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The Fundamental Challenge: Human and Organisational Factors in an ERP Implementation

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Abstract:

Organisations encounter obstacles when implementing ERP systems. This paper intends to explore some of the problems that occur throughout the implementation of an ERP system. Using a combination of the work of Markus et al (2001) and Kim et al (2005), a framework is constructed of Human and Organisational and Technical problems in ERP Implementations during the project phase. Drawing on empirical evidences from a UK furniture manufacturer, this study then discusses and analyses each problem identified in the framework and its affect on the implementation of their ERP system. The findings of this paper reveal that the fundamental challenge of ERP implementation is not technology but organisational and human problems, which, if not properly comprehended and addressed, can lead to ERP failure. Understanding that organisational and human issues are extremely important will encourage practitioners to address these problems and succeed in their ERP system implementations.

Keywords: ERP Systems, Implementation, Human and Organisational Problems, Technical Problems.

1. Introduction:

In the past two decades, companies around the world have implemented Enterprise Resource Planning (ERP) Systems (Nah *et al* 2006). An ERP system is a commercial software package (Davenport 1998, Markus *et al* 2000) that promotes seamless integration of all the information flowing through a company (Davenport 1998). Laudon *et al* (2006) explain that an ERP system collects data from various key business processes in manufacturing and production, finance and accounting, sales and marketing, and human resources. The system then stores the data in a single comprehensive data repository where it can be used by other parts of the business. Managers have precise and timely information for coordinating the daily operations of the business and a firm wide view of business processes and information flows.

ERP systems have near magical effects when they work as promised (Legare 2002), but unfortunately, a significant number of ERP implementation projects do not succeed (Sarker 2002). The fact that many ERP implementations fail or escalate out of control (Davenport 1998), has led academics to concentrate on what makes a successful ERP. Scholars have focused their research on critical success factors (CSF) (Parr *et al* 2000, Somers *et al* 2001, Nah *et al* 2001, Umble *et al* 2002), which focus on the factors that determine whether an ERP implementation will be successful (Umble *et al* 2002). Markus *et al* (2001) explains that most companies experience outcomes that fall some what short of what a "best in class" organisation might achieve. This directs their attention to the problems companies experience when they adopt, deploy, and use ERP systems. Markus' study in 2001 is unusual as it places considerable focus on the problems experienced in ERP implementations as opposed to simply defining CSFs. They explore the aspects of organisations ERP journeys. This study will focus is on the problems experienced in ERP implementations. The authors believe that focusing deeply on ERP problems will produce different findings opposed to focusing on CSFs.

Research suggests that most companies experience problems with their ERP systems, particularly during the implementation phase (Parr 2000). Both technical problems and human and organisational problems can be attributed to ERP failure. '*ERP implementations are affected by both technical and social and organisational aspects*' (Elbanna 2003 p1). This is because the implementation of an ERP system is a socio-technical challenge (Kansel 2006). Laudon (2006) emphasise that information systems are sociotechnical systems. They are composed of machines, devices and 'hard' physical technology, yet they require substantial social, organisational, and intellectual investments to make them work properly.

This paper intends to differentiate between the human and organisational problems and the technical problems in an attempt to explore the presence of the opposing problems in an ERP implementation in a UK furniture manufacturer. According to Sarker (2002), there is a consensus among researchers that human factors, more than technical are critical to the success of ERP projects, this paper intends to explore this assumption. A combination of the work of Markus *et al* (2001) and Kim *et al* (2005) will be used to construct a framework of Human and Organisational and Technical problems in ERP Implementations during the project phase. Drawing on empirical evidences from a UK furniture manufacturer, this study then discusses and analyses each problem identified in the framework and its affect on the implementation of their ERP system.

2. ERP Phases:

A phase can be described as a point in time (Markus *et al* 2000). Kim (2005) states that the identification of ERP problems or impediments as they call them for each phase provides greater detailed guidelines. Although there have been many definitions of phases across the ERP lifecycle (Esteves *et al* 1999, Parr *et al* 2000), this study will focus on the work of and Markus *et al*'s (2000) ideal phases of ERP implementations. In particular the project phase of Markus *et al* (2000) shall be focused on. This is because, as will later become clear, the case study of the UK furniture manufacturer concentrates on this period. According to Markus *et al* (2000) the project phase comprises activities intended to get the system up and running in one or more organisational units. Key activities include software configuration, system integration, testing, data conversion, training and rollout.

3. ERP Problems:

The ERP implementation problems identified by Markus *et al* (2001) and Kim *et al* (2005) will be detailed in this section. The rationale for using the work of these two authors is that both define the ERP phases using Markus *et al*'s (2000) ideal phases and concentrate on the project phase in particular.

3.1 Markus *et al* (2001):

Markus *et al* (2001) conducted a study which reflects the experiences of approximately forty organisations that they have been involved in studying. Markus *et al* (2001) presents findings about adopters' problems with ERP. In the project phase of the ERP lifecycle, they reported that: software modifications, system integration, product and implementation consultants, and turnover of project personnel were the most challenging of problems to overcome. Table 1 details each of these challenging problems in the project phase.

Table 1: Markus *et al*'s (2001) Challenging problems with ERP adoption in the project phase

Challenging problems	Project Phase
Software Modifications	<ul style="list-style-type: none"> ■ Difficulties in operating effectively with systems functionality ■ Difficulty in getting modifications to work well and arrive in time ■ Not understanding the ERP system before modifications were made, resulting in unnecessary modifications
System Integration	<ul style="list-style-type: none"> ■ Difficulty integrating ERP system with a package of hardware, operating systems, database management systems and telecommunications systems suited to their organisations size, structure and geographic dispersion ■ Difficulty finding experts to advise on operating requirements
Product and Implementation Consultants	<ul style="list-style-type: none"> ■ Few IT products and service firms were willing to take end to end responsibility for project managing all parties (ERP vendor, vendors of supporting hardware, software and telecommunications capabilities and implementations consultants etc) ■ ERP adopters reluctant to cede authority for project management to an outside party ■ Conflict between parties ■ Lack of continuity in personnel assigned to adopter projects ■ Conflicts between adopting company and IT product or service vendors
Turnover and Project Personnel	<ul style="list-style-type: none"> ■ Losing Key IT specialists and user representative

3.2 Kim *et al* (2005):

A later study conducted by Kim *et al* (2005), categorise ERP problems or impediments as they call them, into six different areas. These are: human resources and capabilities management, cross-functional co-ordination, ERP software and configuration, systems development and project management, change management and organisational leadership. Within these areas they compiled impediments identified from previous ERP implementation studies. Kim *et al* (2005) grouped together the impediments into phases. Kim *et al*'s (2005) impediments within the project phase are demonstrated in table 2.

Table 2: Kim *et al*'s (2005) impediments with ERP adoption in the project phase

Critical Impediments	Project Phase
Human Resources and Capabilities Management	<ul style="list-style-type: none"> ■ Difficulties in building team ■ Lack of in house resources of project management skills ■ Difficult to gain outside expertise ■ Lack of adequate incentives ■ Imbalanced team composition
Cross Functional Coordination	<ul style="list-style-type: none"> ■ Lack of coordination mechanism to resolve cross-functional differences ■ Lack of communication across cross-functional units ■ Lack of communication across internal project teams ■ Unwillingness to accept changes from other functional units
ERP Software	<ul style="list-style-type: none"> ■ ERP systems that are too difficult to customise

Configuration	<ul style="list-style-type: none"> ■ Complexity of ERP systems only a few people understand it beyond a single model which makes design difficult
Systems Development	<ul style="list-style-type: none"> ■ Lack of Adequate resources to renew systems ■ Frequent changes in requirements
Change Management	<ul style="list-style-type: none"> ■ Lack of organisational change management expertise ■ Too much effort to redesign business processes, resulting in a heavy burden in reconfiguring the software ■ Too much effort to align business process to the ERP process resulting in loss of competitive edge
Organisational Leadership	<ul style="list-style-type: none"> ■ Perspective of ERP as just a technical system ■ Inadequate management of stakeholder politics ■ Lack of adequate monitoring and feedback

4. Human and Organisational Problems and Technical Problems in ERP Adoptions:

The authors have combined the ERP adoption problems defined by of Markus *et al* (2001) and Kim *et al* (2005) so a united framework of ERP problems in the project phase of the ERP lifecycle can be developed. This framework is then divided into human and organisational problems or technical problems. This is displayed in table 3. This paper defines technical problems as involving the machines, devices and 'hard' physical technology. Human and Organisational problems are categorised as attitudes, management and organisational politics and behaviour. It can be observed that six problems have been identified as human and organisational and three have been identified as technical. This combination of work will be used to analyse the case of a UK furniture manufacturer.

Table 3: Human and Organisational Problems and Technical Problems in ERP adoptions

Human and Organisational Problems	Technical Problems
■ Product and Implementation Consultants	■ Software Modifications / Software Configuration
■ Turnover and Project Personnel	■ System Integration
■ Human Resources and Capabilities Management	■ Systems Development
■ Cross Functional Coordination	
■ Change Management	
■ Organisational Leadership	

5. Research Setting and Methodology:

This research belongs to the qualitative school of research in information systems. An ethnographic approach is adopted. Ethnographies in their most characteristic form involves the ethnographer participating, overtly or covertly, in peoples lives for an extended period of time, watching what has happens, listening to what is said, asking questions, in fact, collecting all the data that is available to throw light on the issues that are the focus of the research (Hammersley *et al* 1995). Myers (1999) states that ethnographic research is well suited to providing information system researchers with rich insights into the human, social and organisational aspects of information systems.

The authors were employed by the UK furniture manufacturer to project manage the adoption of an ERP system. This gave the authors the opportunity to immerse themselves in the area of study. The ethnography data was collected between November 2005 and April 2006, a six month period. Data was collected via participant observation and social contact with the participants as well as referring to documentation such as project proposals, vendor contracts and company research. Note taking was

carried out constantly throughout the ethnographical period. Not only observations were noted, the impressions and feelings which emerged were also recorded.

6. The UK furniture manufacturer:

The UK furniture manufacturer specialise in manufacturing storage furniture for the healthcare industry. They offer a service to the industry in which they design, supply and install not only storage furniture but third party products to equip a hospital room for example with all the furniture it needs.

The notion of adopting an ERP system in the UK furniture manufacturer transpired after a systems review exercise in mid 2004. It became apparent that there was an immense need to improve their information systems. Business processes were very inefficient and frustrating to employees. One employee was quoted saying upon the authors arrival at the company 'System, what system?' The manufacturer was mainly controlled by Microsoft Excel. The specialised software that they did use was not used to its full potential; this was mainly due to inappropriate implementation as well as the ineffective software itself. At the time in 2004 there were opposing views of which direction to take the companies information systems. Some parties were confident that a best of breed software approach was the appropriate route, others were adamant that an ERP system would be the best solution, others simply didn't know enough (or care enough) about either option to make a choice. Research into ERP systems took place. In October 2004 IT exhibitions were attended and ERP vendors were asked to demonstrate their products at the company. After seeing a demonstration of Microsoft Dynamics GP the UK furniture manufacturer were suitably impressed. The company were able to compile a case for the ERP system and the best of breed option and convince those reluctant parties that an ERP system was the paramount option. In July 2005 a final version of the contract was compiled by the ERP vendor. The contract was later signed between both parties to implement Microsoft Dynamics GP. The UK furniture manufacturer decided to enlist an external consultant to put together an implementation plan for the ERP system, a plan was compiled before the authors recruitment. In November 2005, the authors were recruited to project manage the implementation of Microsoft Dynamics GP.

The authors joined the UK furniture manufacturer with theoretical experience of ERP implementations. They were confronted with an ERP system which had been selected and consequently had been contracted to be implemented. An implementation plan had been devised by a consultant and everything was set for the implementation to proceed.

In April 2006, a decision was made to abandon the ERP adoption. Between November 2005 and April 2006 the ERP implementation encountered numerous problems. The following sections of this study will explore these problems and analyse them in relation to the human and organisational problems and technical problems framework identified in section four.

7. Human and Organisational problems and technical problems with the UK furniture manufacturer's ERP adoption:

In this section the human and organisational problems and the technical problems incurred by the UK furniture manufacturer will be analysed using the framework compiled in table 3.

7.1 Human and organisational problems

7.1.1 Product and implementation consultants:

Markus *et al* (2001) state that problems might occur because few IT products and service firms were willing to take end to end responsibility for project managing all parties. This problem did not affect the UK furniture manufacturer. The authors were employed to project manage the ERP implementation; they took end to end responsibility for project managing all of the product and service parties involved. Markus *et al* (2001), also state that conflict may occur between parties: the implementation consultant, the ERP vendors and the vendors of existing software. They also state that conflict may occur between the adopting organisation and parties. The UK furniture manufacturer also did not experience any disputes.

7.1.2 Turnover and project personnel:

This problem was identified as such by Markus *et al* (2001). Markus *et al* (2001) recognised that internally adopters are unable to maintain continuity of personnel. Losing Key IT specialists and user representatives was identified as a problem. This was not a problem that the UK furniture manufacturer experienced. The personnel that were involved in the ERP implementation at the beginning of the project were involved in the project at the end.

7.1.3 Human resources and capabilities management:

Kim *et al* (2005) firstly state that the problem they define as human and resources and capabilities management involves difficulties in building a team. The UK furniture manufacturer constructed a steering committee of user representatives, directors and project management personnel. The team was encouraged to join together in the first instance by the directors sponsoring the project. At the time of the recruitment of the authors it appeared that all of members of the steering committee were happy to be part of the team. The building of the team was not a problem for the furniture manufacturer. Kim *et al* (2005) suggest the balance of the team may also be a problem. The team at the UK furniture manufacturer was well balanced of user representatives, project management personnel and technical personnel. The balance of the team wasn't an issue. Kim *et al* (2005) also point out that lack of in house resources of project management skills can be a problem. According to Loh *et al* (2004), good project management is vital and that the scope of the ERP implementation project should be established and controlled. The authors were well experienced in managing projects, theoretically and practically. This problem was not an issue. Kim *et al* (2005) state that lack of adequate incentives may cause a problem. This wasn't particularly the case. The furniture manufacturer is a SME, the fact that improvements were going to be made which would improve the

business seemed to be incentive enough. The frustration of existing systems motivated the steering committee to contribute to the implementation.

7.1.4 Cross functional coordination:

Kim (2005) stated that cross functional coordination was a problem in the project phase of ERP implementations. An ERP system is cross functional. In the case of the UK furniture manufacturer the system was proposed to encompass a large proportion of the business, covering many functions and departments. User representatives from each department were members of the steering committee. The coordination mechanism in place to resolve cross functional differences was the steering committee meetings. Communication was encouraged in these meetings. After deciding upon an incremental implementation oppose to a big bang approach, there was a lot of debate as to which departments would see the implementation of the ERP system first. This disagreement was resolved in the steering committee meeting. As the UK furniture manufacturer is a SME, the cross functional coordination problems were limited.

7.1.5 Change Management:

The authors were fully aware of change management theories and the steps they had to take to make the ERP implementation run smoothly. The project phase, as identified in section two involves: software configuration, system integration, testing, data conversion, training and rollout. The UK furniture manufacturer only really managed to get as far as software configuration stage before the project was abandoned. So although the project phase as a whole involves a lot of change, the stage the UK furniture manufacturer managed to get to, didn't involve a lot of change. Therefore, there was no real change for the users, so no problems occurred with the management of change.

7.1.6 Organisational Leadership:

Kim *et al* (2005) state that perceiving the ERP as just a technical system is a problem for organisational leaders. This point was profound in the UK furniture manufacturer. The user representatives and directors (the leaders) clearly referred to the ERP system as 'the system'. This led the authors to believe that the ERP system was seen by many as just computer software. The managing director saw the ERP implementation simply as an IT improvement, the ERP system wasn't viewed as a social system which would affect the structure, culture and politics of the organisation. The managing director didn't really understand the enormity of an ERP system and its affects on the organisation.

Kim *et al* (2005) suggests that the lack of inadequate management of stakeholder politics an organisational leadership problem for ERP implementations. The politics of information systems can be seen to have evolved from the long tradition of literature on the relationship between information and power (Bull 2003). The whole ERP implementation at the UK furniture manufacturer had a political dimension. The user representative who was the main leader for getting the ERP approved

was a powerful influence. This representative was not necessarily the most informed party on IS, but taking control of vendor selection gave the user representative authority and control. The opposing user representative that was in favour of implementing a best of breed product in the UK furniture manufacturer was also a powerful influence. Although the ERP system was approved and was going ahead, the opposing user representative did not involve themselves in the planning stages (the chartering phase as Markus 2000 would call it). They did not involve themselves in vendor selection and they failed to state their requirements for the ERP system. This is called counter-resistance according to Bull (2003). Consequently the wrong modules were selected and possibly the wrong ERP system had been selected. The process began of trying to correct this. During this process it was established that the ERP system lacked functionality of a product configurator. The ERP vendors proposed a varying degree of options to overcome this problem, from building a bespoke configuration system, using an existing system or linking with another third party product. In making this decision, those opposing the ERP system evidently found an opportunity to discuss abandoning the project. They also began turning up late or make proceedings difficult in steering committee meetings. The management of stakeholder politics should have been focused upon throughout the project stage and prior to this stage. Because it wasn't, the problem of inadequate management of politics could be associated with the abandonment and consequently the failure of the ERP adoption.

Lack of adequate monitoring and feedback was a problem identified by Kim (2005) under the heading of organisational leadership. The project was monitored and feedback was given by the directors attending the steering committees and offering their opinions and advice. There wasn't a problem of lack of adequate monitoring and feedback.

7.2 Technical Problems

7.2.1 Software modifications / software configurations:

The software modifications that were needed to implement Microsoft Dynamics GP were extensive at the UK furniture manufacturer. Holland (1999) states that an organisation should try to purchase the package that fits best into its business processes. They continue to explain that organisations should be willing to change the business to fit the software with minimal modification and work the existing functionality of the system. Working with the existing functionality in with the Microsoft Dynamics GP would have been impossible. The core capability of the UK furniture manufacturer is the fact that there are few limitations to the dimensions and specification of storage cabinets. Microsoft Dynamics was not specialised enough to manage this functionality, it did not have a product configurator. The UK furniture manufacturer realised the lack of capabilities of the ERP system very early on in the project, it was a very big problem for the company to overcome.

Markus *et al* (2001) also state that a problem with ERP implementations in the difficulty in getting modifications to work well. The project didn't proceed at the furniture manufacturer up to the stage where modifications were commissioned. Modifications were discussed in detail, many options and

degrees of modification were deliberated, but the ERP adoption was abandoned before any modifications were made.

7.2.2 System integration:

According to Markus *et al* (2001), problems can occur when integrating an ERP system with a package of hardware, operating systems, database management systems and telecommunications systems which are suited to an organisations size, structure and geographic dispersion. These problems weren't approached with the UK furniture manufacturer as the implementation of the ERP system didn't reach the stage when these aspects were applicable. The UK furniture manufacturer did not experience difficulty finding experts to advise on operating requirements, which is also a problem defined by Markus *et al* (2001). This again was because they didn't reach that stage of implementation.

7.2.3 Systems development:

Kim *et al* (2005) state that the problems that are affected in the project phase that they categorise as systems development are: lack of adequate resources to renew and maintain systems and frequent changes in requirements. The UK furniture manufacturer didn't progress along the project phase enough to experience problems with lack of adequate resources to renew and maintain systems. However, they did experience considerable problems with frequent changes in requirements. Shortly proceeding the recruitment of the authors it was discovered that the modules of the ERP system that had been contracted to be implemented did not fit the business needs. The business needs initially were decided by a particular function, this function neglected the needs of other functions in the UK furniture manufacturer. Therefore there was a major change in requirements even before the implementation started to take place. The changes had severe impact on the cost of the ERP system, it increased. This change was certainly not welcomed by the Managing Director and the Financial Director.

8. Discussion:

This paper is based on only a single exploratory case, so any conceptual insights will need to be verified through subsequent research. With this caution in mind, there do appear to be some interesting theoretical insights that can be derived from the case.

The most challenging human and organisational problems encountered by the UK furniture manufacturer were labelled under the heading of Organisational Leadership. The challenging problems that were defined under the heading of Organisational Leadership were: having the perspective of ERP as just a technical system and inadequate management of stakeholder politics. The most challenging technical problems encountered by the UK furniture manufacturer were labelled under the headings of software modifications / software configurations and systems development. The challenging problem that was defined under the heading of software modifications / software configurations was: difficulties in operating effectively with systems functionality. The challenging

problem that was defined under the heading of systems development was: frequent changes in requirements. The challenging problems of the UK furniture manufacturer can be observed in table 4.

Table 4: The challenging problems of the UK furniture manufacturer

Human and Organisation Problems		Technical Problems	
Organisational Leadership	<ul style="list-style-type: none"> ■ Perspective of ERP as just a technical system ■ Inadequate management of stakeholder politics 	Software modifications / software configurations	<ul style="list-style-type: none"> ■ Difficulties in operating effectively with systems functionality
		Systems development	<ul style="list-style-type: none"> ■ Frequent changes in requirements

It firstly needs to be mentioned that in total six human and organisational problems were identified in table 3 (the framework of organisational problems and technical problems in ERP adoptions) and only three technical problems were identified. This was because the framework was derived from the work of two authors (Markus *et al* 2001, Kim *et al* 2005), and that was what they stated. This point already states that scholar's believe that human and behavioural problems are more profound in ERP implementations. However, because two of the human and organisational problems were found to be relevant to the UK furniture manufacturer, and two technical problems were also found to be relevant, this upon first observation would suggest that the human and organisational problems and the technical problems carry equal importance in the ERP adoption by the UK furniture manufacturer.

However, the findings suggest that the problems experienced due to organisational politics in the planning phase of the UK furniture manufacturer led to the software modification / configuration problems in the project phase. Certain user representatives didn't involve themselves in the planning phase because they were resisting the power of the user representatives in favour of the ERP system, therefore an ERP system was selected which did not fit the business in all departments. Markus *et al* (2001) suggest that in practice, that it is the case that problems experienced in a prior phase which are not perceived as problems and rectified will impact on the subsequent phase. This has been the case in the UK furniture manufacturer. Consequently, if the problem of organisational politics had been resolved in the planning stage, a best fit ERP system could have been selected which would have meant that they would have been limited problems with software modifications. The problem of software modifications on first instance may be perceived as being the cause of the project being abandoned, however the underlining root cause of the modifications was organisational politics. Because of this point it can be argued that the human and organisational problems caused the technical problems and therefore were more profound in the case of the UK furniture manufacturer.

This study also found that the ERP system in the UK furniture manufacturer was viewed as just a technical system. Viewing the ERP system a technical system was defined by Kim *et al* (2005) as a

problem, this study supports this assumption. The fact that the ERP system was viewed as simply a technical system may have led the adopting organisation to treat the project as unimportant. The organisational politics may not have been managed because the ERP adoption wasn't seen as important enough to provoke conflict. User representatives were left to their own devices in the planning stage, if one user representative didn't involve themselves, it wasn't seen as important to encourage their involvement.

The frequent changes in requirements can be seen to originate from the organisational politics too. If the differences between the user representatives were managed, the business requirements would have been accurate. As it was, the requirements were wrong, which led to frequent changes in requirements later on in the project. The changes in requirements led to the cost of the ERP system escalating. This resulted in the Managing Director and the Finance Director seriously questioning the project. There was a budget, and the ERP exceeded this budget. Money was one of the deciding factors that led to the ERP project being abandoned.

9. Conclusion:

This paper has identified the problems that are experienced in ERP adoptions using the work of Markus *et al* (2001) and Kim *et al* (2005). A framework was devised from this work clearly stating which problems were human and organisational problems and which were technical problems. Using this framework the case of a UK furniture manufacturer's ERP adoption was analysed. The findings of this paper identify that in the case of a UK furniture manufacturer, the most profound problem was human and organisational. There was a human and organisational problem (inadequate management of organisational politics), which wasn't addressed because of another human and organisation problem (perspective of ERP as just a technical system) which instigated the technical problems (difficulties in operating effectively with systems functionality and frequent changes in requirements) which increased the costs of the system and led the ERP adoption to be abandoned.

Practitioners can learn from this case. It cannot be emphasised enough that human and organisational factors are extremely important in ERP implementations. Adapting organisations must make a conscious effort to manage organisational politics. If they are not managed appropriately, practitioners ERP adoptions could end up as yet another failed implementation to add to the pile.

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