion is an indirect consequence of the competitive pressures on firms to invest in IS/IT. It is indirect because, ultimately, IS Infusion depends upon the perceptions of managers about the strategic role of IS/IT in their businesses and upon the choices that such managers make. IS Infusion influences the conditions for IS Diffusion to occur. IS Diffusion is made up of managerial action, be it informal and personal (values and attitudes) or formal and impersonal (in the form of behaviour imposed by the structural factors). Together with IS Infusion, IS Diffusion creates climates or contexts related to IS/IT in organizations and which conditions the organizational learning, which can be mustered. IS-related learning completes the loop. It occurs as a result of IS Diffusion and, in turn, conditions future IS Infusion. A higher level of IS Infusion (i.e. the cognition of strategy becoming highly intertwined with a vision of IS/IT) is

Figure 7.5 - The relationship of IS Infusion, IS Diffusion and IS-related learning



only possible through IS-related organizational learning. The feedback loop we have just described can be seen in Figure 7.5.

7.3 Some conclusions about the research methodology

7.3.1 Conclusions about the empirical research

In chapter six we have stated that the challenge we set ourselves in the empirical part of the research was *to find out more about the typical components or characteristics of IS-related contexts or climates, in large organizations* and we have articulated our research question as follows: *what can we find out about IS-related values, formal roles, informal roles and structural conditions, which may improve the level of IS-related organizational learning ?* We have used two research instruments: a questionnaire with 25 items dispatched by post to 1500 managers in 300 companies, resulting in 256 individual replies from 72 companies and 16 semi-structured interviews with top, IS and senior line managers in five companies. The questionnaires were analysed both descriptively and inferentially and the interviews were interpreted in the light of the same research model that guided the construction of the questionnaire, after having been written up in the form of five short case studies. From this part of the research, the key conclusions to be drawn are as follows:

Conclusion 1 - The approach to IS implementation using the notion of organizational climates or contexts is very useful as it allows the discussion to go deeper than the vague generalizations about organizational characteristics. The method of decomposing organizational contexts into dimensions and attributes allows organizational phenomena to be dissected in some detail and conclusions to be drawn, which can be used in improving organizational effectiveness. We have followed the tradition of organizational climate research, where organizational values are the variables to be identified and, hopefully, manipulated. The problem, however, is in finding the best method to select, observe, characterize and make recommendations about such dimensions and attributes, applicable to IS implementation.

Conclusion 2 - The methods we have chosen investigate IS-related organizational contexts were not the best. The characterization of IS-related contexts in large Portuguese companies using a quantitative, descriptive method seems useful, at least to establish a broad picture of the situation. The attempt at inferential statistical analysis, however, was a waste of time. Firstly, because it is very difficult to pre-establish context dimensions, which are easily measurable. Secondly, because to be meaningful context dimensions have to be explained in some length and such explanations do not make good questionnaire items. Thirdly, because concepts such as IS Organizational Learning or IS-related Discipline are so conceptually broad that it is difficult to reduce them to a single variable. The semi-structured interviews, however, were quite successful as a research method, especially because we had a conceptually solid framework to serve as the background for the analysis. An alternative method would be to carry out the interviews based on an action-research framework, but that would require a much larger proportion of the time spent on the empirical research.

Conclusion 3 - From our empirical methods the only *the typical component or characteristics of IS-related contexts or climate, in large organizations* we have been able to identify are: (1) the IS Intent dimension and (2) the structural facilitating/ inhibiting factors related to IS corporate governance. We have reached this conclusion especially based on the analysis of the short case studies. IS Intent and IS structural factors are the dimensions, which appeared most often in the interviews, associated with causes for success of failure of IS implementation. IS Intent and IS-related structural factors are, therefore, two areas where IS research and practice should be focussed. This does not mean that there are no other relevant dimensions to be identified. We believe there are, but that would mean a different type of exploratory research, before committing oneself to this or that dimension. Unstructured interviews would be an appropriate method to carry out such exploration with no preconceived ideas.

Conclusion 4 - The attitudinal dimensions - discipline, trust and support - do not seem to be applicable to IS corporate governance in a way that is any different to their application to management in general. Discipline, trust and support affect IS corporate governance but they cannot be extracted from the general organizational context which surrounds IS corporate governance. The research methods we have used were not successful in establishing any particular relationship between these attitudinal dimensions and IS corporate governance. This does not mean that these or related dimensions are not important in IS corporate governance. What it means is that they should not be researched in the way we have done. In-depth interviews, focus groups or direct observation techniques would be more appropriate methods.

7.3.2 Conclusions about the conceptual research

Regarding the conceptual part of the research, in chapter one we put forward a proposed definition of IS organizational implementation, which we have developed throughout the dissertation. Such development starts with a fundamental concept - the concept of organizational learning. In order to explain this initial concept and expand the proposed definition to other domains, we have had to define our epistemological position vis-a-vis the concepts of organization, knowledge and learning. And in doing so we have established (in chapter two) our method for the task we have proposed to undertake - a new theoretical approach to IS implementation. The method is interpretive in the sense that organizational phenomena are regarded not as being objective reality but as being the result of interpretations or sensemaking by organizational members of the reality around them.

But the method is also based on the parallel notions of embodied cognition (Varela et al, 1991), structuration (Giddens, 1979; 1984) or the method of dialectical analysis discussed by Morgan (1997). We have adopted this method, applied to organizations by Weick (1995), as our key tool for interpretation of all organizational action. In applying enaction to organizations, Weick has added another important dimension: enaction through managerial authority. In other words, managers have the ability (granted to them by owners of the firm) to take “undefined space, time, and action and draw lines, establish categories and coin labels that create new features of the environment that did not exist before” (Weick, 1995:31). Thus, we have used the “organizational

enaction” process (discussed in chapter two), as the leading intellectual device to underpin the rest of our proposals (discussed in chapters three, four and five), regarding the links between managerial action and organizational culture, climates or contexts.

The key advantage of using organizational enaction, together with autopoiesis theory, as key methodological tools is that they have enabled us to move the research to a conceptual level much higher in the hierarchy of systems (Boulding, 1956) than, for example, conventional open systems thinking as it has been applied in much of management and organization science research (Boje, 1996). Autopoiesis theory provides many theoretical explanations and intellectual props for our arguments about the need for a more aggregate (organizational) level of analysis for the study of IS implementation. For example, autopoiesis with its tenets of self-referentiality and organizational closure, provides a compelling argument for the need to intervene at the cultural level in order to improve organizational effectiveness.

Overall, our assessment of the relative effort devoted to the of the conceptual and the empirical parts of the research is that it seems well balanced, in the light of our objectives. The conceptual issues are very complex and they are not very well understood, especially in the IS discipline. We agree with Checkland and Holwell (1998:71) when they state that there has been a “relative neglect of the concept of organization” in the field, and that most researchers “do not present well-defined models of organization, which could be used in any detailed sense to shape and guide the provision of IS within an organization”. Thus, we felt we had to spend some time establishing a solid base from which to evolve some proposals towards a new theoretical approach.

The conceptual part of the research, we think, has also reached its objectives in supplying some new concepts and frameworks for the *exploratory* empirical work in the field.

7.4 Towards a new theory (and practice) of IS organizational implementation

In the light of the discussion so far, we will outline in this section what we believe to be the key tenets of a new theoretical approach to IS implementation.

7.4.1 IS implementation must be framed within a new concept of organization

In chapter four we have suggested managerial action as a new perspective on information systems implementation, i.e.:

The managerial action approach is characterized, as the label indicates, by a bias towards action and by a clear focus on the roles and the responsibilities of management. It is an attempt to complement the top-down bias of the “organizational imperative” perspective with a bottom-up view of collective action, but it is also based on the recognition that the bottom-up “socio-technical interactionist” perspective lacks a top-down view of managerial choice. It is a middle-of-the-road approach intellectually affiliated to mainstream strategic management authors such as Nonaka and Takeuchi (1995) and Ghoshal and Bartlett (1993;1994;1998).

What is a middle-of-the-road approach in IS implementation? A middle-of-the-road approach in IS implementation is, essentially, (1) an organizational approach and (2) an action approach. It is organizational because it considers the holistic consequences of such implementation in the organization as a learning entity, as opposed to a taking a micro perspective on sectoral impacts. And it is an action approach because it tries to reconcile rational planning “on paper” with actual changes and situated learning “on the ground”. There are many organizational approaches depending upon the definition of organization, which the individual researcher adopts. The organizational metaphors discussed by Morgan (1997) are perhaps the best synthesis of organizational approaches there is. Among the metaphors of organizations as “machines”, “organisms”, “brains”, “cultures” or “prisons” there is one which brings together the two dimensions of the middle-of-the-road approach mentioned above - the organizational and the action dimensions. The metaphor in question is the “flux and transformation” metaphor.

As we have discussed in chapter two, Morgan argues that in order to discover the “secrets” of the organization, we have to understand the generative processes that link implicate and explicate orders. And he makes use of another metaphor to explain his theory - the “whirlpool and the river” metaphor. When we see a whirlpool (the implicate order) we see something objective happening in front of us and we can try to explain the phenomenon. But if the river (the explicate order) were to suddenly stop running we would be unable to provide any explanations for the phenomenon. So, in order to explain the whirlpool we need to understand its generative processes, which can only be found in the running river. Furthermore, although it is always the same phenomenon, its shape is continually changing according to the state of the water flow.

In the same fashion, the middle-of-the road approach is focussed on the generative mechanisms, which underlie the relevant phenomena in IS implementation such as, for example, organizational effectiveness related to IS/IT or alignment of IS/IT with organizational processes. Such generative mechanisms, in turn, are found in the action of organizational actors, with special emphasis on the managerial cadre. Why the emphasis on the managerial cadre? Simply because organizations have to be managed and everything in organizations

starts with managerial choices (Porter, 1991). And through such choices (which cover formal as well as informal aspects) managers are responsible for the internal organizational environments, which other organizational players help to enact (Weick, 1995). In other words, managerial action is a key generative mechanism for the creation of organizational contexts, which, in turn, influence organizational effectiveness.

So, what can we conclude about the need for a new perspective on organizations, in IS implementation? In the research literature, IS implementation is not neatly classified into this or that approach, and usually the same paper will contain two or more of the approaches to the implementation phenomenon. To the best of our knowledge, nowhere in the IS literature a single framework that brings together all the IS implementation approaches, is to be found. This makes it difficult to give the reader a quick overview of the field. Trying to bring together all the existing views on IS implementation would be almost the same as trying to put together an overview of the whole IS discipline. In other words, one's view of IS implementation will change in accordance with the definition of "information system", which one will adopt. And because the number of definitions is countless, the number of detailed views on IS implementation is equally daunting.

The conventional views on information systems (IS) implementation are very partial and cannot encompass the whole problem of the infusion and diffusion of new information technologies in the organization. We talk of the *organizational* implementation of information technology artifacts because we consider that the effects of implementing information systems cannot be pinned down to one or two areas in the organization, but are much more pervasive and continuous. Implementation should not be seen as "one-off" event, which is finished when the information systems development cycle is complete. Hence, IS implementation is a process more akin to organizational learning and change than to a single step in the methodological frameworks popularized by the technical or the strategic approaches to information systems management.

According to von Krogh and Roos (1995), organizational knowledge (and organizational knowledge development or learning) resides in both the individual organizational member and in the relations among organizational members, that is, at the social level. According to those authors, organizational knowledge has the following properties: (a) it is shared among organizational members; (b) it is scaleable and connected to the organization's history; (c) it both demands and allows for languaging. Such defining properties are not new. As long ago as 1956, Boulding defined an organization as a system, in very similar terms:

The unit of such systems is not perhaps the person but the role - that part of the person, which is concerned with the organization or the situation in question - and it is tempting to define social organizations or almost any social system as a set of roles tied together with channels of communication (p.205)

Thus, communication (as well as languaging) is the key word in any discourse, which is intended to be organizational. However, organization theory has not been able to free itself from the traditional conceptions embedded in the so-called “information processing” metaphor, which Herbert Simon has popularized of the cognitive sciences and elsewhere (Simon, 1945,1981,1997). The key difference between the autopoietic approach, which we discuss in this dissertation, and the information-processing approach is that the first views the subject as set of mechanisms for information-processing divorced from the object and the second views cognition as a phenomenon of co-emergence between the object and the subject. For organization theories inspired on the information-processing approach, organizations are not about communication. They are about decision making and about uncovering the models used by individuals in decision making.

In the opinion of the biologist and philosopher Francisco Varela (1984:31) there are signs, which show that the first position is losing support while the second is gaining “I firmly believe that there is a major change or a trend of change in our contemporary sensibilities and scientific epistemology in the sense that we are becoming more and more interested in an epistemology, which is not concerned with the *world-as-picture*, but with *laying down of a world*, where a unit and its world co-arise by mutual specification”. There are signs of similar changing trends among the medical sciences research community (Damasio, 1995) and likewise in management and the organization sciences (Boje et al, 1996). The information systems discipline should, likewise, be aware of such developments and be open to the adoption of an organizational discourse informed by autopoiesis and organizational enaction theories.

7.4.2 The role of the organization’s languaging

In drawing attention to the operationally closed nature of systems, autopoiesis brings new meaning to organizational learning. Thus, if organizations are essentially closed systems their internal growth in terms of knowledge and learning has to come from within. The environment as provider of new knowledge in the form of a constant flow of inputs into the system loses much of its previous relevance. In adopting a new paradigm upon which to model the organization and in accepting the essentially closed nature of such a systemic paradigm, languaging becomes the pivot of the new model.

The organization has no substance except for being a self-similar, autopoietic system of knowledge and distinctions. Rather it has its tradition from which new conversations can take place. It demands of its members to continue to language about it on all scales in order for it to survive or, in other words, to continue its autopoiesis (von Krogh and Roos, 1995: 98)

Languaging is the element, which allows change to come into the system, by providing an interpretive context against, which all new data is checked (through self-referentiality) before eventually becoming structurally coupled to the system (through a history of recurrent perturbations) in the form of new information. Von Krogh and Roos (1995, 1995a) build their

argumentation, concerning the use of language in organizations, around the notion of language games. According to this notion, words are considered to derive their meaning from the content of their use rather than from the object or events they denote. To play a language game (i.e. for effective action to occur) it is necessary to know its rules, that is, the particular ways in which different uses may be made of the same word. According to von Krogh and Roos, “to allow for rules and languaging that give way for effective action” (1995: 101) becomes one of the main functions of socialized organizational knowledge. Thus, knowledge development in organizations will come about through the innovative use of old and new words and concepts, in other words, through a managerial effort towards language development - “the currency of knowledge development is language” (1995a: 391).

The recognition that each organization has its unique set of concepts and phrases and that the ability to create new language is an essential component of business strategy in the future is a view shared by an increasing number of writers. Eccles and Nohria (1992) talk about the need to manage the “language cycle”, i.e. the notion that language also has a life cycle and that new words have to be introduced and old words must be discarded from the organization’s vocabulary. Along with von Krogh and Roos (1995a), van der Heijden (1996) and Czerniawsk (1997) also see the ability to manage language and conversations as a powerful new means of creating and sustaining business advantage. An example of the relationship between language use and business competitiveness is given by Czerniawsk (1997:100):

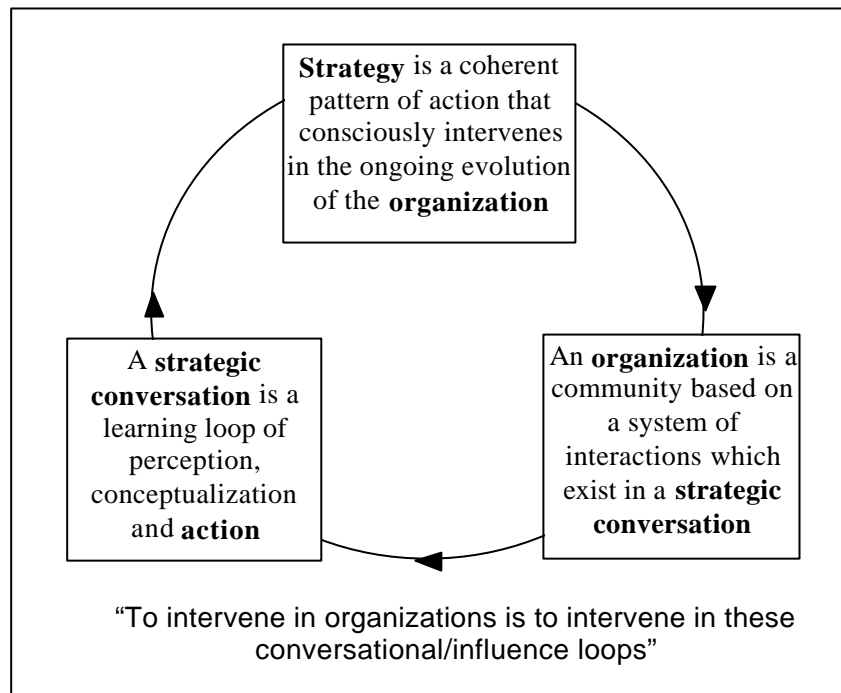
As goods manufacturers face greater competitive pressures they are forced to add service components to their core products in order to differentiate them. Language may be the next step in this evolutionary ladder: as service providers fail to find any conventional points of differentiation within their offering, they start to rely more on language. Language, we might conclude, grows in proportion to competition

Interestingly, the positive relationship between the importance of language use and the level of competitiveness suggested by Czerniawsk is exactly the same as the one we have suggested for the joint development of IS Infusion and IS Diffusion. According to our qualitative analysis, those companies, which find themselves in environments where the competitive pressures are not so heavy, show lower levels of both IS Infusion (see EDP and Petrogal). As the competitive pressures increase, the level of IS Infusion rises (see Finibanco and Cif/BCP), but the level of IS Diffusion also goes up although not following the same pattern. IS Diffusion depends to a great extent on the overall culture of the company.

Thus, given this close relationship between the level of investments in IS/IT (i.e. IS Infusion) and the level of cultural diffusion of IS, we may conclude that the processes leading to IS organizational implementation will, increasingly, come to rely on language and language management. In fact, this is especially relevant when we consider that the translation of *computerese* or *computer-speak* into common language have always been a problem in IS corporate governance. For example, does the expression *IS/IT outsourcing* mean the same to all the stakeholders ? Or, what is the true meaning of the Internet in the organization - a source of information or a new way to do business ? The management of meaning continues to be an

obstacle to IS Diffusion in organizations and a new awareness from the IS practitioners and researchers about the need to manage language will become apparent. This may also be another area for further research in IS.

Figure - 7.6
The role of language as the link between strategy and organization



Source: VAN DER HEIJDEN (1996:274)

The role of language (and languaging) in IS organizational implementation is further reinforced if we think of language as the link between strategic IS-related intent (IS Infusion) and the IS-related organization (IS Diffusion). In section 7.2.1.2 above (Figure 7.5) we had already suggested a causal loop between IS Infusion, IS Diffusion and IS-related learning, but we had not suggested a linking mechanism. Such linkage has also been proposed in the work of van der Heijden (1996) on strategy and scenario planning, in the form of strategic conversation. This author explains that strategic conversation is a product of organizational learning, which acts as the “conveyor belt” between the organization’s strategic thinking and acting and the collective body, which makes up the organization. And according to van der Heijden (1996:274) “to intervene in organizations is to intervene in these conversational/influence loops”. Figure 7.6 which summarizes the causal loop proposed by van der Heijden, highlighting, once again, the role of the organization’s languaging.

7.4.3 A new perspective on IS strategic alignment

In chapter one we had stated that one of our contributions would be the mapping out of an alternative route to achieving better results in IS implementation, i.e. the route of IS-related managerial action or leadership. We have already discussed some of the characteristics that such action or leadership should have, in accordance with our empirical results. Likewise we have discussed, in some length, that IS-related managerial action or leadership have to find expression in organizational language and languaging. Now, what remains to be carried out is a synthesis of all these elements into a new compound, which is attuned to current business terminology. Such synthesis will take the form of an alternative perspective on IS alignment.

In chapter four, when we discussed Earl's (1996) model for strategic alignment of IS we made a reference to the MIT study *Management in the Nineties* (Scott Morton, 1991) and stated that for the contributors to this study the overall effectiveness of IS implementation was attributed to the quality of the alignment achieved between the strategies for IS/IT and the organization's strategies. While strongly agreeing with the causality suggested by the MIT researchers, we differ a great deal with these researchers in what concerns the contents of such alignment and especially the means by which IS alignment is achieved.

For the MIT team, IS alignment is a mechanistic process achieved by a series of iterations between "anchors" (e.g. the IT strategy), "pivots" (e.g. the business strategy) and "impacts" (e.g. the organizational infrastructure and processes). Domain anchors provide the change forces, domain pivots are the problem areas being addressed in that particular iteration and domain impacts are the components affected by changes to the domain pivot. According to this conception of alignment, the key problems to be addressed are where to start the iterations, the direction of rotation (e.g. from the IT strategy domain to the business strategy domain or vice-versa) and how many times to go around the four different domains (MacDonald, 1991).

IS alignment is not, however, as simple as the MIT might us lead to believe it is. In his deconstruction of the concept of strategic alignment, Ciborra (1997:70) makes the following observation:

What happens when we link the boxes of strategy, organization and IT on the "diamond diagram"? It changes our representation of the interdependencies between some key business variables. We obtain a new geometrical representation that materializes the idea of "alignment" in front of our eyes (...) When focussing on the geometrical representation of business variables we tend to grant them essence and existence: it is an ideal, perfect world to which the real world has to conform

In the modified version of the MIT model (named SAM - Strategic Alignment Model) Earl's (1996) model (named OFF - Organizational Fit Framework) offers a different perspective on IS alignment. Instead of a construction model, Earl proposes an observation model, i.e. a check-list of factors, which must not be ignored when trying to integrated IS/IT and the

organization. As the outcome of his model, Earl offers four observational platforms from which to oversee the IS-organization alignment as it unfolds. Such platforms are the four processes we have discussed in chapter four: the clarification, the innovation, the foundation and the constitution processes.

Although it has a distinctly more organizational slant than the MIT's SAM, Earl's OFF model still suffers, as we have pointed out in chapter four, from an overly rational and abstract perspective of organizational life. Although useful as check-list headings, processes such as "clarification", "innovation" and "foundation" are not truly organizational in the sense that they do not emanate from any socially-based actions or events. They may be called managerial processes because they emanate from business-led or from managerial choices. The constitution process, however, is different because it is directly related to the people in the organization and their actions (their values, roles and relationships). The constitution process is a consequence of the managerial processes but it is also at the root of further managerial choices. It is another example of the organizational enaction or structuration processes we have discussed several times throughout the dissertation. Thus, placing the constitution process at the center of the framework and making it interact with the other three processes, it becomes clearer what makes the OFF model function.

In order to function effectively, IS corporate governance needs, more so than other functional areas, a climate of cooperation. Other functional areas in organizations also have processes, which can be called *constitutive* and which become instrumental in their governance. For example, the marketing function tries to instil values such as "customer is king" and production tries to create a quality ethos by insisting on message "right first time". IS corporate governance too needs specific IS-related values, which will bring together the various stakeholders around a common concern: managing information systems in line with the strategies and policies defined for the organization as a whole. We therefore concur with Keen (1991:214) when he emphatically argues that:

The key to alignment is relationships, not "strategy". There is nothing about IT that makes it any more difficult to manage than finance, marketing, production or human resources. The real problem seems to be the history of relationships or lack of relationships in most organizations: the growth of the data processing and telecommunications professions as a technical elite isolated from the wider business; business managers' inexperience with and fear, suspicion, abdication and delegation of IT; business units' dependence on a central IT monopoly and later rejection of it; and a mismatch between business and IT planning processes, accounting, responsibilities and knowledge.

Relationships, along with roles and values are, in our view, the basis of the process of alignment. Interestingly, we believe that (stronger or better) alignment is also the solution to the problem of the cultural gap or "disconnect" (Wang, 1994) between IS and business management. But the question that both IS and business managers want an answer for is "how is alignment achieved in practice?". In line with our arguments so far, we suggest that alignment achieved through **(1) a new language for IS corporate governance; (2) Distributed IS leadership.**

(1) A new language for IS corporate governance

Eccles and Nohria (1992) argue that a new language for strategy is looming. They suggest that the discourse of strategic management is changing from a quantitative orientation to a qualitative orientation and from a factual emphasis to an attitudinal emphasis. As an example, they compare Hamel and Prahalad's (1989) notion of strategic intent with the more traditional view of strategy (see Table 7.5).

Table 7.5 - Old and new strategy as described by Hamel and Prahalad

| Traditional View | Strategic Intent View |
|---|--|
| Trimming ambitions to match available resources | Leveraging resources to achieve seemingly unattainable goals |
| A search for niches | A quest for new rules |
| Reducing financial risk | Reducing competitive risk |
| Conforming to financial objectives | Allegiance to a particular strategic intent |
| Tightly restricting the means the business uses to achieve its strategy | Allegiance to intermediate-term goals ... with lower-level employees encouraged to invent how those goals will be achieved |

Source: Eccles and Nohria (1992)

The strategic intent view is also applicable to the IS-related organizational value we have called *IS Intent*. In our empirical research, the interviewees from companies showing the highest levels of IS Infusion and Diffusion had a discourse, which emphasized intent or commitment, rather than planning or procedures. The key concern of such language, especially in the two banks, was in making IS/IT relevant to the business and in both cases it seem to be approaching the position of the *IS/IT drives cognition of strategy* category.

Ciborra (1997) suggests the adoption of a new language to promote the alignment of IS and the business, a language emphasizing *care, hospitality* and *cultivation*. These expressions imply values that managers should adopt in relation to the technology, when exerting their managerial choice. While agreeing entirely with Ciborra, we believe that the new language should also encompass issues, which do not depend only on managerial choice but which encompass also bottom-up business concerns. The new language should also emphasize values such as *clarification, innovation, negotiation* and *local autonomy*.

As we have discussed in section 7.4.2 the role of the organization's languaging in IS implementation is a very important area for further research. The research question here would be to go deeper into organizational languaging and probe languaging characteristics specifically related IS corporate governance, which may help in the process of IS implementation.

(2) Distributed IS leadership

Alignment, like climate or context in organizations, is something, which is formed by forces, which are *constitutive*. We submit, therefore, that IS strategic alignment depends upon the IS-related climate or context achieved, first and foremost, through IS-related distributed leadership, as defined by Schein (1980). According to that author, leadership is *a distributed set of functions* rather than the behaviour of an individual leader. Such functions can be the articulation and transmission of basic purpose, the monitoring of progress, supporting, clarifying, testing consensus, rewarding, punishing and so forth on all IS-related issues and at all levels in the organization. Likewise, IS-related leadership should be seen as the responsibility of every manager in the organization and not as the sole responsibility of the IS Director. Thus, we suggest the adoption of the “double-triangle” model of IS roles discussed in chapter five (see Figure 5.3) as a framework for distributed IS leadership.

In order to function, this model needs appropriate IS corporate governance structures. Structural mechanisms cannot be replaced entirely by organizational culture or climates. As we have tried to demonstrate through our conceptual development and empirical work, structural factors are part of the constitutive dimensions of organizational contexts and their importance should not be discounted. Hence, in order to achieve alignment between IS and the business mechanisms such as top management direct supervision of the IS function (i.e. CIO-type of functions), cross functional teams, job rotation in and out of the IS function, IS/IT committees, human resources policies targeted at developing hybrid managers and structures which facilitate local cooperation, must be put into place.

Furthermore, IS-related leadership should not be seen as being exclusively concerned with technical issues related to IS development, acquisition or outsourcing, but with much broader managerial concerns, such as (1) *clarifying* IS/IT issues in terms of business objectives; (2) actively promoting the search of IS-related *innovation* and (3) rallying the organization around the cost-effective maintenance of the IT *infrastructure*. These are the three managerial processes put forward by Earl (1996) which, as we have suggested above, structure and are structured by a higher level process also proposed by Earl - the constitution process. The three managerial processes and the three formal roles from the top triangle form the matrix, which has been described in chapter 5 (see Table 5.2). This, in turn, is a prescriptive framework based on IS corporate governance roles, which operationalizes and serves as a basic set of guidelines for IS leadership as a distributed set of functions. The key objective of such guidelines is to foster an ethos conducive to the formation of a “matrix mind set” (Ghoshal and Bartlett, 1990), as discussed in chapter three.

7.5 The contribution of this dissertation to the LSE school of thought in IS research and suggestions for further research

In line with one of its major themes, we perceive the whole of this dissertation as an exercise in organizational learning. We have started and developed our work under the academic influence of the London School of Economics' Department of Information Systems. We have learned old concepts and we have formed new ones, but we have also been able to reflect upon the major trends or lines of academic thought within this Department. Thus, we would like to feed back into the Department the conclusions of our research project as well as our suggestions for further research.

As we have suggested in the introduction to this chapter, the LSE's IS Department has, over the years, explored organizational aspects of IS implementation. However, although many researchers have voiced the opinion that a more organizationally-oriented approach is needed, strategy, organization theory and organizational behaviour still do not have the place they deserve in the Department's research efforts. We hope our dissertation can contribute towards the filling of such a gap.

In his work of the management of change, articulated as a set of guidelines for information systems implementation, Land (1992) takes up the issue of organizational climate, following on from his research on the impact of IT in organizations (1983; 1983a). He states that "for effective transfer of technology into the workplace it is essential that those who will be affected by the change share values and visions" (1992: 149). Land makes various recommendations for the creation of a climate favourable to the implementation of IS. He does not try, however, to go into the components of organizational climate, as we ourselves have tried, in this dissertation. The knowledge that climate is made up of organizational values and of structural factors, for example, is an important input to the management of change, which Land and other authors have approached, in IS research.

Angell and Smithson's (1991) book *Information Systems Management: opportunities and risks* is a sustained attack on the conventional wisdom on IS planning. They state "a blinkered faith in planning, and using the past as a mirror to the future, is likely to lose the initiative by constraining the understanding, insight and lateral thinking of quality employees" (p.47). As an alternative, these authors suggest a strategy of keeping small because small is flexible and small is controllable. The problem, however, is that very often is not possible to keep small. Constant mergers and acquisitions are a fact of life and the secret of strategic management becomes how to make size compatible with staying flexible and in control. This, of course, applies to IS governance in the same way that it applies to corporate governance in general. In this dissertation we hope to have pointed the way for a new perspective on (IS) strategy, a perspective which enables large and flexible to coexist. The new perspective we have introduced is founded upon the renewed emphasis on managerial action and is offered as a "middle-of-the-road" approach to strategy. We hope this approach can be developed further in the IS Department.

Finally, we expect to have contributed to a better understanding of “action” approaches to management and to have extended the Department’s knowledge base on this topic. As discussed in chapter four, Ciborra and Lanzara’s (1994) develop the notion of “action” based on the action theory put forward by Argyris (1977), Argyris, Putnam and Smith (1985) and Argyris and Schon (1978;1996). This is one conception of action, which is focussed mainly on the behaviour of individual actors rather than on group or collective action. In the same chapter, we make a reference to the work of another member of Department - Introna (1997) - and to his conceptions of “management as manus” and “the manager involved in-the-world”. Introna explores yet another angle of action in the managerial world. Inspired on hermeneutics, autopoiesis and the philosophy of Heidegger and Foucault, Introna discusses the situated and unscientific nature of managerial work permanently driving and being driven by networks of power. Sharing much with the writings of Ciborra and Lanzara (1994) and Introna (1997), we contribute, in this dissertation, with another conception of action. Our conception is based on organizational and business-oriented values. Hence, for us action is made up of values-driven managerial activity purposefully aimed at establishing contexts for collective learning and change.

As regards other suggestions for further research in more specific domains of information systems, we put forward the following:

(1) The relationship between IS Infusion and IS Diffusion we have mentioned in section 7.2.1.2. We recall the four research questions we have placed then: (i) Is it possible to maintain both dimensions - IS Infusion and IS Diffusion - in the high/high quadrant as the organization grows and becomes more complex? (ii) Is it important for organizations to achieve a situation of “consistent and centrally controlled” position on IS Diffusion? (iii) How far should IS/IT drive the cognition of future strategy in companies? (iv) If there is a need for a trade-off between the two dimensions what are the guidelines for a such trade-off?

(2) The bottom triangle in the “double-triangle” model of IS implementation we have discussed in chapter five (section 5.3.2). We suggest three research questions regarding the organizational implementation of IS: (i) What is the contribution of the end-users? (ii) What is the (new?) role of middle (i.e. junior) managers? (iii) What are the characteristics of IS-related learning in the bottom triangle?

(3) The final suggestion we would like to put forward concerns a new general management topic, which has many implications for the organizational approach to IS implementation. The topic is **the management of intellectual capital (IC)**. Interest in this area has spread rapidly since 1994 with the publication by the Swedish insurance company Skandia of a supplement to their annual financial report, titled *Vizualizing Intellectual Capital*. The idea is simply to acknowledge that what make organizations more valuable is not financial capital but intellectual capital. As Edvinsson and Malone (1997:44) explain, “intellectual capital is the possession of the knowledge, applied experience, organizational technology, customer relationships and professional skills that provide Skandia with a competitive edge in the market”. Furthermore, they argue that intellectual

capital is made up of human capital and of structural capital. Structural or organizational capital (as it is also known) is the ensemble of invisible assets embedded in the organization's skills, structures and processes, including all the IS and IT, which give and receive support from such skills, structures and processes.

Some of the goals of IC management are (1) to identify and enhance the visibility and measurability of intangible assets; (2) to capture and support packaging and accessibility by knowledge-sharing technology; (3) to cultivate and channel IC through IT networking (Edvinsson and Malone, 1997:45). All of these goals involve the development, the use, the management and the evaluation of information systems. With the exception of Earl (1994), the IS research community has been rather oblivious of this new management challenge, although it seem to be an excellent opportunity to turn the spotlight onto the problems faced by IS as a discipline. IS assets are also invisible assets and a problem that IS practitioners and teachers have always had is "how to make information systems more visible (and more credible)". This is exactly the same concern as that put forward by the proponents of IC management. Thus, we suggest that this an important topic to be pursued and that our organizational approach and research framework (but not necessarily the same empirical research methods) may be a useful input.

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Appendices

Appendix 1

Initial questionnaire for first set of interviews

The following methodological keys and instructions about how to answer the questions were part of the introduction to the initial questionnaire, which was presented to about 30 interviewees. Ten of the interviews (IS lecturers and researchers) were carried in English and the others (IS managers) were carried out in Portuguese. For the interviews in Portuguese the introductory text and questions were translated into Portuguese.

- ? Five identical copies of the questionnaire sent to each company, one to be filled by the Top Manager (the member of the Board of Directors) directly in charge of IT/IS management in the company, another to be filled by the IS Manager and three to be filled by three first line (senior) managers. There was a recommendation that the three line managers chosen should be those in charge of the largest number of IT end users in the company.
- ? For purposes of the questionnaire, Information Technology (IT) should be taken to mean the ensemble of hardware, software and communication technologies in use in the company. The expression Information Systems (IS) should be taken to mean the “system” made up by IT and the contents of the information as well as all the rules, procedures and methodologies necessary for the system to function. It should also be noted that when talking about management tasks it was often difficult to make a clear distinction between IT and IS and sometimes the acronym IS/IT has been used.
- ? Confidentiality about the replies was assured. No individual results (either about individual respondents or individual companies) would be divulged in any way. Only aggregate results would be used.
- ? Respondents were asked not to discuss their replies among themselves and also to answer as sincerely as possible
- ? Replies to each statement should be given twice: (1) regarding the respondents’ perceptions about the way things do happen in their companies at present, i.e. the **actual situation** and (2) regarding the respondents’ perceptions about the way they feel things should happen, i.e. the **desirable situation**
- ? Replies should be given on the following six-point scale:

- A - Agree Totally**
- B - Agree to a Large Extent**
- C - Agree a Little**
- D - Disagree Somewhat**
- E - Disagree to a Large Extent**
- F - Disagree Totally**

? The following acronyms were used:

- TM - Top Manager (member of the Board of Directors with oversight of the IS/IT function)**
- ISM - Information Systems Manager**
- SLM - Senior Line Managers**

Questions

The column on the left shows the latent variable assumed to be associated with the questions (not shown in the interviews with the IS managers)

| | |
|-------------------|--|
| IS Intent | 1. The TM is personally involved in major decisions regarding IS at corporate level as opposed to delegating such decisions on the ISM (e.g. establishing company-wide IS priorities) |
| | 2. The TM recognizes that there are benefits in managing data at corporate level as part of the realization of a company-wide policy for the management of all information resources (i.e. information technology + information content) |
| | 3. In making financial resource decisions regarding IS, the TM is aware that business benefits associated with some investments in IT are sometimes not immediate or tangible benefits (e.g. an IT-based customer support service) |
| | 4. The ISM shares the TM's vision about how IS will support the business in the future, i.e. how the company's IT architecture relates to the business strategy |
| | 5. SLM understand their new responsibilities in IS/IT management in the company, i.e. taking over from the ISM many of his/her old responsibilities in establishing short and long term strategies for the development of IT applications at department/division level |
| | 6. The TM understands the need to clarify the company's strategy in terms of its IS needs, thus affecting the ISM and the SLM in their IS management capacities |
| | 7. The TM challenges the way that IS is managed in the company thus making the ISM and the SLM re-think the status quo (e.g. suggesting outsourcing possibilities as a way of concentrating more on the core business) |
| Discipline | 8. SLM have realistic expectations regarding systems delivery and other IT services provided by the ISM's department (e.g. a Help-Desk for day-to-day end-user difficulties) |
| | 9. The ISM is seen to have a credible track record regarding timely systems delivery and providing other IT services timely and appropriately |
| | 10. The TM recognizes that IS cannot be managed with a short-term time frame |

| | |
|--|--|
| | <p>and that there is a need for consistency regarding company-wide IS policies over time</p> <p>11. The ISM understands the need to keep a balance between “technological perfectionism” and business performance (e.g. a system performing at 100% efficiency but taking 6 months to deliver versus an urgently required system performing at 60% efficiency but delivered in two weeks)</p> <p>12. The SLM accept the need to respect IT standards and recognize the costs and benefits associated with those standards (e.g. purchasing a non-standard office automation equipment now can cost an additional X thousand Pounds to the company in maintenance over the longer term)</p> |
| Trust | <p>13. The TM recognizes that IS management is increasingly becoming a line management function and that line managers must be given equal treatment to IS managers on departmental/divisional IT/IS management issues, as regards their professional competence</p> <p>14. The ISM demonstrates by his/her actions that that line managers are competent to take ownership of most IT resources within their functional areas</p> <p>15. The TM is aware of the need for fostering an information sharing environment (e.g. by promoting the idea of company-wide “information guides” or commonly accessed databases) as part of the development of the company’s information architecture (i.e. the enabler of a company-wide usage of data with common definitions)</p> <p>16. SLM are seen to be actively involved in IS/IT management decisions regarding their departments/divisions (e.g. in the planning and implementation of a strategy for further development of human resources in applicational software)</p> |
| Support | <p>17. The TM understands the need to give SLM equal testament to the ISM as regards IT/IS management at departmental level and specifically concerning financial and human resources, including the autonomy to use such resources</p> <p>18. SLM understands that a large proportion of IT learning by end-users at the local level is local and informal and that, therefore, conditions for such learning to occur need to be created (e.g. allowing some local experimentation with the technology)</p> <p>19. The ISM is aware of its new role of “internal consulting” (i.e. acting as “consultants” to the line departments on IT-related issues) as well as of the need for IS staff to acquire good negotiation, coaching and inter-personal skills in general</p> |
| Facilitators/Inhibitors of IS Organizational Learning | <p>20. The existing IT/IS policy for the company includes explicit mechanisms for integrating IS Management and line management on IT/IS issues (e.g. IT advisory committee, cross-functional job transfers, joint project management, etc)</p> <p>21. The existing organizational structure is adequate for a quick and effective resolution of most of the day-to-day issues, which involve the ISM and SLM (e.g. a “federal” system where the management of the IT infrastructure is centralized in the IT Department and systems development is decentralized to departments/divisions)</p> <p>22. The existing policy for the development of human resources in the company</p> |

| | |
|--|--|
| | gives high priority to the development of IT-related skills (e.g. in the recruitment of IS management specialists) |
| | 23. The technical quality of most IT applications is seen as adequate in relation to the purposes for, which they were developed (e.g. the response time of the company's LAN) |
| | 24. In the company the "us and them" attitude as regards IT staff versus IT users has been satisfactorily resolved |
| | 25. The company has an incentive system, which is appropriate to deal with the existing demand on staff with appropriate IT skills |
| IS Organi- zaional Lear- ning | 26. In the last five years there has been a move from IT service levels determined by the IS Department to IT service levels determined by negotiation between the ISM and SLM |
| | 27. In the last five years there has been a move from mainly use of formal channels for the communication between the ISM and SLM to a true understanding of each other's roles |
| | 28. In the last five years there has been a move from IT/IS planning carried out as a separate exercise to a complete integration of IT planning into business planning |
| | 29. In the last five years there has been a move from ad-hoc attempts to build a corporate-wide IT infrastructure to a firm-wide commitment to maintaining an IT infrastructure that supports the company's strategic objectives |
| | 30. In the last five years there has been a move from an IT infrastructure, which is inflexible and restrictive of business initiatives to an IT infrastructure, which is flexible and facilitatory of new business initiatives |

Appendix 2

The Information Systems Management Function in Large Companies in Portugal: an organizational study

Preliminary Report

(Translation with minor adaptations from an original written in Portuguese)

Rodrigo Magalhães *

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The Information Systems Management Function in Large Companies in Portugal: an organizational study

Preliminary Report

1. Introduction

The main objective of this study is to survey the general state of the information systems (or informatics) management function, in terms of its climate, in large companies in Portugal.

Being a field with much study, research and systematisation yet to be accomplished, even at the international level, it still poses serious problems to managers. Always concerned with the evolution of such managerial issues, the UCP, in line with the same innovative spirit that made it the first University to offer management degrees in Portugal, gave its support to this research project with the academic backing from the Department of Information Systems of London School of Economics, itself also a pioneer in Europe, in the study and research of information systems management in organizations.

This report presents conclusions from the study in a merely descriptive way. Although a description of the present situation of the Information Systems Management function in the large companies in Portugal fulfils the main objective of this particular report, a deeper analysis of the data gathered will be pursued within the context of two wider academic projects (a Master's dissertation and a PhD thesis). A summary of such analysis as well as the theoretical foundations of the methodology will be made available to those companies, which are interested.

This study has been kindly sponsored by the Fundação Luso-Americana para o Desenvolvimento - FLAD.

2. Methodology

The method used to obtain the necessary data was a postal survey of the largest 300 companies in Portugal.

The first part of the construction of the questionnaire consisted on a initial draft of 31 statements reflecting the typical set of activities, tasks, attitudes and relationships in the daily life of a large company, presented from the point of view of the three major stakeholders in the governance of the IS function: the Top Manager, i.e. the Member of the Board of Directors in charge of the IS

function (TMs), the Information Systems Manager (ISMs) and the Senior Line Managers (SLMs).

After some refinement, a preliminary version served as the basis for a set of 30 validating interviews with 10 researchers/lecturers from the field of information systems in the UK and 20 information systems managers in Portugal between May and June 1997. There were two types questions presented to the interviewees. Firstly, they were asked to express their opinion about the adequacy of the statements, in relation to the objectives of the study as well as about any eventual misunderstandings that the statements might cause. Secondly, they were also asked to give suggestions for new statements in the light of their knowledge of the current trends in information systems management (both in terms of factual development and in terms of the relationships between stakeholders). It was also requested from the information systems managers that they expressed their views in relation to the specific situation in Portuguese companies.

The result of these interviews was a reformulated questionnaire made up of 25 statements. Each statement was to be answered on a six-point Likert scale ranging from “strongly disagree” to “strongly agree”. The six-point scale was used in order to avoid “neutral” answers at a mid-point. In each statement respondents were asked to answer in relation to two situations:

- (1) **the actual situation**, that is, how things are in the company **now**
- (2) **the desirable situation**, that is, how things **should happen**, not in an ideal sense but in a sense of potentially attainable

Prior to the survey, a letter from the Dean of the School of Economics and Management of the Portuguese Catholic University in Lisbon was sent to the CEOs of the selected 300 companies, asking for their cooperation.

The sample of surveyed companies was made up of the 300 largest Portuguese companies (in accordance with volume of sales figures) with more than 100 workers. The company data was taken from Dun and Bradstreet’s listing of Portuguese companies (Dun PEP, 1996), from, which the following types of companies were selected:

- ? the largest 235 companies with 100 employees or more from the general listing of companies
- ? the largest 34 banks with 100 employees or more from the financial sector listing
- ? the largest 31 insurance companies with 100 employees or more from the financial sector listing

The criteria used in the choice of this sample were as follows. Firstly, the sheer size of the companies (hence, considering volume of sales and number of workers over 100). This criterion arises from the need to base the study on organizations that are susceptible to the problems associated with large numbers (people, budgets, hardware, software, etc). Secondly, the so-called "IT/IS intensity" factor was also taken into consideration. Under the IT/IS intensity hypothesis, it is assumed that the problems associated with IS management are related not only to the size of the company but also to level of investments in information technologies. This assumption is "a priori" and still lacks empirical evidence. Hence, in order to comply with this hypothesis, the largest 34 banks and the largest 31 insurance companies as institutions that use IT intensively, were included in the sample of the 300 largest companies.

In September 1997, five copies of the questionnaire accompanied by a letter from Rodrigo Magalhães were addressed nominally to the CEO of each company explaining the objectives of the study and also requesting that the questionnaires be answered by the people occupying the following functional roles:

- ? the Member of the Board of Directors in charge of IS policy and management;
- ? the IS Manager;
- ? three Senior Line Managers whose work involves the management of departments or divisions with a reasonable number of IT end users (PCs or terminals).

Each questionnaire, printed in four A-4 pages, was accompanied by a letter explaining the objective of the study and giving some guidelines and instructions for completion of the questionnaire. The five questionnaires were absolutely identical, with the exception of the one destined to the Information System Manager, which had an additional one-page questionnaire aimed at collecting some quantitative data about IT and its organization in the company.

In order to ensure, as far as possible, honest answers and avoid exchange of opinions among the respondents they were asked to mail the questionnaire directly to one of the authors in a self-addressed postage paid envelope.

The 1500 questionnaires (300+300+900) were printed in three different colours, one for each group of managers, so that they could be distinguished. The questionnaires sent to each company were also numbered so that it was possible to reunite them upon receipt.

3. Data Analysis

3.1 General Analysis

The initial deadline for receipt of the questionnaires was 15 October 1997, but the answers kept arriving at a very slow rate. At the end of October it was decided to postpone the deadline until December and initiate follow up action in the form of phone calls to the companies, which had not yet responded. As a result, it was only possible to start the data analysis as from January 1988.

3.1.1 Response profiles

256 answers were received from the 1500 questionnaires sent, representing a total of 72 companies with the following distribution:

| Type of company | Number of companies approached | Number of responding companies | Response rate |
|-----------------------------|--------------------------------|--------------------------------|---------------|
| From general listing | 235 | 53 | 22.6% |
| Banks | 34 | 10 | 29.4% |
| Insurance companies | 31 | 9 | 29.0% |
| Total | 300 | 72 | 24.0% |

In what concerns the three type of managers surveyed the answers were grouped according to the following table:

| Type of manager | Number of questionnaires sent | Number of questionnaires received | Response rate |
|------------------------------------|--------------------------------------|--|----------------------|
| Top managers (TMs) | 300 | 60 | 20.0% |
| IS managers (ISMs) | 300 | 56 | 18.7% |
| Senior line managers (SLMs) | 900 | 140 | 15.6% |
| Total | 1500 | 256 | 17.0% |

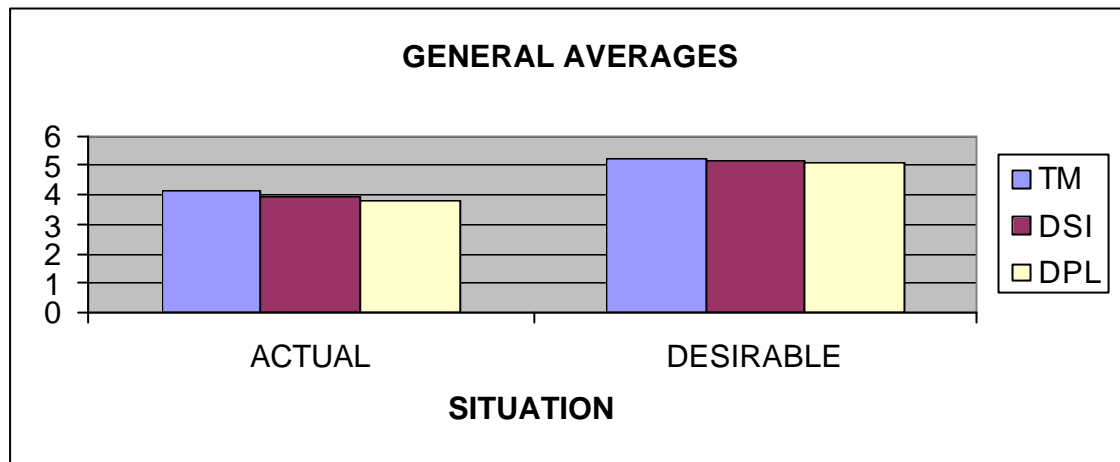
From this, we might infer that top managers are more receptive to this kind of issues, immediately followed by the information system managers.

From the 72 respondent companies, only 45 have sent replies from the TMs the ISMs and at least from one SLMs. Only 18 of these companies sent back the five questionnaires properly answered.

| Type of company | Number of companies approached | Number of companies with replies from TMs, ISMs and least one SLM | Number of companies with five replies |
|-----------------------------|---------------------------------------|--|--|
| From general listing | 235 | 32 | 12 |
| Banks | 34 | 6 | 3 |
| Insurance companies | 31 | 7 | 3 |
| Total | 300 | 45 (15%) | 18 (6%) |

3.1.2 General Indicators

Before showing the results for each statement or sets of statement, some tables containing general indicators will be presented. For each situation – **actual** and **desirable** – and each type of manager (TMs, ISMs and SLMs) the averages of 25 answers were computed (on the basis of the scale 1 to 6). Next, the average per group of managers was obtained for each situation – actual and desirable.

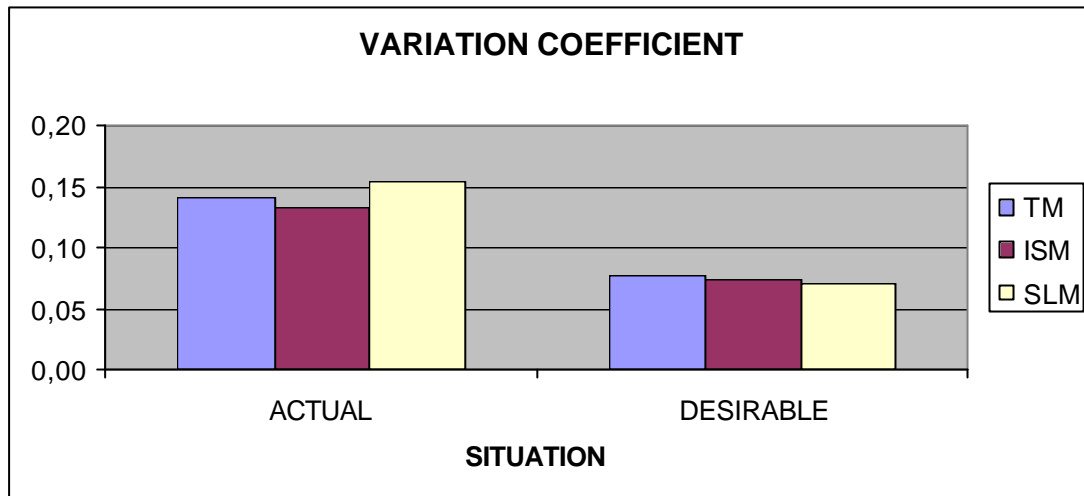


From the 25 statements in the questionnaire, only one was presented in the negative – question 11. For this question the scale was inverted (6 to 1). Hence, it would be reasonable to expected scores for all the questions higher in the desirable situation than in the actual situation, unless a misinterpretation of the statement occurred, resulting either from inadequate wording or from ambiguity in the meaning of the statement.

Variation coefficient

A variation coefficient was calculated for each group of managers and for each situation – actual and desirable. This variation coefficient (the quotient between the standard deviation and the average) is an indicator of the dispersion of the answers in each group. The variation coefficients obtained show that there is less dispersion of the scores in relation to the desirable situation than in relation to the actual situation, within each group of managers. This difference is explained by the diversity of opinions found in each company in relation to a variety of real situations **now**, vis-à-vis a more theoretical scenario somewhere in the future, where opinions seem to be more consensual.

From this we may conclude that **the results in relation to the actual situation are richer in content than the results in relation to the desirable situation**. We regard the former, therefore, as more reliable than the latter concerning any kind of inferences we may wish to make in relation to the governance of information systems (or informatics) in large Portuguese companies.



Based on the scores obtained, indicators of **satisfaction**, **optimism** and **expectancy** were computed for each group of managers.

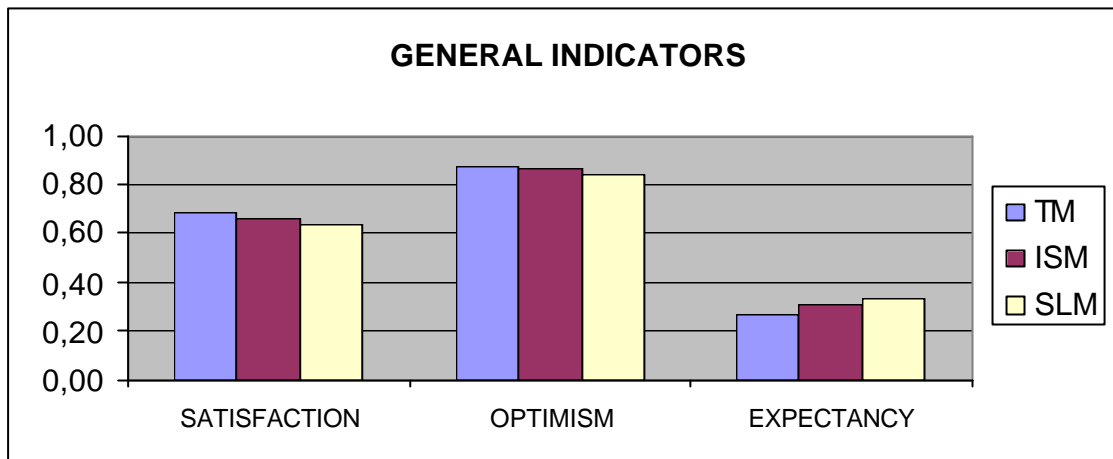
Satisfaction, Optimism and Expectancy indicators

The **satisfaction indicator** compares the average scores obtained for the actual situation with the maximum score possible. This indicator is calculated, for each group of managers, as the ratio between the average obtained for that group of managers in the actual situation and the maximum value in the Likert scale (6).

The **optimism indicator** compares the average score obtained for the desirable situation with the maximum score possible. This indicator is calculated for each group of managers as the ratio between the obtained average for that group of managers in the desirable situation and the maximum value in the Likert scale (6).

The **expectancy indicator** compares the difference between the average score of both situations (actual and desirable) with the situation, which is experienced in the company presently (actual situation). This indicator is calculated for each group of managers as the ratio between the difference of the averages obtained for that group of managers in both situations (actual and desirable) and the average score for the actual situation.

These three indicators are shown in the graphs below. The differences between the mean scores of the three groups of managers have been tested statistically. The differences are significant at $\alpha=0,05$ in all groups of scores, except in Questions 2, 3, 4, 20 and 25 where there are some differences, which are not significant (see Annex 1).



These results indicate, in a general way, **a larger degree of satisfaction on the part of the TMs** than is case with the ISMs or the SLMs. The SLMs seem to be the ones less satisfied with the actual situation. Concerning the optimism in relation to the desirable situation, there is the same tendency: **TMs are the most optimistic** followed by the ISMs. The SLMs are the most conservative in this respect. Yet, the situation changes completely in terms of expectancy in relation to a change from the actual situation to the desirable situation; here, the **SLMs are the highest on expectancy**, that is, they seem to consider change a bigger challenge than is the case with the ISMs or the TMs.

Table 1 in the next page shows a general summary of the results.

Table 1

| | | | QUESTIONS | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|---------------|----------------------|---------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---------|------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | AVERAGE | |
| TMs | ACTUAL | AVERAGE | 4.57 | 4.77 | 4.68 | 4.03 | 4.37 | 4.67 | 4.98 | 4.47 | 3.76 | 4.12 | 3.00 | 4.78 | 3.10 | 4.53 | 4.52 | 3.52 | 3.80 | 4.00 | 3.56 | 3.82 | 3.56 | 4.24 | 4.03 | 4.05 | 4.22 | 4.12 | |
| | | STD DEVIATION | 0.89 | 0.98 | 0.91 | 1.15 | 0.90 | 0.95 | 0.95 | 1.01 | 1.13 | 1.02 | 1.25 | 0.84 | 1.32 | 1.10 | 0.95 | 1.35 | 1.16 | 1.06 | 1.30 | 1.16 | 1.34 | 1.04 | 1.04 | 1.25 | 1.11 | 0.58 | |
| | | VARIAT.COEFF. | 0.19 | 0.21 | 0.19 | 0.28 | 0.21 | 0.20 | 0.19 | 0.23 | 0.30 | 0.25 | 0.42 | 0.18 | 0.43 | 0.24 | 0.21 | 0.38 | 0.31 | 0.26 | 0.37 | 0.30 | 0.38 | 0.25 | 0.26 | 0.31 | 0.26 | 0.14 | |
| | DESIRABLE | AVERAGE | 5.75 | 5.72 | 5.68 | 5.40 | 5.55 | 5.62 | 5.75 | 5.38 | 5.36 | 5.61 | 3.66 | 5.47 | 3.75 | 5.37 | 5.43 | 5.02 | 5.37 | 5.67 | 4.92 | 5.23 | 4.10 | 5.14 | 5.12 | 5.27 | 5.38 | 5.23 | |
| | | STD DEVIATION | 0.51 | 0.45 | 0.50 | 0.67 | 0.57 | 0.56 | 0.47 | 0.72 | 0.69 | 0.56 | 1.72 | 0.65 | 1.50 | 0.67 | 0.67 | 0.97 | 0.64 | 0.51 | 1.19 | 0.83 | 1.78 | 1.04 | 1.11 | 1.29 | 0.92 | 0.41 | |
| | | VARIAT.COEFF. | 0.09 | 0.08 | 0.09 | 0.12 | 0.10 | 0.10 | 0.08 | 0.13 | 0.13 | 0.10 | 0.47 | 0.12 | 0.40 | 0.12 | 0.12 | 0.19 | 0.12 | 0.09 | 0.24 | 0.16 | 0.43 | 0.20 | 0.22 | 0.24 | 0.17 | 0.08 | |
| | INDICATOR | DIFFERENCE (ACT-DES) | 1.18 | 0.95 | 1.00 | 1.37 | 1.18 | 0.95 | 0.77 | 0.91 | 1.59 | 1.49 | 0.66 | 0.69 | 0.64 | 0.85 | 0.92 | 1.50 | 1.57 | 1.67 | 1.36 | 1.42 | 0.54 | 0.90 | 1.08 | 1.22 | 1.17 | 1.10 | |
| | | SATISFACTION | 0.76 | 0.79 | 0.78 | 0.67 | 0.73 | 0.78 | 0.83 | 0.74 | 0.63 | 0.69 | 0.50 | 0.80 | 0.52 | 0.75 | 0.75 | 0.59 | 0.63 | 0.67 | 0.59 | 0.64 | 0.59 | 0.71 | 0.67 | 0.68 | 0.70 | 0.69 | |
| | | OPTIMISM | 0.96 | 0.95 | 0.95 | 0.90 | 0.93 | 0.94 | 0.96 | 0.90 | 0.89 | 0.94 | 0.61 | 0.91 | 0.62 | 0.90 | 0.91 | 0.84 | 0.89 | 0.94 | 0.82 | 0.87 | 0.68 | 0.86 | 0.85 | 0.88 | 0.90 | 0.87 | |
| | | EXPECTANCY | 0.26 | 0.20 | 0.21 | 0.34 | 0.27 | 0.20 | 0.15 | 0.20 | 0.42 | 0.36 | 0.22 | 0.14 | 0.21 | 0.19 | 0.20 | 0.43 | 0.41 | 0.42 | 0.38 | 0.37 | 0.15 | 0.21 | 0.27 | 0.30 | 0.28 | 0.27 | |
| | ISMs | ACTUAL | AVERAGE | 4.77 | 4.39 | 4.71 | 3.68 | 3.64 | 5.02 | 4.36 | 4.91 | 2.91 | 3.82 | 2.98 | 4.43 | 2.48 | 4.29 | 4.80 | 3.07 | 3.21 | 4.18 | 2.84 | 3.75 | 3.71 | 3.98 | 4.20 | 4.43 | 4.48 | 3.96 |
| | | | STD DEVIATION | 0.85 | 0.95 | 1.07 | 1.06 | 1.02 | 0.84 | 1.14 | 1.05 | 1.25 | 1.05 | 1.39 | 1.09 | 1.35 | 1.02 | 1.09 | 1.56 | 1.34 | 0.94 | 1.39 | 1.31 | 1.38 | 1.18 | 0.94 | 1.08 | 1.08 | 0.53 |
| VARIAT.COEFF. | | | 0.18 | 0.22 | 0.23 | 0.29 | 0.28 | 0.17 | 0.26 | 0.21 | 0.43 | 0.27 | 0.47 | 0.25 | 0.54 | 0.24 | 0.23 | 0.51 | 0.42 | 0.22 | 0.49 | 0.35 | 0.37 | 0.30 | 0.22 | 0.24 | 0.24 | 0.13 | |
| DESIRABLE | | AVERAGE | 5.82 | 5.54 | 5.57 | 5.21 | 5.29 | 5.59 | 5.46 | 5.27 | 5.22 | 5.57 | 3.57 | 5.43 | 3.21 | 5.30 | 5.56 | 5.15 | 5.20 | 5.73 | 5.16 | 5.36 | 4.23 | 5.02 | 4.96 | 5.46 | 5.45 | 5.17 | |
| | | STD DEVIATION | 0.39 | 0.66 | 0.63 | 0.65 | 0.81 | 0.63 | 0.76 | 0.83 | 0.69 | 0.57 | 1.66 | 0.60 | 1.41 | 0.71 | 0.60 | 0.85 | 0.92 | 0.49 | 1.00 | 0.77 | 1.79 | 1.20 | 1.22 | 0.95 | 0.71 | 0.39 | |
| | | VARIAT.COEFF. | 0.07 | 0.12 | 0.11 | 0.13 | 0.15 | 0.11 | 0.14 | 0.16 | 0.13 | 0.10 | 0.47 | 0.11 | 0.44 | 0.13 | 0.11 | 0.16 | 0.18 | 0.08 | 0.19 | 0.14 | 0.42 | 0.24 | 0.25 | 0.17 | 0.13 | 0.07 | |
| INDICATOR | | DIFFERENCE (ACT-DES) | 1.05 | 1.14 | 0.86 | 1.54 | 1.65 | 0.57 | 1.11 | 0.36 | 2.31 | 1.75 | 0.59 | 1.00 | 0.73 | 1.02 | 0.76 | 2.07 | 1.98 | 1.55 | 2.32 | 1.61 | 0.52 | 1.04 | 0.77 | 1.04 | 0.96 | 1.21 | |
| | | SATISFACTION | 0.79 | 0.73 | 0.79 | 0.61 | 0.61 | 0.84 | 0.73 | 0.82 | 0.48 | 0.64 | 0.50 | 0.74 | 0.41 | 0.71 | 0.80 | 0.51 | 0.54 | 0.70 | 0.47 | 0.63 | 0.62 | 0.66 | 0.70 | 0.74 | 0.75 | 0.66 | |
| | | OPTIMISM | 0.97 | 0.92 | 0.93 | 0.87 | 0.88 | 0.93 | 0.91 | 0.88 | 0.87 | 0.93 | 0.60 | 0.90 | 0.54 | 0.88 | 0.93 | 0.86 | 0.87 | 0.96 | 0.86 | 0.89 | 0.71 | 0.84 | 0.83 | 0.91 | 0.91 | 0.86 | |
| | | EXPECTANCY | 0.22 | 0.26 | 0.18 | 0.42 | 0.45 | 0.11 | 0.25 | 0.07 | 0.80 | 0.46 | 0.20 | 0.23 | 0.29 | 0.24 | 0.16 | 0.67 | 0.62 | 0.37 | 0.82 | 0.43 | 0.14 | 0.26 | 0.18 | 0.23 | 0.22 | 0.31 | |
| SLMs | | ACTUAL | AVERAGE | 4.12 | 4.57 | 4.41 | 3.88 | 4.29 | 4.35 | 4.47 | 4.01 | 3.59 | 3.55 | 3.20 | 4.20 | 2.87 | 3.83 | 3.83 | 3.01 | 3.56 | 3.70 | 3.29 | 3.50 | 3.45 | 3.61 | 3.74 | 3.87 | 4.14 | 3.80 |
| | | | STD DEVIATION | 1.13 | 1.05 | 1.17 | 1.12 | 1.10 | 0.99 | 1.07 | 1.08 | 1.08 | 1.22 | 1.13 | 0.99 | 1.14 | 1.22 | 1.14 | 1.38 | 1.17 | 1.16 | 1.27 | 1.29 | 1.27 | 1.12 | 1.06 | 1.09 | 1.22 | 0.58 |
| | VARIAT.COEFF. | | 0.27 | 0.23 | 0.27 | 0.29 | 0.26 | 0.23 | 0.24 | 0.27 | 0.30 | 0.34 | 0.35 | 0.24 | 0.40 | 0.32 | 0.30 | 0.46 | 0.33 | 0.31 | 0.39 | 0.37 | 0.37 | 0.31 | 0.28 | 0.28 | 0.30 | 0.15 | |
| | DESIRABLE | AVERAGE | 5.56 | 5.48 | 5.45 | 5.42 | 5.49 | 5.35 | 5.55 | 5.04 | 4.80 | 5.45 | 3.50 | 5.29 | 4.23 | 5.05 | 5.26 | 4.86 | 5.26 | 5.51 | 4.66 | 5.05 | 4.31 | 4.81 | 4.97 | 5.08 | 5.11 | 5.06 | |
| | | STD DEVIATION | 0.60 | 0.60 | 0.69 | 0.60 | 0.56 | 0.64 | 0.54 | 0.76 | 0.95 | 0.59 | 1.68 | 0.61 | 1.05 | 0.84 | 0.64 | 0.83 | 0.65 | 0.63 | 0.94 | 0.81 | 1.57 | 1.11 | 0.97 | 1.16 | 1.28 | 0.36 | |
| | | VARIAT.COEFF. | 0.11 | 0.11 | 0.13 | 0.11 | 0.10 | 0.12 | 0.10 | 0.15 | 0.20 | 0.11 | 0.48 | 0.11 | 0.25 | 0.17 | 0.12 | 0.17 | 0.12 | 0.11 | 0.20 | 0.16 | 0.36 | 0.23 | 0.20 | 0.23 | 0.25 | 0.07 | |
| | INDICATOR | DIFFERENCE (ACT-DES) | 1.44 | 0.91 | 1.04 | 1.54 | 1.20 | 1.00 | 1.07 | 1.04 | 1.22 | 1.91 | 0.30 | 1.09 | 1.35 | 1.22 | 1.44 | 1.85 | 1.70 | 1.81 | 1.37 | 1.55 | 0.87 | 1.20 | 1.24 | 1.21 | 0.97 | 1.26 | |
| | | SATISFACTION | 0.69 | 0.76 | 0.74 | 0.65 | 0.72 | 0.73 | 0.75 | 0.67 | 0.60 | 0.59 | 0.53 | 0.70 | 0.48 | 0.64 | 0.64 | 0.50 | 0.59 | 0.62 | 0.55 | 0.58 | 0.57 | 0.60 | 0.62 | 0.65 | 0.69 | 0.63 | |
| | | OPTIMISM | 0.93 | 0.91 | 0.91 | 0.90 | 0.91 | 0.89 | 0.92 | 0.84 | 0.80 | 0.91 | 0.58 | 0.88 | 0.70 | 0.84 | 0.88 | 0.81 | 0.88 | 0.92 | 0.78 | 0.84 | 0.72 | 0.80 | 0.83 | 0.85 | 0.85 | 0.84 | |
| | | EXPECTANCY | 0.35 | 0.20 | 0.23 | 0.40 | 0.28 | 0.23 | 0.24 | 0.26 | 0.34 | 0.54 | 0.09 | 0.26 | 0.47 | 0.32 | 0.38 | 0.61 | 0.48 | 0.49 | 0.42 | 0.44 | 0.25 | 0.33 | 0.33 | 0.31 | 0.24 | 0.33 | |

3.2 Analysis per question or groups of questions

As the 25 statements of the questionnaire were absolutely identical for all surveyed managers, this enables a straight comparison between the groups and also some conclusions to be drawn. Below, the average scores for each group of managers is shown, both for the actual and the desirable situations.

The 25 questions of the questionnaire are grouped into four categories, as follows.

3.2.1. Actions, attitudes and behaviours of the three type of managers (questions 1 to 15)

This set of questions refers to the inter-relationships of the three main type of actors involved in the process of information systems governance. The aim of the questions is to know the opinion of each type of manager about his/her role as well as about the role of others whom they have to be involved with.

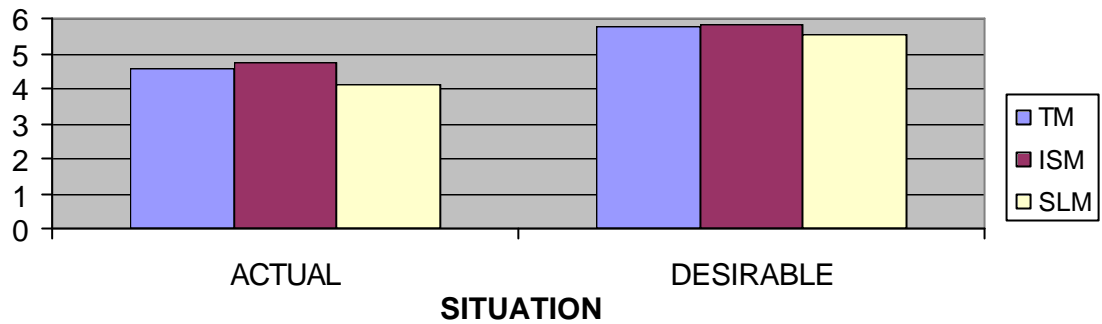
From a first overview of the data, a fact, which seems to be of interest is that **each group of managers tend to overrate** the questions that describe attitudes, behaviours actions of managers of their group in relation to the other groups. Such fact would not be surprising in itself if such over-valuation was consistent throughout the questions, but it is not. What becomes interesting is to note the topics or issues about, which some groups rate themselves above the others, in terms of average scores.

Another interesting point is **the similarity** that can be observed **between the scores of the TMs and SLMs**, which are only altered by the somewhat optimistic views of the TMs or the pessimistic stance of the SLMs, as already mentioned. This balance between the views of the TMs and of the SLMs contrasts with a much more **“defensive” position of the ISMs**, in what concerns either an over-valuation of the questions related to their group, or an under-valuation of the questions related to the SLMs. This kind of “overreaction” from the ISMs, which is more notorious in the actual situation, is noted in relation the desirable situation as well.

The graphs, which follow shows the results for each question in this group of questions.

Question 1

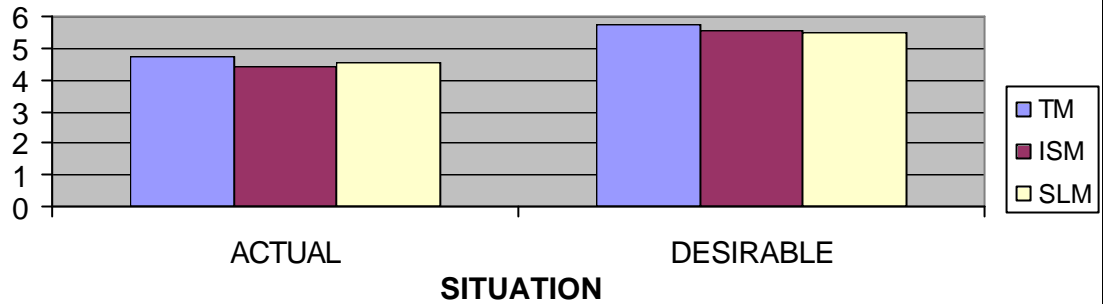
The Information Systems Manager has a clear idea about how the IS/IT infrastructure relates to the business strategy now and in the future



In this first question, which aims at evaluating the attitude of ISMs towards the relationship between IT/IS and the business strategy, the effect of an over-rating of this group in relation to the other two is very clear. The SLMs clearly do not have the same opinion about the ISMs' understanding of how the IS/IT infrastructures relates to the business strategy.

Question 2

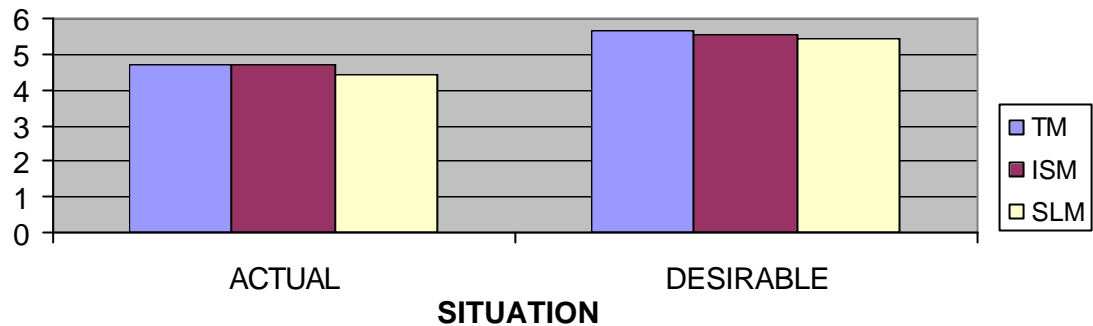
The Top Manager has a personal vision regarding the growing strategic importance of IS/IT for the business and is involved in the major decisions regarding IS at corporate level



In question 2, ISMs show some scepticism in what concerns the recognition that the TMs have a personal vision of the strategic importance of IT/IS in the business. It is also interesting to notice an alignment between the positions of the SLMs and the TMs.

Question 3

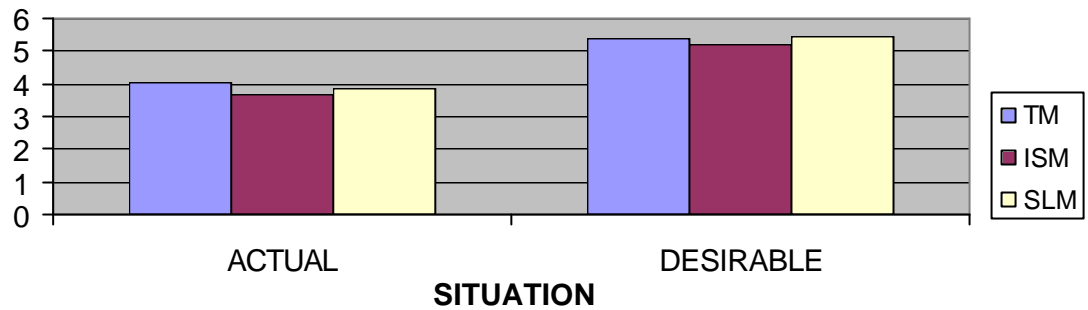
The Top Manager is capable of influencing favourably the company's Board of Directors in key issues for the long-term development of IS/IT



In question 3 ISMs judge the TMs as having more influence over the company's Board of Directors in matters related with the development of the IT/IS than the TMs themselves. The SLMs' attitude towards this question is considerably more pessimistic. This may reflect a relative lack of knowledge of the ISMs about what is going on at the Board of Directors' level and also a distancing of the SLMs concerning such issues.

Question 4

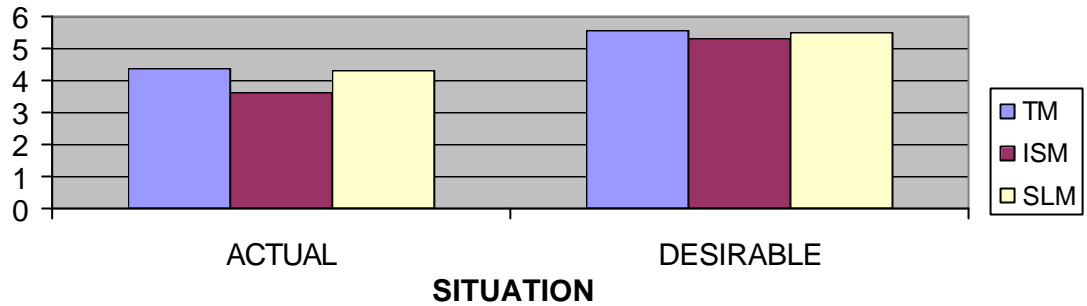
The Senior Line Managers have a relevant role regarding the planning and implementing of short and long-term strategies for the development of IT applications in their own departments/divisions



The relevance of the SLMs role is undervalued by the ISMs in question 4, concerning either the actual situation or the desirable. This trend will be consistent throughout the questionnaire. Again, there is an alignment between the positions of the SLMs and the TMs.

Question 5

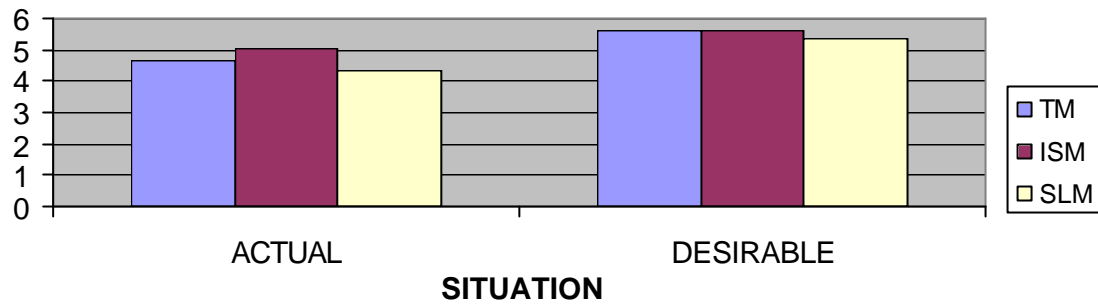
Senior Line Managers understand that a large proportion of IT learning by end-users is local and informal and that for such learning to occur conditions need to be created and managed



In this question, the SLMs' attitude in relation to the use and the process of IT learning at a local level is again devalued by the ISMs, while TMs seem to be closer to SLM' opinions.

Question 6

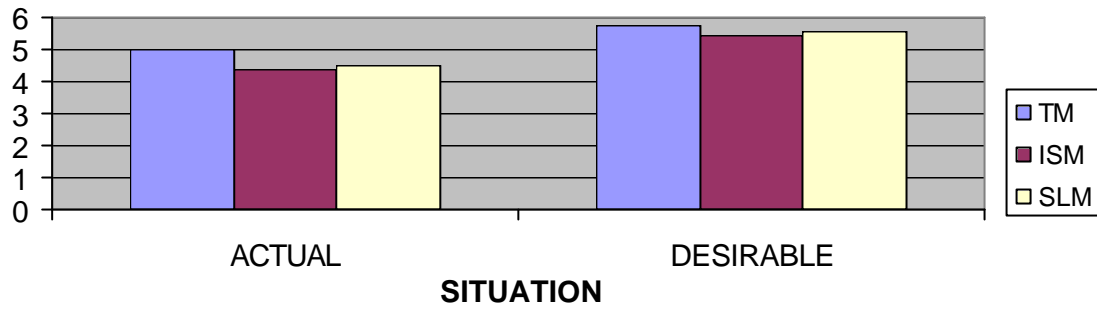
The Information Systems Manager is aware of the need to look outside the company in the search for new technological solutions, either in the form of outsourcing IT services or in finding new technological tools



It is once again conspicuous the effect of ISMs' self-valuation in relation to the views of TMs but especially in relation to the SLMs' opinions. This consistent difference in opinions seems to reveal a **continuation of the "cultural gap" between ISMs and SLMs.**

Question 7

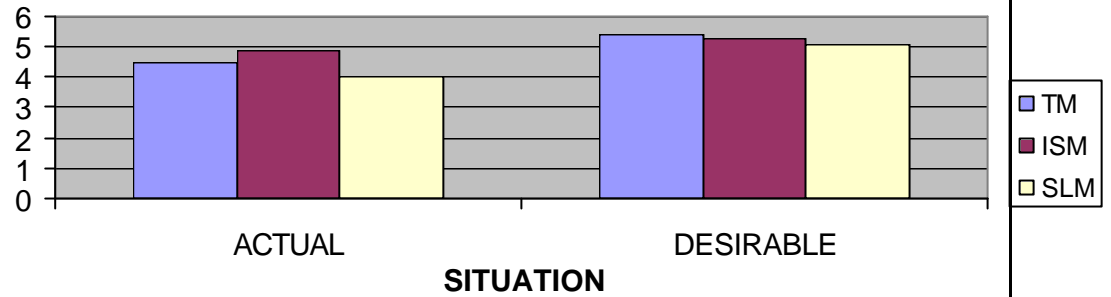
The Top Manager recognizes the importance of the development of an information architecture in the company (i.e. an infrastructure, which enables the management of data through the use of common definitions, essential for avoiding duplications, inconsistencies, etc) and of the need to respect the inherent standardization of processes and procedures



There is, in question 7, a clear over-rating of the TMs in relation to ISMs' opinions, and also in relation to SLMs' opinions, in relation to the importance given by the TMs to the development of an architecture of information in the company and to standard processes. Here, ISMs have quite different opinions from TMs.

Question 8

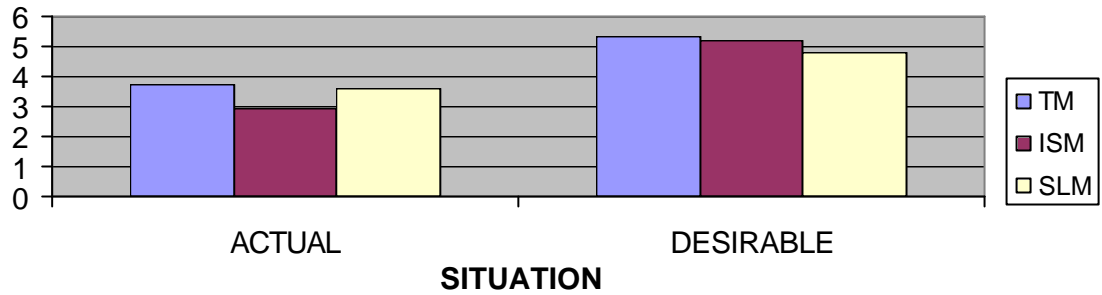
The Information Systems Manager understands the need to keep a balance between “technological perfectionism” and business performance (e.g. a system performing at 100% efficiency but taking 6 months to deliver versus an urgently required system performing at 60% efficiency but delivered in two weeks)



In this question again there is the ISMs self-valuation effect in the actual situation and also the “cultural gap” between the ISMs and SLMs as mentioned before. TMs seem to be more optimistic than SLMs, but this is an issues that concerns mostly ISMs and the SLMs.

Question 9

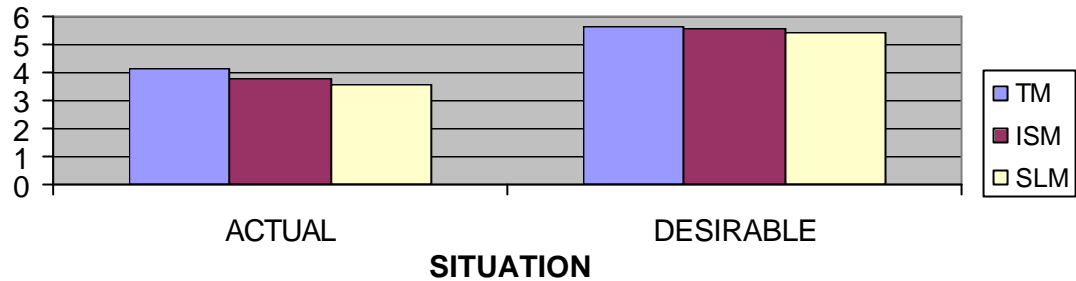
Senior Line Managers understand the need to respect what has been agreed in terms of IT development projects and to resist the temptation of “last minute” alterations



This question is “the other side” of question 8. The results confirm the opposition between ISMs and SLMs shown in the former question. In this question ISMs have a strong negative reaction regarding SLM’ actions at present, regarding the discipline needed in IS development projects. In other words, there seems to a feeling of **lack of discipline** both on the part of ISMs (question 8) and on the part of SLMs (this question). Although with a certain moderation TMs continue to be more optimistic than SLMs, but probably with insufficient knowledge about what is really going on.

Question 10

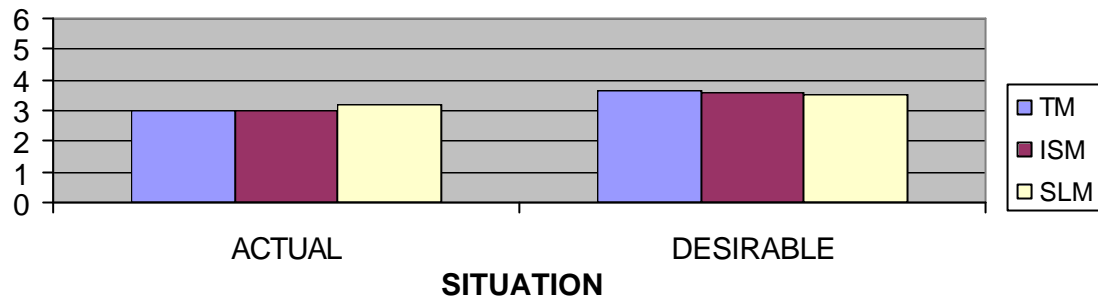
The Information Systems Manager and his/her staff are seen to have a credible track record regarding the provision of timely and appropriate IT services, i.e. they have the trust of the line departments



This question, concerning the credibility of ISMs from the line departments' point of view is the only one from this group that doesn't show the effect of self-evaluation, already referred to. The TMs have given it a higher score than the ISMs themselves. This is interesting, since it may reveal a **certain insecurity on the part of ISMs** in relation to the evaluation made by the other two groups of managers about the perception of credibility that exists in the company relating the performance of ISMs' departments. There seems to be a certain **lack of trust** on the part of ISMs.

Question 11

Senior Line Managers do not have the necessary technical and managerial skills in IS/IT to take over new responsibilities, at departmental level, in a more decentralized management of information systems in the company

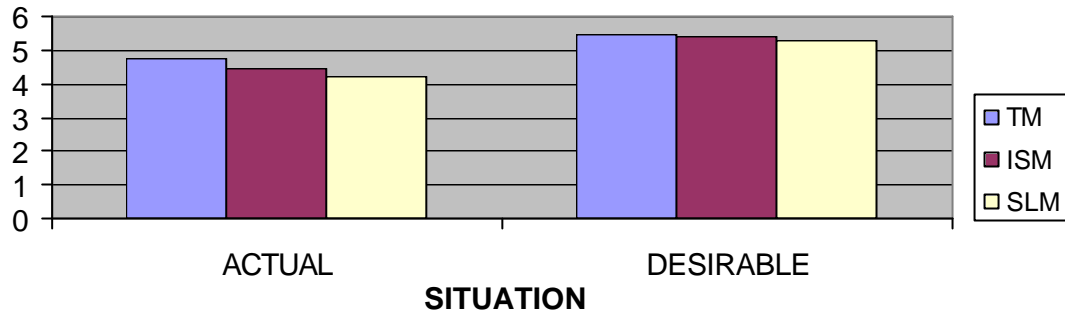


This question was placed in the negative and, as already mentioned, the Likert scale was inverted in the analysis of the data. Here, the SLMs self-valuation effect can be seen. However, the indicators, which have been computed for this question (specially the standard deviation and the variation coefficient) show that some problems exists concerning the clarity of the question. This suspicion is based on the analysis of the standard deviations and variation coefficients obtained for this question for the three groups of managers (see Table 1).

Putting aside the potentially controversial content of this question (i.e. to find out whether or not SLMs have management and technical capabilities to take on new responsibilities in a decentralized management structure of IS) the results show a very high dispersion of scores in this question. This arises probably from the fact that respondents were not sure how to answer using the scale 1 to 6 in a question placed in the negative. Thus, the results from this question **lack validity and must be disregarded**

Question 12

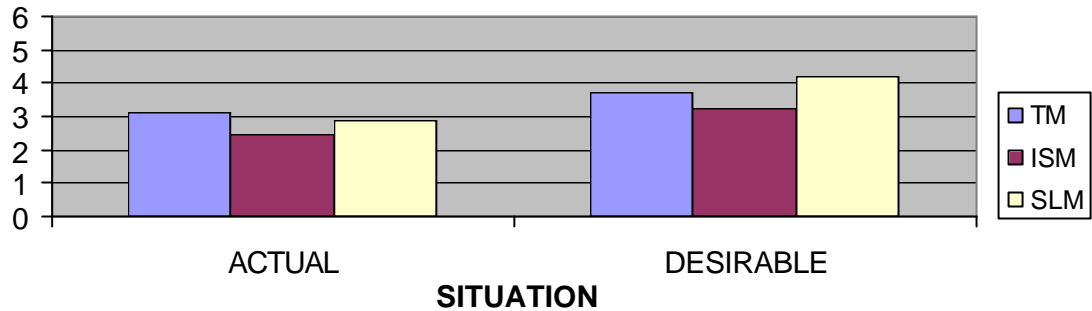
The Top Manager understands that IS management at corporate level is an increasingly horizontal responsibility and that a greater involvement of the line departments is indispensable



Question 12 is about how TMs perceive the changing roles of SLMs. The scores clearly show that SLMs are not in tune with TMs in this matter. **SLMs seem to consider their role in the management of IS to be less valued than do TMs or ISMs.** Again, there seems to exist a degree of **lack of trust** as perceived by SLMs. This feeling of “isolation” of the SLMs seems to be a constant throughout the results. In this question, it is still worth noting a difference of opinions between SLMs and TMs.

Question 13

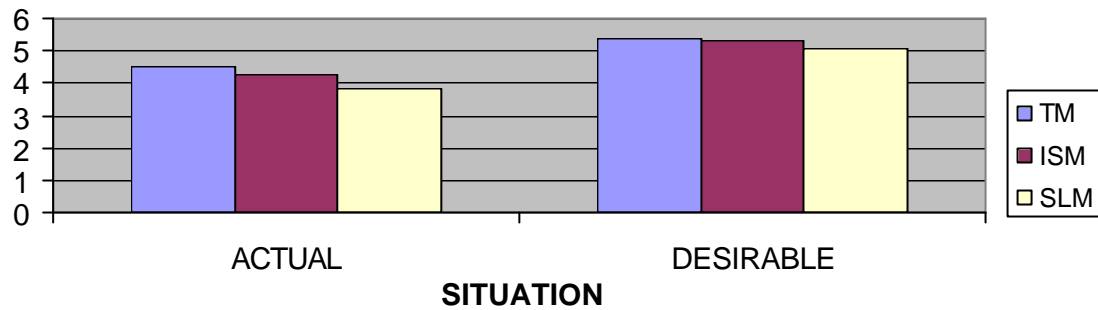
Senior Line Managers have autonomy both in the planning and in the use of IS-related resources at departmental/divisional level



In this question, ISMs differ significantly from the TMs and the SLMs about SLMs' autonomy in IS management. Furthermore, they differ both in the actual and the desirable situations, which seems to indicate that ISMs do not believe that there is a trend for more SLM autonomy in the future. This "inflexible" attitude on the part of ISMs may have may two explanations: (1) either an increase in the autonomy of SLMs is not good for the organization ; (2) or ISMs see this growing autonomy as a threat to their "traditional" power, which would help to understand the **systematically defensive attitude on the part of ISMs**. However, there a high dispersion of scores in this question too. This might be related to either the interpretation of the word "autonomy" or to the diversity of the situations, which exist in the various respondent companies. An analysis on the histograms of the responses (see Annex 2) has confirmed the suspicion that the wording of this statement is ambiguous. Hence, **it was decided to drop this question** from further analysis.

Question 14

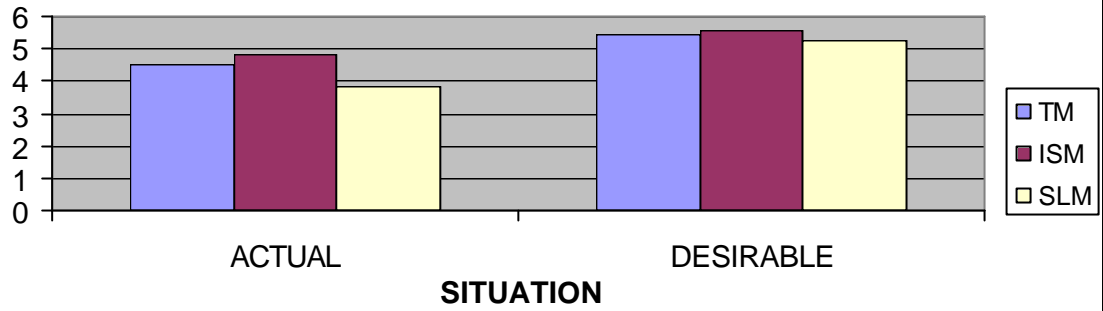
The Top Manager plays an important role in supporting the management of information systems at corporate level by means of a clarification of the boundaries between the Information Systems Manager's and the Senior Line Managers' areas of responsibility



In this question, which is aimed at evaluating TMs' attitudes, an over-valuation of this group in relation to itself can be perceived once again. The scores also shows a significant gap between the views of SLMs and TMs. As well as it happens in question 12, SLMs consider that action on the part TMs, in this case **supportive action through a clarification of issues is less effective** than TMs and ISMs believe.

Question 15

The Information Systems Manager is aware that his/her role of IS/IT service provider is changing and that there is a new role of “internal consulting” to be fulfilled (i.e. acting as “consultants” to the line departments on IS/IT-related issues)

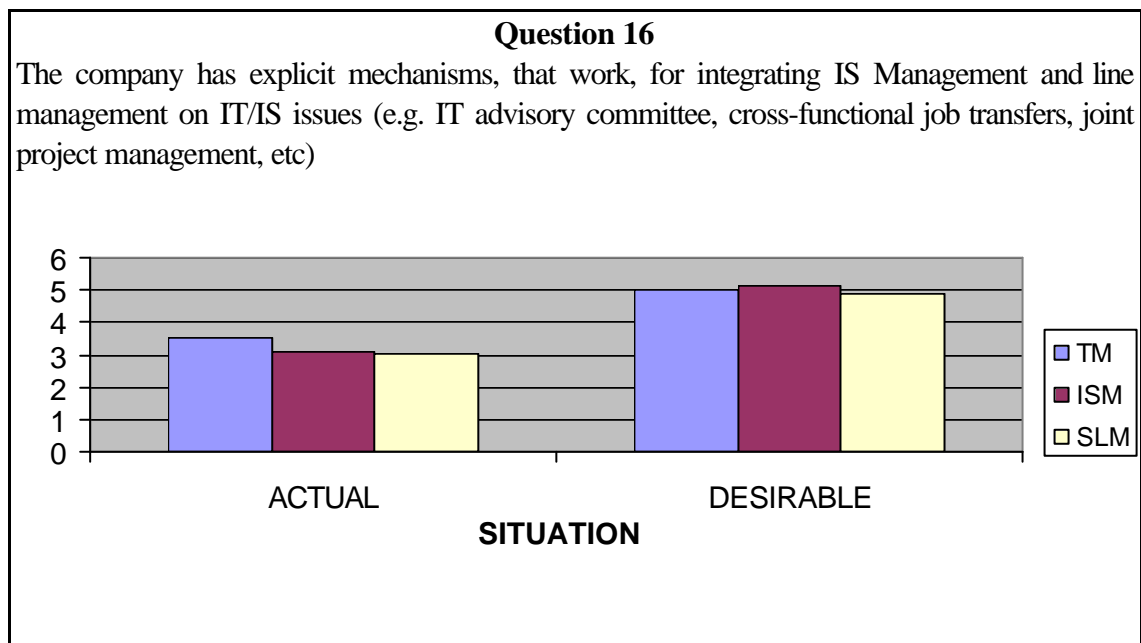


In question 15 there is, once more, an over-valuation of the ISMs in the last question of this group, in relation to an attitude of their own group and, again, a significant gap in relation to SLMs' position.

3.2.2. Structural and normative facilitators or inhibitors (questions 16 to 19)

This set of questions deals with the existing conditions in the company, resulting either from formal rules or structural arrangements, which historically have come to facilitate or inhibit the development of capacities and competencies, which promote the process of organizational learning, specifically related to the IS function.

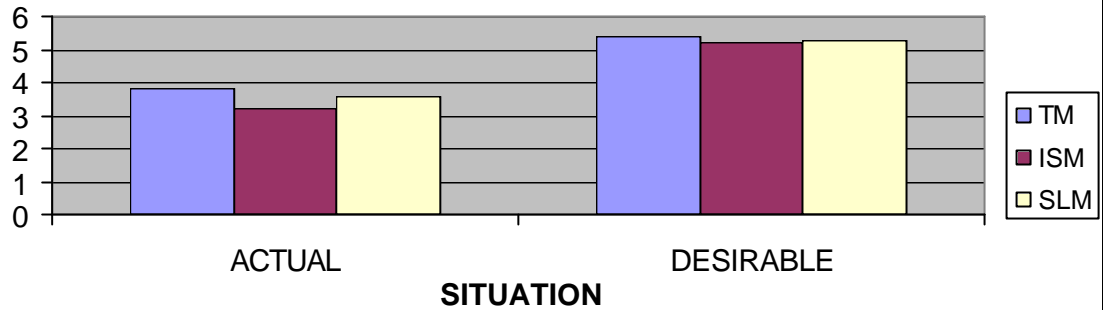
In this group of questions, a balance between the positions of the TMs and SLMs continues to reveal itself, with the TMs scoring slightly higher in a consistent manner, which, as already mentioned, may indicate a certain degree of satisfaction of the part of the TMs in relation to the actual situation. However, this satisfaction may be related to the TMs' unease in justifying an eventual dissatisfaction, since they are the ones responsible for the actual state of affairs and also the ones who may have the most important role in achieving a desirable situation, in the near future. The proportionally lower scoring of the SLMs may be understood as a symptom of common cultural ground with the TMs, although in a more comfortable position to criticise. In this set of questions ISMs present a larger variance in the scores obtained.



Question 16, which deals with conditions facilitating the integration of the central management of IT/IS with line management has deserved the highest scoring from the TMs, in relation to the actual situation. In the desirable situation, however, it is the ISMs who score the highest, which could mean that a **degree of dissatisfaction exists on the part of ISMs** and that they want things changed.

Question 17

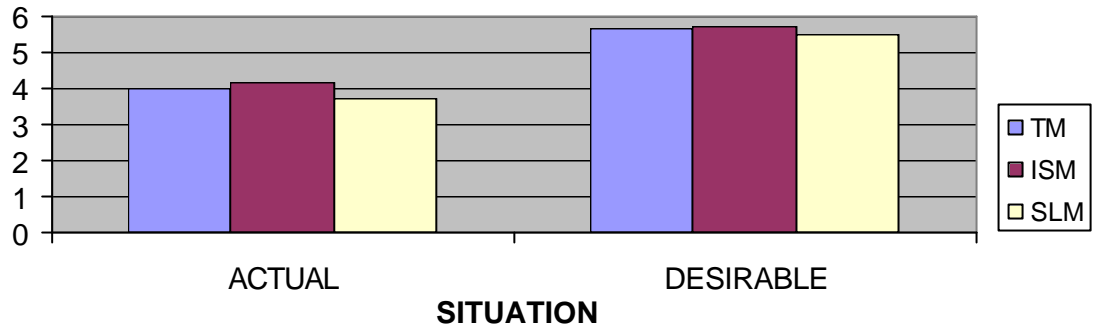
The existing policy for the development of human resources in the company is favourable to the development of IS-related skills (managerial and technical)



In question 17, **ISMs are the ones least satisfied** with the actual conditions for the development of technical and managerial capabilities associated with IT/IS. This is quite relevant since ISMs are the ones more directly affected by the **human resources issues** related to the IS management function.

Question 18

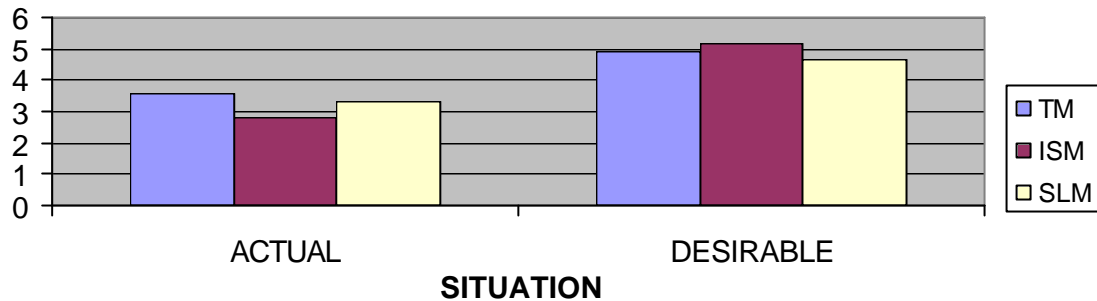
The technical quality of most IT applications is seen as adequate in relation to the purposes for which they were developed, i.e. the technology works when and where it is supposed to work



The technical quality of IT applications is a structural factor in the sense that consistently good or consistently bad applications help to create an ethos or mind-set in the organization about the IS function that could either help or hinder organizational learning. In question 18, ISMs value the quality of the existing IT applications more than TMs and SLMs do. Nevertheless, it is important to mention that this question obtained the highest valuation, in this group of questions, both by the TMs and the SLMs **indicating a generally positive evaluation of the ISMs' and their staff's technical capabilities by the IT/IS users .**

Question 19

The company has an incentive system (salaries and other benefits), which is appropriate to deal with the existing demand over staff with appropriate IS/IT skills (all areas)

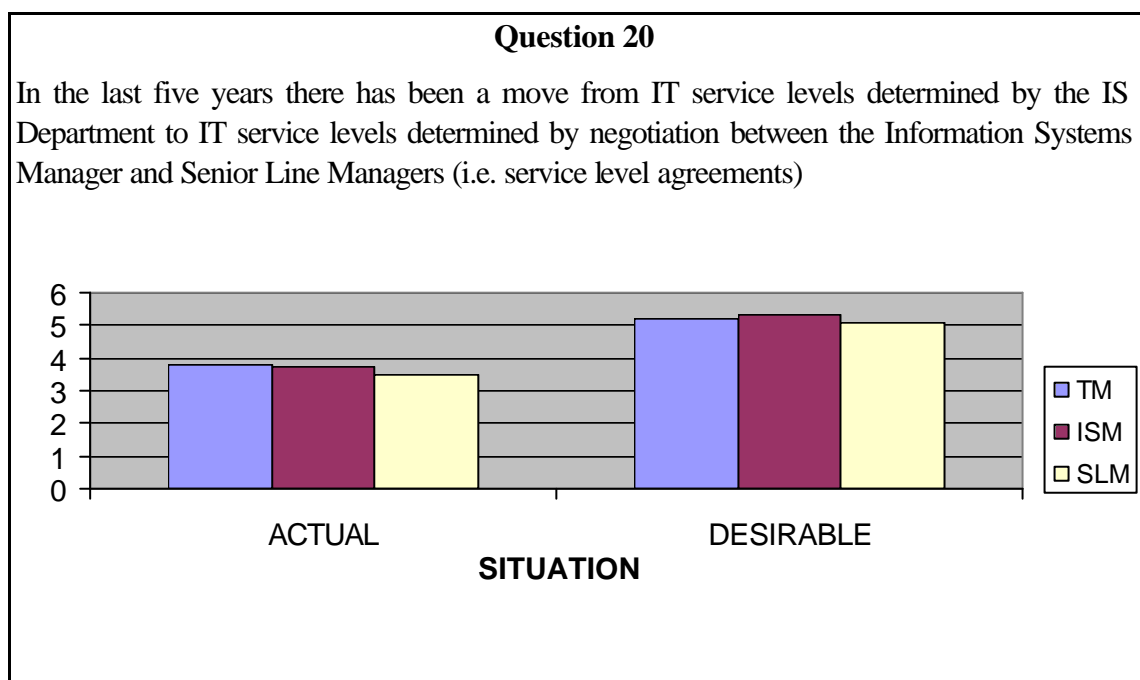


In question 19, which deals with the very touchy issue of incentive systems for IT/IS experts, it is no surprise that it is the ISMs who consider the actual situation less adequate. In this way, this result is very similar to that of the question 17. It is also interesting to notice that in the desirable situation ISMs' opinions distance themselves again in relation to the other groups, revealing a **considerable gap** between what there is in the present and what there should be in the future, in what concerns **incentive systems from the ISMs' point of view**.

3.2.3. Organizational learning related to the management of information systems (questions 20 to 25)

This set of questions deals with the evolution lived or experienced by the organisation in the last five years in what concerns the main relationships involved in the process of management of information systems. Such evolution (i.e. an improvement in organizational effectiveness) can, thus, be considered as an indicator of learning. IS-related organizational learning is defined as *the change in the level of cooperation achieved among the major managerial stakeholders in IS corporate governance characterized by the achievement of an ideal state of IS-related initiatives where all issues are decided by consensus and negotiation rather than by rules and procedures.*

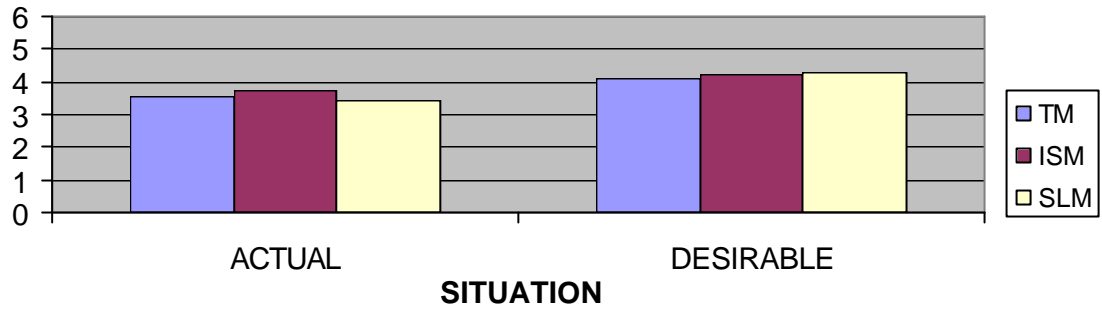
In this set of questions the same trends, which have already been noted in the other group of questions are also present.



Question 20 shows a certain degree of consensus between TMs and ISMs concerning the actual situation, although with average scores, which are the lowest for this set of questions. **SLMs are the least satisfied with the evolution in the last few years.** As it concerns the desirable situation, ISMs seem to show a larger degree of interest in a positive evolution than the other two groups. It is interesting to note that the SLMs are the ones who show the lowest score in what concerns the desirable situation, since this question refers to a direct relationship between ISMs and SLMs.

Question 21

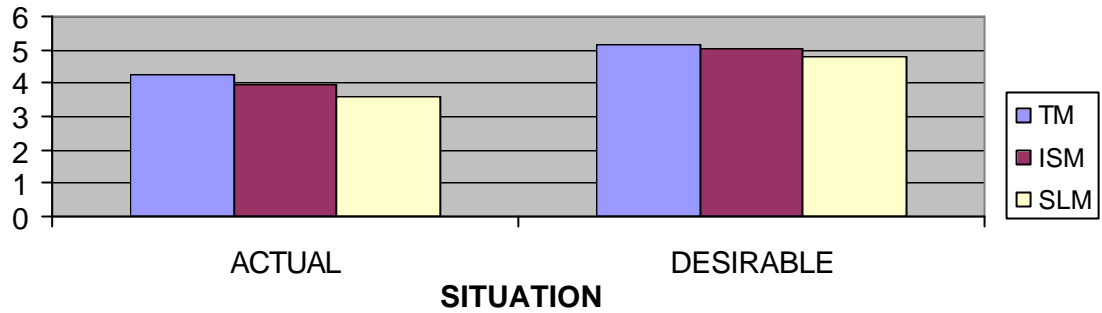
In the last five years there has been a move in the relationship between the Information Systems Manager and Senior Line Managers from a degree of isolation of the first to a better mutual understanding of each other's roles



Question 21 shows indicators (i.e. the variation coefficient) that suggest that there are problems with the statement put to the respondents. The question attributes to the ISMs an attitude of initial isolation in their relationship with the SLMs, which may not always be true and, which may lead to varied interpretations. The high dispersion of the results, which has occurred in this statement (see Annex 2), specially in what concerns the desirable situation, confirms this problem, which was not possible to detect during the different phases of the questionnaire preparation. Hence, **it was decided to drop this question** from further analysis.

Question 22

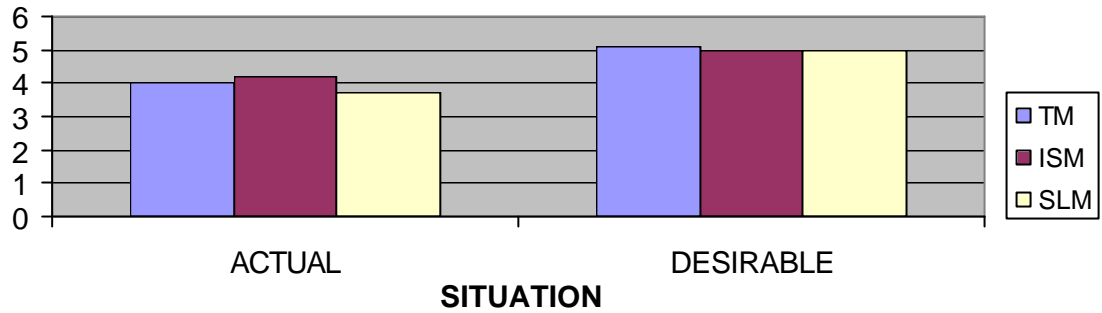
In the last five years there has been a move from IT/IS planning carried out as a separate exercise to a greater integration of IT planning into business planning



In the answers to question 22, TMs are the group, which is most confident in relation to this evolution, perhaps understandable in view of the fact that the question deals with “planning”. It is also interesting to note that ISMs reveal themselves less confident about this topic and SLMs even less so. These results may be indicators of some **difficulties in the interface between business planning and IT/IS planning**.

Question 23

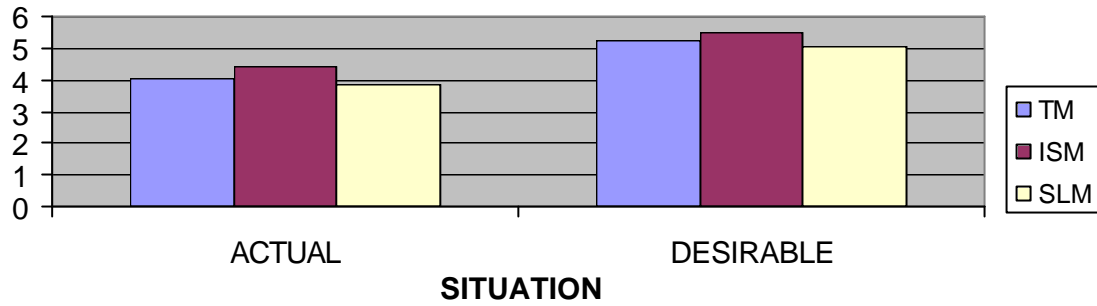
In the last five years there has been a move from unilateral attempts to build a corporate-wide IT infrastructure to a situation of more active and committed participation from Senior Line Managers, in the building/ maintenance of such an infrastructure



In question 23, the idea was to try to find out whether there was any evolution in the involvement of the SLMs in the construction of an IT infrastructure. It is notorious, once more, a pessimistic perspective of the SLMs in relation to the other groups, in the actual situation. Such perspective could also mean that **SLMs may not consider the IT infrastructure as their problem**. However, this view is not confirmed by looking at the scores for the desirable situation, where there is almost total consensus between the SLMs' and ISMs' opinions. The TMs champion this cause by scoring the highest both in the actual and in the desirable situations.

Question 24

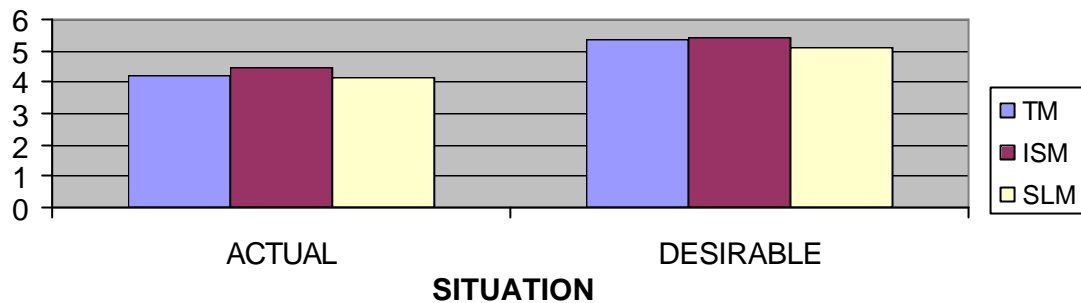
In the last five years there has been a move from an IT infrastructure, which is inflexible and restrictive of business initiatives to an IT infrastructure, which is flexible and facilitatory of new business initiatives



In question 24 the idea is to try to investigate the opinions relating the evolution of the following dichotomy: inflexible and limiting IT infra-structure versus flexible and facilitating IT infrastructure. ISMs perceive that such evolution exists and should go on existing in the future, whereas SLMs and TMs have a more sceptical position. The results show, once more, the tendency for a continuation of **the cultural gap between ISMs and SLMs**.

Question 25

In the last five years there has been a change in the stance of the Board of Managers in relation to IT/IS matters, from one of distance to one of more involvement



This question tries to capture whether any organizational learning related to IT/IS management has taken place at the level of the Board of Directors. The perceived involvement of the Board of Directors in these last few years is higher for the ISMs than for the other two groups and in relation to both situations. These results are somehow curious since TMs are the group closest to the Board of Directors and not the ISMs. Such results may indicate a degree of satisfaction on the part of ISMs in what concerns the development of the situation, not wholly shared by the TMs. This may be due to the fact that the former have less knowledge about the workings of the Board of Directors. Looking at the scores for the desirable situation, where TMs scores are virtually on the same level as the ISMs, one may interpret the TMs response as a manifestation of their belief that the Board of Directors should perform better in the future, regarding IS/IT issues. It is interesting to note that ISMs also score higher than the TMs in relation to the actual situation, in question 3.

3.3 Human and financial resources associated with the IS management function

The survey also included a set of questions, which deal with the professional profiles of Information Systems Managers in large Portuguese companies and another set of questions dealing with the so called, “IT/IS Intensity”, which reflects the investments in human and financial resources related to the Information Systems function.

3.3.1. ISM human resource profiles

The characterization of human resources in the ISM function was based on the questionnaire items about academic background, post-graduate qualifications, place in the hierarchical structure and functional reporting.

Academic background

| Education level | Number of replies | Percent |
|--|--------------------------|----------------|
| Higher education degree | 43 | 78% |
| Technical education (mid-level) degree | 5 | 9% |
| Secondary education | 7 | 13% |
| Total | 55 | 100% |

An analysis of the results show that four-fifths of the ISMs have a higher education degree; 9% have a mid-level degree and 13% have only secondary education. It is interesting to note that, in the sample of surveyed companies, there is still a large percentage of ISMs in the large Portuguese companies that have no degrees. This leads us to the conclusion that these ISMs must be working in the company for quite a number of years. In part this may be related to the fact that the IS function in certain Portuguese companies evolved from the old manual data processing centres where the staff needed no special qualifications.

| Subject area (higher education) | Number of replies | Percent |
|--|--------------------------|----------------|
| Engineering/Mathematics | 27 | 62.8% |
| Economics/Finance | 11 | 25.6% |
| Management/Business Administration | 3 | 6.9% |
| Other | 2 | 4.7% |
| Total | 43 | 100% |

From the ISMs with a higher education degree, 62.8% have their background in engineering/mathematics, since these degrees have an important component of information technology subjects. About a quarter of the ISMs with degrees come from economics or finance, which again may be related to the origins of many IS departments – the “mechanography” centres, which, traditionally, came under the responsibility of the Finance Departments. The rest of the ISMs have degrees in business administration/ management and others areas, such as psychology and languages (12% in all).

It would be interesting to investigate (perhaps by means of interviews) if the 6.9% of ISMs with degrees in management or business administration is part of an emerging trend in staff recruitment for Information Systems or just a result of chance. If it is not the result of chance, it could mean that there begins to be more awareness of the fact that IT/IS must be treated as a strategic resource of the company.

Post-graduate qualifications

| Post-graduate degree | Number of replies | Percent (of the total of higher degrees) |
|---|--------------------------|---|
| MBA | 7 | 16% |
| Masters in Management or Economics | 2 | 5% |
| Specialized courses in IT or Management | 4 | 9% |
| Total | 13 | 30% |

About 30% of the ISMs with higher degrees have completed post-graduation courses or specialization courses. The trend seems to be for people to obtain post-graduate qualifications in areas, which are complementary in relations to their original academic background. Thus, people with degrees in engineering /mathematics look for post-graduation or the specialization courses in management and people with a background in management, economics or finance embark on IT-related courses.

Position in the hierarchical structure

| Level | Number of replies | Percent |
|------------------------|--------------------------|----------------|
| Board of Directors | 2 | 3.6% |
| First line management | 34 | 61.8% |
| Second line management | 19 | 34.6% |
| Total | 55 | 100% |

In 65% of the answers, the position of ISMs in the hierarchical structure of their companies was in the second hierarchical layer (at senior line manager's level) or even in the first layer (at Board of Director's level), which may indicate the relative importance of the IS function for most of the companies surveyed.

Functional reporting

| Functional position to, which ISMs report | Number of replies | Percent |
|---|-------------------|---------|
| Board of Directors | 39 | 71% |
| Finance Director | 15 | 27% |
| Headquarters abroad | 1 | 2% |
| Total | 55 | 100% |

The answers to this question are consistent with the answers obtained in the previous question. Thus, the majority of the ISMs (71%) report to highest level in the hierarchy. The percentage of ISMs that report to the Finance Director (27%) shows, once more, that there is still a strong link between the IS or informatics function and the accounting, invoicing and wages processing areas.

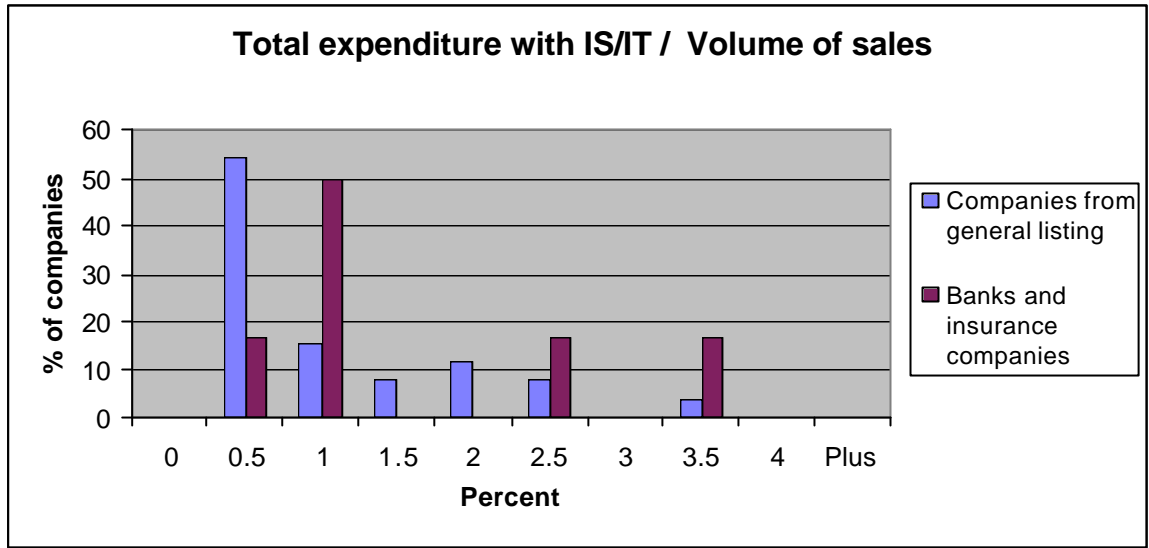
3.3.2. IT/IS intensity

In order to evaluate the intensity of IT/IS in the companies surveyed, ISMs were asked to provide three ratios (or the absolute values, which would lead to their calculation), which are thought to reflect the level of investment in human and financial resources in the information systems management function in these companies. The ratios are as follows:

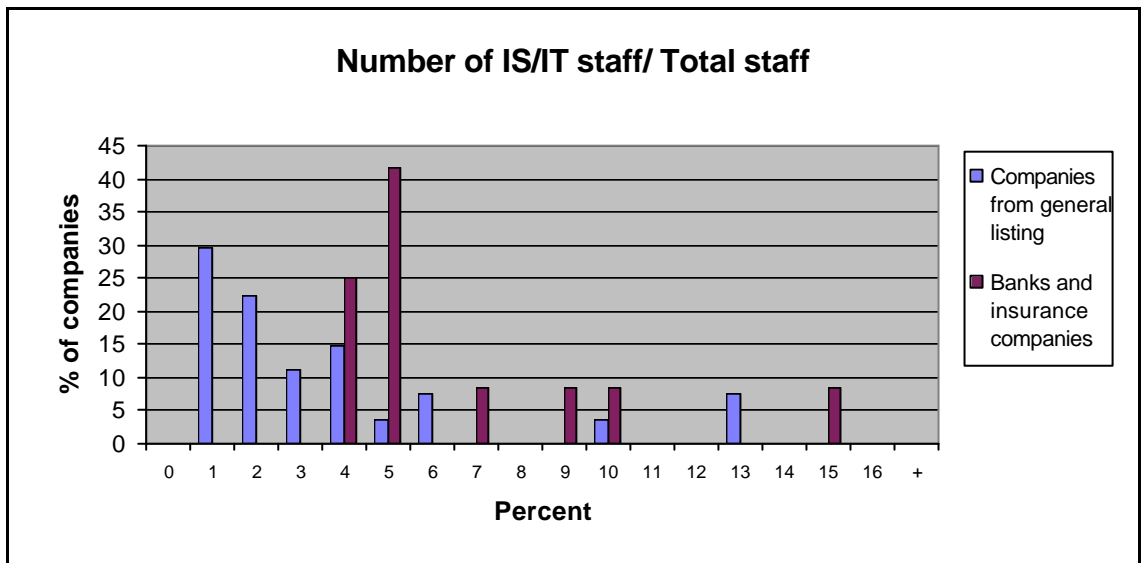
- ? Percentage of IT budget over total sales
- ? Percentage of number of IT staff (including central IT staff and departmental/divisional IT staff) over total staff
- ? Percentage of number of PCs (excluding dumb terminals) over number of total staff

None of these ratios is *per se* a perfect indicator of the intensity of IT/IS investment/use. Furthermore, there is considerable overlap between them. The analysis of the results based on this type of ratios should also take into consideration details such as the type of activity of the company (commercial, industrial, services, etc), the "amount" of information and information technology embedded in its products or services, the use of IT outsourcing and the number of final users involved. Given that none of such items of data were collected as part of this survey, the use of the above ratios is quite limited. Nevertheless, they can help to provide an overview of IS/IT intensity in the sample of companies surveyed.

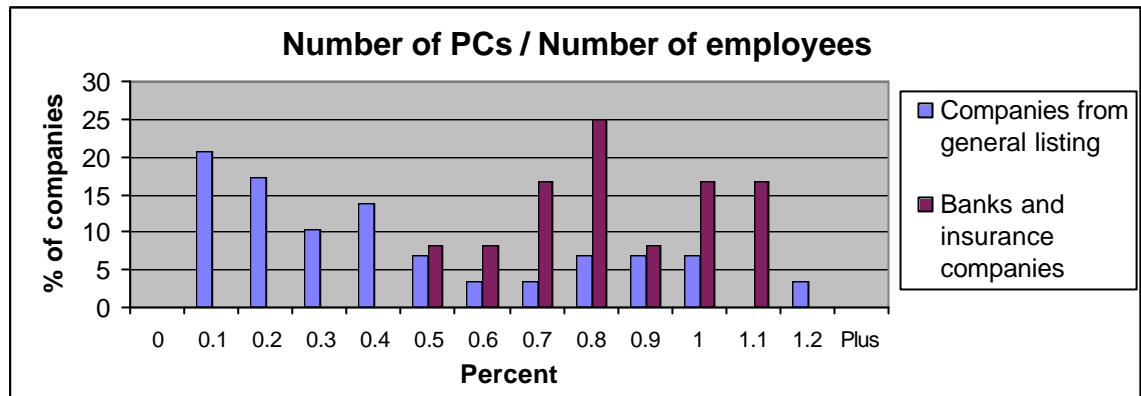
IT budget over total sales



Number of IT staff over total staff



Number of PCs over number of total staff



4. A summary of preliminary conclusions

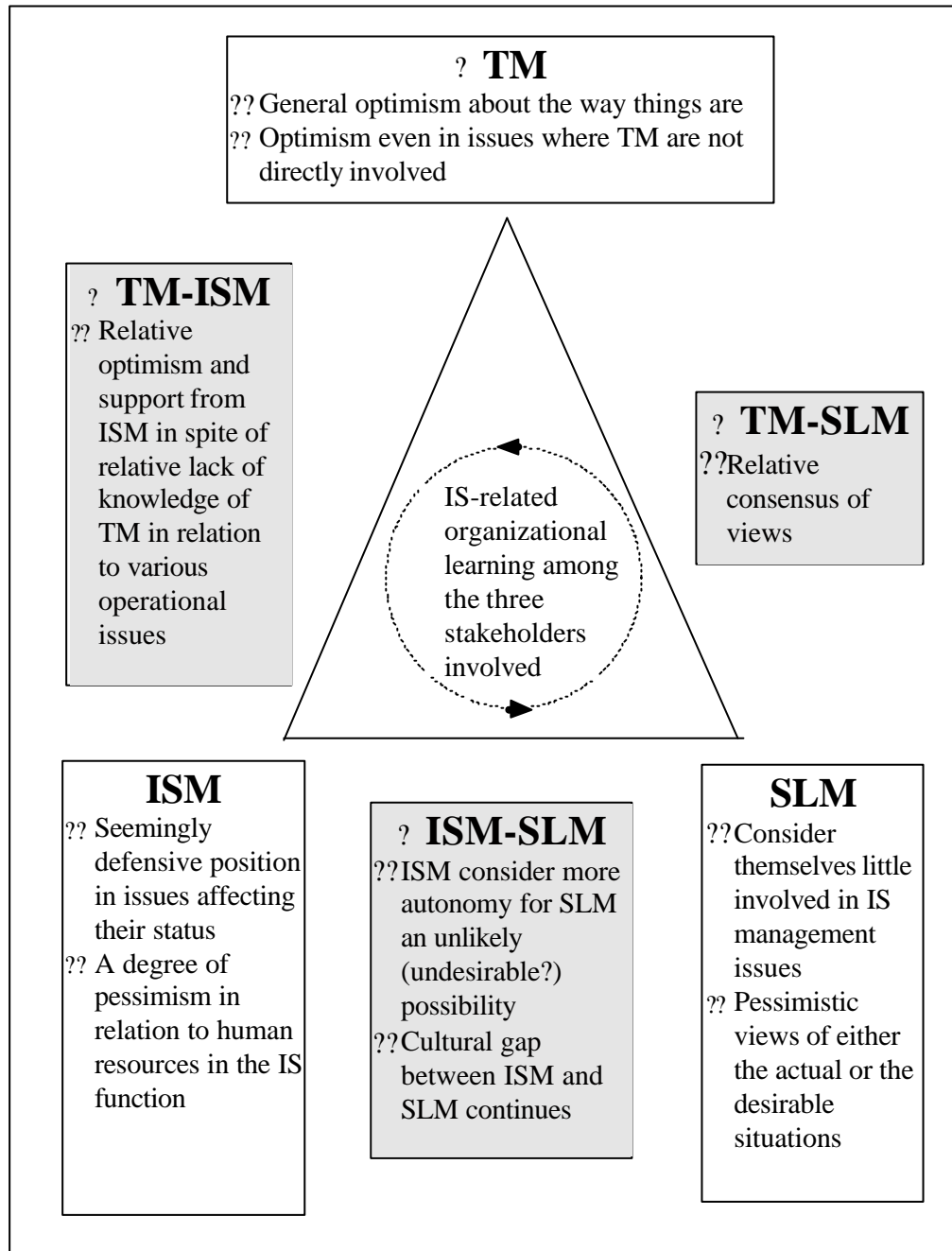
The most interesting points from this type of data analysis and, which might lead to some tentative conclusions, are highlighted in bold in the body of the text. It is important to stress that these conclusions are of an interpretive nature and not positivist, that is to say, these conclusions must not be understood as rules or general laws, which are applicable to all situations in the management of the IS function in the large Portuguese companies, but as trends as interpreted by the researchers. Prior knowledge and experience of the management of the IS function in organizations on the part of the researchers has also contributed to such interpretation. Most of the conclusions or perhaps all of them cannot be said to be new, especially for keen observers of IS/IT management issues. What we can say, however, is that these conclusions serve as a reinforcement of certain *à priori* ideas or intuitions, with empirical data. Figure 1 shows the summary of the conclusions in an integrating diagram.

The diagram highlights some of the prevailing organisational postures, which characterize the roles of the three main stakeholders in the management of the IS function in large Portuguese companies. Such postures can be inferred by means of comparisons among of the responses of the three types of respondents and can be taken to provide indications as to types of relationships that exist among TMs, ISMs, and SLMs. For example, it is plausible to guess that a quite difficult relationship exists between ISMs and SLMs or that a somewhat distant although consensual relationship exists between TMs and SLMs.

Such roles and such relationships, in turn, affect the level of collective learning related to the management of the IS function, which is possible to achieve. This explains the central part of the diagram, where the occurrence of IS-related organizational learning has been placed as a working hypothesis.

According to the management and organisational science literatures, the higher the level of organizational learning, the better the conditions of organisational effectiveness will be and, consequently, the higher the competitive potential of the company. Thus, one major issue in the research projects, which have served as the basis for the present survey is precisely to find out **how** best to intervene (i.e. act) in the organization in order to improve the level of collective or organisational learning related to IS management, at the highest hierarchical levels. This is one of the hypotheses, which will be analysed and discussed further in the final report of the

Figure 1



present study.

Annex 1

Application of ANOVA to test the difference between the means (F test) between groups and within groups in the 25 questions

ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---------------|----------------|----------------|-----|-------------|--------|------|
| Q1 ISM_VISION | Between Groups | 18.728 | 2 | 9.364 | 8.881 | .000 |
| | Within Groups | 258.333 | 245 | 1.054 | | |
| | Total | 277.060 | 247 | | | |
| Q2 TM_VISION | Between Groups | 4.220 | 2 | 2.110 | 2.065 | .129 |
| | Within Groups | 250.324 | 245 | 1.022 | | |
| | Total | 254.544 | 247 | | | |
| Q3 TM_INFLU | Between Groups | 5.574 | 2 | 2.787 | 2.305 | .102 |
| | Within Groups | 296.168 | 245 | 1.209 | | |
| | Total | 301.742 | 247 | | | |
| Q4 SLM_ROLE | Between Groups | 4.151 | 2 | 2.076 | 1.642 | .196 |
| | Within Groups | 309.720 | 245 | 1.264 | | |
| | Total | 313.871 | 247 | | | |
| Q5 SLM_EUC | Between Groups | 19.193 | 2 | 9.597 | 8.894 | .000 |
| | Within Groups | 264.351 | 245 | 1.079 | | |
| | Total | 283.544 | 247 | | | |
| Q6 ISM_SCANN | Between Groups | 17.111 | 2 | 8.556 | 9.454 | .000 |
| | Within Groups | 221.724 | 245 | .905 | | |
| | Total | 238.835 | 247 | | | |
| Q7 TM_STAND | Between Groups | 12.591 | 2 | 6.296 | 5.697 | .004 |
| | Within Groups | 270.727 | 245 | 1.105 | | |
| | Total | 283.319 | 247 | | | |
| Q8 ISM_PERFC | Between Groups | 32.529 | 2 | 16.265 | 14.389 | .000 |
| | Within Groups | 276.939 | 245 | 1.130 | | |
| | Total | 309.468 | 247 | | | |
| Q9 SLM_ALTER | Between Groups | 24.968 | 2 | 12.484 | 9.649 | .000 |
| | Within Groups | 316.995 | 245 | 1.294 | | |
| | Total | 341.964 | 247 | | | |

ANOVA

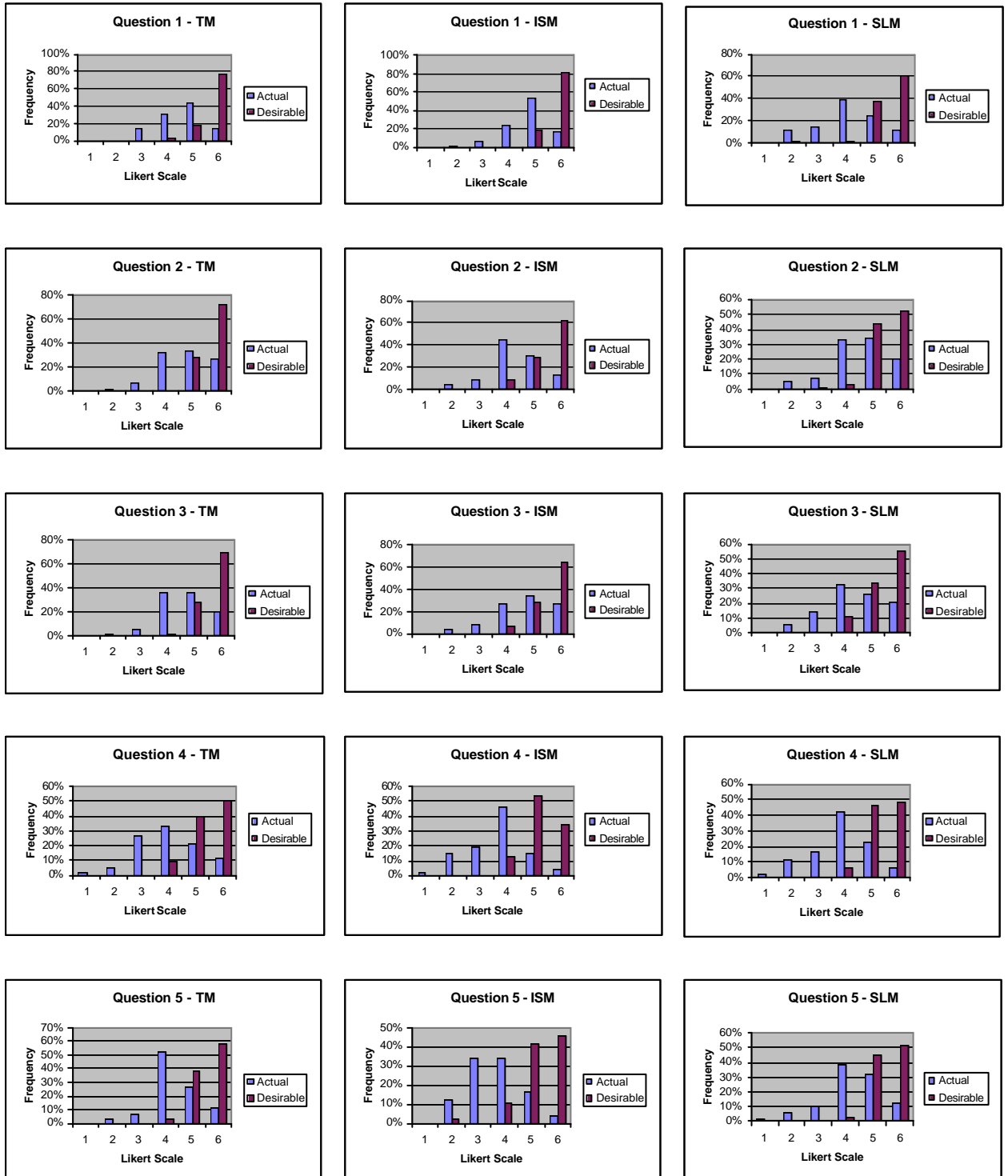
| | | Sum of | df | Mean Square | F | Sig. |
|----------------|----------------|---------|-----|-------------|--------|------|
| | | Squares | | | | |
| Q10 ISM_TRACK | Between Groups | 15.894 | 2 | 7.947 | 6.160 | .002 |
| | Within Groups | 318.682 | 247 | 1.290 | | |
| | Total | 334.576 | 249 | | | |
| Q11 SLM_SKILL | Between Groups | 2.402 | 2 | 1.201 | .794 | .453 |
| | Within Groups | 373.682 | 247 | 1.513 | | |
| | Total | 376.084 | 249 | | | |
| Q12 TM_HORIZ | Between Groups | 13.626 | 2 | 6.813 | 6.961 | .001 |
| | Within Groups | 241.738 | 247 | .979 | | |
| | Total | 255.364 | 249 | | | |
| Q13 SLM_AUTON | Between Groups | 12.240 | 2 | 6.120 | 4.071 | .018 |
| | Within Groups | 371.284 | 247 | 1.503 | | |
| | Total | 383.524 | 249 | | | |
| Q14 TM_CLARIF | Between Groups | 24.108 | 2 | 12.054 | 9.134 | .000 |
| | Within Groups | 325.976 | 247 | 1.320 | | |
| | Total | 350.084 | 249 | | | |
| Q15 ISM_CONSUL | Between Groups | 44.922 | 2 | 22.461 | 18.840 | .000 |
| | Within Groups | 294.474 | 247 | 1.192 | | |
| | Total | 339.396 | 249 | | | |
| Q16 INTEGR | Between Groups | 14.151 | 2 | 7.075 | 3.547 | .030 |
| | Within Groups | 492.765 | 247 | 1.995 | | |
| | Total | 506.916 | 249 | | | |
| Q17 HRMPOL | Between Groups | 9.733 | 2 | 4.866 | 3.300 | .039 |
| | Within Groups | 364.283 | 247 | 1.475 | | |
| | Total | 374.016 | 249 | | | |
| Q18 TECQUAL | Between Groups | 11.574 | 2 | 5.787 | 4.915 | .008 |
| | Within Groups | 290.826 | 247 | 1.177 | | |
| | Total | 302.400 | 249 | | | |

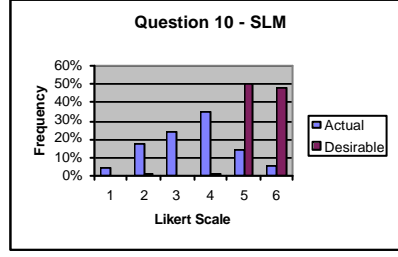
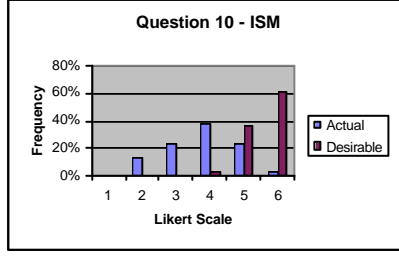
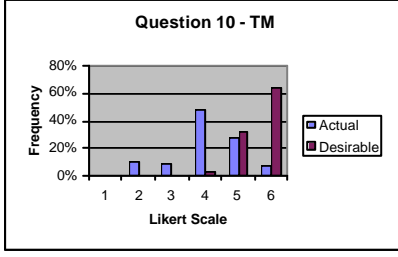
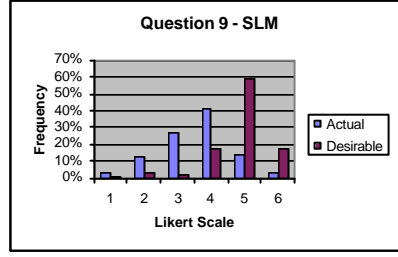
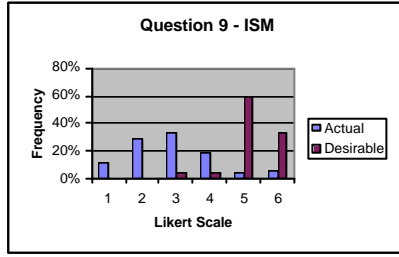
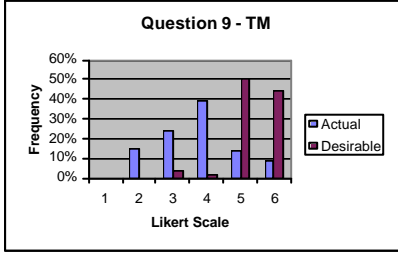
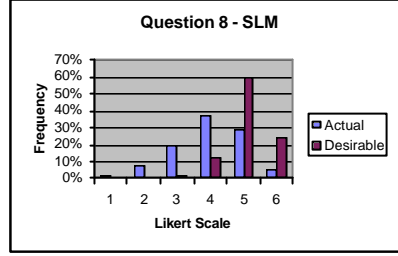
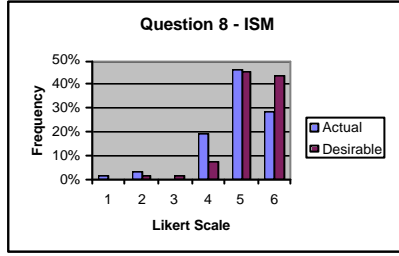
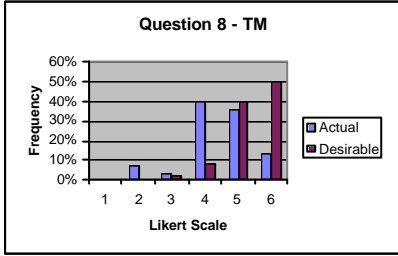
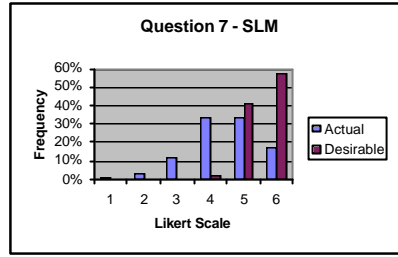
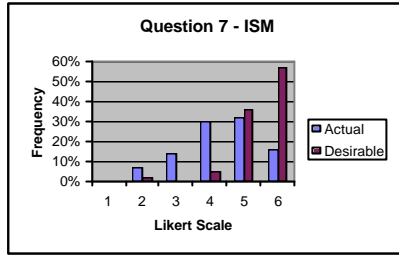
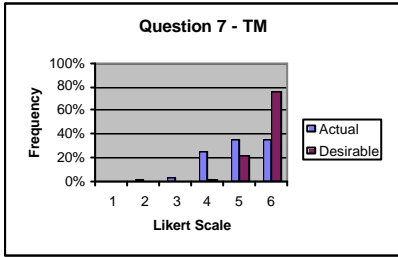
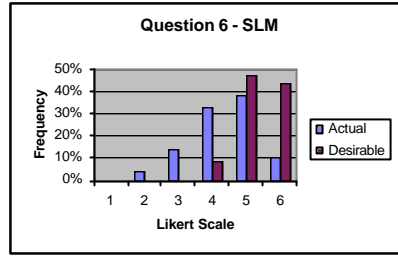
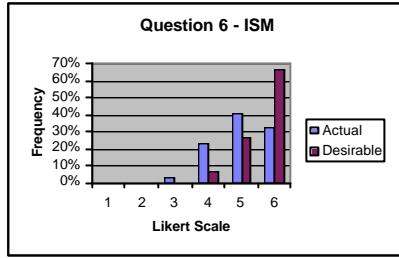
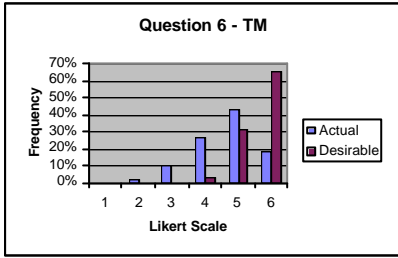
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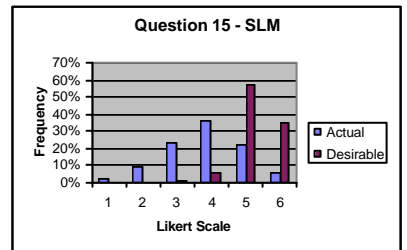
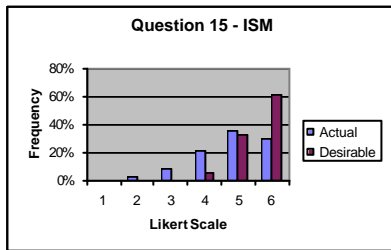
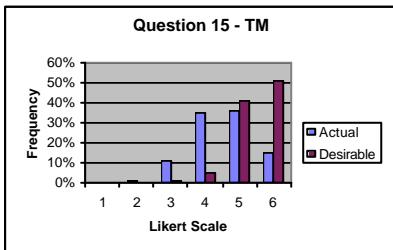
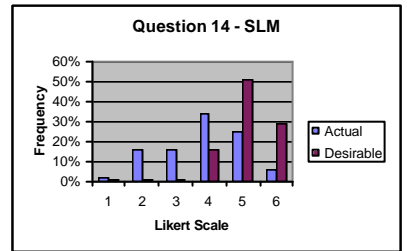
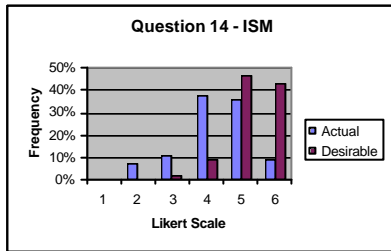
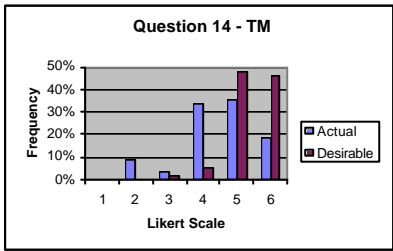
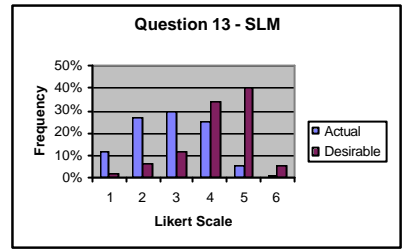
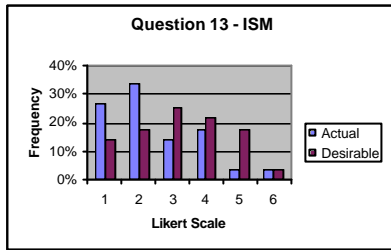
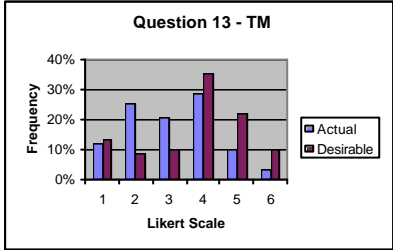
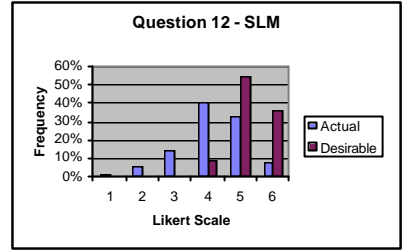
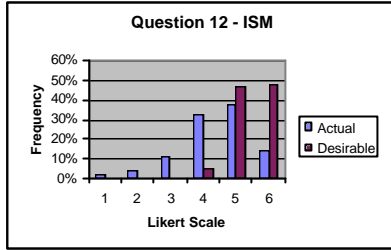
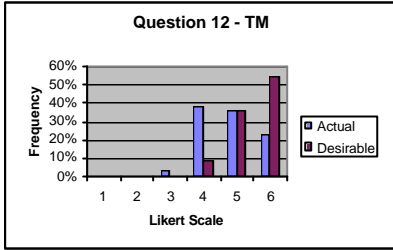
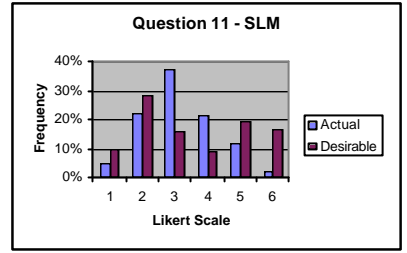
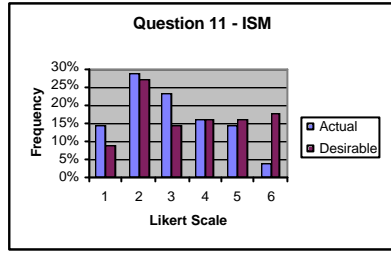
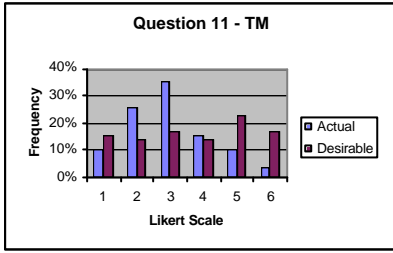
| | | Sum of Squares | df | Mean Square | F | Sig. |
|-------------|----------------|----------------|-----|-------------|-------|------|
| Q19 INCENT | Between Groups | 17.003 | 2 | 8.502 | 5.042 | .007 |
| | Within Groups | 409.749 | 243 | 1.686 | | |
| | Total | 426.752 | 245 | | | |
| Q20 NEGOTIA | Between Groups | 7.754 | 2 | 3.877 | 2.449 | .089 |
| | Within Groups | 384.766 | 243 | 1.583 | | |
| | Total | 392.520 | 245 | | | |
| Q21 ISOLAT | Between Groups | 2.596 | 2 | 1.298 | .758 | .470 |
| | Within Groups | 415.989 | 243 | 1.712 | | |
| | Total | 418.585 | 245 | | | |
| Q22 PLANN | Between Groups | 21.023 | 2 | 10.511 | 8.408 | .000 |
| | Within Groups | 303.806 | 243 | 1.250 | | |
| | Total | 324.829 | 245 | | | |
| Q23 COOPER | Between Groups | 11.323 | 2 | 5.661 | 5.376 | .005 |
| | Within Groups | 255.885 | 243 | 1.053 | | |
| | Total | 267.207 | 245 | | | |
| Q24 INFRAST | Between Groups | 13.603 | 2 | 6.801 | 5.496 | .005 |
| | Within Groups | 300.710 | 243 | 1.237 | | |
| | Total | 314.313 | 245 | | | |
| Q25 BOARD | Between Groups | 4.183 | 2 | 2.091 | 1.542 | .216 |
| | Within Groups | 329.642 | 243 | 1.357 | | |
| | Total | 333.825 | 245 | | | |

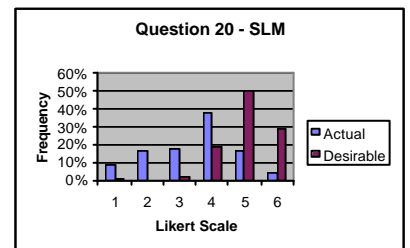
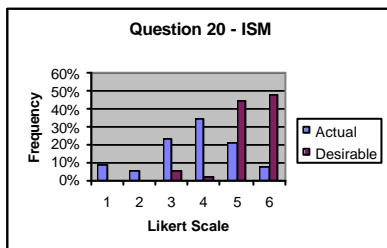
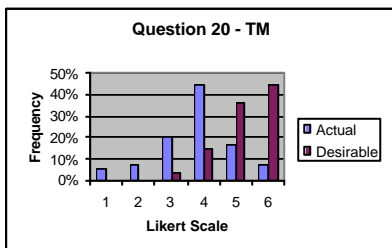
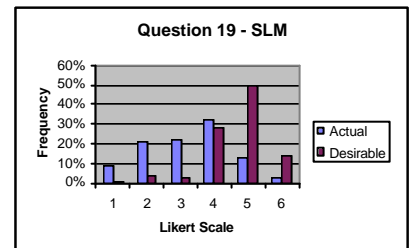
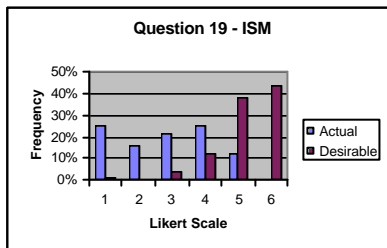
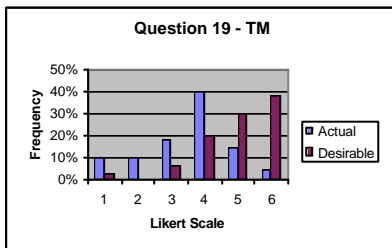
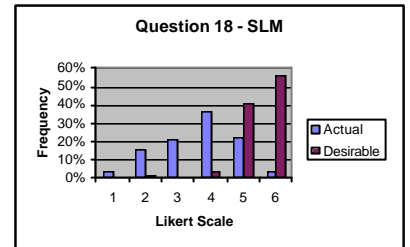
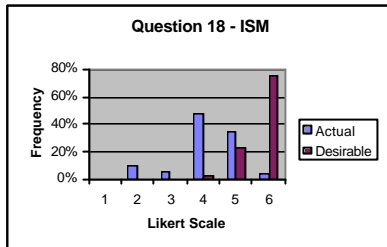
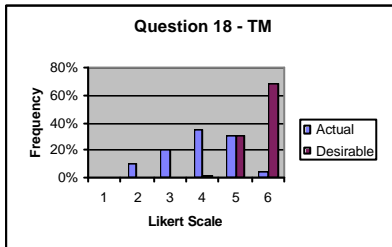
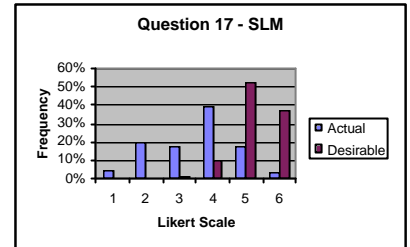
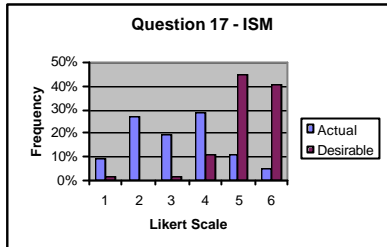
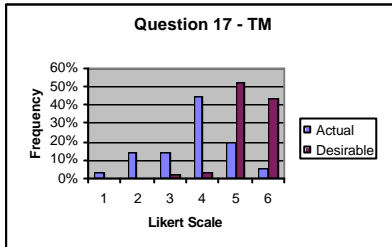
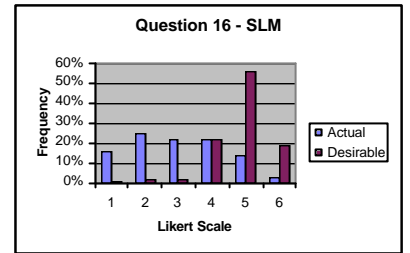
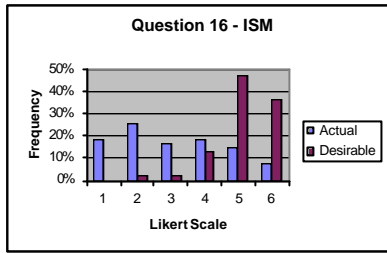
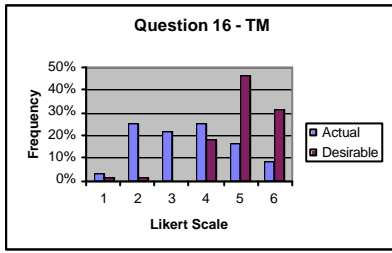
Annex 2

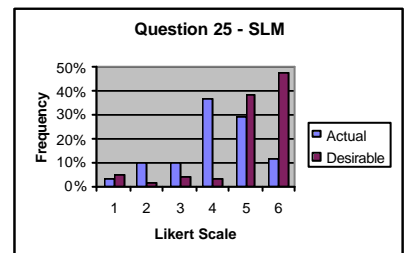
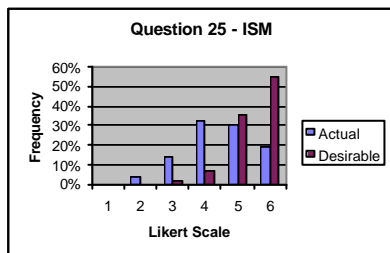
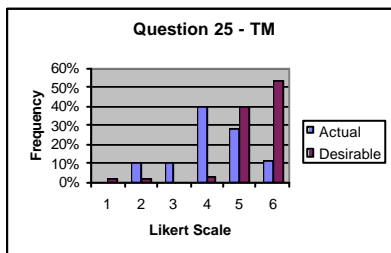
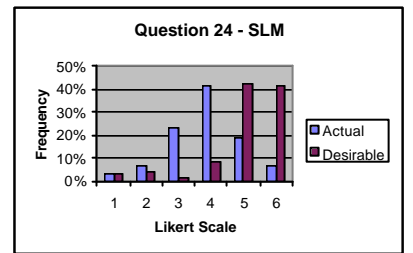
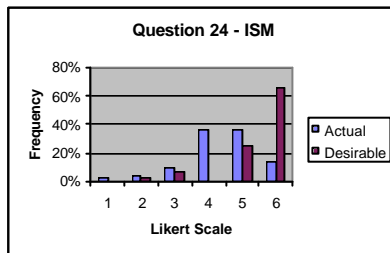
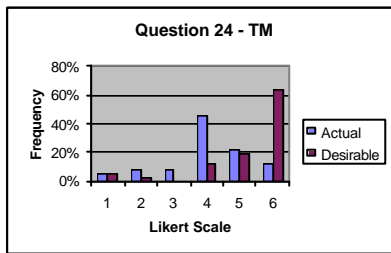
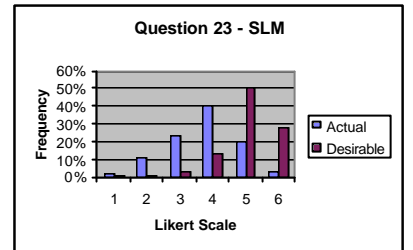
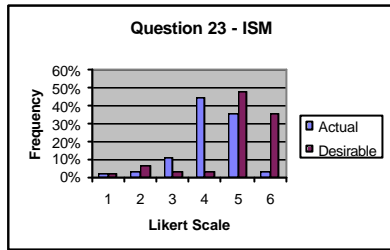
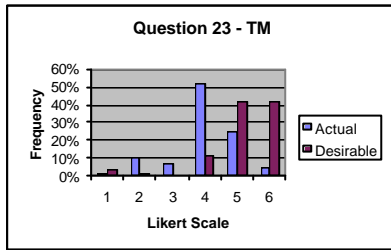
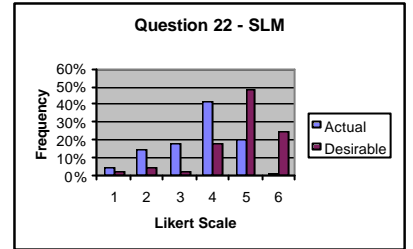
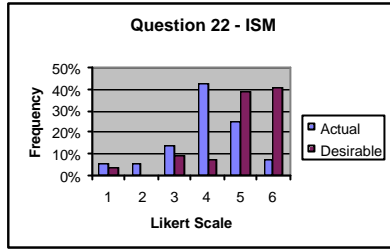
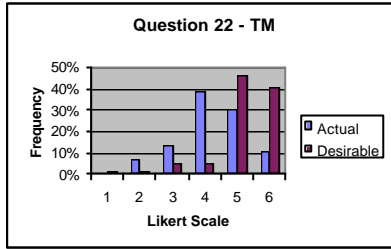
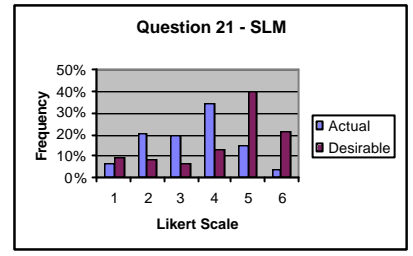
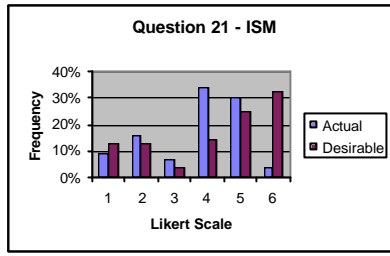
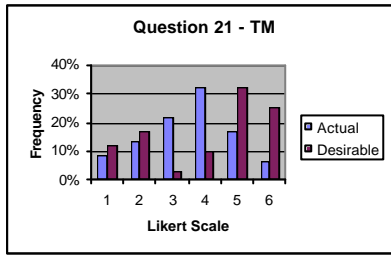
Histograms of the response scores by questionnaire item and by groups of respondents: TMs - Top Manager; ISMs - Information Systems Manager; SLM - Senior Line Manager











Appendix 3

OUTPUT OF THE CRONBACH'S ALPHA COEFFICIENTS

Reliability - IS INTENT

RELIABILITY ANALYSIS - SCALE (ALPHA)

| | | Mean | Std Dev | Cases |
|----|----|--------|---------|-------|
| 1. | Q1 | 4.3665 | 1.0588 | 251.0 |
| 2. | Q2 | 4.5777 | 1.0183 | 251.0 |
| 3. | Q3 | 4.5378 | 1.1034 | 251.0 |
| 4. | Q4 | 3.8685 | 1.1219 | 251.0 |
| 5. | Q5 | 4.1753 | 1.0664 | 251.0 |
| 6. | Q6 | 4.5817 | .9861 | 251.0 |

| | Mean | Variance | Std Dev | N of Variables |
|----------------------|---------|----------|---------|----------------|
| Statistics for SCALE | 26.1076 | 17.4404 | 4.1762 | 6 |

Item-total Statistics

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Alpha if Item Deleted |
|----|----------------------------|--------------------------------|----------------------------------|-----------------------|
| Q1 | 21.7410 | 12.6167 | .4922 | .6929 |
| Q2 | 21.5299 | 12.5221 | .5386 | .6803 |
| Q3 | 21.5697 | 12.2461 | .5149 | .6859 |
| Q4 | 22.2390 | 11.9106 | .5516 | .6744 |
| Q5 | 21.9323 | 13.2714 | .3902 | .7219 |
| Q6 | 21.5259 | 13.9383 | .3436 | .7324 |

Reliability Coefficients

N of Cases = 251.0

N of Items = 6

Alpha = .7360

† † †

Reliability - DISCIPLINE

RELIABILITY ANALYSIS - SCALE (ALPHA)

| | | Mean | Std Dev | Cases |
|----|----|--------|---------|-------|
| 1. | Q7 | 4.5538 | 1.0734 | 251.0 |
| 2. | Q8 | 4.3068 | 1.1160 | 251.0 |
| 3. | Q9 | 3.4861 | 1.1708 | 251.0 |

| | N of | | | |
|----------------|---------|----------|---------|-----------|
| Statistics for | Mean | Variance | Std Dev | Variables |
| SCALE | 12.3466 | 5.3074 | 2.3038 | 3 |

Item-total Statistics

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item- Total Correlation | Alpha if Item Deleted |
|----|-------------------------------------|---|--|-----------------------------|
| Q7 | 7.7928 | 2.9169 | .3378 | .2061 |
| Q8 | 8.0398 | 3.2144 | .2118 | .4303 |
| Q9 | 8.8606 | 2.9445 | .2469 | .3715 |

Reliability Coefficients

N of Cases = 251.0

N of Items = 3

Alpha = .4350

† † †

Reliability - TRUST

RELIABILITY ANALYSIS - SCALE (ALPHA)

| | Mean | Std Dev | Cases |
|--------|--------|---------|-------|
| 1. Q10 | 3.7470 | 1.1578 | 253.0 |
| 2. Q12 | 4.3834 | 1.0075 | 253.0 |

| | N of | | | |
|----------------|--------|----------|---------|-----------|
| Statistics for | Mean | Variance | Std Dev | Variables |
| SCALE | 8.1304 | 3.1932 | 1.7870 | 2 |

Item-total Statistics

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item- Total Correlation | Alpha if Item Deleted |
|-----|-------------------------------------|---|--|-----------------------------|
| Q10 | 4.3834 | 1.0151 | .3590 | . |
| Q12 | 3.7470 | 1.3405 | .3590 | . |

Reliability Coefficients

N of Cases = 253.0 N of Items = 2

Alpha = .5246

† † †

Reliability - SUPPORT

RELIABILITY ANALYSIS - SCALE (ALPHA)

| | Mean | Std Dev | Cases |
|--------|--------|---------|-------|
| 1. Q14 | 4.0945 | 1.1858 | 254.0 |
| 2. Q15 | 4.1969 | 1.1595 | 254.0 |

| | N of | | |
|----------------|--------|----------|-----------|
| Statistics for | Mean | Variance | Std Dev |
| SCALE | 8.2913 | 3.8595 | 1.9645 |
| | | | Variables |
| | | | 2 |

Item-total Statistics

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item- Total Correlation | Alpha if Item Deleted |
|-----|-------------------------------------|---|--|-----------------------------|
| Q14 | 4.1969 | 1.3445 | .4033 | . |
| Q15 | 4.0945 | 1.4061 | .4033 | . |

Reliability Coefficients

N of Cases = 254.0

N of Items = 2

Alpha = .5746

† † †

Reliability - DISCIPLINE/TRUST/SUPPORT

RELIABILITY ANALYSIS - SCALE (ALPHA)

| Statistics for | Mean | Variance | Std Dev | N of Variables |
|----------------|---------|----------|---------|----------------|
| SCALE | 28.7200 | 26.6763 | 5.1649 | 7 |

Item-total Statistics

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Alpha if Item Deleted |
|-----|----------------------------|--------------------------------|----------------------------------|-----------------------|
| Q7 | 24.1680 | 20.3893 | .5285 | .7475 |
| Q8 | 24.4200 | 20.8711 | .4490 | .7627 |
| Q9 | 25.2400 | 22.2474 | .2776 | .7967 |
| Q10 | 24.9840 | 19.3491 | .5893 | .7343 |
| Q12 | 24.3440 | 20.3872 | .5798 | .7391 |
| Q14 | 24.6280 | 18.9494 | .6164 | .7281 |
| Q15 | 24.5360 | 20.0328 | .5120 | .7504 |

Reliability Coefficients

N of Cases = 250.0

N of Items = 7

Alpha = .7798

† † †

Reliability - FACILITATION/INHIBITION

RELIABILITY ANALYSIS - SCALE (ALPHA)

| | Mean | Std Dev | Cases |
|--------|--------|---------|-------|
| 1. Q16 | 3.1498 | 1.4277 | 247.0 |
| 2. Q17 | 3.5425 | 1.2384 | 247.0 |
| 3. Q18 | 3.8664 | 1.1127 | 247.0 |
| 4. Q19 | 3.2713 | 1.3172 | 247.0 |

| Statistics for | Mean | Variance | Std Dev | N of Variables |
|----------------|---------|----------|---------|----------------|
| SCALE | 13.8300 | 13.3693 | 3.6564 | 4 |

Item-total Statistics

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Alpha if Item Deleted |
|-----|----------------------------|--------------------------------|----------------------------------|-----------------------|
| Q16 | 10.6802 | 7.3729 | .5105 | .5831 |
| Q17 | 10.2874 | 8.0349 | .5413 | .5644 |
| Q18 | 9.9636 | 9.7588 | .3412 | .6842 |
| Q19 | 10.5587 | 8.1175 | .4685 | .6111 |

Reliability Coefficients

N of Cases = 247.0

N of Items = 4

Alpha = .6806

† † †

Reliability - IS ORGANIZATIONAL LEARNING

RELIABILITY ANALYSIS - SCALE (ALPHA)

| | Mean | Std Dev | Cases |
|--------|--------|---------|-------|
| 1. Q20 | 3.6429 | 1.2590 | 252.0 |
| 2. Q22 | 3.8373 | 1.1472 | 252.0 |
| 3. Q23 | 3.9206 | 1.0456 | 252.0 |
| 4. Q24 | 4.0397 | 1.1459 | 252.0 |
| 5. Q25 | 4.2421 | 1.1745 | 252.0 |

| | N of | | | |
|----------------|---------|----------|---------|-----------|
| Statistics for | Mean | Variance | Std Dev | Variables |
| SCALE | 19.6825 | 15.2295 | 3.9025 | 5 |

Item-total Statistics

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item- Total Correlation | Alpha if Item Deleted |
|-----|-------------------------------------|---|--|-----------------------------|
| Q20 | 16.0397 | 10.0144 | .4556 | .6541 |
| Q22 | 15.8452 | 10.4979 | .4595 | .6512 |
| Q23 | 15.7619 | 10.7240 | .4983 | .6379 |
| Q24 | 15.6429 | 10.7564 | .4204 | .6672 |
| Q25 | 15.4405 | 10.3829 | .4581 | .6518 |

Reliability Coefficients

N of Cases = 252.0

N of Items = 5

Alpha = .7011

† † †