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THE ROLE OF TOP MANAGEMENT IN IS IMPLEMENTATION: A PRACTICAL STUDY IN SAUDI ARABIAN UNIVERSITIES

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Abstract

The Saudi Arabian Higher Education Sector (SAHES) faces many challenges which constrain its capability of adaptation to change, including its success in appropriate development and implementation of IS projects. At the same time, the attention and resources devoted by the government to this sector demand success of technology and information systems to provide high quality services in all functions within the university.

This study investigates top management support as a critical factor of IS implementation in SAHES, focusing on three specific systems (Student Tracking, HR and Financial). It explores the major role this factor plays in success, and investigates problems regarding this factor in IS implementation. A conceptual framework is developed combining the top management role with the 'Seven Ss' model to support the resolution of implementation problems in SAHES. Data were collected through the triangulation of interviews and questionnaires with twenty-five senior and middle managers within five universities. The data are analysed and presented based on the conceptual framework by using an interpretive approach and employing Miles and Huberman's (1994) tactics.

A conceptual framework of the top management role in IS implementation is developed which contributes to theory, and a model is suggested to be adopted in SAHES to overcome implementation problems in that area. The study concludes with identification of the weaknesses and strengths of IS implementation in the factor studied and clarification of the role of the conceptual framework in overcoming problems in top management support.

1. Introduction

Despite the recent tremendous increase in the use of information technology in different kinds of organisations to facilitate the work and improve the quality of services and products, the implementation of such systems is still problematic.

However, while the design and development of information system receive much attention in many organisations, the implementation process is comparatively ignored (Land, 1992).

As Lucas (1981) indicated, implementation is an important process that contributes significantly to IS success or failure. Implementation cannot be considered as a technical task only; he found that most systems that failed were very advanced technically. However, IS implementation is a change process that involves technical, human and organisational aspects.

Although developing countries have achieved success in some IS projects, some authors, based on the study of large numbers of IS projects in these countries (Odedra-Straub, 1996; Roche and Blaine, 1996; Avgerou and Walsham, 2000), have categorised many of these projects as total or partial failures (Heeks, 2002).

The Kingdom of Saudi Arabia is a developing country affected by global change in the economic, social and technological environment and facing many obstacles to adapt to and keep up with these changes, especially in the technology area. Although the Kingdom of Saudi Arabia is considered as a developing country, it is more advanced than many other developing countries in technology usage, but the way technology is developed, implemented and used still needs more attention (Abdul-Gader, 1999).

Attiyyah (1989) reported many IT staff comments on the problems facing Saudi organisations during IS procedures, while Abdul-Gader (1990; 1999) indicated that IS implementation in Saudi organisations is a problematic area due to lack of management knowledge and awareness of IS requirements, lack of planning, lack of commitment to the process of implementation and shortage of indigenous manpower.

One area where these issues are of concern is the universities in Saudi Arabia. These are recognised as public organisations because they are under government authority, control and funding and they provide services without making a profit. The massive expenditure from the government on this sector promotes the need for success of technology and information systems to provide high level services in all functions within the university: teaching, research, administrative and academic services. These institutions need high level and specific information that meets their needs. However, the Higher Education Institutions (HEIs) in Saudi Arabia face many challenges as regards technology distribution in general and as regards Management Information Systems in particular.

Critical success factors (CSFs) are defined as “the limited number of areas in which results, if they are satisfactory, will ensure successful performance for the organisation” (Sabherwal and Kirs, 2007, p. 302 Dibbern *et al.*, 2004). Much research has been done on the CSFs in different areas, such as project management (Chileshe and Haupt, 2005), the implementation process of different types of systems (Karlsen *et al.*, 2005, Finney 2007, Ravesteyn, 2010) and public sector information systems (Rosacker, 2007). Each study identified various critical success factors that play a big role in system success.

In the Higher Education field, relatively few studies, e.g. Craig *et al.*, (1998), McCredie and Updegrove, (1999) Vaughan, (2001), and Ahmad and Zairi, (2007) examine the critical factors associated with successful IS implementation. In 2007, Sabherwal and Kirs, based on a survey of literature and studies conducted in higher education institutions developed 34 CSFs for these institution.

Most of the previous studies highlighted top management support as one of the main crucial factors. This research focuses on the role of top management support in IS implementation, with the aim of finding out how best to carry out the change process.

2. Research Objectives

The main aim of this study was to investigate the role of top management in supporting IS projects through the implementation process of three specific systems (Student Tracking, HR and Finance) in Saudi universities, with a view to developing a framework to help organisations overcome problems in this area. Specific objectives were:

1. To investigate and analyse the role of top management in supporting IS implementation in Saudi universities.
2. To investigate and analyse how the top managers carried out IS implementation of three specific systems (Student Tracking, HR and Finance).
3. To identify problems in top management support during IS implementation.
4. To develop a conceptual framework to support the resolution of the problems in top management support in IS implementation.

3. Background of the study

3.1 Implementation Definition:

IS implementation is a broad area composed of different activities and skills which together lead to completion of a system change (Avison and Shah, 1997; Curtis, 1998). The word implementation has been used in many methodologies to describe the stages of the system life-cycle, especially testing and handing over the system (Finkelstein, 1990; Kumar, 1990).

In the research area, Land (1992) declared that the importance and the role of the implementation process in achieving success of information systems are not given enough attention. Later, some authors attempted to clarify methods to help organisations to form IT strategies (Porter and Millar, 1985; Wiseman, 1988; Earl, 1989). Most of these approaches focused on connecting the information systems strategy with organisation strategy (Nolan and Mulryan, 1987). In addition, they were based on a top-down analysis. This approach has been criticised by Ciborra (1991) who advocated involvement of end-users, because they play a big role in information system success (Galliers, 1991; Galliers and Sutherland, 1991).

The two major UK-based researchers in the IS strategy field, Earl (1987) and Galliers (1991) argue that IS strategy consists of four separate elements: the information strategy, the information technology strategy, the information management strategy and the implementation strategy or change management. They asserted that IS

implementation should be treated as an issue of change management, in order to achieve the desired goals successfully. However, in the higher education context, it has been claimed (Allen and Wilson, 1996) that most universities focus predominantly on technology only and neglect the other components.

This study treats implementation as a change management issue focusing on the role of top management in the process. Thus, the terms implementation and change management are used interchangeably.

3.2 Research in IS Implementation:

The research on IS implementation/management change can be classified into various streams, including factor research, process research, political research and prescriptive research, each stream focusing on a specific stance (Kwon and Zmud, 1987).

Factor research is the largest stream, which tries to explore and specify the factors that impact success and failure of IS implementation (Fuerst and Cheney, 1982; Schultz, 1984; Sanders and Courtney, 1985; Al-Mashari and Zairi, 1999; Nah *et al.*, 2001).

Most of this research is very old, such as the North-western university studies, which were the first empirical research on key variables based on data. The research focused on operations research, but many authors applied it to computer-based information systems. Table 1 summarises these studies:

Table 1.: The North-western studies

Authors	Year	Study	Factors
Rubenstein <i>et al.</i>	1967	Effectiveness of operation research group	Management support Client receptivity
Radnor <i>et al.</i>	1970	Implementation success	Client relations Management support
Neal and Radnor	1973	Implementation success	Formal procedures for operation research projects
Bean <i>et al.</i>	1975	Implementation success	Structural variables Behavioural variables
Radnor	1979	Implementation success	Context

Rubenstein *et al.* (1967) collected the data in their study in a cross-sectional field study from 66 industrial firms by interview. They identified from their research ten key issues which significantly affect implementation. These factors are: management

support, client acceptance, organisational and technical qualifications, leadership impact, differentiated activity in the organisation, proper allocation of resources, whether the project meets the organisation's needs, level of resistance in the organisation and the prospects for OR/MS success in the organisation. Radnor, Rubenstein and Tansik (1970) conducted their study in government and private organisations in a cross-sectional field study. They developed a complex model of implementation, which they tested with data from interviews. They stated that two factors, the relationship between IS staff and users and top management support, are correlated with implementation problems. Neal and Radnor (1973) conducted their study in 108 large business firms. The data were collected from 178 managers, practitioners and clients through cross-sectional interview. They found that there is a significant relationship between implementation success and procedural guidelines, along with top management support. Bean *et al.* (1975) conducted correlation analysis of cross-sectional data collected from 108 firms. They defined two sets of success variables, Structural and Behavioural. Structural variables include budget, and level in hierarchy, whereas behavioural variables include managers' attitude and top management support. They found specific variables that impact implementation success. Radnor (1979) outlined many of the North-western studies and proposed some dimensions of implementation. These dimensions include OR/MS programmes, OR/MS as a change phenomenon, the environment, the organisation, technology, management and resources. He discussed only the first two in detail.

Many other studies identified different factors such as attitude and decision style. Lucas conducted many researches in the same area in USA. Lucas (1973) studied at a major university the attitudes of users of a computerised administrative system, and their rating of computer services, through a questionnaire survey. Also, information services staff rated the computer systems on criteria of users' satisfaction, other than technical criteria. The results indicated a positive relationship between user attitude toward the system and system quality. Another study by Lucas (1975a) was conducted in a Manufacturing Company. It included three divisions within the company and the sales information system. The data were collected through questionnaires distributed to 419 sales representatives. The results showed a relationship between attitudes, situational and personal variables, decision style and system use, as indicators of implementation success. Furthermore, Lucas conducted

other studies on the same variables in various industries like banks (Lucas, 1975b), brokerage firms (Lucas, 1979) and pharmaceutical firms (Lucas, 1978). In addition, he examined research by other authors such as Harvey (1970) who examined factors related to implementation success and Swanson (1974), who showed in his study that user involvement is associated with a good attitude which leads to a high level of use. Schultz and Selvin (1975) concluded from their study on 136 MBA students, who responded to a questionnaire on their attitude to marketing models in a business case, that attitude is correlated strongly with implementation success. The previous studies identified numerous factors which Lucas (1981) organised into five categories: technical system quality, client actions, attitudes, decision style and personal and situational variables.

Zmud (1983) identified three critical factors as important for any computer-based IS implementation. The three specific issues are an organisational climate that supports implementation (resources, reward system...etc), participants' commitment to their tasks and comprehensive, timely and complete implementation planning. Swanson (1988) indicated nine factors that affect implementation success and failure, namely, "user involvement, manager commitment, value basis, mutual understanding, design quality, performance level, project management, resource adequacy and situational stability" (p.3).

Alvey (1986) sorted the variables into six groups of factors: motivation for introducing the new system, commitment to the system, organisational culture, the management of the implementation process, the distance between the existing system and the replacement system and the technology itself.

Land (1992), based on Alvey's study, draw up guidelines to prepare the organisation for change. These guidelines encompass organisational climate, stakeholder understanding, setting up the organisation to manage change, identifying obstacles to change and determining the implementation strategy.

From these studies, some factors were identified which are widely held to be significant for implementation success. They include top management support, user involvement and organisational culture. Top management support is recognised as a

significant factor due to their ability to influence resources (Lucas, 1981) and users' attitude (Ginzberg, 1981). Such support should not be limited to the first stages of implementation, but should be integrated throughout the process (Bingi, 1999; Sumner, 1999; Ranganathan and Kannabiran, 2004) by involvement and willingness to demonstrate that the new system is a top priority within the organisation (Wee, 2000). Top management play a big role in guiding the implementation activities from the managerial aspect (Bruwer, 1984).

New researches in the last decade have not been oriented to study the critical factors in IS implementation in general. They concentrate on specific systems and identify the critical factors that play a big role in the successful implementation of the system in question. Such studies have focused on groupware software implementation (Orlikowski, 1992; www.netSPACE.org/users/athomps/cs776/introduction.html), enterprise systems (Nah *et al.*, 2001; Hong and Kim, 2002; Al-Mashari *et al.*, 2003; Umble *et al.*, 2003), maintenance management information systems (MMIS) (Hipkin, 1997), Business Process Re-engineering (BPR) (Al-Mashari and Zairi, 1999) and Information Communication Technology (ICT) projects (Milis and Mercken, 2002). Another research trend has been to focus on one specific factor from the issues identified in the literature and study in depth its impact on implementation. Such studies, for example, have explored human factors (Henry, 1994), communication (Yazici, 2002) and top management support (Thong *et al.*, 1996). Some researchers have studied the relationship between factors like users' acceptance and training and effectiveness (Lee and Kim, 1995).

In the Higher Education field, there are a few studies about different aspects of IS implementation, which are summarised in Table 2, but only three of them (Craig *et al.*, 1998; McCredie and Updegrave, 1999 and Vaughan, 2001) study the critical factors associated with successful IS implementation.

Table 2: Studies of IS implementation in HEIs

Authors	Year	Location	Study
Anderson	1992	UK	Implementing an information infrastructure strategy: the university of Edinburgh experience
Bortz	1993	USA	Implementing a culture of change
David	1993	USA	Implementing a new system on time in bad time
Craig <i>et al.</i>	1998	USA	Changing (Almost) everything and keeping (Almost) everyone happy
McCredie & Updegrove	1999	USA	Enterprise system implementation: lessons from the trenches
Trost & Yohe	1999	USA	Chasms and bridges on the path to a new administrative system
Smith	2000	USA	Avoiding problems in implementing Administrative systems
Burke <i>et al.</i>	2001	USA	Success or failure: human factors in implementing new systems
Vaughan	2001	USA	System implementation success factors; it's not just the technology
Yakovlev	2002	USA	An ERP implementation and business reengineering at a small university
Middleton	undated	Canada	A tale of two systems? Success and failure in a single IS implementation

The first study (Craig *et al.*, 1998), conducted in Indiana University/Bloomington identified some key issues that contribute to successful implementation, based on practical experience in revamping university central academic systems. Another study (McCredie and Updegrove, 1999) presented public and private universities' experience in implementing enterprise-wide administrative systems in some applications such as financial, human resource and student resource management systems, and identified important variables in the implementation process such as project management, planning, training, communication and understand institution ability. The third study, by Vaughan (2001), adopted some factors from scholarly research and examined them in practice within higher education institutions (HEIs) in the United States (e.g. George Washington University, University of Pennsylvania, Arizona State University...etc). It was found that many of the same issues discussed in the literature are connected to successful implementation in HEIs and lie outside the technology.

There are other studies on IS implementation in the higher education sector, of which some review practice and experience in implementing specific systems, while others are more comprehensive (Anderson, 1992; Bortz, 1993; Trost and Yohe, 1999 & <http://hsb.baylor.edu/ramsower/acis/paper/cmiddlet.htm>).

One study in HEIs focuses on human factors and the role they play in implementing new systems such as administrative computing systems and library systems in some small universities (Burke *et al.*, 2001). Furthermore, David (1993) conducted a study in the University of Connecticut and identified many problems such as financial resources, documentation, staff knowledge about the project and accumulated work the computer centre faced during the implementation process of a new registration system and how management support helped them to overcome these problems. Smith (2000) focused in his study on four problems that face universities when they implement administrative software systems, and how they avoid those problems.

In Saudi Arabia, by contrast, there is a lack of IS implementation research. One study analysed the implementation process in Saudi organisations and found that poor management of change, project structure, processes and culture are factors in failure and proposed a model of IT managers' influence on computer-based IS (Al-Ghobiri, 2000). Also, Al-Ghobiri (2003) conducted a study about the role of senior managers in the IS implementation process in the Saudi Arabian private sector and found a strong relationship between top management involvement and system success.

3.3 Top management Support:

A factor on which there is consensus among researchers as a significant factor associated with IS implementation success is **top management support** (Rubenstein *et al.*, 1967; Radnor *et al.*, 1968; Radnor *et al.*, 1970; Ginzberg, 1981; Lucas, 1981; Markus, 1981; Fuerst and Cheney, 1982; Schultz, 1984; Sanders and Courtney, 1985; Wilson, 1991; Thong *et al.*, 1996; Craig *et al.*, 1998; Nah *et al.*, 2001; Umble *et al.*, 2003), also termed **role of top management** (Joshi, 1990; Al-Ghobiri, 2003; Ranganathan and Kannabiran, 2004).

The importance of top management support in IS implementation has been highlighted frequently since the late 1960s (Argyris, 1971; Senn, 1978; Turner, 1993; Belassi and Tukel, 1996; Wateridge, 1996 and Fowler and Walsh, 1999; Kankanhall *et al.*, 2003; Zhang *et al.*, 2005; Wang *et al.*, 2008) and many case studies, have identified the significance of this factor (Elam, 1988; Yap, 1989; Young and Jordan, 2008). This factor was recognised in Remus' (2006) study as foremost among the

critical success factors throughout the implementation stages. The study of Al-Mudimigh and Ullah and Alsubaie (2011) which was conducted in Saudi organisations for portal implementation confirmed the importance of top management support and this factor was given high value (as critical) by the organisation managers and IT managers. The importance of top management support is due to their ability to influence the level of support provided by managers to the project (Lucas *et al.*, 1990; Belassi and Tukel, 1996; Ku *et al.*, 2009) and the attitudes of the users, which helps to achieve smooth transformation (Ginzberg, 1981). They can also overcome organisational resistance (Keen, 1981; Markus, 1983), and allocate the needed resources (Lucas, 1981). Top management should acquire sufficient information about the project to be able to make decisions, and that is not possible without their involvement in the key areas of the implementation process (Turner, 1993). Zwikael (2008) identified that top management involvement in project management is significant for project success and asserted that top management support should be effected in different industries.

Authors have different views regarding the nature of top management involvement in IT. Some suggested that the ideal role is personally sharing in IT management (Adams, 1972; Rocwell, 1986; Lederer and Mendelow, 1988 and Rifkin, 1989; Raghurathan, 1992; Ranganathan and Kannabiran, 2004). Also, Brandon (1970) indicated that the top management role is to set up a plan for IT within the organisation, support the acquisition of equipment and monitor performance. Others like Kunde (1989) suggested that while top management are not professionals in technology, they should know how to benefit from it, while still others urged top managers to have regular communication with IT management (Lederer and Mendelow, 1988; Rohan, 1988). On the other hand, Bedell (1985) argued that creating a climate of support throughout the organisation is more important than action and activities. Jarvenpaa and Ives (1990) defined the involvement of top management in terms of their perceptions towards IT within the organisation and the role it contributes to the organisation's success and system success (Ifinedo, 2008). Moreover, Das and Kumar (2011) confirm the role of top managers as leaders for implementing systems and following up the activities of the IS implementation process (Dong, 2008)

Based on the above, various problems are anticipated to arise where such support is absent or inadequate. These problems can be summarised as insufficient resource allocation (Lucas, 1981; Bardi and Rauhuathan, 1994), negative influence on other managers' and staff attitude toward the new system (Ginzberg, 1981), which could lead to rejection of IS projects and resistance to change (Keen, 1981; Markus, 1983; Wang and Chen, 2006; Lin, 2010), low IS effectiveness due to lack of monitoring (Thong *et al.*, 1996) and negative impact on decision making regarding IS projects because of failure to acquire sufficient information about the project (Turner, 1993). In addition, top managers' misunderstanding of the way support should be provided to IS projects is one of the main problems identified in many studies such as Rockwell (1986); Brandon (1970); Kunde (1989); Bedell (1985), Doll (1985), Belassi and Tukul (1996) and Wee (2000).

Consequently, a high level of support from top management helps the organisation to overcome many problems and achieve higher usefulness and success from IS systems.

4. Organisational Model and Framework

As noted previously, it has been widely recognised that IS implementation is not solely a technical matter, but like any strategic change involves human and organisational issues also. Problems in these areas may cause failure of IS systems, even when the technology itself is successful (Drake, 1972; Grayson, 1973; Urban, 1974; Keen, 1976). A framework is therefore needed that takes account of such areas, in order to diagnose and address adequately issues that could undermine the change effort, in the present case, specifically, the organisational critical success factor of top management support.

In order to develop such a framework, the researcher began by examining existing models of strategic change. A number of these exist; for example Leavitt (1965) proposed the 'Diamond' model, which categorises organisational variables into four interacting systems: Task, Technology, People and Structure. Because of the interaction among those elements, the impact of change in one of them (e.g. technology) is moderated by the others. The 'Diamond' model is important for the

attention given to the previously comparatively ignored elements of people and structure. Subsequent authors used it as a base for developing new frameworks, for example Hussey's (1990) EASIER (Envision, Active, Support, Install, Ensure and Recognise) model.

However, for this study McKinsay's "Seven S" model, linking strategy, Structure, Systems, Staff, Style, Skills and Shared Values, was adopted as the starting point for model development. It was preferred to other models because it contains most of the CSFs for IS implementation, particularly skills, style and shared values, which are crucial in IS change. The model is flexible and has been successfully employed in IS development in a variety of cultures (Galliers *et al.*, 1998).

The Seven S model assumes that effective organisational change depends on adequate attention to each of the model's seven elements, all of which are equally important.

The 'Seven Ss' are defined in Table 3

Strategy	Plan or course of action leading to the allocation of a firm's scarce resources, overtime, to reach identified goals.
Structure	Characterisation of the organisation chart (i.e. functional, decentralised, etc.).
Systems	Procedural reports and routine processes such as meeting formats.
Staff	Description of important personnel categories within the firm.
Style	Characterisation of how key managers behave in achieving the organisation's goals; also, the culture style of the organisation.
Skills	Distinctive capabilities of key personnel or the firm as a whole.
Shared Values	The significant meaning or guiding concepts that an organisation imbues in its members. Can be described as superordinate goals

Table 3: The Seven 'Ss' (Adapted from: Pascale and Athos, 1981, p. 81)

According to Peter and Waterman (1982), the seven elements can be classified into hard 'Ss' and soft 'Ss'. The hard elements are strategy, structure and systems. These are relatively easy to identify and can be found in strategy statements, plans and documents. The soft elements are style, staff, skills and shared values, which are more difficult to identify and describe, because they are highly determined by people and culture, which change continuously. Many organisations concentrate on the hard 'Ss' and give less attention

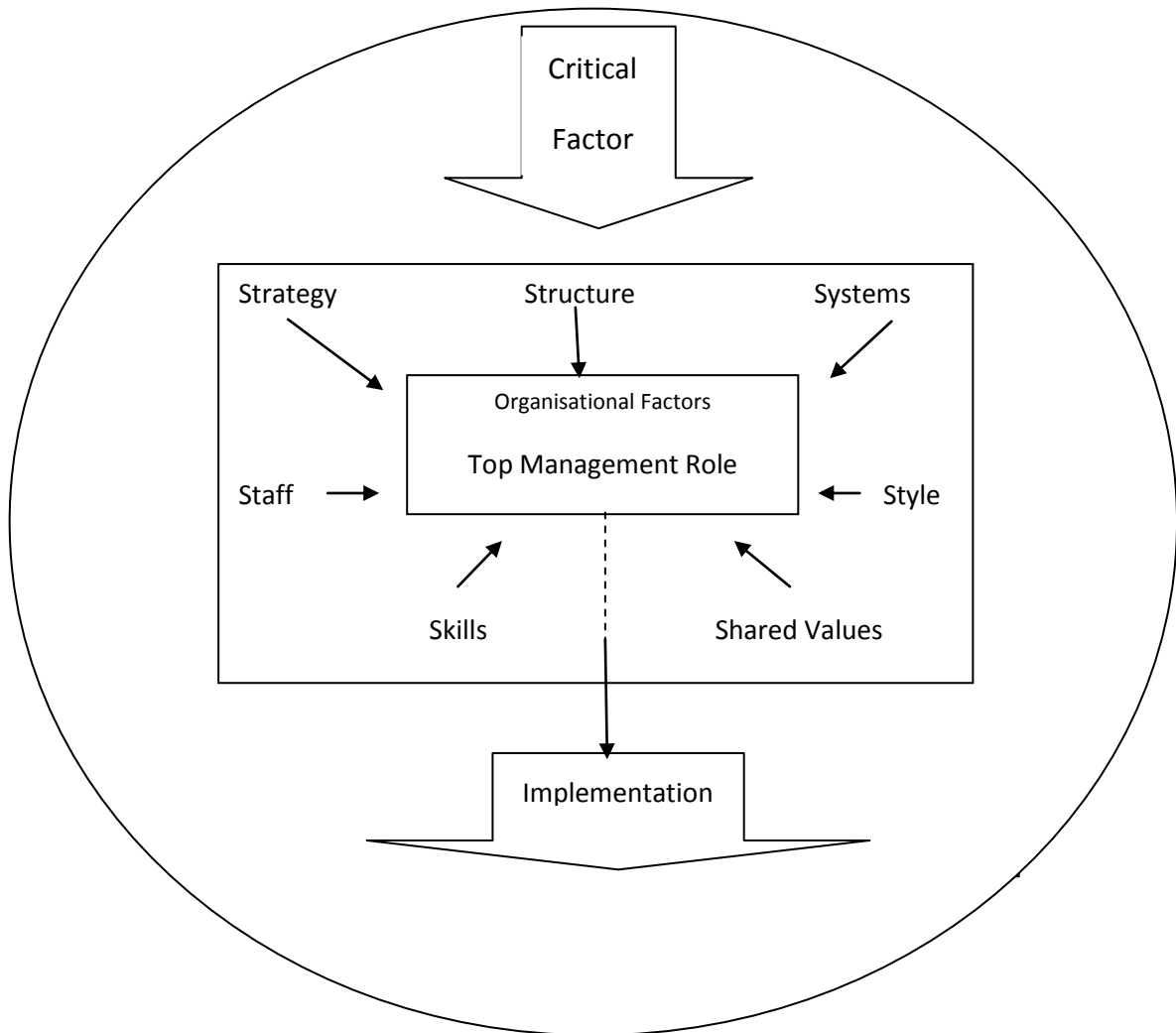
to the soft 'Ss', but this could undermine the change process, because these factors have a big role in deciding whether a change succeeds or fails.

Indeed, Waterman *et al.*(1980) claimed, based on testing the model in different industries, that “effective organisational change is really the relationship between structure, strategy, systems, style, skills, staff, and superordinate goals” (p.17). They argued that because these elements in organisations are interconnected, it may be impossible to make progress in a specific area without making improvements in the others. Finally, there is no hierarchical order for these elements; the circumstances within the organisation will dictate which is the steering factor in any given situation. Many authors have discussed the Seven-S model as a favourable strategy for guiding change within organisations (Pascale and Athos, 1981; Mintzberg *et al.*, 1995; Stoner, 1995).

Therefore, in order to manage the critical organisational factor of top management support and enhance the role of top management in helping the organisation to carry out IS implementation effectively, the framework developed for this study (Fig 2) maps this factor onto the dimensions of the Seven S model, to create a matrix which can guide implementation.

As the diagram indicates, the critical factor is now not simply “Top Management Role” but Top Management Role analysed and enacted from the perspective of each of the Seven S elements.

Fig 1: The Conceptual Framework of the Top Management Role in IS Implementation



Each of the Seven S elements constitutes a 'lens' through which to view the top management role. This provides a diagnostic guide to identify where weaknesses lie in current practice and to assist in considering how problems in those areas could be solved. It can also be used as a framework to guide future change initiatives by drawing attention to the range of factors that need to be taken into consideration. Analysing and organising top management support, as a critical factor in IS implementation, based on the Seven Ss will ensure that this factor is paid sufficient attention and enacted effectively. This in turn will contribute significantly to smooth and effective IS implementation.

5. Higher Education Sector in Saudi Arabia

The Kingdom of Saudi Arabia has paid great attention throughout successive development plans to educating and training human resources. Therefore, massive expenditure has been allocated by the government to this sector and its development. There are twenty four public universities, and ten private universities in the Kingdom. Strategic goals for Higher Education aim to develop academic programmes that meet the demands of the Saudi labour market for human resources and to support administration and planning in the universities within an Islamic framework. Investment in this sector includes the introduction of advanced technology, in line with national and global trends.

At the same time, many international and national driving forces create external and internal challenges for the higher education environment in Saudi Arabia, including the development and use of information systems. For example, public universities, being reliant on government funding, are subject to rules that determine the direction of expenditures according to government instructions. This constraint has impeded development of IS within these universities. Rapid population growth creates increased demand on higher education which exacerbates the impact of funding constraints. At the same time, rapid technological development soon renders IS innovation obsolete. This problem has impeded the HEIs from improving their performance and accomplishing their tasks effectively. Nevertheless, users have claimed that their systems were successful even though they did not meet their needs, did not provide their requirements efficiently and failed to match their expectations in solving organisational problems, which made the problems more severe (Al-Ghobiri, 2003).

Organisations in general aim to achieve a variety of benefits from technology. Improved information management and process efficiency play a big role in strategic planning and decision making, and have been identified as significant advantages from IS within the organisation (Ward *et al.*, 1996; Lin and Pervan, 2003). To achieve these advantages, however, needs robust and reliable information, which

cannot be provided by unsuccessful or only partly successful information systems, which may occur if systems are not implemented properly.

These issues are of concern in the universities in Saudi Arabia because they are academic institutions acquiring high qualification, providing teaching, carrying out research and absorbing substantial investment. This highlights the need for success of technology and information systems to provide a high level of service in all functions within the university.

6. Methodology

6.1 The case study approach:

This study adopts a case study approach, defined by Robson (1993) as “the development of detailed, intensive knowledge about a single case or a small number of related cases” (p.40). This strategy provides the researcher with a rich and deep understanding of the phenomenon being studied (Morris and Wood, 1991). Moreover, it allows the researcher to focus on a specific phenomenon or problem to study in great depth (Bell, 1993).

Case study has two strengths for this research. First, it takes a holistic and meaningful view of real-life events such as organisational and managerial processes (Yin, 1994). Secondly, case study is an in-depth investigation because of the ability to incorporate a wide range of research techniques, including interviewing, observation, questionnaire, document reviewing and text analysis, to collect various kinds of information (Hamel, 1993; Yin, 1994).

However, there are weaknesses associated with the use of a case study approach: the impossibility of generalising case study findings (Yin, 1994), the possibility of the researcher’s characteristics and background affecting the interpretation of events, the necessity of restriction to a single event (Galliers, 1992b), difficulty in controlling variables and difficulty in demonstrating the direction of causation when establishing relationships between variables (Cavaye, 1996). However, as Cavaye (1996) identified, “When a researcher selects case research as an appropriate research

strategy for a study, the strengths of case research are considered of importance and the weaknesses are accepted as method-related limitations of the research” (p.229).

In this study, the case study strategy is suited to the shift in information systems research from technological to organisational and managerial questions, and the salience of context.

A multiple case approach was used in this study, involving five universities in the Saudi higher education sector. Such multiple cases enable investigation of a specific phenomenon in different settings (Broadbent and Weill 1993; Cavaue and Cragg, 1995). Each university represents a case study to describe, explore and explain the phenomena on (the role of top management in IS implementation) in depth and all the five cases represent the Higher Education Sector in Saudi Arabia.

Moreover specific systems were specified to enable more focus on the events in this study. These are the Financial System, the Human Resource System and the Student Tracking System.

6.2 Data Collection Method:

The study was initiated in 2005, but the researcher collected new data from the same interviewees at the same universities where the study conducted between 2009-2010, to examine the current situation.

In order to answer the research questions, the data collection was divided into two dimensions, secondary and primary.

Secondary data were gathered from unpublished printed and electronic documents collected from the universities studied, various libraries, on line sources, and conferences. Most of these references are in English, although some of them are in Arabic, especially those related to the Saudi Arabian environment.

The primary data were obtained by a combination of qualitative and quantitative methods, in-depth interviews with key managers involved in the implementation process for the three specific systems and questionnaires filled by the same selected sample of key managers who were interviewed. Qualitative and quantitative methods have been successfully combined in many research studies (Cook and Reichardt, 1979; Light and Pillemer, 1982; Maxwell *et al.*, 1986) and give both testability and context to the research (Kaplan and Duchon, 1988). In addition, collecting various data by different methods and from different sources gives clearer and more complete insight into the event studied (Bonoma, 1985).

Qualitative interviews in general are a powerful way of enabling people to understand and explore meaning in depth and access the perspective of the person interviewed. Furthermore, questionnaires were used to complement and support the data collected from the interviews, for example to checking the strength of interpretation of interview data (Arksey and Knight, 1999).

Interviews and questionnaires were applied with 25 managers, five in each university: one top manager with authority on ITC, three senior or middle managers from the departments that implemented any of the three specific systems (Finance, HR, Student tracking) and one IT director or his deputy.

Semi-structured interviews were used because they provide deep information and allow more flexibility (Miller and Crabtree, 1999). There were some differences in the questions between the three groups of managers according to their position and authority. The interviews were conducted one-to-one with each manager by telephone due to cultural and religious constraints on face-to-face meeting. Each interview lasted approximately 50-60 minutes.

The questionnaires were used to decrease the time needed for the interviews and used as a complement to the data collected from the interviews. They requested respondents to rank in order of importance the critical factors of IS implementation collected from the literature. The scores and average for each factor were used to deduce the ranking assigned by each group of managers and a general ranking for all the managers in the five universities.

Both the questionnaire and interview protocol were piloted with four managers to refine the items and streamline procedures.

6.3 The Sample:

Based on the research objectives, a purposive sample or judgmental sample was selected. This type of sample is mostly used with very limited or small samples, such as in case study research or for specific cases which are especially informative (Neuman, 1997).

The intention of the study was to target specific key managers who participated in the implementation of the three selected systems (Student Tracking, HR and Financial) and should be responsible for the process and involved in it. The researcher selected, in each university, five particular managers as shown in Table 4, who were involved in implementation of the three specific systems within the university and could provide useful information and insight about the implementation process.

Table 4: The sample involved in the field work in each university

The managers	The universities				
	A	B	C	D	E
Top manager	1	1	1	1	1
IT Director	1	1	1	1	1
Head of Department	3	3	3	3	3
Total	5	5	5	5	5

6.4 The Participating Universities:

Universities were selected based on age, student number, number of academic and non-academic staff, number of colleges, availability of the three systems and the distribution of technology within the university. All these universities are public institutions and categorised between large and middle sized according to the number of staff and students.

Access to the participating universities was gained by providing them with an official letter from the sponsoring university.

6.5 The Systems Included in the Study:

The researcher investigated the systems available in Saudi universities, which depend on technology diffusion within the university, based on issues such as technology infrastructure, university size, university age and budget.

The most commonly available system was the Student System, because it is a backbone system that supports admission and registration functions.

The systems considered as most important systems for academic and administrative activities within the universities by all the managers were the Student Tracking System, the Human Resource System and the Financial System. Some universities had different systems other than those three, but what was available in one university was not available in the others. Based on this situation, the researcher selected the three specific systems identified earlier for two reasons: first, they are important systems and second, they were available in all five universities.

6.6 The Departments Included in the Study:

The university units are served by specific administrative departments that perform various services for the university staff and students. In addition, there are many supporting services in the university, such as the Information Technology Centre, which participated in the study.

To study each case in depth, multiple units of analysis were included through interview with managers of different levels and from different administrations, involved with the implementation of the three specific systems. These units are: Top Management, Admission and Registration Deanery, Planning and Budget Department, Financial Department, Personnel Affairs Department and Information Technology Centre.

6.7 Data Analysis:

The study is based on qualitative data which emphasises an interpretive approach to answer the research questions. Collecting various data by using different methods from multiple sources provided a wide range of rich data which in turn resulted in a clear picture and deep understanding of the phenomenon studied.

6.8 Limitations of the study:

This study has limitations in some specific issues as follows:

- Because of the time available, the field study was conducted in stages after the implementation of the three specific systems was finished. It would have been preferable to conduct the study during the actual implementation of any system and investigate the situation throughout the process.
- Collection of data from the individuals who were involved in the implementation of the three specific systems was confined to the managers and did not include the end-users, due to the time and cost of extending the process of data collection, especially with interviews and a qualitative data approach.
- The study included only five universities from the total of 24 universities in Saudi Arabia. A more complete picture of the phenomenon would be obtain by including more universities, but due to time and cost constraints, this was not possible.
- The study concentrated on academic institutions, which does not support the generalizability of findings. Further research involving comparison between public and private organizations would be valuable.
- The sample size in the study is relatively small (only 25 managers), however, a larger sample could allow more depth in analysis.
- The study was conducted in Saudi universities but if the researcher could conduct a comparative study with some universities in developing countries, it could give a broader view regarding IS implementation problems and their way to overcome such problems.
- Preservation of anonymity in compliance with the managers' request prevented the researcher from revealing the universities' names. Although the researcher made every effort to ensure anonymity and the participants were assured that the data would be treated as anonymous data, it may still be possible to recognise these universities. Concern for anonymity also prevented the researcher from including any documents provided by the universities about outline strategies and development plans for the universities in the appendix, to avoid giving any signal as to the university's name.

Despite these limitations in the research, the study was able to overcome these limitations and analyse the top management support factor and the implementation process from the perspectives of senior and middle managers in the Saudi universities through using the conceptual framework to identify how the implementation process could be improved. The researcher feels very confident of the results derived from this study and the conclusions drawn. However, further research, ideas for which are suggested, should be aware of these limitations and take them into consideration.

7. Validity and Reliability

Validity is an important issue that concerns the truth and authenticity of the research. In qualitative research a more common term is trustworthiness, defined as “the extent to which the findings of the study are true and accurate” (Holloway, 1997 p.159).

Case studies have high validity because they enable the researcher to adopt a holistic view about the phenomenon studied. In this study, internal validity was established by triangulation of different methods of data collection (interviews, questionnaire and documents) and multiple sources of evidence (different groups of managers: top managers, IT Directors and Heads of Department). Such methods help to counter the problem of lack of control over variables and researcher bias. Moreover, “internal validity may be demonstrated through a coherent storyline and sound argument consistent with the evidence that supports it” (Remenyi et al., 1998, p.180).

External validity, which is concerned with generalisation of the research findings, is difficult to achieve with the qualitative approach. In the case study approach, generalisation of the findings of the research is not possible, and this has been considered by some authors as a weakness of this approach (Yin, 1994; Cavaye, 1996; Galliers, 1992b). More relevant is transferability; Lincoln and Guba (1985) and Holloway (1997) proposed using “thick description” and detailed data to help the reader to form a clear picture based on the evidence provided, in order to decide the appropriateness of transfer.

Since the conceptual framework developed in this study was based on various sources from a variety sort of countries, it may be useful in different countries. On the other hand, the results found from the application of the conceptual framework and the usefulness of these

results would only apply to a specific situation that is similar to the situation studied, for example a similar culture.

8. Findings

8.1 Description of top management role in IS implementation:

Descriptive data about top management support were extracted from the questions formulated based on different elements of Seven 'Ss'. All the seven elements were recognised as significant for this factor and used to extract the data because strategy concerns building the infrastructure that guides, directs and enthuses the top managers to support the IS project. In addition, they should be involved in the implementation structure to acquire sufficient information and be able to make decisions and identify system priorities. Their style will play a big role in creating a climate of support and spreading the idea that the new system is a top priority for all the staff within the university. They should also have the necessary skills and be aware of technology benefits. These attributes will help to disseminate values and beliefs regarding technology and new systems among those involved in the implementation of the new system.

Top management support has two aspects; one of them relates to the financial and management strategy, whereas the other relates to non-material support (moral support).

In **University A**, the top managers were aware of technology benefits and supported the ITC financially and morally. However, the ITC occupied a middle level in the university organisational structure and the IT Director was regarded as a middle manager. This situation caused uncertainty among some managers as to whether top management were completely supportive.

In **University B**, the new focus on IT strategy influenced top management support. The university Rector personally supervised and followed up the development of IS/IT within the university. Moreover, the ITC was placed at a high level in the university organisational structure, which gave the IT director decision-making

power. Top management had given strong support to the new IS plan within the university, for example by giving considerable autonomy and responsibility to the IT Director and his Deputy in planning and controlling IS implementation, which gave them authority in the eyes of other departments.

University C had embarked on a strategy to increase the awareness of technology among top managers. Top managers gave maximum financial support to IS projects, even by withdrawing funds from other uses. However, they were not involved in any activities related to IS implementation. The ITC was located under Vice-Rector's supervision but his involvement in the implementation process was limited to the first stages. On the other hand, the top management viewed the IT Director's position as a middle manager and the ITC's position in the middle of the university organisational structure as satisfactory and indicated that the Director needed more authority they would support him.

The top management in **University D** recognised technology's importance, and aimed to achieve the ultimate benefits from it in line with the university's mission. They exerted every effort to provide the required resources for IS projects. The top management supported the ITC's high position in the university organisational structure, giving it power and authority. Consequently, the IT Director became a senior manager, which supported his role in IS implementation. However, one Head of Department expressed doubt about the top management committee's role in technology development.

In **University E**, the top management were aware of IT's importance as a result of a long-standing technology strategy in the university. Consequently, they supported the ITC strongly. It was placed high in the university organisational structure, reporting directly to the university Rector. This was considered necessary to expedite decision-making.

However, the top management, Rector or Vice-Rector, were not involved in the implementation process and settled for regular reports from the ITC and the department concerned. They established a committee for Information Systems Development to study the current situation within the university, renew the technology plan, and motivate the university staff towards joining the programme.

They also set up many computer labs in different locations in the campus to create awareness and promote use of computers and information systems.

Although the IT Director was considered as a senior manager, he was not, however, given power and authority to participate in decision making.

8.2 Analysis of top management role in IS implementation:

The Seven 'Ss' elements were used to derive data about top management support in IS implementation.

Top management support is recognized as a significant factor in the literature. Based on the descriptive analysis of the current situation of top management support factor in the previous section, in the five universities included in the study, clear similarities regarding this factor were found in these universities.

In **University A**, top management financial and moral support were moderately available. Their concern about technology was very clear in the objectives of IS/IT strategy. Moreover, they tried to provide the required budget for IS projects, even though a shortage of financial resources was identified as an important problem, on which all the interviewees agreed. This situation could be a sign that the financial resources provided for IS projects were inadequate and given insufficient consideration. On the other hand, moral support appeared in their awareness of technology and their willingness to distribute it in the university in order to achieve the ultimate benefits they expected from it.

However, the ITC did not have a top level position in the university's organisational structure, and the IT Director's managerial level was that of a middle manager. The top management were not involved directly in the implementation process through the regular meetings held between ITC and the departments concerned to discuss new system implementation, but the plan for changing to a new system in any department emerged from top management instructions and guidelines as a first stage in the implementation of the new system. Turner (1993) discussed this kind of situation and indicated that top management involvement in the key areas of IS implementation is

very important to enable them to acquire real and sufficient information about the project, in order to be able to take decisions. Details of the implementation process were referred to the IT Director. Top management involvement in IS implementation is perceived in different ways by authors, but the actual situation needs their participation, starting from planning, through allocation of resources, to continuing follow up and involvement in some meetings between ITC and the department concerned, in order to monitor the project's progress and ensure the acquisition of sufficient information. In University A, the top management's reliance on a weekly project progress report indicates some weakness of support; it needs more involvement to observe the implementation in real life and not only on paper. Moreover, Bingi (1999), Sumner (1999) and Ranganathan and Kannabiran (2004) asserted that top management support should not be limited to the first stages of the implementation plan, but should be integrated throughout the process.

The salience of this factor was agreed by all the five interviewees, who categorised it as one of the most important factors for the change process. In the ranking of the critical factors, top management support was ranked among the three most important factors by most of the interviewees.

In **University B**, top management support was confined to the Rector who supervised the development of IS/IT within the university. The other members of top management were unwilling to show support commensurate with the high power and authority given to the IT Director. Top management attitude toward technology influences the level of support provided by managers and staff to the project (Lucas *et al.*, 1990; Belassi and Tukel, 1996; Ku *et al.*, 2009). The emergence of a new focus on IS/IT strategy in University B influenced top management support.

The ITC's position in the university organisational structure was at the top and connected directly with the university Rector. Despite this, the IT Director was considered by the organisation as a middle manager.

Management involvement in IT distribution was very low, being confined to the first stages of the implementation plan, contrary to Bigni's (1999) and Sumner's (1999) recommendations. Without ongoing involvement, top management would be unable

to acquire sufficient information about the project for effective decision-making (Turner, 1993). Consequently, the ITC had all the information and controlled all the decisions, along with the Rector. Top management involvement would make the managers feel that the new system is important and a top priority within the university (Wee, 2000), but this was not the case in University B, which in turn negatively influenced users' attitudes towards the new systems.

In general, all the managers in University B emphasised the importance of top management support in IS implementation, most ranking it one of the two most important factors.

University C did not have a strategy in general and for IS/IT in particular; also there was no specific plan for technology. Consequently, there was no top management strategy to guide change within the university, as Carr (1993) recommended. As a result, the top management were not very willing to support the technology that emerged from ITC initiatives.

In this situation, cost estimation was not precise, so financial resources were not allocated correctly, and shortfalls often occurred, which could only be met by withdrawing funds from another project or requirements funding. This was a lengthy procedure, which delayed the implementation process. This situation supports the claim made by Belassi and Tukul (1996); Stratman and Roth (2002) and Ku *et al.*, (2009) on top management's role in resource availability. In this case, because they did not have an effective role in the implementation process, their support extended only to finding hasty solutions to protect the project from damage. This approach created a strain on the university finances and affected other projects. Moreover, it caused negative attitudes towards the IS project, from those departments that lost their funding.

The ITC's position in the university organisational structure was in the middle and the IT Director was considered as a middle manager. The top management viewed this position as suitable and argued that if the ITC or IT Director needed more authority, they would provide it. This situation was illogical, in the IT Director's view, because he always had to wait a long time for instructions from the top management, which

could have a negative impact on his work and attitude towards the project and the implementation process. Moreover, he argued that a high position would give him power and authority during the implementation process, instead of his having to go through long procedures to obtain instructions from the top managers, causing delay. The ITC was located under the Vice-Rector's supervision, but his involvement in the implementation process was limited to the first stages. He became involved after the ITC and the department concerned had discussed the new development and had agreed on a specific decision; then the project was forwarded to the top management for approval. This situation conflicts with the advice of Bingi (1999) and Sumner (1999), who indicated that top management involvement should continue throughout the process. Also, it is not harmonious with Turner (1993) and Ranganathan and Kannabiran (2004), who argued that top management should acquire sufficient information about the project to be able to make decisions; this was not possible in University C, because they were not fully involved. The ITC did not have any authority or power; all its activities had to await top management decisions, which were built on insufficient information and lack of involvement in the process.

In general, all the managers in University C acknowledged the importance of top management support in IS implementation. In addition, most of them placed it at the top of the list of the critical factors, as one of the three most important factors, because they faced many problems during the implementation of the three specific systems with regard to top management support and financial resources.

In **University D**, the financial side of top management support was performed reasonably effectively. Moreover, attempts were made to provide the required financial resources for IS projects through the process undertaken to increase the university budget. On the other hand, moral support was completely neglected because top management failed to encourage involvement of departments in the implementation process or to spread the idea that the new system was a top priority within the university, as Wee (2000) recommended.

At the same time, the top management supported the ITC and IT Director by giving them power and authority, and supported the IT Director's role in dealing with the departments. This indirectly facilitated the allocation of financial resources for ITC projects as a result of the director's closeness to the top managers and ability to keep

them abreast of the ITC's progress and give them all the data they needed. Managers' involvement in the responsibility for process of IT distribution was very low, because it was limited to the first stages of the implementation plan, in contrast with Bigni's (1999) and Sumner's (1999) views on the necessity of top management involvement throughout the process. Moreover, the top managers thought that the implementation process in general was the ITC's responsibility and their main role was limited to providing the financial resources for IS projects to support technology distribution.

In general, most of the interviewees agreed that top management support is a critical factor of IS implementation, even though they gave it widely different rankings, ranging from first place to the end of the list.

In **University E**, most of the managers discussed top management support from the financial aspect, whereas the other aspects like user involvement and moral support were neglected. The top management concentrated on acquiring advanced technology, more than integrating it with the departments and their needs.

In general, all the interviewees agreed that top management support is a critical factor of IS implementation and they all ranked this factor in the upper middle among the list of factors, because they faced problems with regard to top management support, such as shortage of financial resources.

The foregoing analysis of the top management support factor in the five universities is summarised in Table 5.

Table 5: Top management support in the five universities

University	Top management support	Top management involvement	No. of managers agreed on importance (out of 5)	Factor ranking
A	Aware of technology importance Financial budget not enough High moral support ITC not in a top-level of the structure IT Director middle manager	Involved in the first stage Satisfied with weekly report. Regular communication between Vice-Rector and IT Director	5	One of the three most important factors.
B	High financial support No moral support ITC in a top-level IT Director middle manager	Involvement was very low Some involvement limited to the first stage Insufficient information about the project Regular communication with IT Director.	5	One of the two most important factors.
C	Unwilling to support the technology Financial resources were not allocated correctly. No moral support. ITC in middle position of the structure. IT Director middle manager	Involvement limited to the first stages. Insufficient information about the project. Regular communication between Vice-Rector and IT Director.	5	One of the three most important factors.
D	Good provision for financial resources. No moral support. ITC high position IT Director senior manager.	Involvement was very low. Involvement limited to the first stages.	4	Different ranking from top to the end of the list.
E	Aware of IT importance. Some shortage in financial resources. No moral support. Establish committee to study the current situation. ITC has high position. IT Director senior manager	Involvement limited to the first stages. Settled to regular report from ITC and the departments concern.	5	In the upper middle on the list.

9. Discussion:

As a result of the foregoing analysis, the overall view is that there was general support from the top management regarding IS development, which was supervised directly by the Vice-Rector and sometimes by the Rector personally, but the degree of support varied from one university to another. The top management role generally appeared only in the first stages of IS implementation and was confined largely to providing the financial resources, and even then not always accurately. Top management participation in implementation and involvement in communication, control, and follow up of progress was absent, contrary to the principles asserted in the literature.

This situation could be due to lack of clarity or to misunderstanding of top management's role in IS development. Top management took the view that responsibility for the implementation process and follow up rested with the ITC, which would deliver the final result. Given their many responsibilities, they felt it was very difficult, and even irregular for them to participate in the implementation process in real life.

Most of the interviewees connected top management support with the position of the ITC in the university organisational structure and the IT Director's managerial level. From their perspective, assigning a higher level to the ITC and IT Director increased the feeling within the university that technology is a very important matter and gave the IT Director power and authority during the implementation process. Such a view is consistent with previous studies asserting the connection between IS effectiveness and location of ITC (Dean, 1968; Schoderbeck and Babcock, 1971; Dale, 1973; Kwon and Vogler, 1983; Attyiah, 1989).

Moreover, ITC location was through to facilitated and supported the allocation of financial resources for IS projects. Previous studies have not mentioned this relationship, nor has it been discussed in connection with top management support as a critical factor of IS implementation. Thus, this finding appears to identify a previously unrecognised element of top management support in IS implementation.

Despite the favourable implication of ITC location, top management involvement in the key areas of IS implementation was limited. The literatures suggests that top managers ideally should personally share in IT management (Adams, 1972; Rockwell, 1986; Lederer and Mendelow, 1988; Rifkin, 1989). Brandon (1970) indicated that their role is to set up a plan for IT, provide support in acquiring equipment and monitor performance. Doll (1985) suggested top management can improve IS functions, by having an active executive steering committee, the existence of a written plan, provision of stable funding for IS activities, and guiding the IT director's attention to important issues that need to be taken into consideration. Others like Lederer and Mendelow (1988) and Rohan (1988) argued that top management should have regular communication with IT management.

In the five universities, the top management applied some of these suggestions, such as involvement in IT management, even though not at a detailed level, communication with IT management when they have problems and providing feasible funding for IS projects.

All the levels of managers in the five universities agreed that top management support is a critical factor of IS implementation. Although they differed in their ranking of this factor between the top, middle and end of the list of the critical factors, most of them (22 out of 25) ranked it among the most important factors.

To conclude, top management support was recognised and somewhat available in all the universities but the problem appeared of a lack of understanding about how this support should be provided and managed and what role they should perform in the IS implementation process.

10. Conclusion:

This study investigated the top management role regarding the implementation of three specific systems (Student Tracking, HR, Finance) in the Saudi Arabian Higher Education sector (SAHES) and developed a framework to help the organisations overcome IS implementation problems regarding top management support..

The evidence collected showed that implementation of new information systems within these universities has brought challenges. Universities have faced massive expenditure, yet the result has been failed systems or limited success.

Implementation is an important process that plays a big role in IS success or failure (Lucas, 1981). Consistent with Lucas' finding, this study showed that problems in this process are not necessarily technical. IS implementation is a change process involving technical, human and organisational aspects. This means the necessary organisation, people and skills associated with change management should be given more attention.

This section will discuss the findings to identify the weaknesses and strengths in the top management role, and explore how the conceptual framework developed can help in overcoming IS implementation problems regarding this factor in the SAHES.

10.1 Weaknesses in the top management role:

The HEIs in Saudi Arabia faced many difficulties in adaptability to change in IS, reflecting insufficient knowledge regarding the top management role in IS implementation.

Critical weaknesses appeared in this factor, notably lack of knowledge about appropriate procedures to be carried out and the proper support role of executive senior managers in IS implementation. Top management did not fully participate in the process because it was seen as the ITC and IT director's responsibility.

In addition, whereas most of the IT directors and heads of department connected top management support with the position of ITC in the university organisational structure and the IT director's managerial level, the top managers retained decision-making authority regarding the project and did not advocate decentralisation of ITC, which had negative impact on decision-making in line with Turner (1993). Consequently, the top management in Saudi universities either located the ITC in the middle of the hierarchy and subjected it to their authority, or even if they located it at the top, still gave it little

authority or power. Nevertheless, none of the suggestions found in the literature regarding top management involvement in the implementation process were effectively applied in any of the five universities, except for the allocation of financial resources, which they thought was their main concern.

The main problem was a lack of understanding about how support should be provided and managed. Top managers did not like to admit to their lack of knowledge, but they attributed their lack of involvement in IS implementation to their burden of responsibilities. Similar problems have been identified in many studies such as those of Adams (1972); Lederer and Mendelow (1988); Rifkin (1989); Rockwell (1986); Brandon (1970); Kunde (1989); Bedell (1985), Doll (1985), Belassi and Tukul (1996) and Wee (2000).

On the other hand, a contributory factor could be Saudi Arabia's unique culture, particularly high power distance whereby the top managers like to keep themselves in an ivory tower with power and authority and decline involvement in any process in real life, which could be a constraint that impedes IS implementation. Top managers are isolated from the actual process, but at the same time, all the authority and influence is in their hands, and if the implementation process faces any obstacles, any solution is impeded by the bureaucratic system. Negative impacts include insufficient resource allocation, as suggested by Lucas (1981), negative influence on managers and staff attitude as identified by Ginzberg (1981), and low IS effectiveness because top managers do not monitor the project or attend meetings regularly, as Thong *et al.* (1996) identified.

According to the previous conclusion, the main weaknesses in the top management support in Saudi universities were attributed to lack of strategic knowledge about appropriate procedures to be carried out and the proper role of top managers.

In general, many of the problems surfaced in Saudi universities are similar to the problems identified in other organisations and western studies, but the Saudi culture made these problems more severe, as identified earlier.

10.2 Strengths in the top management role:

The main strength in relation to **top management support** in the Saudi universities was the awareness of technology and the benefits achieved from it in the Higher Education Institutions. Top management support was agreed by nearly all interviewees to be critical in IS implementation, although centralisation of authority, which is considered as a cultural issue, impeded the universities from achieving the ultimate benefits from technology.

A new contribution of this study that emerged from the ideas of IT Directors and Heads of Department concerned the ways in which top management supported IS implementation. They identified the ITC's position in the University organisational structure and the IT Director's managerial level as signs of top management support for technology within the university in general and support for IS implementation in particular. From their perspective, assigning a high level to the ITC and IT Director increases the feeling within the university of technology's importance and priority. This creates a positive perception and confidence in the ITC's ability. Moreover, if the IT Director is treated as a senior manager and given the necessary authority and power, this will facilitate the availability of financial resources, because he will be close to the highest level in the university and can communicate directly with the top management about any unexpected issues that impact the new project. This issue has not previously been identified in the literature as an aspect of top management support during IS implementation, although it has been considered as a significant issue in IS success by some authors (Dean, 1968; Schoderbeck and Babcock, 1971; Dale, 1973; Kwon and Vogler, 1983; and Attiyyah, 1989). The top managers within the universities, however, were not very enthusiastic about this idea and opposed it. They considered that they could provide authority and power for IT Directors if they needed it. Their stance can be attributed to cultural issues in the Saudi environment such as power distance, uncertainty avoidance, authority distribution and lack of decision autonomy.

To conclude, the main strength in top management role was the awareness of benefits of technology in higher education institutions. All the managers recognised the importance of this factor during IS implementation, even though they did not perform it adequately.

10.3 The conceptual framework's role in overcoming the problems in the top management support:

This section answers the last research question, about how the SAHES could resolve IS implementation problems in top management role and explores how the proposed conceptual framework can support these universities in managing the problems that surfaced during the implementation process of the three specific systems. As a result of the previous discussion of the weaknesses and strengths in the top management support factor application in the Saudi universities, the conceptual framework (illustrated previously will be used to organise and manage this factor on the basis of the Seven 'Ss' elements to help the SAHES to resolve IS implementation problems, as follow:

The main weakness in top management support in all the five universities was that it was largely confined to providing the financial resources for IS projects. This weak point can be attributed to lack of knowledge or misunderstanding of the implementation process and the appropriate role for them in this process. To overcome this problem, it will be located under the strategy, structure, skills, system, staff, style and shared values elements in the conceptual framework. Availability of a clear **strategy** towards IS/IT will help top management in supporting the technology within the university and increase their awareness regarding the main objectives. **Structure** helps them to identify the direction that guides them.

The top managers and senior managers need to develop their managerial **skills**. This means they must know how to plan for IS implementation and acquire sufficient information about the appropriate procedures and their proper role in the process. It can be suggested that the top managers, IT Directors and senior managers within the departments and implementation team should be given specific courses to increase their knowledge related to the implementation process when introducing or changing

information systems and to enable them to recognise different avenues to support the process. These should cover social and organisational as well as technical aspects. This will help them to play an effective role and be better able to guide the process, which will support the arrangement of other elements.

System can be used to identify the priorities in systems development and the benefits of technology adoption, which in turn will provide guidelines for effective support and an appropriate role to achieve the ultimate benefits from technology. **Staff** should include all the top managers within the university. **Style** would highlight the need for encouragement to adopt a more democratic management style and decrease centralisation through courses designed to improve top managers' skills.

Shared values is a key element because top managers' concern about these values is very critical, due to their strong position in resource allocation and need to see adequate return from IS projects. So these values would encourage them to support ITC and IS projects for effective implementation.

Table 6: How the conceptual framework manages the problems in the top management support for IS implementation:

The weaknesses in the org. category	How the conceptual framework manages IS implementation problems						
	Strategy	Structure	System	Staff	Style	Skills	Shared values
Inadequate Top Management Support	Understanding the IT area and willing to act effectively to achieve the desired benefits	Identify the main guidelines	Identify the priority in systems development	All the top managers within the university should be qualified	Change managers style to democracy and decentralisation	Managerial skills and special courses about implementation process	More concern about achieving the desired goals in the technology area

This study is considered as the first study of the role of top management in IS implementation in the Higher Education sector in Saudi Arabia. No previous studies conducted in higher education sector have focused on top management role in HEIs IS in particular.

The new conceptual framework developed in this study contributes to both theory and methodology by combining the top management support factor of IS implementation with the Seven 'Ss' elements, to give possible guidelines for investigating and managing implementation issues.

At a practical level, the model helps to organise the factors and the implementation process strategically by using the Seven 'Ss' elements, and shows how the model can help in understanding and resolving the implementation problems in top management support within higher education institutions.

New ideas emerged in this new context in relation to top management support which have not been identified in previous studies. The first idea was the suggestion that support for IS implementation is related to the ITC's position in the organisational structure and IT Director's managerial level.

The second concern is the major role of culture in the shortcoming in the top managers' role in IS implementation in the Saudi context, because Saudi culture is characterised by bureaucracy, uncertainty avoidance, authority distribution and lack of decision-making autonomy, all of which could impede IS implementation.

The main strength in the top management support in IS implementation in SAHES was that all the managers at different levels recognised this factor and emphasised its importance. This could be distinctive to HEIs in the Saudi context in contrast to the result obtained by Al-Ghobiri's (2003) study in other Saudi organisations (public and private) where the managers underestimated the importance of this factor.

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