

ERP Implementation Failures in Saudi Arabia: Key Findings

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Abstract: This research aims to investigate the factors that contribute to Enterprise Resource Planning (ERP) implementation failure in Saudi Arabia (SA). The initial findings of this study were based on the existing research that examined this subject from both international and Saudi Arabian perspectives. The outcome of the literature review suggested that factors such as lack of senior management commitment, ineffective communication with users, failure to gain user support and ineffective change management, to name a few, tend to result in ERP implementation failure. While the research carried out by Saudi Arabian scholars also alluded to similar factors, exploration of one of the most famous cases in SA (i.e., MADAR) indicated that the following three factors played the most critical role in ERP implementation failure in the organisation: the business process engineering was not in place, the size of customisation was not measured and understood, the ERP implementation was not analysed properly and the management failed to rally all those involved in the project (both internal and external participants) behind the implementation process which led to its failure. Based on the findings of the literature review section four hypotheses were developed and tested through collection and analysis of secondary and primary data (5 interviews and 150 questionnaires). The result of data analysis led to acceptance of all 4 hypothesis while other factors such as change management and senior management commitment were also considered as significant contributors to ERP implementation failure in Saudi Arabia.

Key words: ERP, failure, factors, implementation, Saudi Arabia, perspectives

INTRODUCTION

Enterprise Resource Planning (ERP) refers to the categories of management software which enable companies to gather, manage and analyse data on a number of business activities such as product planning, manufacturing, marketing, delivery/shipping and inventory management (Gattiker and Goodhue, 2005; Ke and Wei, 2006; Lingard *et al.*, 2012). The integrated facilities and functions provided by ERP Software enable companies to integrate all departments and functions across a company into a single system that can serve all those different department's particular needs. Therefore, the main outcome of effective implementation of ERP is achieving synergy and interaction across various interfaces of a business which allows for various departments to operate separately while their input and output is synchronised to generate optimum output and achieve operational efficiency (Venugopal and Suryaprakasa, 2011). While the initial cost of implementing ERP could be high, there is evidence to suggest that effective implementation is likely to yield high Return on Investment (ROI) for organisations (Venugopal and Suryaprakasa, 2011).

The implementation of ERP became widespread among the large multinationals towards the latter part of 90's and early 20th century. Some of the papers published between 2000 and 2003 indicate that by 2001 over 90% of the fortune 100 companies had implemented some type of ERP system while in the USA the trend had spread rapidly among the manufacturing firms, whereby it was reported that by the same year over 75% of large manufacturers were using ERP systems for example by DeWitte and Jung (2001) and Lingard *et al.* (2012). This trend was later replicated by the small and medium sized companies in the subsequent years as the potential advantages of ERP implementation became evident (Deep *et al.*, 2008). The implementation of ERP was not unique to the USA or the developed world and it soon spread to countries such as China and the rest of the developing world where the system was seen as a solution to the changing economic landscape and a source of gaining competitive advantage over the competition. Nevertheless, the latest available research on the success and failure of ERP implementation reveals that around 72% of the ERP implementations end in failure due to occurrence of one or a number of reasons such as "Takes longer to implement than expected",

“Costs more than expected”, “Fails to deliver at least half of the expected business benefits” (Anonymous, 2011), lack of leadership support and/or knowledge (Cater and Pucko, 2010), human resources (Lorange, 1998), organisational culture (Law and Ngai, 2007) and key project players and their taxonomies (Akkermans and Helden, 2002; Hong and Kim, 2002) to name a few. The existing variety of factors that could lead to success or failure of ERP indicates that there is little agreement among scholars as to what the primary causes of ERP implementation failure are which could essentially allude to the uniqueness of each instance of failure and its contributing factors.

Literature review

Benefits of ERP implementation in organizations:

Researchers and practitioners have been focusing on the importance of ERP systems for the past two decades as firms continually strive towards extracting strategic and competitive advantages from these technologies (Nwankpa, 2015). The study conducted by Gattiker and Goodhue (2005) indicates that the benefits of ERP implementation for businesses should be measured in terms of both intermediate and overall benefits. The evaluation of ERP impact and performance in intermediate terms allows organisations to measure the benefits yielded in the longer term which could include aspects such as enhanced coordination and task efficiency (Gattiker and Goodhue, 2005; Liang *et al.*, 2007). Studies by Benders *et al.* (2006) and Soh *et al.* (2000) have revealed that the intermediate impact of ERP implementation could result in increased standardisation and integration of business process and functions which would result in reducing cost and time of operations while generating greater customer satisfaction. The overall benefits of a fully functional ERP system for business are: ability to address the organisation’s needs through integrated modules and these modules could be scaled to grow as the organisation’s operations do (Liang *et al.*, 2007), organisations are able to customise the software to make it uniquely specific to their needs (Soh *et al.*, 2000) and ERP increases the vendor’s understanding of market and allows them to meet the market requirements through generating bespoke offerings (Gattiker and Goodhue, 2005). In a report by Anonymous (2011), the ERP solution company, reveals that effective implementation of ERP would result in “22% reduction in operating costs, 20% reduction in administrative costs, 17% inventory reductions (for manufacturing and distributing), 19% improvements in complete and on-time delivery and 17% improvements in schedule compliance (for manufacturing

and distributing)”. The study by Fryling (2010) also indicates that effective implementation of ERP would enable organisations to achieve greater customisation of their offerings for customers, improve their cross-departmental coordination, enhance their task efficiency and boost their strategic operational mechanisms which would inevitably lead to reduction of cost and time of production and increase their competitiveness.

All the benefits stated above are related to the large corporations which differ from Small and Medium-sized Enterprises (SMEs) in regards to the resources they have at their disposal when it comes to implementation of ERP (Proudlock, 1999). According to a number of researchers in (Chen, 2008; Proudlock, 1999) SMEs are not financially well positioned to dedicate large sums of money or significant parts of their human and operational resources to implementation of ERP. This problem assumes greater significance in the light of the fact that ERP implementations involve huge capital investments and flawed system implementation can escalate the costs further (Proudlock, 1999). Therefore, when contemplating the idea of ERP implementation, SMEs should consider not only the cost of system but also the compatibility of system with their unique needs and requirements. Al-Mashari *et al.* (2003), similarly argue that “ERP project involves a complex transition from legacy information systems and business processes to an integrated IT infrastructure” which should be carefully studied and analysed before a final decision on potential implementation is made. Therefore, effective and successful implementation of ERP is of huge importance to both large corporations and SMEs and even more so to the latter group considering the financial and other resource constraints they face when making a decision to implement ERP.

What makes a good ERP system?: A research by Jafari *et al.* (2006) which looked at ERP implementation in Malaysia indicates that ERP systems are only effective and successful if they benefit from “Support from top management, Clear goals and objectives, Communication, Effective project management, Business process engineering, Data accuracy and integrity, Suitability of software and hardware, Support from vendor, Education and training and User involvement”. However, the research by a number of other scholars for by Hariss and Brown (2010), Somers and Nelson (2004), Umble *et al.* (2003) and Upadhyay and Dan (2008) emphasise on the role of project management, existence of clear and predefined objectives, capability and competence of project management team and having effective change

management strategies in place before the project has begun. However, other issues such as evaluation of existing vendor and system options, identifying and appointing ERP product champions, provision of the required time and resources for training of employees and effective communication in order to reduce the potential resistance to change have been noted as the main aspects of successful ERP implementation (Shang and Seddon, 2002; Vogt, 2002).

Business and technology on ERP: However, in most case there is a misfit between organisational requirements and what an ERP system provides. As a result, many ERP implementation projects achieve limited success and the failure rate is high between 60 and 90% (Al-Dayel *et al.*, 2011). The high failure rate of ERP implementation comes from the difference in interests between customer organizations that aim to provide the optimum solutions for business problems and ERP vendors who prefer a generic solution applicable to a broader market (Al-Dayel *et al.*, 2011). Based on the high potential of ERP implementation failure, one could assume that such high rates could be associated with the limitations of ERP.

Limitations of ERP: Regardless of the positive feedback most have provided on the impact of ERP implementation on business performance, there has been some degree of cynicism about the actual impact of such technology on organisational performance (Alshawi *et al.*, 2004). The main criticisms of ERP technology are focused on the two aspects of technical and business perspectives (Alshawi *et al.*, 2004). From a business perspective, implementation of ERP is often shrouded in much dilemma and problems as there is the requirement for balancing the internal and external factors and ensuring that the system fits their requirements and is able to deliver on what they need (Alshawi *et al.*, 2004). However, in most cases, acquiring an ERP system that is inexpensive requires a shorter implementation time and is less parameterised (Themistocleous *et al.*, 2001). Such requirements, nevertheless are likely to have limited the choice of ERP system for the business and confine them to a small number of vendors that are able to provide them with such ERP system which resultantly could be less effective and fail to produce the required results (Loos, 2000). On the other hand, effective implementation of ERP heavily depends on the ability of the organisation to ensure that all those involved during and after implementation process are willing to cooperate (Alshawi *et al.*, 2004). Therefore, a piecemeal approach to implementation would not yield the required results and is likely to nullify the

potential impact of ERP implementation, thus leading to implementation failure (Loos, 2000; Themistocleous *et al.*, 2001). From the technological perspective and according to a research by Soh *et al.* (2000), another limitation of ERP implementation is imbedded in what they call the ‘Spectrum of Misfit’ which tilts between the two aspects of customisation and organisational change. Therefore, achieving the optimum results from implementation requires greater customisation which may lead to the need of greater organisational change. Soh *et al.* (2000) suggested the different steps that could be followed to creating equilibrium between these conflicting requirements.

ERP implementation failure factors: Researchers and experts acknowledge the fact that in spite of widespread adoption of ERP systems, a high rate of implementation failure has become a cause of grave concern. ERP implementations require very high levels of capital and resource investments and any incident of implementation failure can severely disrupt an organization’s business cycle. Some experts claim that ERP implementation failure rates are as high as 80%. Moreover, in the past, even renowned organizations like Dell, Apple and Whirlpool have confronted debilitating difficulties in their respective ERP implementation efforts (Chakravorty *et al.*, 2016). An important aspect of such failures is that they are universally unprejudiced (Mabert *et al.*, 2002). In other words, they happen in every country to large companies and small businesses; in commercial, non-profit and governmental organizations and without regard for status or reputation of the organisation (Mabert *et al.*, 2000). Various researches indicate that the cost of these failures for business (in private sector) and public organisations (cost to tax payer) is on the rise and amount to billions of dollars every year (Lorange, 1998; Mabert *et al.*, 2000). However, considering the frequency and scope of such failures, there seems to have very little agreement among academics as to what the main factors contributing to ERP failures are. In an attempt to conceptualise the issue of ERP implementation failure, Ghosh (2012) first tried to establish what factors constitute ERP failure, he could enlist the following factors: lower returns than expected, inability of the ERP system to meet predetermined functional requirements, crossing budget limitations, higher maintenance and training costs, missing development and deployment dates, incorrect working of the system and not living up to estimated expectations (Ghosh, 2012).

There is some evidence that ERP implementation failure may not be caused by the technological aspect (i.e., software) and the main culprit is the complex nature

of implementation which requires organisations to overhaul their process (Helo *et al.*, 2008; Lorange, 1998; Soh *et al.*, 2000). According to Zornada and Velkavrh (2005) one of the causes of ERP implementation failure is that companies stress on adopting 'best practices' of those organisations that have successfully implemented ERP technologies instead of localising the implementation. However, Helo *et al.* (2008) argue that "Unlike other information systems, the major problems of ERP implementation are not technologically related issues such as technological complexity, compatibility, standardization, etc. but mostly (about) organization and human related issues like resistance to change, organizational culture, incompatible business processes, project mismanagement, top management commitment, etc".

Others have also produced lengthy lists of factors that are deemed to contribute to ERP implementation failure for example by Hong and Kim (2002). Hong and Kim (2002) produced a list containing 'top ten ERP risk factor's which puts the three factors of 'lack of senior management commitment', 'ineffective communication with users' and 'insufficient training and end uses' at the top of this list.

However, another factor that could be considered as highly influential in potential success or failure of ERP implementations is business process reengineering (Fryling, 2010). Frantz *et al.* (2002) similarly note that "the major challenge for the organization implementing an ERP is instituting a major paradigm shift for executive leadership". However, the issue of change when considering ERP implementation is not confined to paradigm shift for the executive leaders. It is important to notice that implementation of ERP would unavoidably force numerous changes upon the organisation which spans not only the how employees or senior management interact with the business but also how the operations are carried out (Dodds and Spencer, 2007). Dodds and Spencer (2007) mainly emphasise on the need for business process reengineering which is an integral part of how the business process should be conducted during and after the implementation process. However, failure to gain full support and commitment of the executive management as well as all others involved in the post-implementation era is likely to contribute to failure of the implementation (Peng and Nunes, 2009). In other words, business process reengineering could lead to emergence of resistance and lack of cooperation from various members involved which as a system that thrives in connecting different aspects of business, ERP is not likely to yield the required result if

the post implementation phase is not clearly planned (Yu, 2000). Hence, not only should organisations benefit from full support of the top management, the top management should also consider the right training provisions and engage all members in ongoing communication loops about the current and eminent changes (Peng and Nunes, 2009; Yu, 2000).

ERP awareness in Saudi Arabia: Market research companies such as Frost and Sullivan highlight that Saudi Arabia is in fact the largest IT Market in Middle East. With the country's ambitions to become the leading IT and e-Business nation in the foreseeable future (Al-Dayel *et al.*, 2011), Saudi Arabia has increased its expenditure on ERP implementation in a number of industries which include education and oil and gas to enlist two (Al-Dayel *et al.*, 2011). According to Al-Dayel *et al.* (2011) over 69% of Saudi organisations are using different ERP packages. This clearly indicates that the current level of awareness of ERP and its implementation is relatively high among Saudi organisations and businesses.

A number of studies that have emerged on ERP implementation in Saudi Arabia (Al-Dayel *et al.*, 2011; Al-Nafjan and Al-Mudimigh, 2011) while mainly focusing on the success factors of ERP implementation, cover a number of landmark ERP implementation failures such as MADAR. "MADAR is an ERP Project developed in King Saud University (KSU). In 2007, KSU decided to implement the financial, human communications, inventory control, warehouse and employee service in this MADAR project" (Al-Nafjan and Al-Mudimigh, 2003). However, the project was a failure as it did not meet its objectives. According to the research carried out by Al-Shamlan and Al-Mudimigh (2011a, b) four factors of lack of top management commitment, lack of change management, failure in business process change and lack of IT infrastructure led to ERP implementation failure of MADAR. However, others for (Alshawi *et al.*, 2004; Mabert *et al.*, 2000) argue that failure of MADAR project stems from three factors which are the business process engineering was no in place, the size of customisation was not measured and understood, the ERP implementation was not analysed properly and the management failed to rally all those involved in the project (both internal and external participants) behind the implementation process which led to its failure. While there has been much speculation and contradictory reasoning about the failure of such large-scale ERP implementation projects in Saudi Arabia, this study aims to shed some light on the situation through collection and analysis of primary data.

MATERIALS AND METHODS

Hypothesis: Considering the large number of papers that have been produced on the subject of ERP, especially in the context of contributors to ERP implementation failure, putting an inclusive number of hypotheses would have had complicated the analysis process. Therefore, the author decided to shift the focus of the study towards the main issues highlighted by Saudi Academics writing on the contributing factors to ERP implementation failure in Saudi Arabia. Therefore, the following four hypotheses are generated:

- H₁: lack and/or underutilised business process engineering is directly correlated to ERP implementation failures
- H₂: absence of clear and well-measured understanding of the size of customisation is directly related to ERP implementation failures
- H₃: miscarriage and/or poor execution of requirements and implementation analysis are directly related to ERP implementation failures
- H₄: failure of the management to rally all those involved in the project (both internal and external participants) behind the implementation process is directly correlated with ERP implementation failures

Considering that the above four factors have been noted as the main contributors to ERP implementation failure in Saudi Arabia, the main focus of data collection and analysis study's is on testing their validity. However, other factors have also been included in the data collection instruments which are explained in the following study's.

Data collection and tools

Data sources: The sources of secondary data collected in this research are mainly from reputable academic journals and this qualifies them as being reliable and credible. Use of such sources is commonly advocated by various scholars for Corbin and Strauss (2008), Day *et al.* (2008), Saunders and Lewis (2011) and Saunders *et al.* (2009). Therefore, the data gathered through review of existing literature constitute the secondary data collection.

Data collection methods: The primary data were collected through both interviews and questionnaires. The reason why this mixed method was adopted is to offset the shortcomings inherent in each method as by Bryman (2008) and Day *et al.* (2008). Moreover, the research by Gupta and Naqvi (2014) indicates that using the mixed method approach to data collection while posing some

unique problems to the researcher (i.e., analysis) tends to provide numerous advantages. Chiefly among these advantages are achieving greater representativeness of data collected (Gupta and Naqvi, 2014). In other words, when using interviews, the researchers are able to gather information that provides great depth and answers questions on how and why a phenomenon occurs. Quantitative data, on the other hand, tend to lack the depth qualitative data provide while their main contribution is increasing the representativeness of data and answering questions such as what and how many (Corbin and Strauss, 2008).

Construction of data collection tools: Construction of the data tools (i.e., interview and questionnaire questions) was solely based on the findings of the literature review section and therefore, both tools carry a degree of similarity. The construction of both methods is explained separately in the following sub-sections.

Interview: The interview questions were based on the outcome of the literature review. Therefore, the questions were designed in an exploratory fashion while a structured design was implemented in order to achieve greater consistency in answers (Saunders and Lewis, 2011; Saunders *et al.*, 2009). There were a total of five questions listed as follows:

- Q1: how do you see the current state of ERP awareness in Saudi Arabia?
- Q2: how successful have these ERP implementation been? If you have been involved with any implementation or know of any cases?
- Q3: what do you think contributes to ERP implementation failure in Saudi Arabia?
- Q4: if you were to mention three factors that have mainly contributed to ERP implementation failure in Saudi Arabian organisations, what would these be?
- Q5: how do you think Saudi Arabian organisations could achieve effective ERP implementation and reduce or eliminate the potential risks or failure?

The interviews were carried out via phone and on average lasted 10 min. The structured design of the interviews allowed for keeping the interview times short and the researcher managed to reach 5 participants, all of whom work as IT managers at Aramco (the state owned oil company) and have different levels of experience.

Questionnaire: The questions used in the survey were also derived from the outcome of the literature review. However, the questions were mainly multiple choice (Liker

scale format) whereby respondents were asked to rate each variable based on the extent of their agreement or disagreement with each statement (Saunders *et al.*, 2009). Hence, the survey contained 10 Likert scale questions, one open-ended question and three demographic questions. Once the questionnaire was finalised, after a pilot test session, it was placed online on www.surveymonkey.com, shared on social media and directly emailed to potential respondents. A total of 154 questionnaires were filled out which represents a relatively strong level of participation, considering that all respondents were from one company (i.e., Aramco). However, after careful screening of data only 150 cases were chosen as useable as four questionnaires were not filled out appropriately and lacked a large number of variables. Considering that the total population of Aramco's employees is just fewer than 60,000 people, the 150 participant's rate reveals a confidence level of 95% and a potential error margin of 8% which is a relatively strong indicator of representativeness of collected data. In addition, only a small segment of Aramco employees work as IT specialists or strategy developers/executioners in the company who were the main target audiences of the survey which further increases the reliability of the data obtained.

Case study: The last issue that this study of the study explains is the overall design of the research. Considering that the research is investigating a specific issue and its respondents are from a certain organisation (i.e., Aramco) the most suitable approach to design the research is through the use of a case study. According to Yin (2009), the case study guides the investigator in the process of collecting, analysing and interpreting observations and therefore drawing inferences concerning causal relations among the variables under investigation.

Using a case study approach, therefore, allowed us to investigate the factors contributing to ERP implementation failure from the perspective of the most relevant participants from one organisation. What makes Aramco a suitable case is its pedigree and importance to Saudi's economy and the organisation's emphasis on implementation of the newest and most cutting edge technologies to its large scale operations.

RESULTS AND DISCUSSION

Data analysis method: The data analysis method implemented in this research is mainly qualitative. This method of analysis is applied to all types of collected data (i.e., secondary and primary). The reason this method was applied, even to data collected through surveys is achieving consistency across various data forms and creating a blanket approach that could enhance the

outcome of the data analysis. Therefore, the analysis is carried out in three parts: the first part is qualitative analysis of survey results, the second part dedicated to analysing the outcome of interviews and the final part analyses the secondary data collected in the literature review study. The following study, present the findings of the data analysis.

Questionnaire analysis: As stated in the methodology study, 150 valid questionnaires were filled out on survey monkey the result of which is analysed here. Analysis of demographic data indicates that majority of respondents are from four departments of IT, HR, operations and project management (Fig. 1) which qualifies them to provide educated and constructive comments on the subject of ERP implementation and allows the researcher to investigate the issue of ERP implementation failure from different perspectives.

Another factor that may divide respondents in their attitude towards the factors that lead to failure of ERP implementations is the length of their research experience. The result of the survey, Fig. 2 shows that the

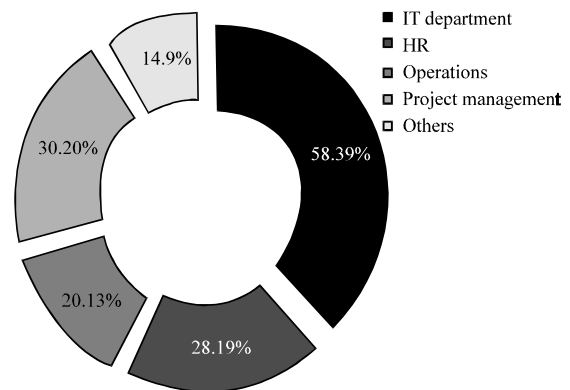


Fig. 1: Questionnaire respondent's positions

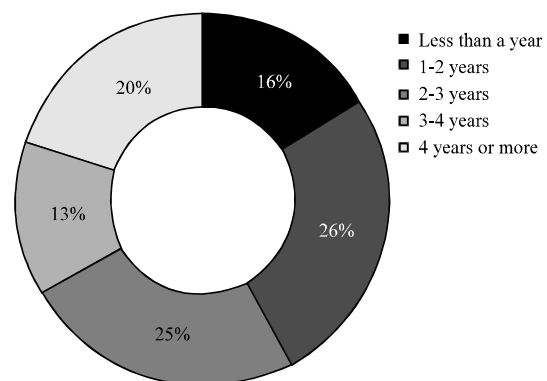


Fig. 2: Questionnaire respondent's number of years working in their corresponding position

respondents are relatively well-distributed into various groups of work experience which would provide some useful insight through further analysis.

What is more, the gender distribution of the respondents is significantly eschewed towards as 92% of the respondents Fig. 3 are males. This factor therefore would not provide any useful insight into potential differences that gender analysis could provide.

The analysis of the main factors (Likert scale questions), however, provides the main context for analysis which will eventually be combined with demographic data in order to create a clear picture of the main factors respondents of the survey highlighted as the main contributing factors towards ERP implementation failure. The factors are analysed on a question by question basis.

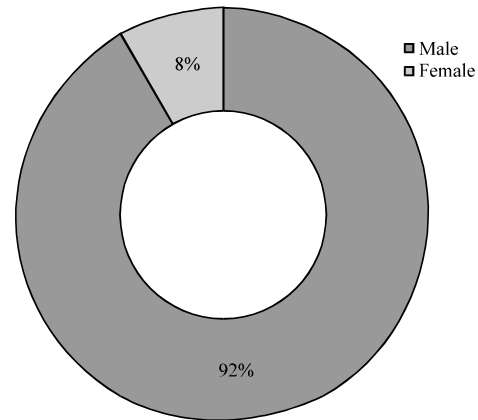


Fig. 3: Questionnaire respondent's gender

Lack of senior management commitment: The result of the survey reveals that a strong majority of respondents (68% of the respondents, Fig. 4 either agree or strongly agree with this statement) believe lack of senior management commitment is a major contributor to ERP implementation failure in Saudi Arabia.

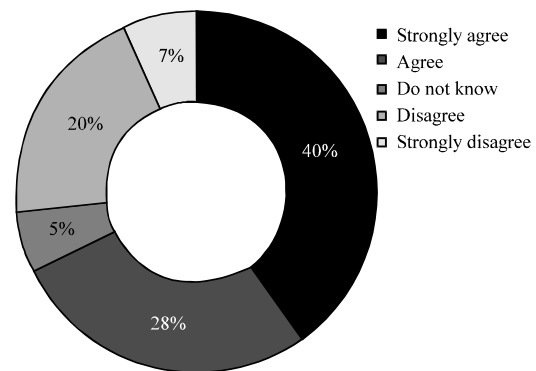


Fig. 4: Lack of senior management commitment

Ineffective communication with the users: The second question is focused on the issue of communication and the role it plays on ERP implementation failure. The respondent's answer reveals that less than half of the respondents believe that communication is a major contributor to ERP implementation failure in Saudi Arabia. Nevertheless, 46% of the respondents Fig. 5 agreed or strongly agreed with the statement that ineffective communication with the users does play a negative role on the outcome of ERP implementation in KSA.

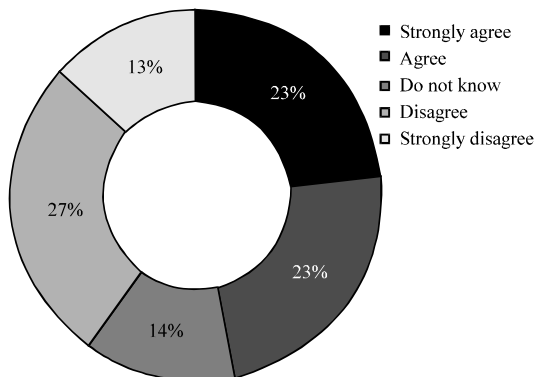


Fig. 5: Ineffective communication with the users

Insufficient training of the end users: The result of the survey indicates that this is not a major concern among Saudi Arabian businesses and their employees. In fact, the result of the survey reveals that only 21% of the respondents, Fig. 6 believed that insufficient training of the end users has an impact on ERP implementation failure. Manual cross-examination of the result further shows that those who has agreed or strongly agreed with the statement mainly fall under the work experience categories of 1-2 years which could allude to changing mind-set towards required training among the younger generation of Saudi employees. Nevertheless, this factor was not considered to have a major impact on the outcome of implementation in the country or is not among the main contributors to ERP implementation failure.

support which was noted as one of the important factors in the literature review section. The outcome of the survey indicates that 92% of the respondents agreed or strongly agreed with this statement (Fig. 7).

Failure to gain user support: The fourth factor on the survey enquired about the role of gaining user (employee)

Lack of effective project management: Another factor that perhaps to some extent, ties in with the previous one

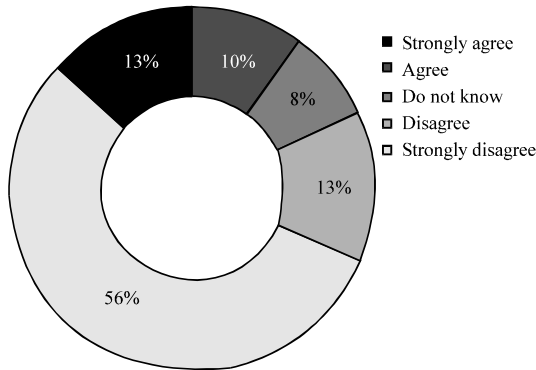


Fig. 6: Insufficient training of the end-users

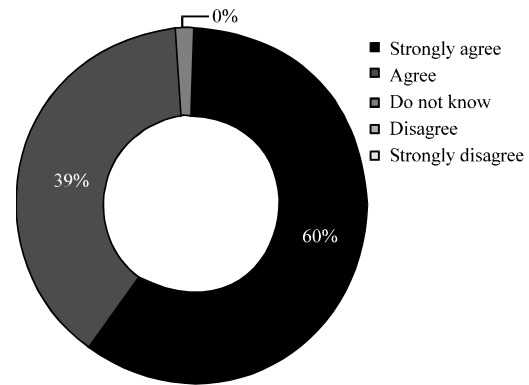


Fig. 8: Lack of effective project management

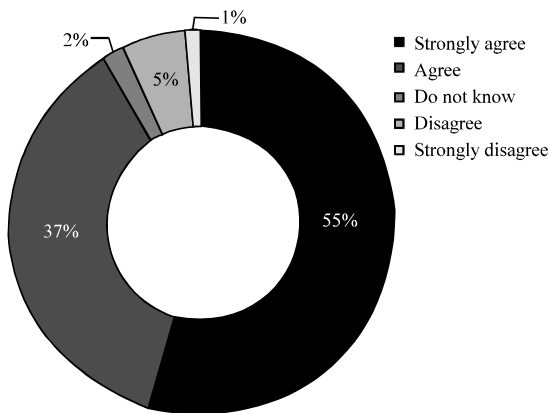


Fig. 7: Failure to gain user support

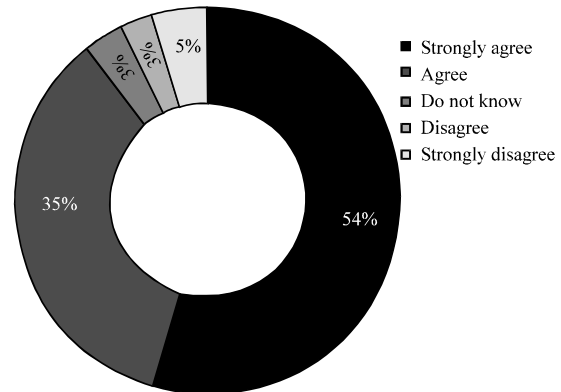


Fig. 9: Conflict between user departments

is lack of effective project management. The result of the survey indicates that 99% of the respondents, Fig. 8, believe that lack of effective project management is a major contributor to ERP implementation failure. The high percentage of agreement with statements number 4 and 5 clearly reveals that the issue of ERP implementation failure to a large extent, results from lack of synchronisation and positive contribution from various groups involved in the project which includes all parties such as the management, employees and project management team.

Attempts to build bridge to legacy application: While some literature has linked this factor with ERP implementation failure, the result of the survey found no linkage between this factor and ERP implementation failure in Saudi Arabia. The results indicate that only 15% of the respondents agreed with this statement while the remainder disagreed that this issue would be among the main contributors to ERP implementation failure.

Conflict between user departments: The result of the survey shows that conflict between departments is a

major cause of ERP implementation failure in Saudi Arabia. Analysis of the survey indicates that 89% of the respondents, Fig. 9 agree or strongly agree that conflict between departments is a major cause of ERP implementation failure in Saudi organisation which also ties in with factors number 4 and 5 that were analysed above.

Misestimated need for customization: Another factor that weighs heavily based on the results of the analysis is assessment of the customization required after ERP implementation. The outcome of the research indicates that 91% of the participants, Fig. 10 agree or strongly agree with the statement that misestimation of needs for customization plays a critical role in ERP implementation failure. This means that in most cases organizations are too eager to implement ERP based on the known benefits the system provides, however are oblivious to potential changes and customizations they need to render once the implementation period is over.

Business process reengineering: This factor also received high rates of agreement as a major contributor to

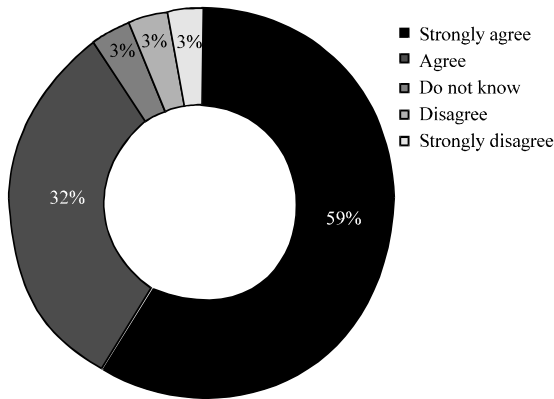


Fig. 10: Misestimation of need for customization

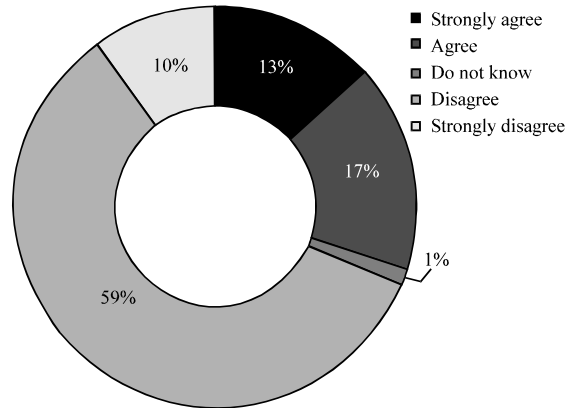


Fig. 12: Misunderstanding of change requirements

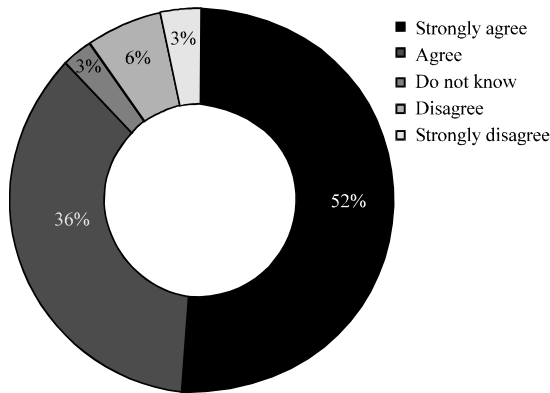


Fig. 11: Business process reengineering

ERP implementation failure. The results reveal that 88% of the respondents, Fig. 11 believe that failure to achieve effective business process reengineering negatively affects the outcome of ERP implementation. This means that companies in Saudi Arabia in most cases of ERP implementation failure achieve negative results due to their lack of understanding or general obliviousness to the business reengineering requirements in the post implementation period. Therefore, it is possible to assume that in most cases they continue practicing the same process which leads to failure of the system and squandering of organization's financial and non-financial resources.

Misunderstanding of change requirements: It is important to notice that there is some distinction between change management and business process reengineering, although both issues could lead to varying degrees of resistance and/or confusion in the organizations once ERP has been implemented. The result of the questionnaire analysis reveals that only 30% of the

respondents, Fig. 12 believe that misunderstanding of change requirements is an issue that contributes to ERP implementation failure in Saudi Arabian organizations. This alludes to two facts; firstly as mentioned earlier, there is some degree of distinction between change and business process reengineering and secondly, change management is not among the main factors recognized by Saudi Arabian employees as contributors to ERP implementation.

Interview analysis: Interviews are considered as complimentary to the replies gathered through questionnaires in the previous section. The respondents of the interview questions are referred to by acronyms (A-E) to avoid repeating their names. The outcome of the interviews is as follows:

Demographics: All five respondents are IT managers and have worked for Aramco for more than 4 years which means they have been exposed to ERP implementation as the company is considered one of the most advanced oil and gas companies in the Middle East. Moreover, all respondents have been educated in the West which indicates that they have relatively significant knowledge of ERP implementation and concepts from both internal and local perspectives.

Main questions:

Q1: how do you see the current state of ERP awareness in Saudi Arabia?: The respondents, though interviewed separately, all provided relatively similar answers to this question which referred to existence of a high degree of awareness of ERP systems and ERP implementation. Interviewee A for instance, mentioned that "Saudi Arabian government has been spending heavily on ERP implementation in the education, oil and gas and other

public sectors and their aim as far as I know is to achieve 80% ERP penetration in public sectors by 2025". Interviewees C and E, similarly mentioned that, since, 2003 there has been a notable increase in the amount of IT investment by the government, most of which has been dedicated to ERP implementation with the aim of enhancing the performance and efficiency of the public sector". Respondent D, however, noted that many medium to large private companies have also begun implementing ERP to reduce cost and increase efficiency.

Q2: How successful have these ERP implementations been? If you have been involved with any or know of any cases:

Most of the answers alluded to large scale failures, mostly in the public sector. Interviewee A noted that in most cases the outcome falls very short of the expectation and in some cases that I am aware of, the programme was withdrawn prematurely. Respondent B, similarly noted that he has been involved with one case that is ongoing which is proving successful, thus far and knows of two cases which were unsuccessful and cost the organisations considerable amount of time and resources. Respondents C-E, also argued that in most cases the implementation has been a failure apart from Aramco which has been running the system for a longer period than others and is now in the process of changing the system. The outcome of this question indicates that the overall experience of Saudi Arabian organisations with ERP has been unsatisfactory and resulted in numerous failures, although the country has been exposed to ERP for a long period of time.

Q3: What do you think contributes to ERP implementation failure in Saudi Arabia?:

The answers provided by the interviewees were similar on certain factors and dissimilar on some others. The factors that were suggested by all five interviewees are: inability to analyse and formulate business process reengineering, traditional approach to management and lack of appreciation for change management and new methods required for managing the workforce in an ERP equipped organisation, lack of focus on customisation of the system and adopting a generic approach to ERP implementation or borrowing from best practices without changing certain aspects to meet the specific needs of the organisation and failure of management to align the interests and channel energy of various parties and departments behind the implementation process, especially in regards to end users and project managers.

Other factors were also suggested by the interviewees such as: misestimating of cost and duration

of the project (A), assigning the wrong project team to the implementation task (A), lack of accountability (B, C), lack of a vision or clear outcomes expected from ERP implementation (B, E), working on unrealistic deadlines for completion of implementation (C, E and D), employee resistance to change (C, E), lack of communication between various interest groups and stakeholders (E, D) and lack of efficient training during and after implementation period (A, E).

Considering the large number of factors involved (this was predicted in advance) the following question was designed to achieve a shortlist.

Q4: If you were to mention three factors that have mainly contributed to ERP implementation failure in Saudi Arabian organisations, what would these be?:

The outcome of the responses provided by the interviews could be broadly categorised into the following three categories: Generally, Saudi Arabian organisations do not have a strong or well-evaluated business process reengineering in place which does not allow them to enhance the outcome of ERP after the implementation of the system. The size of customisation required after the implementation process is not effectively analysed which results in failures in most cases. Normally, there is divide and conflict between senior management, project managers and end users which results from lack of communication or management's inability to create consensus between all parties involved.

Q5: How do you think Saudi Arabian organisations could achieve effective ERP implementation and reduce or eliminate the potential risks or failure?:

The answers provided by the interviewees were mainly catered towards the main factors they had mentioned in the previous question. For instance, interviewees A-C, suggested that management should receive substantial training on the ERP implementation in order to become fully aware of the factors that could make the implementation a success or result in its failure. Their suggestions further alluded to the need for assigning greater accountability to managers and holding them directly responsible for success or failure of the project as they tend to play a big part in making the decision towards ERP implementation, putting the project teams together and overseeing the project. Interviewee D, however, argued that a new approach to management is required. Respondent D also added that ERP implementation brings about a host of changes to the way organisations run their operations and the old methods of management and the status quo will not result in success of the project. Interview E, similarly, referred to the important role of management team in ensuring that all

parties involved make positive contributions towards implementation of the system. Respondent E also noted that it is the management's responsibility to ensure that he understands the system requirements as well as the requirements of the organisation and the need for customisation of the system through time in order to achieve greater performance and synergise the efforts and output of all departments through effective ERP implementation.

Literature review analysis: In the literature review study, we presented a number of factors contributing to ERP implementation failure in general and in the case of Saudi Arabian organisations. Using the data analysis methods stated above in this study, the results obtained confirmed that the three factors considered as the main factors behind ERP implementation failure in Saudi Arabia stated in the literature review are effectively the major influencers of ERP implementation failure in SA. Therefore, the result of this research accepts the four hypotheses stated before in the methodology section. However, the outcome of this research also indicates that other factors such as lack of management commitment, ineffective communication with end users and misunderstanding of change requirements are among the factors that affect ERP implementation. Therefore, in case of ERP implementation failure in SA, the findings of this research divide the influencing factors into two categories of primary and secondary contributors. The factors that fall under the first taxonomy are: the business process engineering was not in place, the size of customisation was not measured and understood, the ERP implementation was not analysed properly and the management failed to rally all those involved in the project (both internal and external participants) behind the implementation process which led to its failure. And the secondary factors are: lack of management commitment, ineffective communication with end users and misunderstanding of change requirements.

CONCLUSION

The aim of this research was to investigate the factors contributing to ERP implementation failure in Saudi Arabia. Critical review of the existing literature indicated that ERP implementations tend to fail due to a number of reasons such as lack of senior management commitment, ineffective communication with the end users, insufficient training of the end users, failure to gain user support, lack of effective project management and time and/or cost over runs to name a few. However, in case of ERP implementation failure with reference to one

of the landmark cases of the recent past (i.e., MADAR), it was noted that the failure in the country mainly boils down to three reasons listed in the data analysis section of this study. These findings were also confirmed through collection and analysis of primary data from Saudi Arabian based employees of Middle East's largest oil and gas company (i.e., Aramco). The outcome of data analysis indicates that ERP implementation failure in Saudi Arabian organisations could result from a large number of factors. In conclusion, the three factors of, lack of well-evaluated process reengineering, ineffective analysis of customisation requirements and internal feuds (lack of unity and coherence between various parties) are the main contributors to ERP implementation failures in Saudi Arabian organisations, although other factors may also play critical roles in failure of ERP.

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