Evaluating ERP Success Factors: Vendor’s Perspective

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ABSTRACT
In the last decade, Enterprise Resource Planning (ERP) systems have been the most important technology adopted by organisations around the world. Successful implementation of these systems depends on many stakeholders, all of whom make a substantial contribution to the project. ERP success also depends on organisational, technological and environmental factors. However, to date, most of the ERP success studies have been focused on improvements and success factors from the consumers’ perspective. Since the vendors play a very important role in ERP implementation success, and are required to abide by stringent contract agreements and SLAs, this paper presents an exploratory study on ERP success factors from the vendors’ perspectives. It includes a review of literature on ERP systems success factors, findings of research accomplished via interviews with people involved in ERP implementations from a consulting organisation, analysis of findings, success factors identified from this research and issues for further research.

Keywords
Enterprise systems, ERP, vendor, success factors

INTRODUCTION
ERP systems are software packages that are widely adopted to support enterprise systems (Davenport, 1998; Nah et al; 2001; Presley, 2006). These include business process functionality and information from all functional areas in an organisation (Davenport, 1998; Nah et al; 2001; Presley, 2006). An ERP system allows the modules to communicate freely through sharing information and processes via a centralised database and hence integrating an organisation’s functions (Davenport, 1998, Nah et al., 2001; Shang & Seddon, 2002; Umble et al., 2003). These systems have been widely adopted by organisations around the world in the last decade, up to a value of USD64.8 billion (AMR Research, 2005). Existing literature on ERP systems focused on implementation issues (Davenport, 1998; 2000), benefits (Shang & Seddon, 2000) and critical success factors (Somers & Nelson, 2001). Most of the research and publications to date are focused on the customers’ (organisations) points of view. ERP implementations are carried out by vendors, consultants and developers (Skok & Legge, 2001). Implementation of ERP is a huge responsibility for the vendors due to stringent legal contracts agreed upon between the vendor and the customer (Grossman & Walsh, 2004). Thus this research explores what constitutes success from the vendors’ points of view.

This paper provides a brief introduction to ERP systems, discusses ERP implementation issues, ERP success and success factors from the vendors’ points of view. It is based on a qualitative study accomplished with ten interviews with ERP consultants, developers and project managers. The next sections of this paper include a review of literature, a brief description of research methods and a discussion of the findings.

LITERATURE REVIEW
Implementation time for ERP systems can range from one to three years. The implementation time is determined by size of organisation; amount and type of modules implemented; scope of implementation; extent of customisation; extent of integration with other applications and implementation strategy (Bingi et al., 1999).
The ERP packages are very generic and need to be configured to meet an organisation’s requirements (Davenport, 1998). Due to the modularised nature, organisations can install only those modules which they require (Davenport, 1998). Although some degree of customisation is allowed, it usually takes a long time and is determined by the organisation’s requirements (Bingi et al., 1999). ERP systems are large, complex, require some extent of customisation (Davenport, 1998; Davenport et al, 2004), require business process reengineering (Kraemmerand et al. 2003), integration with existing legacy systems and their implementation times and success vary. This leads to vendors being under a lot of pressure to achieve success.

**ERP Implementation Success**

Despite the hype of ERP systems, Hong & Kim (2002) claim it was reported that three-quarters of ERP projects were unsuccessful. According to a Standish Group Research, “90% of ERP implementations end up late, or over budget” (Umble et al., 2003, p. 244). ERP implementation successes have been realistically difficult to achieve mainly due to the complexity of projects and the difficulty of integration with other technologies at organisational and technical levels (Huang et al., 2004). However, a successful ERP implementation will help organisations gain benefits that are different ranging from operational; managerial; strategic; technological and organisation benefits (Shang and Seddon, 2000).

**Factors that Contribute to ERP Success**

An analysis of literature on ERP success factors is summarised in Table 1 arranged by their research context, to demonstrate the perspective on which success factors have been identified.

<table>
<thead>
<tr>
<th>Research Context</th>
<th>Sources</th>
<th>Critical Success Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of existing ERP literature</td>
<td>Bingi et al. (1999)</td>
<td>Top management commitment; Reengineering; Integration; ERP consultants; Implementation time; Implementation costs; ERP vendors; Selecting the right employees; Training employees; Employee morale.</td>
</tr>
<tr>
<td>Analysis of existing ERP literature</td>
<td>Nah et al. (2001)</td>
<td>ERP teamwork and composition; Top management support; Business plan and vision; Effective communication; Project management; Project champion; Appropriate business and legacy systems; Change management program and culture; Business process reengineering; Software development, testing and troubleshooting; Monitoring and evaluation of performance.</td>
</tr>
<tr>
<td>Analysis of existing ERP literature</td>
<td>Al-Mashari et al. (2003)</td>
<td>Management and leadership; Visioning and planning; ERP package selection; Communication; Process management; Training and education; Project management; Legacy systems management; System integration; System testing; Cultural and structural changes; Performance evaluation and management.</td>
</tr>
<tr>
<td>Context: Global organisations</td>
<td>Holland &amp; Light (1999)</td>
<td>Legacy systems, Business vision; ERP strategy; Top management support; Project schedule and plans; Business process configuration; Client acceptance; Monitoring and feedback; Communication; Troubleshooting.</td>
</tr>
<tr>
<td>Context: Global organisations</td>
<td>Sumners (1999)</td>
<td>Justification of project costs; Reengineer business process; Implementation Strategy; Competent business analyst / consultants; Top management support; End users training and commitment.</td>
</tr>
<tr>
<td>Context: Global organisations</td>
<td>Somers &amp; Nelson (2001)</td>
<td>Top management support; Project team competence; Interdepartmental cooperation; Clear goals and objectives; Project management; Interdepartmental communication; Management of expectations; Project champion; Vendor support; Careful package selection; Data analysis and conversion; Data analysis; Dedicated resources; Use of steering committee; User training on software; Education on new business process; Business Process reengineering; Minimal customization; Architecture choices; Change management; Partnership with vendor; Use of vendor’s tools; Use of consultants.</td>
</tr>
<tr>
<td>Context: Large organisations in different countries</td>
<td>Shanks et al. (2000)</td>
<td>Balanced project team; Best people full-time; Change management; Clear goals; Data accuracy; Education and training; External expertise; Minimal customisation; Presence of a champion; Project management; Top management support</td>
</tr>
</tbody>
</table>
Table 1: List of Critical Success Factors from Literature

| Context: Single Organisation | Akkermans & Heldon (2002) | Top management support; Project team competence; Interdepartmental cooperation; Clear goals and objectives; Project management; Interdepartmental communication; Management of expectations; Project champion; Vendor support; Careful package selection. |
| Context: List of organisations provided by vendor | Hong & Kim (2002) | Organisational fit of ERP project; ERP adaptation and process adaptation and organisational resistance. |
| Context: CIOs from global organisations | Nah et al. (2003) | Appropriate business and IT legacy systems; Business plan and vision; Business process re-engineering; Change management culture and program; Communication; ERP teamwork and composition; Monitoring and evaluation of performance; Project champion; Project management; Software development, testing and troubleshooting; Top management support. |
| Country: China-based organisations | Zhang et al. (2003) | Top Management Support; Re-engineering Business Process; Effective Project Management; Company-Wide Commitment; Education and Training; User Involvement; Suitability of Software and Hardware; Data Accuracy; Vendor Support. |

From Table 1, it is apparent that most of the studies on ERP success factors are from the organisation’s (client’s) perspective. Important success factors for ERP implementation that stand out from the analysis are top management support; business process engineering; education and training; change management; business plans, vision and objectives; communication; project management and project management. Literature analysis also clearly shows that there is a lack of prior research carried out from the vendor’s perspective specifically.

**ERP Success from the Vendor’s Perspective**

The above literature discussion on success factors is from the organisations’ perspectives. However, Lyytinen & Hirschheim (1987) highlight that success is not limited to the deployment of the system. Having the system up and running on schedule and within budget, as well as, having user acceptance is also important. Lyytinen & Hirschheim (1987) suggest that IT projects’ success is subjective and varies according to the stakeholder’s involvement. According to Lyytinen & Hirschheim (1987), success of IT projects can be categorised into the following four categories:

1. **Correspondence success** – where the developed IT system meets the specific planned objectives.
2. **Process success** – where the IT system is developed on time and budget.
3. **Interaction success** – where users’ attitudes towards the system is positive.
4. **Expectation success** – where the system matches the users’ expectations.

Another point of view on ERP success includes customers’ expectations and user attitudes (Al-Mashari et al, 2003).

The above discussion of extant literature is heavily biased on ERP success from the customer’s perspectives. As mentioned earlier, for the vendors, achieving ERP implementation success is of paramount importance. Therefore:

- What is ERP success from the vendor’s perspective?
- Which factors from the vendor’s perspective lead to ERP success?
- How do success factors from the vendor’s perspective vary from the customer’s perspective?

**RESEARCH METHODOLOGY AND APPROACH**

To understand the vendor’s perspective of ERP success which is largely unexplored, an exploratory study guided by interpretivism and qualitative methods was used for this study (Cronbach, 1975). Interpretivism supports the exploration of a phenomenon by studying it from the perspectives of the participants in its natural context without any controls (Wynkoop and Russo, 1997), and attempts to understand phenomena through the meanings that people assign to them (Klein and Myers, 1999). For the scope of this study, the use of the qualitative methods was adequate.
The interview tool (Appendix A) consists of semi-structured questions that were presented to every interviewee to gain their views on success factors and other issues related to ERP project success. Each interview lasted about two hours and was audio-recorded and later transcribed. Analysis was then carried out on the data with the use of the theme coding technique (Miles & Huberman, 1994). This coding technique helped identify themes relevant to ERP success factors. Descriptive or inferential information in the transcription were labelled with units of meanings. The data was coded by labelling sections of the text with similar topics or information. Sorting and categorisation of the coded data was then carried out to identify similar themes (success factors).

Ten participants were approached randomly from one multinational consulting company in Singapore. Participants with different levels of experience with ERP implementations were interviewed. Respondents to interviews were functional consultants, technical consultants, system developers and project managers.

FINDINGS

1. Success as Perceived by Vendor

The following is a description of ERP success identified from interviews with vendors:

- Meeting/fulfilling user requirements – Seven out of ten respondents indicated that the system developed should be able to meet all of the requirements as specified in the contractual agreement. Others indicated that all requirements in the contractual agreement are not always fulfilled due to constraints of resources.

- Project completed on time and budget – Four out of ten respondents indicated that a successful ERP system is one that was delivered to the client without any delays and on budget, meeting all the requirements. They also indicated that vendors have to strike a balance between what has to be delivered and the available resources and time.

From the above it is clear that project management is very important for the success of ERP implementations according to vendors. Effective project management helps vendors complete the implementation on time and budget.

2. ERP Success Factors from the Vendor’s Perspective

The responses from the vendors on ERP success are presented in Table 2. These responses were classified in eight themes based on Miles & Huberman’s (1994) thematic analysis technique of drawing common themes from information collected. The first column in Table 2 lists the success factors, and the rest of the columns present the responses of the interviewees on the importance of each success factor.

<table>
<thead>
<tr>
<th>Themes / Interviewee</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>F</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competency of project team</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge management</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stakeholder relationship management</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Communication</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Project management</td>
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<td>✓</td>
<td>✓</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>User requirements and specification</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Resources and budget</td>
<td>✓</td>
<td>✓</td>
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</tr>
<tr>
<td>User acceptance to ERP system</td>
<td>✓</td>
<td>✓</td>
<td></td>
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<td></td>
<td></td>
<td>✓</td>
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</table>

Table 2: Interviewees' list of success factors

Responses on each success factor recorded in Table 2 are discussed in the following section of the paper.

**Competency and Experience of Project Team**

Consultants and developers have to be equally competent in order to handle the scope of the project. Consultants must have a certain degree of knowledge regarding the technical specifications in order to propose a system that the developers can implement. Having competent consultants and developers, especially those with experience, will certainly increase the success rate of the ERP project.
“People (consultants and developers) with the right knowledge is elementary, but in most projects or rather in eighty percent of the projects, there are people with the wrong knowledge.” (Interviewee B)

A lot of vendors depend on new graduates and contractual developers with low pay rates to implement projects as large as ERP systems.

“Sometimes when the project is in its peak period, [the] company will just throw in fresh graduates and [let] them manage on their own. They struggle.” (Interviewee H)

As a result the project progresses slowly, is not on time and does not meet the customer’s requirements. Therefore it is very important for the vendors to have competence and experience with ERP systems implementation, customisation and integration.

**Knowledge Management**

From the responses, it was clear that business and technology knowledge within the vendor organisation should be retained to enable new staff learn from past experiences to avoid repeated mistakes. Respondents indicated that due to a high turnover rate of staff in this consulting organisation, each project manager went into the project without experience and knowledge. New staff recruited by the vendor is required to learn the customer’s organisational culture, politics and business processes during the implementation. This generally delays project completion.

“You actually find that [it] is not the knowledge holders that are changing, it’s just that knowledge is leaving the project in small parts.” (Interviewee E)

Documentation of events, experiences, success and problems is important within the vendor organisation to achieve success.

**Stakeholder Relationship Management**

The relationship(s) between all stakeholders and the implementation team is a success factor that has a high degree of relevance to monitor progress and success. Users need to realise that the relationship between the consultants and developers has to be balanced.

“[Customers] should avoid having [the] ‘I hire you to implement something for me and you should only listen to me’ kind of mentality.” (Interviewee A)

On the other hand, within the vendor’s project team, the relationships between all parties have to be amicable and professional. Consultants are the people who provide the functional roles while the developers provide the technical roles. Both have to cooperate well to ensure that the project is delivered in a timely manner and within the customer’s expectations. Hence stakeholder relationship management is an important success factor for the vendor.

**Effective Communication**

Respondents highlighted that effective communication helps manage relationships between the stakeholders. Consultants must communicate clearly with the users and the developers. Users, consultants and developers must understand how their work complement each other. This leads to clearer information being passed on from the users to the consultants and finally to the developers. As ERP implementations are large-scale projects, a slight miscommunication can easily lead to complications in the project.

“It depends on the size of the project team and the consultants within the team [on] how we are able to effectively communicate everything to each other, and how we are able to manage the time well within the team.” (Interviewee I)

Information can be seen as the foundation for any ERP project where it determines how the system is going to turn out in the end. Good communication and effective relaying of critical information are regarded as key to a successful ERP implementation. Effective communication between the consultants and developers is important as it determines their roles in the project. Proper communication also aids in building a healthy relationship between the all stakeholders in the project team.

**Good Project Management**

Project management is important for the development and the progress of ERP implementations. Project management varies from organisation to organisation depending on its size and tools and methods used by the vendor.
“Most of the times it depends on the size of the project. If it is a large scale or medium size implementation, the greatest problem [that] lies in the project is the project team, management and its complication.” (Interview I)

A good project management would take into consideration all project variables and uncertainties to ensure successful implementation and hence completing the project on time and within resources. It also means equal distribution of workload among project team members which in turn provides better motivation and increased productivity resulting in successful implementation.

**Accurate User Requirements and Specifications**

All respondents indicated that gathering the correct and accurate user requirements is important for ERP system implementation success. User requirements and specifications determine the scope of the ERP system and how the system turns out ultimately. Gathering accurate user requirements reduce the amount of time that vendor will need to revisit any problems arising from the system design flaws.

“Basically, what happens is, [the] baseline (in the context of SAP systems) is what the buyers’ business is based on: the core of their business. For the baseline, it is the functional requirements gathering, analysis or whatever must be done correctly, which are important. That means the skeleton of the whole project should be based on what the customer requires” (Interviewee D)

User requirements also define the design of the ERP system that would help vendor fulfil the ERP project objectives. Formal methods and tools of recording user requirements and specifications lead to vendors achieving successful ERP implementations.

**Adequate Resources and Budget**

A success factor that is highlighted by the respondents was the resources and budget. Although this factor is often not within the control of the developers and consultants, it does play an important part in the success of the ERP project. This critical success factor is dependent on how much the vendor’s top management supports resources and budget. The resources allocated to a project directly impact its success. Resources in terms of time, manpower, and knowledge are just as important as finance.

“I would say most of the time in projects it’s a luxury to have manpower. You can fairly assume that most projects are run with minimal people.” (Interviewee G)

Vendors tend to quote a low bid to win customers, and in doing so are usually restrained to lesser resources. However, profit maximisation should not underestimate the resources required to achieve the successful implementation of the project.

**User Acceptance of ERP System**

User acceptance at the customer’s end supports the progress of the project at a quicker pace. Vendors need to obtain approvals to incorporate changes to business processes for the ERP systems. Users that embrace the ERP implementation will be more willing to cooperate with the vendor and be more open to new business process concepts.

“So once in a while, you need to actually find out what business process they are not willingly to tell because it’s over and above their normal job scope.” (Interviewee C)

If users accept the new system, they quickly highlight problems if there are any and this supports business process reengineering required for ERP modules. This helps vendors implement the system successfully

**DISCUSSION AND CONCLUSION**

From the findings of the research discussed above, it is clear that factors that help vendors achieve success with ERP system implementations are competency of the project team; knowledge management; stakeholder relationship management; effective communication; realistic project management; accurate user requirements and specification; adequate resources and budget; and user acceptance of ERP systems. This research highlights that even for vendors, technical as well as soft skills with adequate resources and efficient project management are essential to achieve success with ERP system implementation.

The stringent legal contractual obligations of ERP projects make it critical for vendors to achieve successful implementation of ERP systems. This research highlights that ERP success from the vendor’s point of view include competency of the project team; knowledge management; stakeholder relationship management; effective communication with all parties; good project
management; identification of user requirements and specifications; adequate resources and budget; and a positive attitude towards the new technology from the customer organization. By comparing the findings of this research to the analysis of literature findings on success factors discussed earlier, it is apparent that a number of ERP success factors are common to both vendors and customers. These include competency of the project team; stakeholder relationship management; effective communication; good project management; adequate resources; and user acceptance.

Success factors unique to vendors, for ERP implementations, identified from this research are knowledge management and a careful understanding of user requirements and specifications. This paper makes a significant contribution to ERP literature by highlighting ERP success factors from the vendors’ points of view. It adds to the success factor theories for ERP systems.
REFERENCES


APPENDIX A – INTERVIEW QUESTIONS

Definition of ERP Implementation Success
1. How would you define the success of an ERP project?
2. How different is project success different from customer satisfaction?
3. Comment the relative importance of the 4 type of ERP project success:
   a. Project completed within time and budget
   b. Users attitude towards new system is positive
   c. A match between ERP system implementation and users requirements
   d. ERP system implementation matches user’s expectations

Success Factors for ERP Project – Vendor Perspective
1. List and elaborate on the success factors critical for the success of ERP implementations.
2. This is a comprehensive list of 22 success factors that have been proposed by academics, please kindly elaborate on the ones that you think are also important to vendors.

| 1. Client top management support | 2. Project team competence |
| 3. Interdepartmental Cooperation | 4. Clear goals and objectives |
| 5. Project management | 6. Interdepartmental cooperation |
| 7. Management of client’s expectations | 8. Project champion |
| 11. Date conversion and analysis | 12. Dedicated resources |
| 13. Use of steering committee | 14. User training on software |
| 15. Education on new business process | 16. Business process reengineering |
| 17. Minimal customisation | 18. System architecture choices |
| 21. Use of vendor tools | 22. Use of consultants |

3. Why do you think this is or not an exhaustive list of CSFs for ERP implementations?

Issues that vendors experienced for ERP implementations
1. List and elaborate the common problems and issues that vendors faced during ERP implementations for the following:
   a. Organisational related
   b. Financial related
   c. Management related
   d. System related
2. Explain if the problems/issues were unique or generic to organisations?
3. How do the problems and issues experienced by the vendor relate to the success factors discussed previously?