The Critical Success Factors of IS Implementation: Saudi Managers' Perspective

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Abstract

Recently, the use of information technology has become important and critical, for organizations, as it enhance the quality of products and integrity of organizational services. However, the implementation of such systems is still problematic. Due to globalization and the variation in the monetary, social and technological environments, Information Systems (IS) have turned out to be an imperative feature and high priority for different kind of organizations. In this regard, critical success factors play a vital role in successful implementation of IS. This paper evaluates and analyzes the critical success factors (CSFs) of IS implementation from the Saudi managers' perspective in different industries in Saudi Arabia. This study will also present the illustration or identification of 19 critical success factors, which are based on a review of literatures and the first phase of a study in Saudi industries. The study will also rank those 19 factors in a logical way and will characterize them into three categories of factors, including organisational, human and technological factors.

1. Introduction

IS implementation is a broad area, which is composed of different activities and skills which together lead to completion of a system change [9]. It has been recognized that the term "implementation" has been used in many methodologies, in order to demonstrate the phases of the system life-cycle, especially testing and handing over the system [23]; [32]. In explaining the activities involved in utilizing a new information system, [64] states, "The implementation stage, of course, produces running code".

The focus of this research is on the critical success factors (CSFs) relating to IS implementation issues that affect managerial and technical aspects across the project and lead to success, if managed effectively. [54], has stated, in line with [9], that "implementation can be viewed as a procedure in planned changes that lays out steps taken to entice stakeholders to support changes.

This research study will examine and inspect the CSFs (critical success factors) of IS (information system) implementation from the perspective or view point of Saudi managers. This research will recognize nineteen (19) different critical success factors, based on the analysis of wide range of literature reviews. Moreover, this study will also focus on the first phase of a study in Saudi industries. This study will help in assessing the fact that critical success factors are logically divided into three major categories and types. These may include organizational, human, and technological. This study will profoundly evaluate all of these three factors, while analyzing their availability in Saudi companies.

The study aims to explore the situation in Saudi industries with regard to the important and critical factors that play a big role in IS deployment. This study also aims to recognize the fact that how managers rank these critical success factors in order of importance. The study attempted to answer following four research questions:

1. What are the critical success factors that play a big role in IS implementation as seen by Saudi managers?
2. Are these factors available and adequate or not in Saudi companies?
3. What are the ten most important CSFs of IS implementation from the Saudi managers' perspective?

4. What is the order of importance of these CSFs from the Saudi managers' perspective?

2. Background of the Study

The research on IS implementation takes various streams as categorized by [33]. These may include a perspective research stream, a political research stream, a process research stream, and a mutual understanding research stream. It is significant to notice that each and every stream gives attention to a specific stance in the IS implementation field.

Factor research is the largest stream, which tries to explore and specify the factors that impact success and failure of IS implementation [24]; [57]; [56]; [5]; [47]. The focus in this research is on the critical factors that impact IS implementation within the organization; hence, it falls under the factor stream. Therefore, the study will take the multifactor perspective as a theoretical framework.

Many different studies have identified the factors related to successful implementation. It has been examined that most of the researches are extremely old and outdated. These studies or researches may include North-western university studies. It is observed that North-western university studies were the first empirical research on key variables based on data. The research tended to focus on operations research, but many authors applied it to computer-based information systems. Table 1 is provided in the proceeding discussion, which summarizes the findings of those studies:

Table 1: Findings of the North-western studies

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

[55], collected interview data in a cross-sectional field study from 66 industrial firms. They identified from their research ten key issues, which significantly affect the implementation of information systems. Those factors may include management support, client acceptance, organizational and technical qualifications, leadership impact, differentiated activity in the organization, proper allocation of resources, analysis of project's performance with respect to predefined organizational needs, level of resistance in the organization, and the prospects for OR/MS success in the organization. [53] conducted their study in government and private organizations in a cross-sectional field study. They developed a complex model of implementation. Afterwards, they tested their model by using interview technique. According to their views, two factors, i.e., the relationship between IS staff and users and top management support, are correlated with implementation problems. [49] conducted their cross-sectional study in 108 large business firms. The data was accumulated or collected from 178 managers, practitioners and clients, by using interview technique. They found that there is a considerable affiliation amid implementation success and procedural guidelines, along with top management support. [14] conducted correlation analysis of cross-sectional data, which was collected from 108 firms. They defined two sets of success variables, i.e., structural and behavioral. Structural variables include budget and level in hierarchy. On the other hand, behavioral variables include managers' attitude and top management support. They found specific variables that impact the successful implementation. [52] outlined many of the North-

western studies and proposed some dimensions of implementation. These dimensions include OR/MS programs, OR/MS as a change phenomenon, the environment, the organization, technology, management, and resources. Radnor discussed only the first two in detail.

Many other studies identified different factors such as, attitude and decision style. Lucas conducted many studies in the same area in USA. [35] studied, at a major university, the attitudes of the users, who were dealing with the computerized administrative system. He also researched or studied their rating of computer services, through a questionnaire survey. Also, information services staff rated the computer systems on criteria of users' satisfaction, rather than technical criteria. The results indicated a positive association amid user attitude toward the quality of the system and system towards system. Another study, by [38] was conducted in a manufacturing company. It included three divisions within the company and the sales information system. The data was collected through questionnaires, which was 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 has also conducted other studies on the same variables in various industries like, banks [39], brokerage firms [37] and pharmaceutical firms [41].

In addition, he examined research by other authors such as [28], who examined factors related to implementation success and [61], which showed in his study that user involvement is associated with a good attitude, which leads to a high level of use. The previous studies have identified numerous factors which were organized, by [36], into five categories. Those categories may include technical system quality, client actions, attitudes, decision style, and personal and situational variables. [72] identified three critical factors, which are important for any computer-based IS implementation. The three specific issues are an organizational climate that supports implementation (resources, reward system, etc), participants' commitment to their tasks and comprehensive, timely and complete implementation planning. [62] has indicated nine factors that affect implementation success and failure. Those factors may include user involvement, manager commitment, value basis, mutual understanding, design quality, performance level, project management, resource adequacy and situational stability.

On the other hand, [8] sorted or categorized the variables into six groups of success factures. Those factors may include the technology itself, the distance amid the replacement system and existing system, the management of the implementation process, organizational culture, commitment to the system, as well as motivation for introducing the new system. [34], based on Alvey's study, draw up guidelines to prepare the organization for change. These guidelines encompass a number of features including, organizational climate, stakeholder understanding, setting up the organization to manage change, identifying obstacles to change and determining the implementation strategy.

To summarize, from the foregoing presentation of early studies, some factors can be identified, which are widely held to be significant for implementation success. These factors may include involvement of users, support of top management, and organizational culture. Top management support is considered as a significant factor due to their ability to influence organizational resource [36] and users' attitude [25]. User involvement is also highlighted frequently by many authors. [31] and [12] and others have asserted that user involvement should include users at different levels and spread through all the stages of the implementation process [5]. Furthermore, [6] specified an important relationship amid user involvement and use of the system. Finally, organizational culture, which is defined as a collection of value and beliefs, emerge from various experiences and shared by the members of the organization [67], affects the ability of an organization to absorb change.

New research in the last decade has not been oriented to study the critical factors in IS implementation in general. It concentrates on specific systems and identifies the critical factors that play a big role in the successful implementation of that system. Such studies have focused on groupware software implementation [51], enterprise systems [47]; [6], maintenance management information systems (MMIS) [29], business process re-engineering (BPR) [5] and information communication technology (ICT) projects [45]. Another research trend has been conducted to focus on one specific factor from the issues, which were identified in the literature. Such

studies, for example, have explored human factors communication [71], and top management support [63]. Some researchers have studied the relationship between factors like users' acceptance and training, as well as effectiveness [54].

[15] conducted a comparative study about critical IT implementation issues in developing and developed countries of the world. They examined the differences and similarities in IS implementation problems, and found that the greatest similarities surfaced in human resources issues. Those issues may include availability of IT personnel, supply of trainers in the IT field, level of sophistication of users, and the need for training of IT personnel. In academic institutions, there are a few studies about different aspects of IS implementation, but only three of them [18]; [44]; [66] have studied the critical factors, which are associated with successful IS implementation. It was investigated that many of the same issues discussed in the literature, are connected to successful implementation in higher education institutions and lie outside the technology.

In Saudi Arabia, by contrast, there is a lack of IS implementation research. One study analyzed the implementation process in Saudi organizations and found that poor management of change; project structure, processes, and culture are factors in implementation failure. The study also proposed a model of IT managers' influence on computer-based IS [3]. Also, [3] conducted a study about the role of senior managers in the implementation process of IS, in the Saudi Arabia private sector. The study investigated a strong relationship amid top management involvement and system success. There are two studies in the higher education sector. One of them, by [2], studied the critical success factors of ERP implementation in higher education in Saudi Arabia and identified the critical factors that affect this specific system's implementation success. Another study by [7] also focused on the implementation of ERP systems, in higher education institutions and clarified that user satisfaction is related to different aspects of system quality like, content and format, which cannot be improved without user involvement in various stages of IS development. There have been no studies focused on critical success factors in Saudi Arabia in general or on specific systems in particular in the private sector.

The previous discussion shows that various research strategies have been used in the IS implementation field, depending on the research objectives and the depth of the study. Also, it emphasized that many organizations faced various problems during the process of implementation. As a result of a review of evidence on different kinds of implementation problems, the researcher deduced that the absence of specific critical factors during the implementation process might be the cause of these problems.

3. Review of Literature

3.1 Critical Success Factors – The Concept

Critical success factors or CSFs are usually utilized to state and identify the key elements, which are required for the successful implementation of the systems, within the organization. More so, critical success factors also play an incredible and inevitable role in the successful accomplishment of business operations [61]. It has been established that critical success factors can also be termed as the small number of recognizable operational goals, which are usually shaped by the organizational environment, the manager, the firm, and by the organization [52]. One of the major objectives of CSFs is to ensure the success of an organization. It has been examined that critical success factors indispensably supports the successful implementation of the systems, specifically technological systems, within the organization. The identification of the critical success factors allows the businesses and enterprises to focus on the most important areas, which needs to have special supervision or management [56].

It has been examined from the analysis of research and studies, which were carried out by [20] that critical success factors can be characterized as the set of variables, conditions, and characteristics, which must be adequately managed, maintained, or sustained. It is due to the fact that these activities ultimately lead the businesses and organizations towards the attainment of predefined goals and objectives. Thereby, it can be

affirmed that critical success factors possesses undeniable importance in any business or project. Recent reports and researches, which were carried out by [72] have revealed the fact that critical success factors play a major role in the implementation of information system (IS), within the business environment. It is because; critical success factors allow the project managers as well as the companies to identify and analyze the crucial elements, which must be necessarily, complied and considered during the implementation of system [21].

3.2 Critical Success Factors of IS implementation

After some considerable searching on critical factors in IS implementation literature in general, the researcher found numerous factors, some of which were selected for inclusion in the study on the following basis:

1. Factors which are the subject of consensus and are frequently cited in the IS implementation literature;
2. Factors including all important areas in IS implementation (organizational, human and technological);
3. Factors recognized in the first stage of the study by Saudi managers in Saudi industries;
4. Factors related to the problems noted in the first phase of the study in Saudi industries;

These categories yielded a total of 19 critical factors for IS implementation which were measured in Saudi industries to identify the ten key factors from the Saudi managers' perspective. The 19 factors are listed in the following table:

Table 2: The Critical Success Factors Included in the Study

The Factors	The Factors
Top management support	User involvement
IT strategy	Commitment
Client acceptance	Management process
Design style	Communication
Training	Motivation
Qualified IT staff	Technology itself
Attitude	Situational stability
Data quality	Implementation strategy
Organizational culture	Design quality
Technology itself	

- The factors on which there is consensus from authors and researchers and which are frequently mentioned in the literature as significant factors associated with IS implementation success and include all the important area in implementation process are top management support [53]; [49]; [52]; [25]; [36]; [42]; [24]; [57]; [56]; [69]; [63]; [18]; [47], and user involvement [25]; [35]; [42]; [72]; [30]; [61], [70]; [18]; [5]; [66]. [44]and [66] identified some important factors which are also considered as essential by other authors, such as commitment [8]; [29]; [5], communication [34]; [5]; [66]; [45]; [71], training [8]; [48]; [5]; [45]; [5]; [65] and the management process [25]; [72]; [8]; [5]; [45].
- Some factors identified by the interviewees in the first phase of the study in Saudi Arabian industries and also by some researchers are IT strategy [68]; [5]; [65], qualified IT staff [60]; [44] financial resources [18] design quality [61], data quality [27]; [1] and implementation strategy [34].
- Some factors were chosen to be included in the study because they are related to some problems, which are identified by Saudi managers in the first phase conducted in Saudi industries. One of the important problems is resistance to change. This problem has often been indicated and debated in the literature. [42] identified three types of resistance. First of all this resistance could be based on specific issues related to internal reasons of an individual or group (people orientation). Secondly, it could be based on factors related to the technology used or the system design (system orientation). Thirdly, resistance

might appear because of the interaction of personal features with those of the IT system (interaction theory).The researcher therefore included some factors, which may cause some these problems in Saudi industries. Some other factors were identified in many studies like client acceptance [55], motivation [8]; [5], technology itself [55]; [35]; [8]; [62], attitude toward the new system [61]; [57]; [13]; [35]; [38]; [40]; [36] and training [8]; [48]; [5]; [65]. Other problems that surfaced during IS implementation were top management decision, conflict between middle managers and operational managers and frequent changes in requirements. These problems relate to some factors which are asserted to be important by various authors such as organizational culture [55]; [8]; [68]; [46]; [54]; [16]; [17]; [10]; [5]; [6]and situational stability [61], and decision style [35].

- Finally, all the 19 factors were categorized by the researcher in a framework, incorporating three main factors. These may include organizational, human and technology-related factors. However, the researcher does not consider the technical aspects of the technology-related factors, because the research do not focus on that aspect; moreover in the pilot study in Saudi industries, technical issues were not seen as a problem faced during IS implementation. The researcher categorized the 19 critical factors included in the study into three categories. The first category contains factors related to the organizational area. The second category group's factors related to human resources and personnel. The third category contains factors related to technology.

3.3 Critical Success Factors of IS Implementation in the Perspective of Saudi Managers

It has been recognized from the in-depth and critical evaluation of research and studies, which were conducted by [54] that information systems, (IS), have become one of the most important features for businesses. It is due to the fact that information systems enable the organizations and companies to sustain in today's fast paced corporate environment. In addition to this, these information systems also allow the businesses to achieve competitive advantages and higher revenues [71]. Thereby, it can be affirmed that businesses are responsible to adopt and implement efficient and effective information systems, in order to assure their integrity and sustainability, within the target market. In this regard, [35] has claimed that the implementation of information systems is one of the most complex operations. It is because; implementation of information system requires higher expertise, financial or economic capital, IT infrastructure, and adequate and appropriate strategies [19]. Thereby, it is considered as one of the most significant responsibilities of the businesses to ensure the reliability and credibility of the implementation process, in order to achieve predefined goals and objectives, in terms of successful implementation and competitive advantages [38]. In this regard, the identification of critical success factors may vitally help the organizations, specifically Saudi companies, to successfully implement information system or IS [69]. A large number of critical success factors of IS implementation have been identified, in the perspective of Saudi managers. It is important to notice that these factors are mainly divided into three categories. These may include technology factors, human factors, and organizational factors [45].

Table 3: The Categorization of the Critical Factors of IS Implementation included in the Study

Organizational factors	Human factors	Technology factors
Top management support	User involvement	Technology itself
IT strategy	Commitment	design quality
Motivation	Organizational culture	Data quality
Implementation process	Attitude	
Communication	Qualified IT staff	
Training	Client acceptance	
Financial resources		
Situational stability		

Decision style		
Implementation strategy		

The proceeding paper incorporates the brief yet comprehensive evaluation of all of these factors, which are associated with the critical success factors in the implementation of IS.

3.3.1 Organizational Factors.

Organizational factors can be categorized as one of the most fundamental critical success factors, which are associated with the implementation of IS [23]. It is because of the fact that these factors assist the project managers to identify or evaluate the requirements of the resources, which are needed for IS implementation. It has been documented in the research and studies, which were accomplished by [64] that various other factors are incorporated in the organizational factors of CSFs. These factors my include support from top tier management, IT strategy and implementation strategy, motivation of the project team or employees, implementation process, communication practices, training of employees, financial or economic resources, decision making styles, and situation stability, within the organizational environment [44].

The dimensions of the top management support may include various elements or aspects. Most prominently, it includes how top tier management recognizes or identifies the IS, in terms of high priority. Additionally, it may also include the involvement of top managers in the implementation of IS, as successful implementation is entirely impossible without the strategic contribution of top management [23]. On the other hand, IT strategy and implementation of that strategy is also categorized as the most important organizational factor. This factor plays an indispensible role in formulating clear and effective strategies, while considering organizational missions and visions. Thereby, this factor also possesses undeniable importance in the deployment of IS. According to [62] employee motivation has great importance in the successful implementation of IS. It is due to the fact that motivated employees or project team performs their tasks and duties, with full dedication and enthusiasm. Moreover, they also play a vital role in introducing innovative and advanced strategies and techniques; hence resulting in profitable outcomes. Economic resources are one of the most basic requirements, which are needed for the deployment or implementation of IS [24]. Without having ample economic resources, it is quite impossible for the organizations to execute their plans, in terms of IS implementation. Lack of sufficient economic resources may lead the companies to various difficulties, like lack of technical staff, lack of adequate infrastructure, and lack of training sessions; hence resulting in devastating situations [59].

3.3.2 Human Factors.

Human resource plays a significant role in the successful accomplishment of projects or tasks. It is because of the fact that project team or project personnel provides integrated and innovative ideas and approaches to the companies, which facilitates them in the process of IS implementation [35]. According to the perspective of Saudi managers, various human factors are critical for the successful deployment or implementation of IS. Some of the most prominent factors may include user involvement, client acceptance, qualified IT staff, attitude of the employees or project team, organizational culture, and commitment of employees [55]. It has been examined from the evaluation of research and studies, which were accomplished by [66] that inadequate or lack of user involvement often results in project failure or poor implementation of IS. In addition to this, client acceptance is another most effective human factor, which is associated with IS implementation. Acceptance or satisfaction of client plays a commendable role in strengthening or empowering the credibility of the IS system, which is being designed and implemented [71].

On the other hand, qualified and proficient IT staff can be categorized as the most crucial factor behind inevitable and sustainable implementation of IS. Working attitude or behavior of employees is another utmost

human factor, which is characterized as one the most commendable CSFs in IS implementation [52]. Organizational culture is another foremost human factors, which impacts the IS implementation process. Organization culture incorporates several elements, including values, norms, and beliefs, which are being shared within the organization. According to [39] organizational culture sets the foundation of strategy, which is going to be implemented within the working environment. In the given scenario, organizational culture assists the organizations in formulating adequate and appropriate strategies, in order to ensure the integrated and successful implementation of IS [13].

3.3.3 Technology Factors.

Technological factors are the most imperative and integral CSFs, which enable the companies and organizations to assure the valuable and effective implementation of IS, within the working environment. Technological factors may include wide range of aspects including data quality, design quality, and technology itself. After analyzing and examining the perspectives of Saudi managers, it has been identified that appropriate technological tools indispensably facilitates the process of IS implementation, within the companies [45].
It is because of the fact that these technological tools help the companies in designing and developing the hypothetical infrastructure of the project, specifically on computers. More so, these technologies or technological tools also provide opportunities to the project managers to inspect potential risks and vulnerabilities, which can take place during implementation process [23]. Design and data quality are other major critical success factors, which have great significance in the implementation of IS. According to Saudi managers, both of these factors can be characterized as utmost features of IS implementation, as the performance or efficiency of the system depends on design and data quality [67].

3.4 Analyzing the availability of Critical Success Factors in Saudi Companies

The preceding paper has briefly illustrated the perspective of Saudi managers, regarding the critical success factors in IS implementation. The preceding illustration has presented an approach that these factors possess undeniable worth in the successful deployment of information systems. Therefore, it is essential for the companies, specifically Saudi companies, to assure the availability of all of these factors, CSFs, in order to guarantee or assure hassle free IS implementation. Profound evaluation of recent studies has proposed an idea that Saudi companies do not integrate ample or sufficient organizational factors, technological factors, and human factors [57].
In accordance with the perception of Saudi managers, adequate and effective IT strategies are completely unavailable in the companies of Saudi Arabia. More so, it has also been identified from evaluation of different Saudi company cases that these companies have extremely insufficient or inadequate financial resources and training facilities. It is significant to notice that limited financial or economic resources hinders the integration or implementation process of IS, in Saudi companies [40]. Poor training practices are other greatest concerns, which are faced by Saudi companies. According to [39] insufficient trainings restrict the intellectual development of the employees; hence resulting in several difficulties and problems during IS implementation.
In addition to this, Saudi companies have to face wide range of issues and vulnerabilities, in terms of having limited support from top management. This factor affects the processes of strategy formulation and implementation. This situation often leads the companies towards poor configuration or deployment of IS. The companies of Saudi Arabia also lacks in the human and technological factors. Some of the most prominent factors may include involvement of users, client acceptance, qualified, proficient, and competent IT staff, appropriate organizational culture, quality of design, and ample technological tools [56]. Saudi companies have to face extensive issues, because of having limited technology, human, and organizational resources or critical

success factors. Thereby, it can be declared that critical success factors are not sufficiently available in Saudi companies [65].

3.5 Ten Most Important CSFs of IS implementation in the Perspective of Saudi Managers

Critical success factors of IS implementation have been discussed in preceding paper. According to the perspective or viewpoint of Saudi managers, these CSFs enable the businesses and organizations to gain competitive advantages, by implementing IS. Some of the most prominent CSFs, which are identified from the standpoint of Saudi managers, may include top management support, design quality, technology itself, implementation strategy, organizational culture, situational stability of an organization, data quality, attitude, qualified IT staff, motivation, training, communication, design style, management processes, client acceptance, commitment, IT strategy, and user involvement [56]. Collectively, all of these factors play a fundamental role in strengthening or increasing the reliability of IS implementation. In all of these CSFs, ten CSFs have commendable importance, in views of Saudi mangers. Proceeding paper includes the evaluation of ten most important critical success factors of IS implementation, as identified by the managers of Saudi companies [10].

3.5.1 Top Management Support

Top management support can be considered as most significant and effective critical success factors, which are related to the IS implementation, in Saudi companies. It has been examined from the evaluation of research and studies, which were carried out by [45] that top management commitment and support can improve and enhance internal communication. This internal communication supports proper collaboration, more effectiveness, and integration of information systems within the working environment of Saudi companies. It has been established that successful IS project relies on the encouragement of team members, in order to ensure cohesive implementation of IS. This encouragement is usually done by the ultimate support from top management of the company [66]. Thereby, it can be asserted that top management support has undeniable importance in IS implementation.

3.5.2 IT Strategy

IT strategy also possess significant importance in IS implementation, within Saudi companies. These strategies help the project team to act or perform their duties, according to the formulated strategies. More so, these strategies also assist the project managers in predicting or forecasting potential risks and vulnerabilities, which may occur at any stage of the project, i.e., IS implementation. It is important to notice that IT strategies also play an indispensible and appreciable role in developing risk management strategies, in order to cope with potential issues and concerns [46].

3.5.3 Design Quality

The analysis of Saudi manager's perspective has presented an idea that quality of the design has imperative importance, in the implementation of IS. In other words, design quality can also be termed as most essential critical success factors, which are associated with the IS deployment [53].

3.5.4 Training

In accordance with the perspective of Saudi managers, training plays an indispensable role in the efficient and sustainable operations of implemented IS. Without ample or adequate trainings, the organizations may not get

desired outcomes or results. Thereby, organizations and companies are liable to organize and conduct effective training sessions, in order to get their predetermined goals and objectives [34].

3.5.5 Qualified IT Staff

Qualified IT staff assists the project managers and organizations, during IS implementation. In this regard, competent, skilled, and proficient IT staff may also enable the companies to resolve technical issues and concerns, in a convenient and well timed manner [62].

3.5.6 Organizational Culture

Organizational culture has great influence on the implementation or integration of IS, within the organization. It has been examined from the analysis of research and studies, which were accomplished by [19] that overall norms, values, mission, and vision of an organization plays a major role in shaping organizational culture; hence it can be affirmed that the organizations must formulate or develop appropriate mission and values, in order to assure cohesive deployment of information systems. Saudi managers have also stated that organizational culture is one of the most influential success factors in IS implementation [45].

3.5.7 Technology Itself

It has been contended by [51] appropriate and suitable networking, hardware, and IT infrastructure is crucial for the success of information systems' implementation. It is a fact that IS implementation incorporates a complex and highly complicated transition from business processes and legacy to common business processes and IT infrastructure, throughout the company. Thereby, it is considered as one of the greatest accountabilities of the companies to choose or select appropriate technologies, including software, hardware, and networking techniques [59].

3.5.8 User Involvement

User involvement is characterized as the most vital factor in the integration or deployment of IS in any business. It is due to the fact that user involvement helps system developers to understand the needs and requirements of the user; hence designing the entire system in accordance with the user's requirements. In accordance with the views and perceptions of Saudi managers, user involvement is nothing more than the involvement, acceptance, and participation of users during the designing and implementation of IS [26].

3.5.9 Client Acceptance

Client acceptance in IS implementation is considered as one of those factors, which shows the satisfaction levels of the client, regarding the performance of the system. In other words, the integrity, sustainability, and performance of the information system can easily be identified or analyzed by the acceptance or dissatisfaction of client [32].

3.5.10 Financial Resources

It is a fact that implementation of information system is not possible without having sufficient or proper financial resources. Without having apt financial resources, it is considerably hard for the companies to hire skilled

technical staff or personnel. Additionally, lack of financial resources also affects the availability of technological tools and training and development programs [62].

3.6 Order of Importance of CSFs from the Saudi Managers' Perspective

Ten most important CSFs (critical success factors) have been illustrated in the preceding paper. It has been assessed from the thorough and profound analysis of all those critical success factors that the successful deployment or implementation of IS mainly depends on these factors. It is important to notice that these factors have been proposed or perceived by the Saudi managers [31]. According to their views, these ten critical success factors must be complied and followed by all companies, which are intending to deploy information systems, within their working environment. The proceeding paper includes the brief overview of the order of importance of ten critical success factors, in accordance with the perspective of Saudi managers.

1. Top management support;
2. IT strategy;
3. User involvement;
4. Financial resources;
5. Qualified IT staff;
6. Client acceptance;
7. Design quality;
8. Organisational culture;
9. Training;
10. Technology itself.

Above order of importance of CSFs has been examined and evaluated from the perceptions or point of views of Saudi managers. It is quite evident or obvious from the presented order that support from the top managers is one of the most important and undeniable aspects, which are linked with the successful implementation of IS, within the working environment of Saudi companies. After top management support, IT strategy is needed to be specially developed by the companies, Saudi companies. It is due to the fact that the entire process of implementation mainly depends on the pre- developed strategy [20]. This strategy also allows the companies as well as the entire team of the project to recognize or identify the needs and requirements, and potential outcomes of the project. In addition to this, user involvement is another most essential factors behind successful and cohesive deployment of IS, in Saudi companies.

User involvement and participation considerably increases and enhances the credibility, validity, reliability, and integrity of the project. Afterwards, financial resources are fourth most significant features, which ensures the fruitful implementation of IS in Saudi companies. Qualified IT staff comes on number six, as technical queries or issues can never get resolved with the assistance and presence of IT staff. Client acceptance or approval is another utmost factor behind valuable and profitable deployment of IS, within the organizations of Saudi Arabia, in accordance with the perspectives of Saudi managers [28]. Design quality also holds undeniable importance. Organizational culture has greatest significance, as it entirely depends on the organizational culture that whether employees are ready to embrace change or not. If they are not ready for change, i.e., IS implementation, then it may inevitably impact the deployment process [25]. Afterwards training and technology comes in the importance order of critical success factors, of IS implementation, in accordance with the perspective of Saudi managers [32].

4. Research Methodology

From the previous presentation on IS implementation research, the researcher noticed that most early research employed cross-sectional field study by using a questionnaire survey method rather than interviews, because the field was new and the researchers were seeking to describe a particular phenomenon at a specific time or compare factors in different organisations. Some of them, such as [39]; [41]; [37] used a case study approach and employed the interview method to collect the data.

The new research is multiform and employs a variety of strategies including, desk research [5], field study [63]; [47]; [45]; [71] and case study [26]; [29]; [65] using various methods to collect the data, such as interviews and questionnaire survey. In this study, interviews and questionnaires were both used to gather or accumulate data from Saudi companies in different industries to recognize the critical success factors (CSFs) of IS implementation from the viewpoint of different levels of managers (top managers, middle managers and IT managers).

One of the major objectives was to explore the situation regarding these factors and identify their perceived order of the most ten important factors. To gain an overall view of the Saudi managers' perspective, the researcher included in this study different levels of managers in the participating companies. Interviews were conducted and questionnaires distributed to top managers, middle managers and IT managers. The primary data were collected through a three-phase approach, comprising overall qualitative and quantitative methods.

4.1 Phase One: After a wide and precise review of the literature in the field, the researcher tried to identify all or most of the critical factors of IS implementation and put them in a list, which included more than thirty factors. This list was presented in the first phase to different levels of managers in Saudi companies who were asked to give their opinions about all critical success factors, which were recognized in the literature and choose from their perspective the critical factors of IS implementation in Saudi industries to include in the study. They chose 19 factors, which were being included in subsequent phases to answer the research questions.

4.2 Phase Two: This phase, i.e., phase two, was consisted of interviews, conducted with 25 managers from different levels in the six companies included in the study in Saudi Arabia. The researcher hoped from this phase first, to gain co-operation for questionnaire distribution, and second, to verify recognition of the critical success factors recognized in the first phase from the Saudi managers' perspective which would answer the first question in the study. The interviewees were also given an opportunity to mention any other factors or problems they thought were important. Furthermore, it was intended to find out whether or not the factors recognized by the managers are available and adequate in these companies (research question two). Moreover, managers were asked to note the five most important problems faced by their company as a result of absence or inadequacy of factors, in order to assess the validity of their choice of factors, which were related to these problems.

4.3 Phase Three: Phase three of the research was consisted of questionnaires, which were designed based on the data collected from phases one and two. The questionnaire was distributed to the top managers, middle managers and IT managers in six industries. A total of 80 questionnaires were distributed and 54 responses were received, as described or elaborated in the proceeding table.

Table 4: The Respondents by Industries

Industries	Number	percent
Manufacturing	25	46.3
Financial Services	11	20.3
Business Services	10	18.5
Health Services	2	3.7
Education	4	7.4
Government	2	3.8

Total	54	100.0%

The questionnaire concerned the 19 critical factors of IS implementation which were identified earlier for inclusion in the study. They were to be ranked in order of importance in order to find out the important ten factors and their order from the Saudi managers' view in Saudi industries. SPSS was used to calculate the mean and standard deviation to deduce a general ranking of all the managers in the six industries. Mean value of rank scores 10+ mean high, 1+ means low and 0+ means the factor is not in the top ten. Participants were asked to select the first factor by giving it the score 19 e.g. if a manager ranked a factor first its score would be 19, the second-ranked item was scored 18, and so on down to one for the last ranked item and 0 for any factor that was ignored, to answer research question number three. Also another section in the questionnaire asked the managers to identify, for each of the factors they ranked in the table, whether or not these factors were available and adequate (research question two).

The questionnaire was pilot tested with a similar sample of managers. The pilot test assisted in improving the validity and reliability of the data collected. Moreover, it afforded an opportunity to obtain feedback about questionnaire structure, ambiguity, clarity of instructions, layout, and any other comments. The researcher refined the questionnaire and was confident that no problems would appear in the main fieldwork.

5. Data Analysis

Based on the collected or accumulated data, the researcher will answer the four questions in this study. This section answers the main research question, which concerns identifying the ten critical factors of IS implementation from the managers' perspective in the Saudi industries. The study investigated nineteen critical factors of IS implementation selected by the researcher based on previous studies in the field and phase one conducted in participating Saudi companies. The investigation of the critical factors was concerned with two main issues. Those issues may include methodological aspects and the appropriateness of the factors. The managers' perspective towards the critical factors of IS implementation in Saudi companies emphasised the importance of the 19 factors included in the study which is in line with what is mentioned in the literature by many authors in the field [35]; [61].

The researcher asked the managers to rank these 19 critical factors, in order to assess their importance from their perspective. More so, it was also asked to identify the top ten factors and their relevance to the implementation problems rose in Saudi organisations. No previous studies in the IS implementation field have included such ranking of the critical factors. Due to the lack of research on IS implementation in Saudi Arabia in general, the researcher aimed from this ranking to clarify specific issues from managers' perspective related to the Saudi environment in different industries in particular and to recognise their view regarding the level of importance of these factors in general. It would then be possible to investigate whether they agreed with the perspective of other studies or if Saudi managers have a different view, which might indicate that culture plays a role in the opinion of those managers.

The responses in the interviews and questionnaires towards some of these factors, such as attitude and commitment were somewhat negative. The managers paid little attention to them and they acquired low percentages in comparison to other factors. Nevertheless, the researcher did not eliminate these two factors from the critical factors in Saudi industries, due to the important role given to these factors in the literature. In addition, the Saudi managers did not agree on ignoring these two factors, but they disagreed on giving them a high level of importance.

Also, the management process and communication factors were ranked at the end of the list of important factors. It is because of the fact that the former was available but not managed effectively, whereas the second received a high level of attention from different managers based on the mean, standard deviation, but at the same time,

was not carried out sufficiently. The following Table 5 illustrates Saudi managers' ranking of the most 10 important factors.

Table 5: The General Ranking of the CSFs of IS Implementation in the Saudi Industries

Rank	The Critical success Factors (CSFs)	Mean	SD
1	Top management support	6.8	1.5
2	IT strategy	6.5	2.1
3	User involvement	5.9	2.4
4	Financial resources	4.7	2.6
5	Qualified IT staff	4.4	3.0
6	Client acceptance	3.4	2.6
7	Design quality	3.3	2.8
8	Organisational culture	3.1	2.0
9	Training	2.5	2.3
10	Technology itself	2.4	2.1

6. Discussion and Conclusion

From Table 5, it can be noticed that all three kinds of factors were included in the upper range of the list in order of importance, even though some organisational factors like top management support, IT strategy and financial resources and some human factors like user involvement and qualified IT staff had priority in ranking. This can be attributed to the problems the companies faced during IS implementation due to lack or inadequacy in carrying out the critical factors. In addition to this, the proposed ranking emphasises the knowledge and awareness of the importance of the critical factors in the eyes of all three groups of managers.

At the same time, it shows a specific perspective regarding some human factors such as attitude and commitment. Although managers located user involvement in the third place in order of importance, they associated this involvement with a specific level of managers and not all the users. This situation reflects lack of concern from the Saudi managers regarding human sensation, feeling and perception, especially at the users' level. This tendency from the managers to give insufficient consideration to human interest could be attributed to the management style in general. They give more attention to functions and processes than people, which indirectly impacts operations negatively. This tendency could be affected by cultural issues. In general, based on the investigation conducted and results found in the Saudi institutions, the critical factors of IS implementation were not adequately considered or effectively carried out.

The next section will look in detail at the way the critical factors were implemented in the industries. It should be pointed out, however, that in the sections that follow, the discussion covers all nineteen of the factors investigated, even though some of them were not taken into account during the implementation process, were ranked low in the list and had low frequency. Some of the reasons are illustrated in the proceeding discussion:

- Several of the comments made and problems reported by managers can be related to the missing factors;
- The managers agreed that all factors are interrelated;
- The importance attached to these factors in the literature, and the problems found in Saudi companies, suggest that although the factors were given little attention by managers, there is justification for keeping them in the framework.

In the next section, the researcher divides the ranking based on the categorisation identified earlier in section 3.2 and Table 3.

6.1 The Perspective toward Organisational Factors in the Saudi Companies

The researcher grouped the top organisational factors together in a separate ranking. The ranking of these factors in order of importance from the managers' view was as illustrated in the following Table 6.

Table 6: The General Ranking of the Organisational Factors in the View of the Three Groups of Managers

Order of importance	The organisational factors
1	Top management support
2	IT strategy
3	Financial resources
4	Training

Generally, the managers within the six companies agreed that all the organisational factors identified in the study are critical and important, to a similar degree, except the decision style factor, management process, and communication. All of these factors were placed at the end of ranking and not included in the top ten factors. From the finding, it could be interpreted that even though most of the managers agreed on the organisational factors, still, some of these factors could be, from their perspective, more important than the others. The low ranking of the other organisational factors could be interpreted in two ways. First that managers lacked knowledge about the importance of these factors located at the end of the list and second, that managers may have felt that these factors are not important at all. This is not agreed by many authors and researcher in the literature ([38]; [5]; [45].

6.2 The Perspective toward Human Factors in the Saudi Companies

The second aspect is the ranking of the human critical factors in order of importance by the three kinds of managers: top managers, middle managers and IT managers in the six companies. The researcher deduced from the main ranking Table 5 rankings for the human factors. On this basis, the ranking for the four human factors by all the managers in the six companies is illustrated in Table 7.

Table 7: The General Ranking of the Human Factors in the View of the Three Groups of Managers

Order of importance	The human factors
1	User involvement
2	Qualified IT staff
3	Client acceptance
4	Organisational culture

Generally, the managers within the six companies agreed that the human factors identified in the study are critical and important, but not to the same degree. One of these factors may include user involvement. This factor was agreed on by all the interviewees and took first place in the human factors ranking. The remaining factors, such as commitment, attitude and 206ehavior206ional culture were identified by some respondents. This situation could be interpreted as a general agreement on all the four human factors of IS implementation from different kinds of managers, as although some of them ignored some factors, each factor was accepted as important by most of them.

On the other hand, it could be interpreted that even though most of the managers agreed on the four factors, still, some of these factors could be, from their perspective, more important than others. According to the previous table of managers' perspective toward the ranking of the human factors, it was noticed that they ranked

some factors such as, user involvement and qualified IT staff at the top of the human factors, which could be attributed to the problems they faced in relation to these two factors.
Lack of or inadequate user involvement and severe shortage of IT staff within the Saudi industries could play a big role in the placing of these two factors to the top of the list. Other factors such as attitude and commitment were located at the bottom of the list. This situation shows less concern from the Saudi managers regarding human aspects, which reflect the management style in Saudi organisations in general. Nevertheless, more attention to human 207ehavior and their affiliation with the project is still needed, to achieve the desired objectives for all the group managers and staff.

6.3 The Perspective toward Technology Factors in the Saudi Companies

Technology factors were one of the categories, which were specified in this study. It is important to notice that the researcher did not focus on technical aspects. It is because of the fact that most Saudi companies have advanced technology. In addition to this, none of the managers mentioned problems related to the technical side. The concentration in this area was on three factors: technology itself, design quality and data quality, which two of them were ranked from the top ten factors as follows:

Table 8: The Ranking of the Factors Related to Technology

Order of Importance	The Technology Factors
1	Design quality
2	Technology itself

In the technology category, there was a general agreement on the two factors, even though technology itself was located at number ten in the general ranking. This means that two factors of the technology category come in the top ten important factors of IS implementation. Based on the previous table the researcher noticed that the focus was on the design quality, whereas the technology itself comes at the end of the ranking. This situation could attributed to the problems managers faced in design quality factor and they gave less importance to technology itself because it is available in Saudi companies and they did not faced any problems regarding.
Finally, it was found from the investigation in the Saudi industries that the 19 critical factors included in the study are all recognised and known, but the top ten of these factors are divided into two groups. First group may include those, which are unavailable. On the other hand, second group may include those which are available but inadequate or insufficient. Both of these groups are illustrated in Table 9, in order to show the unique situation toward the ten critical factors of IS implementation in the Saudi Arabian environment.

Table 9: The Critical Factors groups in Saudi Industries

Factors Category	Agreed Factors	
	Unavailable	**Inadequate or Insufficient**
Organisational Factors	IT strategy	Top management support Training Financial resources
Human Factors		User involvement Client acceptance Qualified IT staff Organisational culture
Technology Factors		Design quality Technology itself

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