December 2004

The IS Function and IS Professionals in a Virtual IS Context: a Qualitative Research

Jose Nascimento
University of Minho

Luis Amaral
University of Minho

The IS Function and IS Professionals in a Virtual IS Context: a Qualitative Research

José Carlos Nascimento
IS Dept., University of Minho, Portugal
jcn@dsi.uminho.pt

Luís Alfredo Amaral
IS Dept., University of Minho, Portugal
amaral@dsi.uminho.pt

ABSTRACT

The present paper aims to improve our understanding of the context where Information Systems (IS) activities are performed, how this context is evolving and what will be the impacts of this evolution on the roles and skills of IS professionals.

This study was conducted under the ontological and epistemological fundamentals of interpretative research and aims to build theories and models based on data from semi-structured interviews with 30 IS leading experts, both academic and practitioners.

Factors that affect IS activities have been identified and a dynamic model that supports IS context transformation is proposed. This model aims to explain how relations among different actors, roles and responsibilities have evolved and to predict scenarios in the present virtualized context where IS activities are performed. Finally, contributions are made to the ongoing debate about IS professional's skills and a model that supports the multi-dimensionality of today's IS professional profile is presented.

Keywords

IS management, IS function, IS professionals, IS skills.

INTRODUCTION

There is a growing awareness that few activities and professions have seen such a rapid change over the past years as the activities and professions related to the field of Information Systems (IS) (Lee, Trauth and Farwell, 1995). These transformations are occurring in a shifting environment, whose pace of change is far away from slowing down. Furthermore, as business managers and end users became more aware of IS importance to their organization, increasing dissatisfaction is perceived, concerning the contribution of the IS function to the effective use and deployment of IT. Due to the above, significant pressure is being sensed towards new forms of IS management and an ongoing debate about IS professionals' skills and attitudes is gaining relevance, particularly in large organizations.

Significant research has been conducted about these subjects and different aspects of IS activities have been analyzed. Some of these studies were concerned with the role, opportunities and risks of the IS function (Applegate and Elam, 1992; Bashein and Markus, 1998; Earl and Feeny, 1995), others were more concerned about how the IS function should be organized (Cross, Earl and Sampler, 1997) (Peppard, Lambert and Edwards, 2000) and a series of studies addressed the development of IS Human Resources, in terms of organizational needs (Heckman, 1998; Lee et al., 1995) or in terms of Curriculum development.

Most of the studies stressed the importance of further research in these areas due to the complexity and the moving nature of these subjects. But perhaps the most compelling argument to the present study is that changes in the fundamentals of the IS function are being felt, making crucial to understand its real nature and their potential impact on IS professionals.

The significance and relevance of the subjects covered in this paper come from the possible contribution to diverse IS domains - organizational design, IS professionals management, curricula design and IS function development are directly connected with the outcomes of this study. Additionally, the nature and fundamentals of this study may support future research in these fields and encourage diversity in IS research.

RESEARCH PROBLEM AND QUESTIONS

This study identifies the main forces that are inducing changes in the organizational context where IS are managed, in order to understand how a changing context can impact the IS function's standing and to find the competences, skills and attitudes needed by IS professionals to act accordingly new demands.

Several research questions were posed:

- What is the nature of the forces that affect the evolving context where IS activities are performed and what changes are they causing?
- What will be the impact of how IS are managed in the positioning of the IS function within the organizational structure?
- How will these impacts affect IS personnel's competences, skills and roles in organizations?

These questions evolved from a theoretical background supported by research on two IS subjects (IS function and IS professionals) that showed increased interest in the last decade, both by academics and practitioners.

From the literature review important contributions about IS function's development were found concerning core IS capabilities and needs (Feeny and Willcocks, 1999), significant trends (Brancheau, Janz and Wetherbe, 1996), (Rockart, Earl and Ross, 1996) and ways of organizing the function (Boynton, Zmud and Jacobs, 1992), (Malone, 1997), (Cross et al., 1997), (Heckman, 1998), (Sambamurthy and Zmud, 1999).

Similarly, significant studies were presented concerning IS professional's skills (Lee et al., 1995) (Todd, McKeen and Gallupe, 1995), (Klenke, 1998), with a particular focus on the model curriculum in the IS field. Work on model curriculum has been done since the 80's by professional and academic organizations, such as ACM, AIS or the AITP (formely DPMA). The "IS'97 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems" (Davis, Gorgone, Couger, Feinstein and Longenecker, 1997) and it's 2002 Update (Davis, Feinstein, Gorgone, Longenecker and Valacich, 2001) are the most significant results of these efforts.

Although covering different IS subjects, the correlated message of these works is that flexibility and wider involvement typifies the context where IS professionals are acting.

RESEARCH APPROACH

Based on the degree of uncertainty that applies to the future of IS activities and professions, the lack of accepted frameworks to anticipate IS function evolution and the nature of the research problem, it was established that a more valuable contribution could be made if theory were derived from data obtained from fieldwork, with no previous preconceptions about the problem under research.

Under these assumptions, the ontological and epistemological principles of interpretative research were found more suitable to the achievement of research goals. The choice of an interpretive approach should not be seen as a hostility to or disagreement with positivist research, which is more common and widely accepted in the IS research arena (Orlikowski and Baroudi, 1991), but as a natural answer to the research purposes. Accordingly, no previous formulation of hypothesis was done and an open and non-biased approach to the research contributors was envisaged, as propositions were expected to derive openly from a continuous interplay between researchers and data (Strauss and Corbin, 1998).

Albeit the growing acceptance of interpretative research in IS domains, it is important to present its basic principles to support some assumptions in this study:

- Our knowledge of reality is gained through social constructions such language, consciousness, shared meanings and other artifacts. Interpretative research does not predefine dependent and independent variables, but focus on the complexity of human sense making as the situation emerges (Klein and Myers, 1999);
- The phenomena under research need to be studied in its own context and in combination with it. Under these assumptions, in different context, different interpretations of the same phenomena can be obtained;
- Due to the nature of the relation between the researcher and the contributor, the later should not be seen as a "research subject" but as an "active participant". (King, 1994).

RESEARCH METHOD AND DESIGN

Although no direct connection should be "naturally" granted - as often stated - it should be acknowledged that some research methods and some techniques are more suitable than others to support the underlying philosophical assumptions of the

researcher (Myers, 1997). Under this principle, data has been collected from a group of 30 IS leading experts that contributed with their experience, interpretations and views, through semi-structured interviews (Oppenheim, 1992). All the interviews were taped for subsequently analysis and complete transcriptions were sent to each contributor.

The diversity of original fields of the contributors (academics, IS managers, RH managers, IS senior consultants and IS industry managers) reflects the "growing awareness in IS community that our subject domain is broader than we had first thought" (Galliers, 1998) and that a trans-disciplinary approach is required due to the complexity that is related with today's problems.

During the research process, data obtained were continuously under analysis and new concepts and findings were introduced in the process, until "theoretical saturation" was reached, following the basic concepts of "grounded theory" (Strauss and Corbin, 1998).

For the process of indexing and theorizing, the support of a software tool was found imperative due to the large amount and complexity of the collected material. NUD*IST software was chosen because of its potential in indexing, searching and theorizing - the "IST" part of product's designation - and the relation with the identification of concepts, the creation of categories and the emergence of propositions that bases a "grounded theory" approach.

ENVIRONMENTAL FORCES IMPACT ON THE IS CONTEXT

The first major concern was to identify the forces that presently drive IS context transformation and their relationship with the different dimensions that describe it. When we say "presently", we mean the period of time that surrounds the present moment, both evaluating the near past and trying to foresee the nearby future, according to what is drawn from the data gained from the interviews.

Changing Dimensions

One of the most valuable findings in this phase of the research is that relevant forces were not only a direct result of identifiable trends in the IS field, (e.g. globalization, Internet) but also – and particularly – a result of new perceptions and assumptions that players withdraw from these trends (e.g. assuming change and volatility as natural, bigger awareness on information issues and IS strategic thinking). In order to emphasize the role of relevant forces, these are presented in their relation with IS context's dimensions that are influenced by.

A "boundary less" horizontal dimension

The extent of IS intervention was significantly changed by spreading out business activities beyond the organization boundaries, involving both customers and suppliers. With new approaches - such as Customer Relationship Management (CRM) and Supplier Chain Management (SCM) - and the emergence of new forms of inter-organizational relationships that are strongly dependent of IS support, the inside of the organization is no longer the sole playing arena for IS activities (Machado and Beira, 2001).

A rising vertical dimension

Transformation forces were also remarked towards the top of the organization, although if, as referred by the panel of interviewees, in a more gradual approach. First under the form of Decision Support Systems (DSS) or Executive Information Systems (EIS), later pulled-up by the development of "massive" technologies, such as Data Warehouses and Data Mining, it is notorious the growing importance of transforming operational data in business information.

It should be noticed that the importance of this vertical force is amplified by the broadening of operational level and by the fact that it impacts directly high levels of management, affecting not only the way how they work but also their mind-set about IT's role.

The strategic dimension

The presence of IT in the top management level can also be felt as the driver to change the way of conducting business or even changing business itself, with a real intervention in the domain of business strategy (Galliers, Leidner and Baker, 1999).

Actually, as assumed by an interviewee, "if the presence of IS in organization's strategy is showing to be important, it should be natural that decisions about IS strategy should be carried out by top management".

Complexity as an accepted dimension

As time goes by, organizations and IS professionals are accepting that complexity, diversity and permanent change are not the problem to solve, but the normal and positive way of managing: "an new ubiquitous era" (Applegate, Mcfarlan and McKenney, 1996).

The growing number of business aspects under IS support and the increasing demand of "business thinking" in the IS solutions delivery process, which claims for an outstanding performance of the IS function in these domains and the involvement of multiple players, exemplifies the characteristics of this complexity.

A new data dimension – unstructured data

The growing awareness about unstructured data and information, that will probably introduce an all-new framework of IS activities and applications, in an unpredictable extension. This new scenario will establish significant challenges, that will be amplified by the present culture of IS professionals, which has been developed under the premises of structured information, analytical approaches and Cartesian accepted wisdom.

The IS services dimension

Finding "Outsourcing" and IS service providers in the IS context is more and more usual. As stated by one interviewee "In the uncertainty of IS domains, its certain that we will use more external services, in a growing manner". And as stated by many others, this will not only happen in the traditional operational domain, but also in the value-added arena.

The complex dimension "time"

As a significant finding, the only dimension of the IS context that was described by interviewees as a "shrinking" one was "time". To support these finding different perspectives were presented: the evidence that the time available to build and deliver new solutions is shorter; the fact that IS technologies and IS solutions have shorter life and demand for more changes in their lifetime and the fact that the gap between business and IS planning is shortening, even disappearing.

A MODEL TO EXPLAIN AND PREDICT TRANSFORMATION OF THE IS CONTEXT

As result of theorization process, some propositions referred that an evolutionary model - that normally supports natural development and growth of an entity - is not suitable to explain the fundamental transformation that is occurring in the IS context. A new model is proposed, in order to better support the nature of this transformation.

This model, briefly described in this paper, is based in two time opposite representations of the IS context, with a transformation process supported by morphing principles.

The two representations of the IS context

The first representation is the Initial IS Context, which reflects the way Informatics appeared in organizations: a small number of tasks and responsibilities, with a technological focus, developed in a limited functional and physical environment – the IT department. As a result, a limited number of activities were performed, targeting the inside of the organization and having automation and efficiency as the major goals

On the opposite side of the model, the Final IS Context representation is presented. This representation reflects a number of significant transformations and can be seen under three different and cumulative perspectives:

- The dimension and scope of the context;
- The nature of the activities;
- The way these activities are managed.

The dimension and scope of the context must be seen using a different scale, assuming a superior order of magnitude. At same time the nature of the activities progress extensively, not only in number but also in type, category, style, focus and goals. They are managed in different ways and can be produced either inside or outside the organization, to satisfy internal or external demands. The management of these activities is assured in a virtual manner, with no explicit representation of functional ownership, as presented later. In Figure 1, the diversity of ways how tasks (T) and responsibilities (R), both internal and external, can be combined in order to assure activities (ACT), show the different nature and complexity of today's IS context.

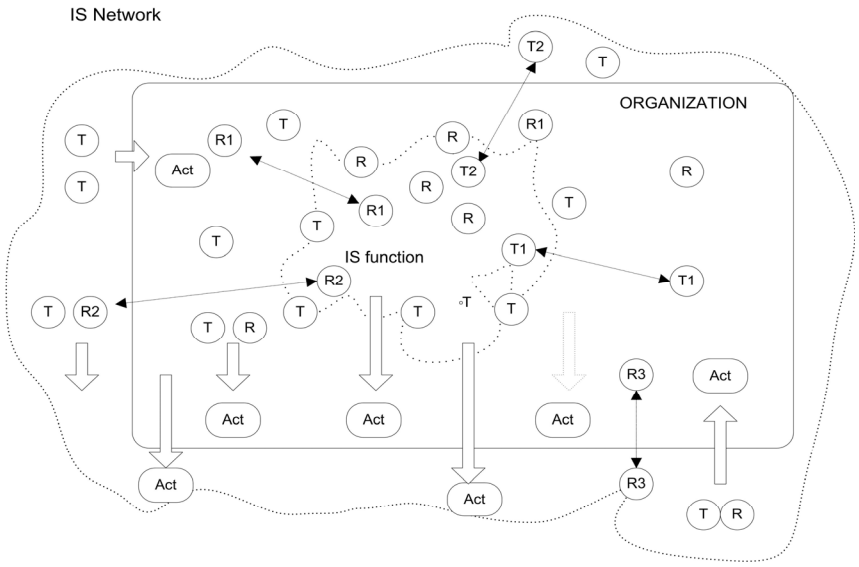

Figure 1. The Final IS context

A morphing process conducting to virtualization

Under the "morphing principles" a first representation is gradually replaced by a new representation, allowing the occurrence of new and the replacement of old basic characteristics. Appling these principles to the IS context, its possible to identify the changing nature of IS activities, as presented in Table 1:

IS Activities	Initial Context	Final Context
Number	Reduced	High
Main Drivers	Technology , Support	Assorted natures
Organizational Scope	Operational, internal	Operational, tactic and strategic – internal and external
Actors	IT professionals mainly	Varied, both internal and external
Manipulated Object	Structured Data	Multiformat and multimedia Information – Structured and unstructured
Changing Pace	Slow	Very fast
Responsibilities and Tasks	Few and well defined	Diffused and shared: inside and outside the organization
Organizational Representation	Existing (In the IS function)	Non-Existing (Virtualized)

Table 1. IS activities characteristics

Major consequences derived from the analysis of the Model

The interviewees frequently emphasized a growing virtualization of IS activities, as a growing number of actors outside IS organization, based on their importance and diversity, are developing a complex and borderless network that assures a significant part of IS activities (Heckman, 1998). As if a Meta-IS organization replaced the traditional IS function, but without being perceived, under no explicit strategy and carrying misconceptions about each others roles and responsibilities.

This effective "non-management" of IS activities is the real problem and a significant number of interviewees expressed - in an assortment of shapes and details - the inevitability of developing a "new" IS function, that should define itself (mission, role and organization) according to this "new" IS context, to act as a keeper of the IS vision and to lead the "network of actors" in the pursuing of planned organizational goals.

ACTING AND MANAGING IN THE FINAL IS CONTEXT

From the findings of this study, new propositions are suggested and grouped in the following three sections:

The separation of IT and IS functions

In order to implement a new IS function, the research process pointed towards the need to clarify roles in organization, namely of those that are directly related with the IT and IS management activities. According to this principle, the separation and definition of IT and IS functions were advised.

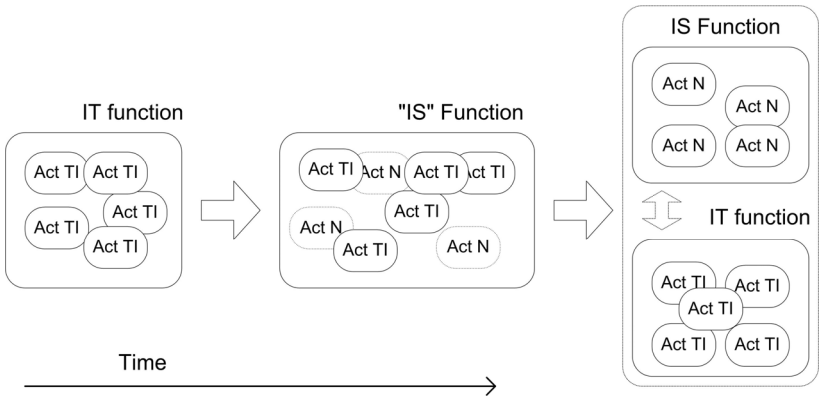

Figure 2. Separation of IT and IS functions

The adoption of a multidimensional federal model

A multidimensional federal model to manage IS activities is proposed. It builds on a federal approach, were "*equilibria"* between centralization and decentralization, between relations and separations are permanently searched, all along with what can be designated as the "continuum of decentralization". This permanent search doesn't seem to be an easy task but the effective management of these *"equilibria"* could be one of the differences between organizations that will prevail and those that will fail (Malone, 1997).

The multidimensional dimension of the federal model is imposed since the IS function will have to manage this federal relations and the search of these "*equilibria"* with different stakeholders (i.e. top management, business units, suppliers, costumers and partners).

Rethinking the replacement and restructuring of basic units in IS organization

From the scenario described above, three propositions about the fundamentals of this dematerialized context emerged:

- The impracticality of expanding individual skills "ad infinitum" establishes the need to foresee IS professionals in the context of dynamic teams: IS teams - not individuals - became the basic unit of IS organization.
- Due the growth of IS solutions' complexity, it is difficult to assume a "tayloristic" approach to describe IS work, with sharply defined tasks. Projects - not tasks - are suggested as the basic unit of IS work.
- IS professionals tend to integrate multiple projects, in an asynchronous manner, assuming different roles and applying different skills. The ability of recombining skills from a dynamic portfolio is more important than the amount of skills itself.

The analysis of these basic units - team, project and skills combination - shows two different components: a materialized one, which results from the aggregation of old units and a dematerialized one, which builds from the established relations.

A MODEL FOR THE IS PROFESSIONAL'S PROFILE

Following the basic proposition that the IS professional is today part of a complex IS context, a multi-dimensional model of IS professional's profile is proposed in order to sustain and organize the significant number of skills and capabilities that are implicit and related in this environment

Five fundamental dimensions were used to build this model's nucleus and an involving dimension was used to complete it, as presented in Figure 3

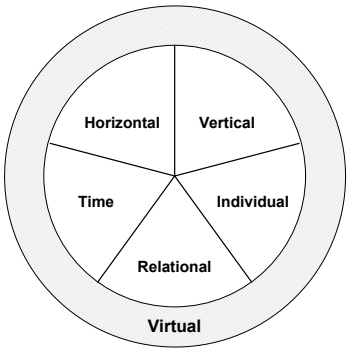

Figure 3. IS Professional Profile - five plus one virtual dimensions

Horizontal Dimension

As a result of the spreading out of IS activities, the growing involvement of different actors and the assumptions of new fundamental structures - Team, Project, Skills combination – the horizontal expansion of IS professional's skills and relations within is unavoidable.

Nevertheless this scenario doesn't shape the IS professional as a "superhero", capable of acting as a specialist in all the domains. What it really rises is the need of a holistic vision of the context, going together with adequate knowledge and skills to interact with the all players that, in different places and with diverse goals, share the IS context.

Vertical Dimension

One of the interviewees stated "excellence in a field must come from individual contributions; it's not a team "sub product". Other said that "to an individual, surrounded by people with global generic knowledge, the differentiation and his real added value is gained from being specialist and outstanding in a vertical field".

This is a particularly important dimension as huge satisfaction, self achievement and long-lasting skills can be obtained by developing excellence in a selected field. (Farren and Kaye, 1996).

Generalization caused by horizontality and specialization caused by verticality should not be seen as a paradox but as natural complementarities of the two dimensions.

Relational Dimension

In a SI context with multiple players and varied interactions, relational skills are often referred, covering the needs of coordination, negotiation and leadership.

Stressing the needs for team and project management, the interviewees addressed not only the importance of improving individual contribution inside the team but, particularly, the capability of developing the potential and the productivity of the team as an all.

Negotiation skills, in "lacto senso", appear as particularly important, as a significant number activities are related with different kinds of negotiation, both internal and external, where the IS professional acts, sometimes simultaneously, as a customer or as a supplier. "The ability to offer, to ask, to promote, to counteroffer, to reject, to deal, to defer, to decline and to insist is also related with the role of coordination" (Denning and Dunham, 2001).

Time Dimension

Thinking about the "time dimension" involves two different perspectives:

- The capability of dealing with the consequences of "retrenchment" of time in fast changing environments. In today's IS context, IS solutions require sooner involvement, faster implementation but present shorter lifetime. "Time dimension" will grant IS professional the skills to normally behave in a "lifelong changing environment".
- The capability of managing a valuable but finite resource: time.

Individual Dimension

Although a proposition suggests "the replacement of 'individual' by 'team' as a fundamental of IS organization", a deeper analysis of the data collected shows that, as 'team' gains importance in the organizational context, the awareness of the IS professional about management of his own assets should also increase.

The strongest point of the "individual dimension" is the permanent search for excellence, which is at first a matter of attitude. This endogenous relation between the acknowledgement of the "individual dimension" and the adoption of a fitting attitude is one of the genitors of the related skills. The others results from an everlasting dialectic evaluation about the scope and goals of the team and the scope and goals of the individual. After all, when a project ends – after a day, a month, a year – teams disaggregate and their members become again individual agents looking for a new project (Malone and Laubacher, 1998). As stated by an interviewee: "an IS professional should feel himself as an entrepreneur and not as a passive element of a chain".

The Sixth Dimension - the virtual involving dimension

Stretching the multidimensional dimension of the IS professional, an additional dimension is presented, with characteristics of virtual behavior, complexity and even loose characterization This virtual dimension gains from and integrates all the others and it is not structured with explicit skills or capabilities. On the opposite, this virtual dimension represents a specific ability or a developed talent to naturally act and progress in environments and milieus that are insecure, complex and ever changing.

Following the principles that support some of the precedent propositions, this dimension appears as an end result of the interactions among other basic components. Skills and capabilities that add up to build the fundamental five dimensions, also contribute to the development of this virtual dimension.

This virtual dimension – demanding practice, mind-set and everlasting reasoning - should go together with the IS professional's development. This virtual dimension is the "virtual tool" – almost an instinct - that will allow IS professionals to behave effectively in an IS context that incorporates uncertainty, virtual teams and organizations, informal communication, unstructured data and unexpected and transitory realities.

CONCLUSIONS

To contribute to a better usage of IS in organizations, academic community must continually monitor industry in order to better understand how IS management evolves and how IS professional skills should be developed. But in a changing environment, contributions should also be made to suggest and to assist transformation.

The present research was designed to contribute with new propositions, theories and models, allowing a better understanding of IS function precedent behaviors and problems and an anticipation of scenarios and phenomena.

Some contributions concerning the IS function and IS professionals have been drawn up from the conceptual model:

- To the IS function, by providing support to the "new" IS function, creating a leadership attitude in a virtual IS Context.
- To the on-going debate about the essential knowledge and skills of IS personnel and about IS curricula. This can be a useful contribution to organizations - supporting the "IS Skills logistic process"; to individuals - supporting a career management process and to academics, supporting IS curricula and "lifelong professional learning" debates.

As secondary outcome the research was planned and conducted in a rigorous manner in order to contribute to the assessment of complementary research methodologies, which is expected to be inline with the emerging acceptance of diversity in research approaches (Markus, 1997).

REFERENCES

1. Applegate, L.M. and Elam, J.J. (1992) New information systems leaders: A changing role in a changing world, *MIS Quarterly*, 16, 4, 469-486.
2. Applegate, L.M., Mcfarlan, F.W. and McKenney, J.L. (1996) *Corporate Information Systems Management: Text and Cases*, (4th ed. ed.) Irwin, Chicago, USA.
3. Bashein, B.J. and Markus, M.L. (1998) A credibility equation for IT specialists, *Sloan Management Review*, 39, 4, 35-44.
4. Boynton, A.C., Zmud, R.W. and Jacobs, G.C. (1992) Whose Responsibility Is IT Management?, *Sloan Management Review*, 33, 4, 33.
5. Brancheau, J.C., Janz, B.D. and Wetherbe, J.C. (1996) Key issues in information systems management: 1994-95 SIM Delphi results, *MIS Quarterly*, 20, 2, 225.
6. Cross, J., Earl, M.J. and Sampler, J.L. (1997) Transformation of The IT function at British Petroleum, *MIS Quarterly*, 21, 4, 401-423.
7. Davis, G.B., Feinstein, D.L., Gorgone, J.T., Longenecker, H.E. and Valacich, J.S. (2001) IS 2002 - An Update of the Information Systems Model Curriculum, Association for Compyter Machinery, ACM Association for Information Systems, AIS , Association of Informatio Techonology Professionals AITP (DPMA).
8. Davis, G.B., Gorgone, J.T., Couger, J.D., Feinstein, D.L. and Longenecker, H.E. (1997) IS '97 - Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems, Association for Compyter Machinery, ACM Association for Information Systems, AIS , Association of Informatio Techonology Professionals AITP (DPMA).
9. Denning, P.J. and Dunham, R. (2001) The core of the Third Wave Professional, *Communications of the ACM*, 44, 11, 21-25.
10. Earl, M.J. and Feeny, D.F. (1995) Is your CIO adding value?, *Sloan Management Review*, 35, 3, 11-21.
11. Farren, C. and Kaye, B.L. (1996) New Skills for New Leadership Roles, in: *The Leader of the Future,* F. Hesselbein, M. Goldsmith and R. Beckhard (eds.), Jossey- Bass Publishers, San Francisco, USA.
12. Feeny, D.F. and Willcocks, L.P. (1999) Rethinking capabilities and skills in the Information Systems Function, in: *Rethinking Management Information Systems,* L.W. Currie and B. Galliers (eds.), Oxford University Press, New York, USA.
13. Galliers, R.D. (1998) Problems, Knowledge, Solutions: solving complex problems - a response to Enid Mumford´s paper ICIS 1998, Hensiki, Finland, *Journal of Strategic Information Systems*, 7, 271-274.
14. Galliers, R.D., Leidner, D. and Baker, B.S.H. (1999) Introduction: The Emergence of IT as a Strategic Issue, in: *Strategic Information Systems Management,* R.D. Galliers, D. Leidner and B.S.H. Baker (eds.), Butterworth-Heinemann, Oxford, UK.
15. Heckman, R. (1998) Planning to Solve the Skills Problem in the Virtual Information Management Organization, *International Journal of Information Management*, 18, 1, 3-16.
16. King, N. (1994) The Qualitative Research Interview, in: *Qualitative Methods in Organizational Research,* C. Cassel and G. Symon (eds.), Sage Publications, London,UK.
17. Klein, H.K. and Myers, M.D. (1999) A set of principles for conducting and evaluating interpretative field studies in informations systems, *MIS Quarterly*, 23, 1, 67.
18. Klenke, K. (1998) Developing Leadership Skills for IS Professionals, Conference of the Association for Information Systems, 1128-1130.
19. Lee, D., Trauth, E. and Farwell, D. (1995) Critical skills and knowledge requirements of IS professionals: a joint academic/industry investigation, *MIS Quarterly*, 19, 3, 313-340.
20. Machado, A.B. and Beira, E. (2001) TSI: Contributos para uma análise prospectiva, *Cadernos de Economia*, Mars.
21. Malone, T.W. (1997) Is empowerment just a fad? Control, decision making, and IT, *Sloan Management Review*,38,2, 23.
22. Malone, T.W. and Laubacher, R.J. (1998) The dawn of the e-lance economy, *Harvard Business Review*, 76, 5, 144-152.
23. Markus, M.L. (1997) The Qualitative Difference in Information Systems Research and Pratice, Proceedings of the IFIP TC8 WG 8.2 International Conference on Information Systems: Information Systems and Qualitative Research, Philadephia, Pennsylvania, USA, 11-26.

24. Myers, M.D. (1997) Qualitative Research in Information Systems.
25. Oppenheim, A.N. (1992) *Questionnaire Design, Interviewing and Attitude Measurement* Pinter, London, UK.
26. Orlikowski, W.J. and Baroudi, J.J. (1991) Studying Information Technology in Organizations: Research Approaches and assumptions, *Information Systems Research*, 2, 1-28.
27. Peppard, J., Lambert, R. and Edwards, C. (2000) Whose job is it anyway?: organizational information competencies for value creation., *Information Systems Journal*, 10, 291-322.
28. Rockart, J.F., Earl, M.J. and Ross, J.W. (1996) Eight imperatives for the new IT organization, *Sloan Management Review*, 38, 1, 43.
29. Sambamurthy, V. and Zmud, R.W. (1999) Arrangements for IT Governance: aTheory of Multiple contingencies, *MIS Quarterly*, 23, 2, 261-290.
30. Strauss, A. and Corbin, J. (1998) *Basics Of Qualititive Research*, (2nd ed. ed.) Sage Publications, Inc., Thousands Oaks, USA.
31. Todd, P.A., McKeen, J.D. and Gallupe, R.B. (1995) The evolution of IS job skills: A content analysis of IS job, *MIS Quarterly*, 19, 1, 1.