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Justification of An Upgrade of An Enterprise Resource Planning (ERP) System - The Accountant's Role

By Sylvia Dempsey, Ruth Vance & Liam Sheehan

Cork Institute of Technology

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JUSTIFICATION OF AN UPGRADE OF AN ENTERPRISE RESOURCE PLANNING ERP SYSTEM THE ACCOUNTANTS ROLE

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Justification of an Upgrade of an Enterprise Resource Planning (ERP) System – The Accountant's Role

Sylvia Dempsey^a, Ruth Vance^o & Liam Sheehan^p

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I. INTRODUCTION

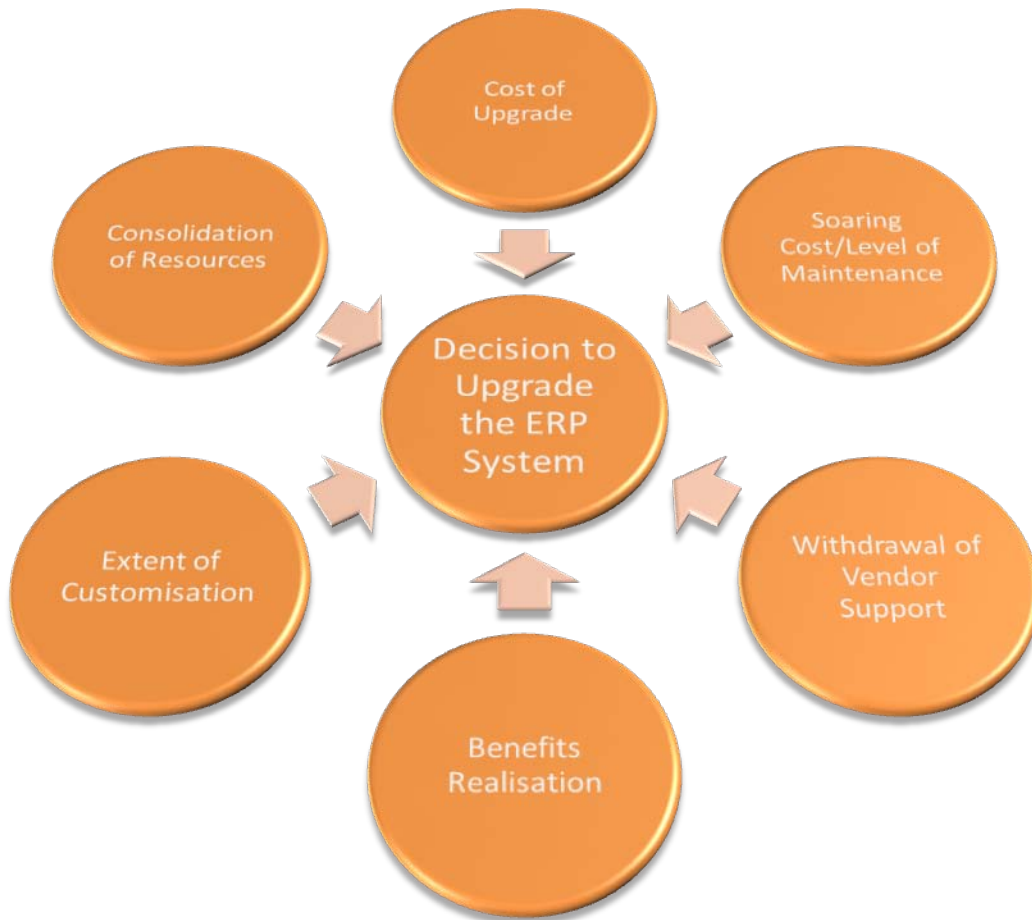
Over the past two decades organisations around the world have shifted from developing in-house information systems to purchasing integrated enterprise resource planning (ERP) systems. An ERP system enables an organisation to consolidate the data from its various departments into one database. Due to the high cost and the associated risk of implementing an ERP system, research at the end of the twentieth century and the beginning of the twenty-first century focused on the implementation of ERP systems and the critical success factors necessary for successful implementation (for example; Davenport, 1998; Motwani, Subramanian and Gopalakrishna, 2005; Griffin and Dempsey, 2009; Karsak and Özogul, 2009). Organisations are now facing the choice of continuing to maintain the current version of their ERP systems or upgrading to newer versions. There is a dearth of literature in this area, most research has stopped at the initial go-live phase, neglecting to deal with post-implementation issues (Ng, 2001; Beatty and Williams, 2006; Nah and Delgado, 2006; Olson and Zhao, 2007; Law, Chen and Wu, 2010; Otieno, 2010). The objective of this research is to analyse how the management team, including the accountants, reach the decision to upgrade the ERP System rather than continue maintaining its existing ERP system.

II. REVIEW OF THE EXTANT LITERATURE

The activities carried out at the post-implementation phase of an ERP system can be divided into maintenance and upgrade activities. Ng (2001) further divides maintenance activities into vendor-led or client-led maintenance. Vendor-led maintenance is initiated by the ERP vendor to improve the quality of on-going support to its clients and contain its operating costs. For example, ERP vendors offer support packages or patches to correct flaws or bugs to clients who have subscribed to maintenance services (Ng, 2001; Law *et al.*, 2010). Client-led maintenance includes modifying the system to meet the unique needs of the organisation and also on-going system and help-desk support. The most popular way of categorising ERP upgrades is either technical or functional upgrades. A technical upgrade is the replacement of an existing ERP application with a system using a superior technical platform and enhanced performance, without changing the systems functionality or degree of complexity. A functional upgrade has a greater impact, as it offers key business improvements and enhanced functionality.

Instead of continuing to maintain an ERP system, if an upgrade is available, an organisation may decide to upgrade its system (McGinnis and Huang, 2007; Olson and Zhao, 2007) and conversely, if the available upgrade is seen as too expensive, then an organisation may decide to continue maintaining the existing system. The researchers created Figure 1 to illustrate the major factors, cited by the existing literature, which influence the decision whether or not to perform an upgrade.

*Author ^{a o p} : Cork Institute of Technology, Ireland.
E-mail : sylvia.dempsey@cit.ie*

Figure 1 : Factors Influencing the Decision to Perform an Upgrade

For any organisation the primary factor against upgrading its ERP system is the expected cost of the upgrade. Carlino and Smith (2005) estimated that ERP upgrades, on average, cost 80% of the initial implementation. As well as the obvious financial costs, the time and the massive commitment of information technology (IT) and business resources have to be included in calculating the expected cost of the upgrade. If an organisation sees the estimated cost of an upgrade as excessive, it may choose to continue maintaining the current version (McGinnis and Huang, 2007; Olson and Zhao, 2007), which will incur annual maintenance costs.

The escalating level/cost of maintenance activities is one of the main factors motivating an organisation to upgrade its ERP systems. Knowing the amount of effort required to maintain the system allows an organisation to make a well-informed decision as to whether or not to upgrade. Ng (2001) shows that new version upgrades reduce the number of enhancements and maintenance performed by the ERP client, thus reducing maintenance Costs. These costs should be offset against the upgrade costs thus increasing the chance of justifying an upgrade decision (Ng, 2001).

Another motivating factor for organisation to “upgrade to newer versions of their application suites” (Beatty and Williams, 2006, p.106), is that ERP vendors issue de-support dates, that is a date from which the older version will not be supported (Olson and Zhao, 2007). This withdrawal of vendor support, often termed ‘vendor pull’, leads to the users losing eligibility for help-desk support. Most companies recognise that they can’t afford to risk running their business on unsupported ERP software (Shepherd, 2007). If a company chooses to support its old release by internal staff or external consultants, maintenance costs can escalate easily. Unless the users have the staffing ability to take total responsibility of maintaining their ERP system themselves, then they have to upgrade their ERP system at this stage (Beatty and Williams, 2006).

Davenport (1998) stated that the main justification for an ERP upgrade should be to take advantage of new technologies, which in-turn leads to competitive advantage. Organisations upgrade their ERP systems in an attempt to “expand the capabilities of their systems by integrating new modules, or add-ons, into their core ERP system implementations” (Beatty and Williams, 2006, p.106). For example; new,

expanded or improved features in an upgraded version of an ERP system may include a new HR module or a facility for web access that was not available in the previous version. The term “benefits realisation”, in the context of ERP systems, means achieving more capabilities and business values from a newer version of the Company's ERP system.

Early literature stated that if an ERP system was highly customised, the organisation may be inclined to postpone an upgrade, as all that customisation may have to be redone on the new version (Davenport, 1998). During an upgrade, dealing with previous customisations can require up to 80% of software developers' and 66% of a business analysts' time and effort (Beatty and Williams, 2006). Even though ERP consultants and researchers continually advise that unless customisation is adequately justified at the strategic level, it should be the last choices for adopting organisations, organisations still insist on investing heavily in customising their ERP systems (Davenport, 1998; Holland and Light, 1999; Brehm *et al.*, 2000; Light, 2001; Law *et al.*, 2010). Also, as an ERP system ages it becomes more customised, due to the addition of new functionality by the support team requested by the users. Beatty and Williams (2006) describe the process of upgrading a highly customised system as “the biggest technology headache” (p.108). On the other hand, more recent literature states that an ERP upgrade offers the chance for organisations to “un-customise customisations” (Beatty and Williams, 2006, p.108). Much of the functionality that the organisation previously had to customise into the system may now be a generic part of the newer version (Beatty and Williams, 2006). This allows for a cleaner upgrade and may make it easier to apply patches and avail of support from the vendor in the future. Therefore, even though “over-customisation” of the original system was seen as a prohibitive factor to an upgrade, much of the literature now states that even though this is still a prohibiting factor it is no longer a critical factor.

A major benefit of ERP upgrades is that they consolidate the resources within an organisation. It makes sense for large companies with multiple divisions, nationally and internationally, to consolidate as much as possible, both to save on resources but also to help integrate the activities of the company. One of the modern approaches that organisations use to consolidate resources is the use of a Shared Service Centre (SSC). This is a unit within the organisation that provided centralised, high quality, cost-effective business support services to the rest of the organisation. The hosting of the ERP system is one of the services that a typical SSC could supply. Herbert and Oppenheim (2004) stress that to achieve the full potential of shared services, companies must reduce the number and diversity of ERP systems they have internally. Even if the ERP system is not hosted by a

SSC within an organisation, the benefits of having one system throughout the entire organisation is one of the factors that would influence an organisation towards undertaking an upgrade of its ERP system.

From this analysis the researchers determined that the two main factors prohibit or delaying the undertaking of an ERP upgrade are the expected cost of the upgrade and the existing level of customisation that may have to be redone on the upgrade. The other four factors act as motivators to undertaking an upgrade; namely the soaring cost and level of maintenance on the existing system, the withdrawal of vendor support, benefits realisation from a more functional system and the consolidation of resources within a large diverse organisation.

Throughout the early 1990's, it was assumed that an information system (IS) would retire and be replaced by a newer IS after an extended duration of time (Markus and Tanis, 2000). However, as systems became more integrated and software package costs increased the chance of systems being replaced became rarer. Instead they are “leveraged, upgraded, expanded and refined, but are definitely not replaced” (McGinnis and Huang 2007, p.627). The lifecycle model developed by Markus and Tanis (2000) has four phases; namely project chartering, project configuration and rollout, shakedown and onward and upward. When organisations undertake a major upgrade or replacement of their existing system, they should “recycle through the phases”, going back to the start once implementation is complete (Markus and Tanis, 2000, p.190). McGinnis and Huang (2007) criticise organisations that view the implementation of an ERP as a final goal instead of a milestone. That is one of the main reasons why “many ERP systems have been discontinued three months to a year after they were ‘successfully’ completed” (McGinnis and Huang 2007, p.626). Instead of an end, the post-implementation stage should be viewed as an extension of the implementation. For example, Motwani *et al.* (2005) highlight the importance of continued support when they include post-implementation in their three stage framework [pre-implementation (setting-up), implementation and post-implementation (evaluation)] and also propose revising each of these stages when an upgrade is to be undertaken. McGinnis and Huang (2007) argue that “ERP implementation projects rarely have a static ending point” and that “continuous improvement activities are generally required to lengthen the life” of ERP systems (p.626). This lifecycle view of ERP systems requires the assumption that there will be upgrades in the future and that they will have the effect of starting the lifecycle over again (Law *et al.*, 2010). Failure to include the inevitability of another upgrade in the planning of the implementation of this upgrade will result in “dire consequences” (Law *et al.* 2010, p. 297).



Literature on the subject matter of ERP upgrades is scarce. In a recent paper, Otieno (2010) stated that the decision to upgrade is “one of the most neglected issues related to ERP systems” in the existing literature (p.5). This research attempts to narrow this gap by analysing the post-implementation process, in particular the justification of an ERP system upgrade.

III. METHODOLOGY

Company X, a Cork-based service division of a large multi-national organisation, wishes to remain anonymous. The company was chosen as the case study organisation because it is an excellent example of a market leading company that developed and tailored its ERP system since its initial implementation over 12 years ago, and in January 2010 commenced the process of deciding whether to upgrade its system or not. The researchers observed a number of key meetings; including presentations to staff, executive steering committee, global consulting partners and a number of project meetings between the core project team. They conducted unstructured and structured interviews. The unstructured interviews involved meetings with various people on the project throughout the organisation. To validate the information obtained, the researchers then conducted structured interviews with those directly involved in the project. The interviewees were sent a copy of the proposed interview questions shortly before the interview. Throughout the interviews, open-ended questions were used, allowing the interviewees to expand beyond the facts and give opinions about events. The structured interviews were taped and the interviewees were sent a transcript of the interview after it was completed.

The researchers had access to internal documents made available by Company X, for example tender documents, e-mails, minutes of meetings, proposals, progress reports, presentations, and training manuals. These provided confirmation of information obtained from the interviews and they provided more rounded information. The researchers in this study acknowledge the fact that the documents were prepared for a specific purpose rather than for the case study. By bearing this in mind during the analysis of the case study, the researchers were not misled by the contents of the documents.

a) *The Case Study: Company X*

Company X utilises a highly customised J. D. Edwards World (JDE World) ERP system to provide the functionality required to meet its business's financial, manufacturing and distribution requirements. Currently, Company X uses JDE World version 7.3 Cum 13. This was originally implemented in 1998. There has been no upgrade to this system since its implementation. However by the end of 2010, Company X had justified a major upgrade of its ERP system to Enterprise One. The

researchers have used the following research questions to analyse why the company did not perform an upgrade earlier (prohibitive factors) and why the company is now considering an upgrade (motivating factors).

1. *What were the main factors prohibiting Company X from implementing an upgrade of its ERP system in the last 12 years?*

A high level of customisation of its ERP system was necessary to allow Company X meet the unique diverse needs of its customers.

“Even though we try to derive as much as we can from the ERP, we have a large number of systems that are integrated in to, or added onto, the ERP. Some systems we developed ourselves, others we bought in. Whatever we need we just add to it” (Project Manager 1/7/2010).

While contributing to the Company competitive advantage and making it a market leader in its industry, the high level of customisation was the factor most prohibiting Company X from proceeding with an upgrade of its ERP system. In recent years, Company X was aware that it needed to upgrade its system to avail of improved functionality and technology, but given the level of existing customisation, it was apprehensive about the complexity (and cost) of such an upgrade. The management of Company X feared that all the customisations completed over the last twelve years would have to be redone on the new system. It didn't want “to start all over again, that would be a daunting task” (Project Manager, 1/7/2010).

Another effect of the high level of customisation, combined with the age of the system, was full withdrawal of the ERP vendor's support over five years ago. Company X's IT department was left maintaining the system itself. Paradoxically, this did not result in increasing maintenance costs. Due to the high level of customisation it completed over the last twelve years, Company X's IT department had a strong knowledge of its system and was able to continue maintaining the system in-house without incurring additional maintenance costs. Maintenance costs in this case were a deterrent to the upgrade, rather than an inducement to upgrade as suggested in the literature.

The potential cost of, and risks involved in, an upgrade were also major factors prohibiting an upgrade. An upgrade of Company X's ERP system is a considerable investment. The Vice President of Information Systems stated that he knew, due to the age of the current system, that a major upgrade was “on the cards” but “everyone was watching their own budgets for the next quarter” and the cost of an upgrade was “difficult to justify in the short-term” (7/9/2010). It was finding it difficult to justify the cost of an upgrade, in terms of money, time and business disruption, as without an upgrade Company X had the capability to

fulfil all of its customers' requirements. The fact that, without an upgrade the organisation was successful made it difficult for it to prioritise an upgrade that could involve major business disruption.

"It's scary for people because people are worried that a major change in our IT infrastructure could cause enormous business disruption" (Vice President of Information Systems, 7/9/2010).

A combination of stable maintenance costs and substantial upgrade costs and risks, encouraged Company X to delay an upgrade.

Another factor delaying the undertaking of an upgrade was Company X's lack of confidence in the newer versions of JDE. In 1996 the management team of Company X was not convinced about the reliability of JDE One World and decided not to avail of this upgrade. In 2000 the release of One World Xe saw a marked improvement in quality, patching and change management, but again Company X decided to wait. When PeopleSoft acquired J.D. Edwards in 2003, One World was added to PeopleSoft's software line, along with PeopleSoft's flagship product Enterprise, and was renamed JD Edwards Enterprise One. In 2005 PeopleSoft was acquired by Oracle and shortly after Oracle announced the development of a new product called Oracle Fusion Applications. Company X ruled out an upgrade to Oracle Fusion, the Project Manager did point out that it preferred to wait until the system "has been tried and tested by other organisations first" (Vice President of Information Systems, 7/9/2010). It didn't make sense to prioritise an upgrade when a lack of confidence existed in the newer version. Company X's parent company invested in Enterprise One in 2007. Company X decided to "wait and see how successful this implementation was" (Business Analyst B, 7/9/2010).

2. What are the main factors motivating the organisation to upgrade its ERP system? Why does the organisation want to upgrade now?

The main motivating factor in the justification of an upgrade of the ERP system in Company X was to increase its competitive advantage by acquiring a more efficient system with more functionality. Company X's customers would not be impressed if they knew that the "software used was created well over thirty years ago" (Business Analyst A, 18/8/2010). Even though the existing ERP system is described as the core of all the systems, the Vice President of Information Systems stated that a lot of the work done in Company X is outside of the ERP and then integrated in. An upgrade would allow Company X to radically reduce the number of existing customisations, as much of the functionality had to be "customised into" or "added onto" the existing system, is now part of the generic newer version of the system.

"We have a lot of stuff that is offline on spreadsheets which we intent to change. This could be

done by an upgraded ERP system" (Vice President, 7/9/2010).

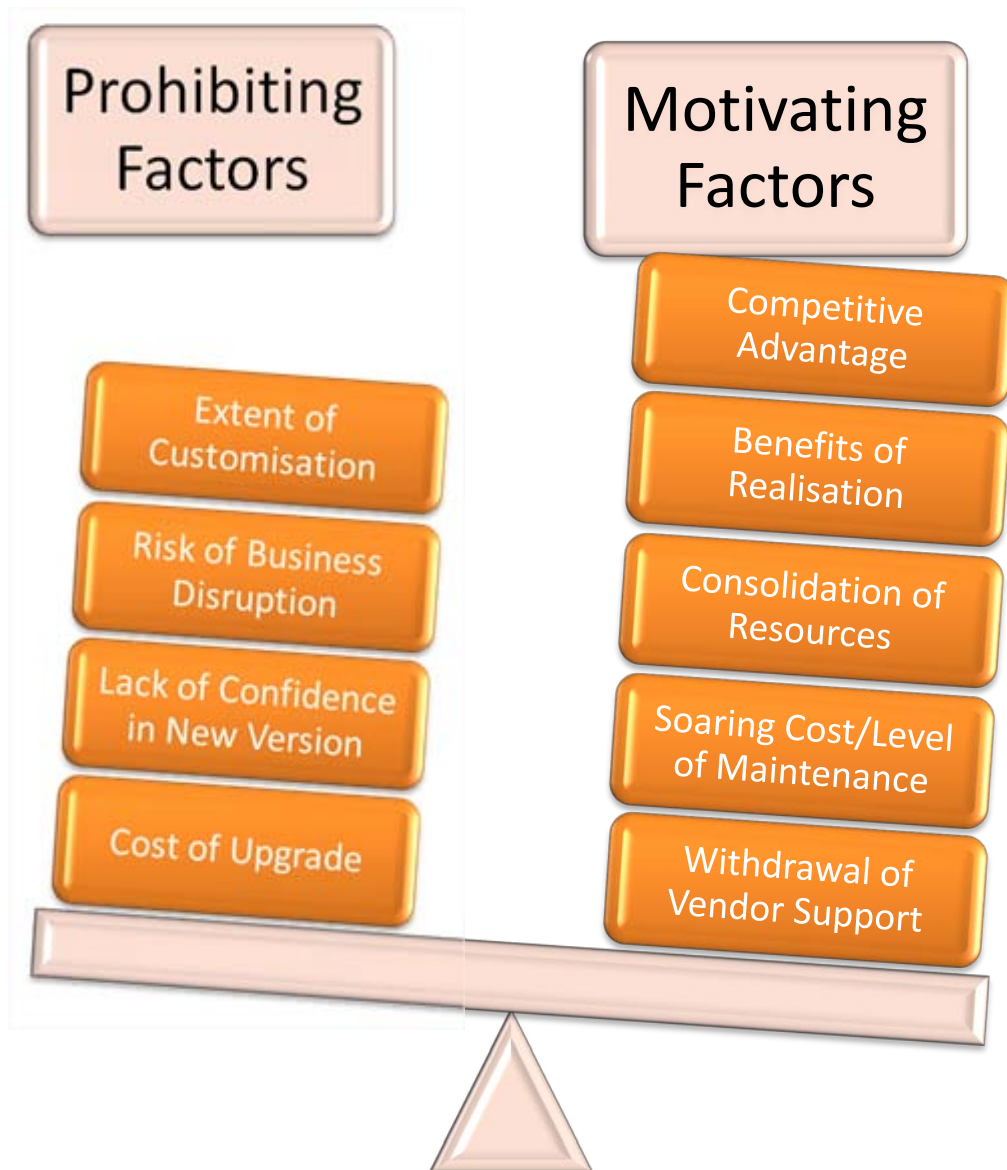
Company X sees this upgrade of its ERP system as an opportunity to standardise its business processes. Company X is aware that it will have to customise the new system to some extent. This standardisation of processes and using the generic functionality that now exists on the newer version of the system will reduce customisation to a minimum. Enterprise One would have the option of eighteen new modules to implement. Even though Company X knows it would not implement all of these new modules immediately, it would have the option to in the future. The Vice President of Information Systems insisted that this option would allow Company X to "grow and change" when required (7/9/2010). He recognises that Company X needs to look at the "big vision" and it has to have the capabilities available when the opportunities arise. Therefore the prohibitive factor of having to redo all customisation had been downgraded substantially, making an upgrade more appealing to Company X.

Another major motivating factor for the upgrade was the movement towards one corporate-wide system. Aligning with the system currently used worldwide by the parent company would mean that Company X would move under its parent company's global licence thus enabling a significant annual cost saving. This reduces the previously articulated prohibitive factor of the high cost of an upgrade. The parent company has found Enterprise One to be more dependable than its predecessor. Therefore another of the prohibiting factors, namely lack of confidence in the newer versions of the ERP system, is also no longer a major factor holding Company X back from performing an upgrade of its system.

IV. WEIGHING PROHIBITING AND MOTIVATING FACTORS

All of the interviewees in this study agreed that the upgrade was long overdue and that in the future they would not leave an upgrade as long before action was taken. The question is not whether or not to upgrade, it is "when should the next upgrade take place". The answer is when the benefits of an upgrade outweigh the prohibiting factors. The prohibiting and motivating factors need to be weighed against each other on a regular basis. This is depicted in Figure 2 (Weighing of Prohibiting and Motivating Factors in the Upgrade Decision) below.

Some of the factors that once deferred the undertaking of an upgrade in Company X are no longer as prohibitive as they once were; this makes an upgrade more appealing. Some of the factors that motivated progression to an upgrade have become stronger, again making the option to upgrade a more viable "scales" to weigh-up the prohibiting and motivating factors when deciding an appropriate upgrade date.

Figure 2 : Weighing of Prohibiting and Motivating Factors in the Upgrade Decision

It would be valuable to compare the experience of this case study with that of other organisations preparing to undertake upgrades of their ERP systems. Further research could be used to validate the findings of this research in other multinational organisations from different industries and backgrounds, regardless of the ERP brand in use. The human aspect of an ERP upgrade was also ignored in this paper. Given the importance of human interaction with ERP systems this is a worthy area of research in the future. These, as well as quantitative analysis of the costs versus benefits of an upgrade, are worthy of future research.

V. CONCLUSION

The extant literature cites the expected cost of an upgrade as the factor most prohibiting the undertaking of an ERP upgrade. Cost was indeed a

major factor deterring the undertaking of an upgrade in Company X, it was compounded by the fact that the more Company X postponed the undertaking of an upgrade, the greater the scale, and thus the expected cost, of the inevitable future upgrade. However, the management of Company X felt that the main reason why the upgrade was delayed was the extent of Company X's customisation of its existing system. All of these customisations contributed to the success of the organisation in meeting its customers' needs. However all of these customisations made the prospect of an upgrading a time consuming, expensive task, resulting in the continuous postponing of the upgrade. However, as predicted by the existing literature, on the realisation that many of the customisations will not have to be done on the new version of the system, Company X is now more open to upgrade. Another prohibiting factor found

in this study was lack of confidence in newer versions of its ERP system. Again this made an upgrade an unattractive option, until the newer version had proven its reliability.

The factors listed in the existing literature as motivating an organisation to undertake an upgrade of its ERP system were the soaring costs/level of maintenance, withdrawal of vendor support, benefits realisation and consolidation of resources. This study concurs with the latter two motivating factors. It found that the main driving factors for the upgrade were the strategic objectives of retaining competitiveness through improved functionality and ability to grow, and aligning Company X's system to that of the rest of the organisation. However, the former two factors did not exist in Company X. The cost of maintenance was not rising and even though the vendor had pulled its support, this did not provide motivation to move to a newer version of the system. The researchers however are slow to make a generalisation here. It was the capability of the IT department in Company X to maintain the system in-house that reduced the influence of these two factors in this study.

By looking at the prohibiting factors and the motivating factors involved in the decision whether or not to upgrade an ERP system separately, and then weighing them against each other, the researchers provide a framework, a "scales", which could be used by other organisations when making this decision. For any organisation that wishes to sustain the competitive advantage that an up-to-date ERP system can achieve, it is inevitable that it will have to upgrade (or replace) its ERP system at some stage. Each organisation needs to regularly use this scales to weigh the strength of the prohibiting factors against the strength of the motivating factors for an upgrade, as the issues are not stagnant. Organisations should be very careful in this analysis, as it may only be after examining the extent of the benefits of upgrading that they realise how to minimise the factors prohibiting the upgrade. A prompt upgrade results in a low cost and less complex implementation. That is not to say that the next available upgrade should always be undertaken, but by careful, regular consideration, the organisation will make the best judgement for the lifecycle of its ERP system.

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