

## **IMPACT OF ERP IMPLEMENTATION AT MALAYSIAN SMES: ANALYSIS OF FIVE DIMENSIONS BENEFIT**

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### **ABSTRACT**

A wide range of researches have been carried out on ERP implementation to seek general evaluation of its benefits. The purpose of this paper is to outline the benefits of ERP implementation on Malaysian small- and medium-sized enterprises (SMEs). Two main categories are analysed, namely tangible plus intangible. This study would assist other SMEs in developing countries on ERP implementation. This study is restricted to small and medium-sized companies in Malaysia implementing ERP system. Data collection of this study is done based on combination of survey questionnaire and interviews with managers, chief information system (CIO), directors and also ERP experts conducted in January of 2012. The survey obtained 84 response samples out of 147 (57.14% response rate).

“Better resource management”, “Improved decision making and planning” in Managerial benefits, “Support for business growth” in Strategic benefits have highest ranking in intangible category. Data gathering in this study carried various limitations of population. The classified results of investigation put in bright benefited Malaysian SMEs by analysing in five dimensions.

**Keywords:** Enterprise Resource Planning (ERP), IT infrastructure benefits, Malaysia, Managerial benefits, Operational benefits, Organizational benefits, Small and medium-sized enterprises (SMEs), Strategic benefits, Tangible and intangible benefit,

### **1. INTRODUCTION**

In period of global and domestic competition, enterprise resource planning (ERP) plays a role in regards to new approach of product development cycles to alter demand of customer favour. It is often considered as one of the solutions for their survival. To put up vulnerable financial market ERP is a versatile solution with effective capabilities to succeed (Rao, 2000).

Integration of abilities through major functions among department organization based on software solution is burden of ERP system altogether. Hence, the objective is aimed to adapt departments by software linked harmonization between suppliers and customers to provide right product at right place at the right time with reducing gross cost (Koch, 2003). This will facilitate real-time sharing information among employees. To respond to customers' orders, quality improvement, augmenting product delivery plus service, enhancing inventory control and also truncating time in production cycle are proven ways of this system (Jaiswal, 2007).

In fact, to accommodate SMEs, they have turned face to ERP adoption and found ERP implementation is not so different from large enterprise. SMEs try to implement ERP to raise the performance of departments in organization throughout providing best practices during business processes by means of updating obsolete technical platforms (Adam & O' Doherty, 2000).

With limitation in resources such as certain number of customers, marketing in wide range of markets, finance, management and manpower, SMEs operation face to smooth flexible structure(Kale et al., 2010). There are several stories to depict success and failure of ERP implementation, then how to perform is the sleek path to convince output. Studying the performance ways in SMEs might boost better results while making decision to execute system. Efficient benefits of ERP system have encouraged SMEs to drag attention towards system adoption by offering services to alleviate cost from vendors.

Literature review explains a potent glimpse at ERP system and SMEs in Malaysia and success and failure factors of ERP implementation in previous studies and ending up regard to benefits of ERP implementation. By open looking at benefits in large organization, it is feasible to draw evaluation on SMEs, then the study has effort to analyse benefits what applied from framework of Shang and Seddon and extract the higher level of benefits in SMEs.

## **2. LITERATURE REVIEW**

### **2.1 ERP System in Malaysia**

ICT growth is achieving higher in Malaysia in order to greater economic growth. andIT infrastructure in SMEs upgraded and adopt Information Technology. ERP software vendors are experiencing global

especially with expansion of SMEs in developing countries throughout Asia-Pacific region (Huang & Palvia, 2001).

In south East Asia, Malaysia could make eye-catching progress of its economy by expanding on investment technology with “corporate-wide integration, corporate restructuring and technological innovation policies” among public and private sectors. This is encouraged by Malaysian government during the 1997 economic crisis (Ministry Of Finance, 2009).

The number of SMEs that hired IT system in Malaysia is more than 10,000. The ERP vendors offer ERP systems in lower cost and customizable to mid market leded competition in customer service globally. SMEs tendency is to adopt ERP system for possessing return of investment by strategic investment planning. In some review of previous studies, adapted SMEs on ERP have carried successful and benefited experiences with local and international vendors. Utilities, manufacturing, technology, high tech sector with government are vastly successful in system adoption in Malaysia (Frost & Sullivan, 2004).

## 2.2 SMEs in Malaysia

Small and Medium-sized Enterprises (SMEs) in Malaysia collaborated in approximately all sorts of industries, considering that they have diversion in their range and significance (Idrus & Shahawai, 2009). A study which was done by Bank Negara Malaysia has reported the present number of SMEs in Malaysia is 349,617 (Bank Negara Malaysia, 2009). 99.2 % of SMEs in Malaysia from the total establishments which numbers 518,996 are in the three main economic sectors: manufacturing, services and agriculture in 2006 (Aris, 2007).

First of all, the classification of Malaysian SMEs is categorized into three levels which are (1) Micro-enterprise, (2) Small enterprise and (3) Medium enterprise. In Malaysia, two key factors are used to define SMEs which are (1) Annual Sale Turnover and (2) Number of Full-Time Employees (The IMD, 2009). Full definition of an enterprise which is considered as SME in Malaysia as provided by SMIDEC is shown in the table below (Small Medium Industries Development Corporation).

	<b>Micro-enterprise</b>	<b>Small enterprise</b>	<b>Medium enterprise</b>
<b>Manufacturing, Manufacturing-Related Services and Agro-based</b>	Sales turnover of less than RM250,000 OR full time employees less than 5	Sales turnover between RM250,000 and less than RM10 million OR full time	Sales turnover between RM10 million and RM25 million OR full time employees

<b>industries</b>		employees between 5 and 50	between 51 and 150
<b>Services, Primary Agriculture and Information &amp; Communication Technology (ICT)</b>	Sales turnover of less than RM200,000 OR full time employees less than 5	Sales turnover between RM200,000 and less than RM1 million OR full time employees between 5 and 19	Sales turnover between RM1 million and RM5 million OR full time employees between 20 and 50

**Table 1:** Definition of SMEs in Malaysia

Source: SMECorp (SMALLMEDIUM ENTERPRISES CORPORATION MALAYSIA)

In some of the Asian countries such as China, Japan and Korea, the economic growth has been made by activities of SMEs where their Gross Domestic Product (GDP) had achieved more than 50% in comparison to Malaysia (SME Annual Report, 2007).

### 2.3 Success and Failure Factors of ERP Implementation

The success of ERP implementation in companies encouraged managers to hire this system. Various expected benefits plot for company on this system plus vast commercial view to enclose success and failure outcomes. The success in implementation is measurable regards to evaluate benefits in accelerated business practices, and decision making elevating.

In continuing of success factors of ERP implementation studies has highlighted that top management perception and support, business process reengineering (BPR), user involvement, effective project management, education and training of staff, and vendor support are certain roles to possess higher places through ranking (Ngai et al., 2008; Al-Mashari et al., 2003).

Results are discussable where this system runs and output might be going live or making issues. There are several critical factors such as role of top management and a clear business vision contribute to the ERP success or failure. (Bhatti, 2005; Yingjie, 2005).

On the other hands, the result of implementing ERP does not always prove successful. Many large companies have installed an ERP system but had to discard their implementation (Soh et al., 2000). Small and medium-size companies are now starting to embrace ERP. Even though, the efforts might be expensive because of the complexity of system implementation or some companies adapted the ERP processes are closed to bankruptcy too. Additionally, marvellous researches have manifested

about the failure factors of ERP implementation through considering the success factors. A load given of failure factors in SMEs by Noudoostbeni et al. (2009) had depicted that are poor technology planning, user involvement and training, overruns of budget and schedule, and adequate skills availability (Umble & Umble, 2002; Wright & Wright, 2002).

In comparing critical success and failure factors of ERP system, the benefits of applying are able to revive adequate approach toward making crystal clear decision in terms of companies' investment.

#### **2.4 Benefits of ERP System**

ERP system would have provided high effective situation for company environment to reach higher potential by monitoring changes of future environment which can also affect the position of the business (Huang & Palvia, 2001).

ERP implementation equip single data source, reduction of indirect and direct cost, better business processes by increasing productivity plus the primary object of benefits of installing ERP is the intergradations with business processes (Davenport, 2000).

The adoption of this system conveyed other benefits including support to exhibit higher efficiency by means of reducing inventory costs, improving profitability and reducing lead time of manufacturing in business processes. An ERP system can pass through an organization by drastically affecting several processes, and also showing benefits at various levels of (Zhu et al., 2010).

Shang and Seddon (2002) had classified the benefits of ERP implementation into five benefits dimensions that included organizational, managerial, operational, strategic, and also Information Technology (IT) infrastructure.

Based on studies there are facts indicating the benefits among two categories such as tangible and intangible. The managerial, strategic and organizational benefits are in intangible category, the operational plus IT infrastructure is within tangible category (Shang & Seddon, 2002).

As the benefits of this system are easily going to affect organization investment, though the productivity measurement of IT investment is very complicated as it involves various factors. According to consolidated framework, the paper examines all retained benefits dimensions mentioned. In table2, all benefits dimensions and sub dimensions are explained.

<b>Category (Tangible / Intangible)</b>	<b>Benefits Dimension</b>	<b>Sub Dimension</b>
		1.1 Cost reduction

Tangible	Operational	1.2 Cycle time reduction
		1.3 Productivity improvement
		1.4 Quality improvement
		1.5 Customer service improvement
Intangible	Managerial	2.1 Better resource management
		2.2 Improved decision making and planning
		2.3 Performance improvement
Intangible	Strategic	3.1 Support for business growth
		3.2 Support for business alliance
		3.3 Building business innovations
		3.4 Building cost leadership
		3.5 Generating product differentiation
		3.6 Building external linkages
Tangible	IT infrastructure	4.1 Building business flexibility for current and future changes
		4.2 IT cost reduction
		4.3 Increased IT infrastructure
Intangible	Organizational	5.1 Changing work patterns
		5.2 Facilitating organizational learning
		5.3 Empowerment
		5.4 Building common vision

**Table 2:** Proposed enterprise system benefits framework by Shang and Seddon (2000)

### 3. RESEARCH METHODOLOGY

In this study, the sampling is not by random. Small targeted population was chosen for data gathering. This study was restricted to all small and medium-sized companies in Malaysia that implemented ERP system in order to see benefits of ERP implementation.

In accordance with population, 94 companies seemed to be capable to respond to the questionnaire and provided an interview. Data collection was derived from email to companies and they are filled by managers, chief information system (CIO), directors and also ERP experts. Data collection of this study was done based on combination of survey questionnaire and interview in January of 2012. In various enterprises there are constructive interviews conducted and they filled the questionnaire. Some enterprises respond more questionnaires, hence, the survey finished up with 84 responded samples out of the 147 (57.14% response rate).

### 4. ANALYSIS AND FINDINGS

Main focus of data gathering is on benefits of ERP implementation and critical success and failure factors. The questionnaire is gathered from the investigation of ERP in Indian SMEs and modified this

form for Malaysia SMEs. Measurement is based on five Likert scale form strongly disagree to strongly agree (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

The questionnaire was validated by reviewing with ERP specialists and academic setting. All experts in this study agreed on the appropriateness, clarity of the items and contents in this questionnaire. This study showed that there were clear and comprehensive ways to respond to the questionnaire and all respondents had agreed that the questionnaire of the study has clarity and adequate content of the items.

Data analysis was from qualitative to quantitative and the reliability of questionnaire was 0.84 based on Cornbach's Alpha formula which is acceptable. To measure benefits, success and failure factors, statistical tools are required. The Statistical Package for the Social Sciences Version 17.0 (SPSS) was utilized to analyze those data.

The test of analyzing these questions is student's t-test. The benefits, success and failure factors were tested by T-test and getting mean values of them. After that, mean values are compared and higher degree is chosen as important benefits and factors of ERP implementation in Malaysian SMEs. Most probable success and failure factors have been considered in test.

To evaluate success factors, "top management support and awareness" has highest rank of mean degree as found by studies done previously. "Clear goals and objectives", "consultant support", "monitoring of implementation", "looking ERP as a strategic investment" are other effective success factors agreed by SMEs respectively. In table 3, all success factors by mean ranking are depicted.

Rank	Top Success Factor	Mean
1	Top management support and awareness	4.01
2	Clear goals and objectives	3.96
3	Consultant support	3.77
4	Monitoring of implementation	3.63
5	Looking ERP as a strategic investment	3.57
6	Resistance of organization to change	3.48
7	IT legacy systems	3.41
8	Strong MIS department and Proper reporting structure	3.32
9	Cultural fit to organization	3.27
10	Willingness to participate of staffs	3.23
11	Project team competence	3.17
12	Related experience of supplier	3.04
13	Business process reengineering	2.91
14	Integration and communication between legacy system and ERP	2.81

**Table 3:** Success factors by degree of importance in ERP Implementation

In implementing ERP system, some companies believed failure of this system is possible if wrong method is taken at the start. In some small companies they underestimated financial cost and overrun-time implementation which reduced performance and output. "Poor support of top management", "minimal support from the vendors after implementing", "poor risk management", "and lack of top management participation", "poor consultant selection and relationship" are highest rank of failure factors of ERP implementation respectively as determined by SMEs' managers and some vendors. In table 4, the total evaluation of failure factors are ranked and pinpointed by mean degree as well.

Rank	Top Failure Factor	Mean
1	Poor support of top management	4.07
2	Minimal support from the vendors after implementing	3.84



3	Poor risk management	3.69
4	Lack of top management participation	3.54
5	Poor consultant selection and relationship	3.37
6	Data transfer errors	3.29
7	Poor documentation of the system, especially for design and controls	3.21
8	Poor package selection	3.14
9	User resistance to the new system	3.09
10	Lack of education on new business process	2.93
11	Lack of team composition in various departments	2.89

**Table 4:** Failure Factors by Degree of Importance in ERP Implementation

The study is going to clarify benefits of ERP implementation. To follow literature review two categories of benefits such as tangible and intangible are measured and ranked by evaluation.

To put comparison on benefits of ERP implementation in SMEs and assessment of goal achievement, the questionnaire carried one part for benefits categorised in five classified benefit types followed by literature review. Responses are measured on five-point Likert scale to evaluate to what extent SMEs benefited by hiring this system. Intangible benefit category included by Managerial, Strategic, Organizational benefits which are related somehow to enterprises to make sensible outcomes for companies with high growth.

In order to probe Intangible Benefits as in table 5, the highest ranking by mean degree of benefits in managerial benefits are "Better resource management "and "Improved decision making and planning".

Ranking	Managerial Benefit	Mean value
1	Better resource management	4.39
2	Improved decision making and planning	4.21
3	Performance improvement	3.67

**Table 5:** Managerial Benefits Ranking

Additionally, in this category the strategic benefits are crucial as shown in Table 6, and “Support for business growth”, “Building cost leadership”, and also “Generating product differentiation” are considered important to certain extent.

Ranking	Strategic benefit	Mean Value
1	Support for business growth	4.19
2	Building cost leadership	4.05
3	Generating product differentiation	3.89
4	Building business innovation	3.59
5	Building external linkage	2.91
6	Support for business alliance	2.86

**Table 6:** Strategic Benefits Ranking

Moreover to follow intangible benefits as in organizational benefits can be seen in table 7, “Facilitating organizational learning” is most beneficial among others.

Ranking	Organizational Benefit	Mean Value
1	Facilitating organizational learning	4.01
2	Changing work patterns	3.36
3	Empowerment	3.15
4	Building common vision	2.97

**Table 7:** Organizational Benefits Ranking

Apparently the intangible benefits put in vital yields in organizations, however tangible benefits such as IT infrastructure and Operational are not dispensable. “Building business flexibility for current and future changes”, “Increased IT infrastructure capability”, in IT infrastructure benefit, and “Customer service improvement”, “Cycle time reduction” ,and “Quality improvement” in operational benefit is found to have benefit factors as given in Table 8, 9 respectively.

Ranking	IT Infrastructure Benefit	Mean Value
1	Building business flexibility for current and future changes	4.17
2	Increased IT infrastructure capability	3.81
3	IT cost reduction	3.38

**Table 8:** IT Infrastructure Benefits Ranking

Ranking	Operational Benefit	Mean Value
1	Customer service improvement	4.09
2	Cycle time reduction	3.96
3	Quality improvement	3.83
4	Productivity improvement	3.62
5	Cost reduction	3.41

**Table 9:** Operational Benefits Ranking

The respondents of this survey believed that ERP system is totally beneficial for SMEs as well as for large companies. In small SMEs enterprise this system is not manipulated or underestimated by financial view. The system is high cost and time consuming, so return of investment in small businesses takes longer time. Short term planning for launching huge system is not accepted by clients. The valid results of this research bring different approaches for higher quality performances.

## 5. CONCLUSION

The outcome of statistical results show the ERP implementation into large companies could affect SMEs altogether. The study and analysis of data drew new approach of benefits for SMEs after completing implementation. In most various cases as expected the system work differently for large companies. In small companies there is no tendency to set ERP system as compared to medium enterprises since there is no adequate gain in return of investment (ROI). System implementation in organization carries various challenges with failure during performance particularly in small companies since if planning is postponed by long delay is not affordable for small companies.

The proposed enterprise system benefits framework by Shang & Seddon (2002) is qualitative and quantitative with ranking. The results of this study are expanded by ranking of benefits of ERP implementation in SMEs based on Table 10. The table details show that managerial benefits are predominant as first and second top benefits.

Ranking	Top Benefits	Mean	Category	Intangible	Tangible
1	Better resource management	4.39	Managerial	•	
2	Improved decision making and planning	4.21	Managerial	•	
3	Support for business growth	4.19	Strategic	•	
4	Building business flexibility for current and future changes	4.17	IT Infrastructure		•
5	Customer service improvement	4.09	Operational		•
6	Building cost leadership	4.05	Strategic	•	
7	Facilitating organizational learning	4.01	Organizational	•	
8	Cycle time reduction	3.96	Operational		•
9	Generating product differentiation	3.89	Strategic	•	
10	Quality improvement	3.83	Operational		•
11	Increased IT infrastructure capability	3.81	IT Infrastructure		•

**Table 10:** ERP Implementation benefits by Degree of Importance

The above table also revealed Malaysian SMEs benefit from ERP system in managerial system and also operation by manipulating resource management in decision making using computerized information system.

The success factors support and awareness of top management is by clarifying goals and objectives with support of Consultants. On the other hand, failure factors such as poor support of top management, minimal support from the vendors after implementation are important.

The benefit derived in this study is not industry based, though able to cover diversity of insights to achieve higher product. Evaluation of ERP running in developed and developing countries have different experiences, and success and failure factors are approximately dissimilar according to firm size and available resources.

Developing countries have been penetrated by systems from developed countries. Adaption of culture in ERP system is highly beneficial and reduces failure factors, in addition, the success factors are expanding further. SMEs in developing countries like Malaysia have benefited but faced limitation together with concerns to coordinate and adapt system in arduous implementation process.

## 6. REFERENCES

- [1] Adam, F. y O'Doherty, P. (2000), "Lessons From Enterprise Resource Planning Implementation In Ireland: Towards Smaller And Shorter ERP Projects", *Journal of Information Technology*, págs. 305-316.
- [2] Al-Mashari, M. & Al-Mudimigh, A. (2003). " Enterprise Resource Planning: A Taxonomy Of Critical factors", *European Journal of Operational Research*, 146 (2), 352–364.
- [3] Aris N. M. (2007), "SMEs:Building Blocks for Economic Growth", *Journal of Department of Statistics, Department of Statistic Malaysia, Kuala Lumpur*.
- [4] Bank Negara Malaysia (2009). *Annual Report 2009*, Kuala Lumpur, Malaysia.
- [5] Bhatti, T.R. (Ed.) (2005), "Critical success factors for the implementation of enterprise resource planning (ERP) empirical validation", paper presented at The Second International Conference on Innovation in Information Technology (IIT05), Zayed University, College of Business, Dubai, UAE.
- [6] Davenport, T. (2000), "Mission Critical: Recognizing The Promise Of Enterprise System", Cambridge: Harvard University Press.
- [7] Frost & Sullivan (2004), "Malaysia Mid Market ERP Software Market", July, available at: [www.researchandmarkets.com/reports/365453/malaysia\\_mid\\_market\\_erp\\_software\\_market](http://www.researchandmarkets.com/reports/365453/malaysia_mid_market_erp_software_market)
- [8] Huang, Z., & Palvia, P. (2001), "ERP implementation issues in advances and developing countries", *Business Process Management Journal*, 7 (3), 276-284.

- [9] Idrus, R. & Shahawai, S.S. (2009), "Research Methodology for Assessing Malaysian SMEs perspective on ERP", Paper presented at the Third Asia International Conference on Modelling & Simulation.
- [10] Jaiswal, M. (2007), "ERP enabled best business practices for competitiveness: case of Auto Component manufacturing Industry in India", Proceedings of the 6th Annual ISONeworld Conference, Las Vegas, NV, April 11-13, pp. 30/1-30/14.
- [11] kale, P.T., Banwait, S.S. ,& Iaroiya.S.C. (2010).Performance evaluation of ERP implementation in Indian SMEs. Paper presented at the Journal of Manufacturing technology Management.
- [12] Koch, C. (2003), The ABC of ERP, Enterprise Resource Planning Research Center, Boston, MA, available at: [www.cio.com/research/erp/edit/erpbasics.html](http://www.cio.com/research/erp/edit/erpbasics.html)
- [13] Ministry Of Finance (2009), "Malaysia Economic Report", 14 March, available at: [www.treasury.gov.my/index.php?ch=22&pg=165&lang=eng](http://www.treasury.gov.my/index.php?ch=22&pg=165&lang=eng)
- [14] Ngai, E.W.T., Law, C.C.H. and Wat, F.K.T. (2008), "Examining the critical success factors in the adoption of enterprise resource planning", Computers in Industry, Vol. 59, pp. 548-64.
- [15] Noudoostbeni, A., Yasin, N.M. and Salarzadeh Jenatabadi, H. (2009). "To investigate the Success and Failure Factors of ERP implementation within Malaysian Small and Medium Enterprises", Paper presented at the International Conference on Information Management and Engineering, Kuala Lumpur.
- [16] Rao, S.S. (2000), "Enterprise resource planning: business needs and technologies", Industrial Management & Data Systems, Vol. 100 No. 2, pp. 81-6.
- [17] Shang, S., Seddon, Peter B. (2002), Assessing and managing the benefits of enterprise systems: the business manager's perspective, Information Systems Journal (2002) 12, 271–299.
- [18] SME Annual Report 2007, "Productivity Performance of SMEs", National SME Development Council, Kuala Lumpur, Malaysia, pp. 34-48.
- [19] Soh, C., Kien, S.S. and Tay-Yap, J. (2000), "Cultural fits and misfits: is ERP a universal solution?", Communication of ACM, Vol. 43 No. 4, pp. 47-51.
- [20] The IMD (2009), "IMD World Competitiveness Yearbook 2009", 1 April, available at: <https://www.worldcompetitiveness.com/OnLine/App/Index.htm>.

[21] Umble, E. & Umble, M. (2002). "Avoiding ERP implementation failure", *Industrial Management*, 44 (1), 253-254.

[22] Wright, S. and Wright, A.M. (2002), "Information systems assurance for enterprise resource planning system: implementation and unique risk considerations", *Journal of Information Systems*, Vol. 16, Supplement, pp. 99-113.

[23] Yingjie, J. (2005), "Critical success factors in ERP implementation in Finland", MSc thesis, The Swedish School of Economics and Business Administration, Helsinki.

[24] Zhu, Y., Li, Y., Wang, W., & Chen, J. (2010), "What leads to post-implementation success of ERP? An empirical study of the Chinese retail industry", *International Journal of Information Management*, 30(3), 265–276.