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ERP Adoption Factors: The Effect of Institutional- and Economic-Based Theory

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ABSTRACT

The introduction of the Enterprise Resource Planning (ERP) system in the early 1990s was perceived as a new way of managing a business that could lead to better management of an organisation and improve its efficiency. However, studies have repeatedly reported a low success rate in ERP system adoption. This encouraged various research studies that sought to uncover factors that could have contributed to the system failure. A poor decision-making process has been stated as one of the main reasons for ERP system failure. Clear objectives and good justification could, we believe, increase the ERP system adoption success rate. Hence, in this study, we extend the existing research on ERP by exploring the effect of institutional pressures and economic benefits on the decision-making process of the management. Specifically, we investigate the influence of external pressures and internal needs in ERP adoption decisions. Empirical analyses in this study are based on survey data obtained from 136 Malaysian companies. Overall, our findings indicate that only operational benefits and mimetic pressure have significant influence on ERP system adoption decisions. Other economic benefits such as managerial benefits and strategic benefits have no significant impact on the management's decision to adopt the system. Similarly, institutional pressures, coercive pressures and normative pressures yield non-significant results. These results are important because the evidence highlights that the management's decision to adopt the ERP system is based on the felt need for the organisation to improve its operational efficiency, and the influence of mimetic pressures further accentuates the importance for the organization of being competitive in its technological capabilities.

Keywords: IT adoption factors, economic-based theory, Enterprise Resource Planning, Information and Communications Technologies , institutional theory

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INTRODUCTION

The advancement of Information and Communications Technologies (ICT) has significantly intensified market competition the world over. Organisations are increasingly seen to rely on technology to enhance their business operations efficiency, either to achieve cost reduction or to improve operating performance. One of the most sophisticated information systems currently known to be able to satisfy the need for efficiency is the Enterprise Resource Planning system (ERP). However, many of the benefits attained from ERP adoption are intangible and difficult to measure (Spathis & Constantinides, 2003). Nevertheless, the strength of the ERP system lies in the system's ability to provide accurate and real time data to facilitate decision-making is one that is too significant to be immediately disregarded (Spathis & Constantinides, 2003). Prior studies on ERP have repeatedly demonstrated that information system technology implementation requires appropriate skills, full support from management and adequate organizational capabilities (Francoise, Bourgault, & Pellerin, 2009; Basoglu, Daim, & Kerimoglu, 2007; Law & Ngai, 2007). A large number of organisations are known to discontinue or stop the progress of a project although a large amount of money may have been spent due to obstacles being encountered during the phases of development (Davenport, 1998). Despite the many challenges identified relating to ERP system implementation, the adoption rate continues to increase (Basoglu *et al.*, 2007). Therefore, this study aims to investigate and analyse the factors that may influence an organisation's decision to adopt the ERP system, particularly in Malaysia.

In 2002, Computimes (Computimes, 2002) reported that there was only a small number of SMEs in Malaysia which had adopted the ERP system. High cost, resistance to change and lack of awareness of the benefits of the system were identified as the key factors for the low adoption of ERP system. Kushairi (2000) highlighted the importance of top management initiatives in paving the way for ERP adoption. It has pointed out that rganisations that ignore the advantages of embracing information technology applications may find themselves in a difficult position in confronting global challenges (Kushairi, 2000). Hun (2005) reported that industry experts predicted that the global market value of the ERP system would increase to US$12 billion in 2008 from US$9.1 billion in 2003. According to SSA Global Technologies, one of the largest producers of ERP system software in South Asia, Malaysia with its strong economic base emerged as the organisation's (SSA Global Technologies) second largest clientele, accounting for 21 % of SSA Global customers, slightly behind India (Hun, 2005). Hun (2005) also highlighted that there is increasing demand for ERP solutions in Malaysia. In addition, The Star newspaper (2010) reported that International Data Corporation (IDC) Malaysia had expected an increase in investments for information technology from the manufacturing sector and investment was expected to grow at a

rate of 5.6 % yearly. This positive outlook for the ERP system arose out of the urgent need for cost saving technologies such as ERP and 3D modelling technologies to cut down on the excessive costs experienced during the global financial crisis (The Star, 2010).

A recent study conducted by Supramaniam and Kuppusamy (2010) shows strong demand for the ERP system in Malaysia. Various industries are seen to have ventured into adopting the system, led by the manufacturing industry. Nevertheless, only 50 % of the participating organisations reported full adoption last year or over a one-year period. This finding indicates that ERP system adoption is still fairly new in Malaysia. As in other developing countries, in Malaysia, the issue of ERP adoption decision has been largely unexplored (Spathis & Constantinides, 2003).

In general, it is widely acknowledged that many studies have been focusing on finding the best approach to ensure ERP system success, for example, Zhang, Lee, Huang, Zhang and Huang , 2005; Katharina, Sabine and Fiona, 2009. However, there has been very limited study into the factors that could influence management in their decision to adopt the ERP system. Hence, this study aims to extend the existing research by exploring the effect of institutional pressures and economic benefits on management's decision to adopt ERP. Specifically, we investigate the influence of external pressures and internal needs in ERP adoption decisions. The remainder of the paper is structured as follows: the next section discusses prior studies on ERP adoption from economics and institutional perspectives, followed by a discussion of the methodology used in this study. The results are subsequently presented while the last section concludes and highlights the implication of this research.

LITERATURE REVIEW

This section will briefly highlight the importance of adopting the ERP system for the right reasons in order to realise its full benefits and then go on to review the literature related to the economic-based benefit theory and institutional theory concepts and their relationship with ERP system adoption.

Enterprise Resource Planning (ERP) System

The introduction of the ERP system as a tool to create competitive advantage and the potential benefits derived from the system adoption have induced many organisations to adopt the system. ERP is a system that connects all of an organisation's business operations through the information sharing concept (Gulledge, 2006). The system has been used worldwide to improve business process and business efficiency (Calisir, Gumussoy, & Bayram, 2009; Hendricks, Singhal, & Stratman, 2007, Price Waterhouse Cooper, 2009). However, implementing the ERP system is not merely installing a new programme. It requires careful planning, substantial effort from management and a large investment of time and money. ERP changes business operation and requires

a total overhaul on the organisation's processes and procedures. It needs to be embedded in the organisation's culture, thus changing how things are normally conducted. Therefore, it is important for the organisation to adopt the ERP system for the right reasons. The benefits expected to be obtained from the system adoption should match the organisation's needs. This is to ensure that significant returns are realised from the ERP system investments.

Many prior studies, for example, Koh, Simpson, and Padmore, 2006; Zhang *et al.*, 2005; Spathis and Constantinides, 2003, assumed that organisations make decisions entirely based on efficiency. However, this assumption is not well substantiated; it ignores other external forces that could hinder organisations from making rational decisions. Understanding motives for adopting ERP system is very important. Organisations that have a good justification and clear objectives for adopting the ERP system have better potential to realise the system's benefits (Sammon, Adam, & Carton, 2003). Clear objectives enhance the organisation's ability to systematically dictate the progress and success of the system. Therefore, it is essential for organisations to have pre-defined objectives prior to the adoption of the ERP system. This initiates the main agenda of this study, which is to examine the influence of both economic realities and external pressures on management's decision to adopt ERP.

Economic-based benefit theory perspective

There are three reasons that initiate the adoption of new technology, which are the organisation's need to expand its existing system functions using new updated tools, to reduce its operational costs and to replace its current legacy software with a new system that provides better performance and speed (Newcomb & Doblar, 2001). The ERP system's ability to integrate many processes within an organisation has long been awaited by managers who feel the need for such a system to help them organise and streamline all data and processes for efficiency (Nah, Lau, & Kuang, 2001; Davenport, 1998). Having an efficient, more accurate and updated data system has been among the most significant motivations that has led to ERP system adoption (Koh *et al.*, 2006; Spathis & Constantinides, 2003). Other contributing factors such as cost reduction, increase in sales revenue, solving year 2000 problems, attaining competitive advantage and survivability have also been identified as key determinants in ERP adoption (Emerson, Karim, & Rutledge, 2009; Law & Ngai, 2007; Zhang et.al 2005; Russell & Hoag, 2004; Spathis & Constantinides, 2003).

Study into this area has also pointed out that an organisation's internal and external strategies are significant driving factors for ERP system adoption (Jang, Lin, & Pan, 2009). Internal strategies include reduction of operations costs, enhancement of employees' motivation, improvement of product cycle time and improvement of data management. External

strategies, on the other hand, enhance the organisation's competitive ability as they push the organisation to continuously seek out opportunities and to consistently upgrade its technological capabilities. Laukkanen, Sarpola, and Hallikainen (2007) found that there were no external influences affecting these organisations' decisions. The majority of the organisations confirmed that in-house analysis was adopted in their decision-making process.

A study on the adoption factors in a less developed country indicates that technical, operations, strategic and decision-making motives are important in the decision to adopt ERP (Kamhawi, 2008). The decision-making and operational motives are found to be the most important reasons for ERP system adoption. These findings suggest that the ERP system is no longer mainly perceived to ease business operational and technical functions but also that it is a competitive tool in facing global challenges. This, of course, has enhanced its value greatly.

The transaction cost theory was used to represent the hypotheses of economic benefits. The theory explains that organisations take into account various costs involved prior to their engagement of any transactions (Robin, 1987). Costs and benefits analyses are conducted to ensure rational economic justifications for every transaction undertaken. It is important for an organisation to ensure that benefits obtained from a transaction are higher than the cost of the products or services. Therefore, in the context of ERP system adoption, the transaction cost theory suggests that the organisation will undertake proper costs and benefits analyses to ensure that the new system adopted will be able to enhance the performance and value of the organisation.

Collecting quantitative data on the exact costs and benefits expected from ERP adoption by an organisation would not only be very difficult but almost impossible because of data confidentiality. Therefore, in this study, measures of perceived economic net benefits were used to represent the overall costs and benefits analysis conducted by each organisation. Profit-oriented organisations are expected to conduct a systematic analysis on the costs (disadvantages) and the benefits (advantages) associated with an investment. Thus, perceived benefits represent the end-result of that rational economic decision based on careful costs and benefits analysis.

Institutional theory perspective

The institutional theory recognises that an organisation operates in an institutionalised environment in which prevailing rules and procedures rather than the rational efficiency factor determine the legitimacy of a business (Meyer & Rowan, 1977). Legitimacy is public acceptance and a vote of confidence that a business is conducted in the best manner. An organisation that adheres to customary rules and procedures demonstrates its effort to do business in an adequate and socially acceptable manner (Fogarty, 1996). The display of such responsible conduct will enhance public support, which will eventually lead to the

survival and growth of the organisation. Thus, the theory provides an explanation for why organisations become homogeneous and the role played by myth and established values in driving many organisations to implement similar procedures and practices (DiMaggio & Powell, 1983; Meyer & Rowan, 1977).

A similar trend can be seen in information system adoption. Over time, many organisations are driven to adopt customary and established criteria. This is because the perceived benefits that can be obtained by conforming to the procedures and practices motivate many organisations to adopt them voluntarily. Additionally, it is suggested that organisations that institutionalise their products, services, policies and programmes may gain added advantages such as increased survival prospect, enhanced public acceptance and confidence in the legitimacy of their business operations (Rowan & Meyer, 1977), reduction in uncertainty (Liao, 1996) improved capability in acquiring resources and improving relationships with business partners (DiMaggio & Powell, 1983).

Furthermore, conformity to rules and procedures protects the organisation from unnecessary legal actions or claims of negligence in conducting its business operations (Meyer & Rowan, 1977). Nevertheless, failure to adapt to these socially established norms and values could expose the organisation to many issues that would potentially lead to loss of business and support (Fogarty, 1996). Therefore, organisations are motivated to obtain legitimacy through the three pillars of isomorphism, which are coercive isomorphism, mimetic isomorphism and normative isomorphism.

Coercive isomorphism

Coercive isomorphism commonly results from resource dependence factors (Teo, Wei, & Benbasat, 2003). Studies suggest that management is more willing to accept rules or procedures enforced upon them if they are highly dependent on the resource providers. These forces are mainly exerted by government, business partners and suppliers (Benders, Batenburg & van der Blonk, 2006). The acceptance of the procedures is based merely on the pressures imposed on them and not because of the economic benefits that could improve the organisation's performance. Non-adherence or disregard for procedures could lead to loss of business and survival ability.

Mimetic isomorphism

Mimetic isomorphism is based on the organisation's ignorance and lack of information available on what is the best method or practice to solve an issue. When faced with uncertainties, many organisations resort to imitate and replicate the practices or structures of any organisation that they view as being the most successful in their field (DiMaggio & Powell, 1983). Management may view imitating other successful organisationa as the best alternative available as it minimises search cost of identifying and experimenting with the best course of action and reduces the risk

of being the first adopters of a procedure or system. Additionally, overwhelming adoption of upcoming technology could also drive management into adopting such technology to avoid being left behind (Benders *et al.*, 2006).

Normative isomorphism

Finally, normative isomorphism exists as a result of duty or obligation as evidenced by members' obligation to comply with a professional body's requirements (Batenburg, Benders & Blonk, 2008). Organisations experience normative isomorphism when decision-making is influenced by prior education and training or from the professional bodies that they are associated with.

A study on the mechanism that influences ERP adoption has led the researchers to adopting a technical isomorphism perspective (Batenburg *et al.*, 2008). The study reveals how technical isomorphism together with coercive isomorphism leads to the standardisation of working procedures and systems adoption. This suggests that managers should be aware of the implications of isomorphism during the early stage of decision-making.

It is argued that due to a high level of uncertainty associated with the ERP system and the fact that many of its benefits are intangible, increase the possibility of institutional influences on management's decision (Ugrin, 2009). Management may choose to pursue institutionalised reasoning to legitimise their justifications to adopt the ERP system.

An investigation on the impact of generalised competition and firm strategy choices on ICT adoption has indicated that investment in ICT does have a positive impact on firm value (Loukis, Sapounas, & Aivalis, 2008). The study also finds that only the bargaining power of suppliers, suggesting the existence of coercive isomorphism, and frequent introduction of new products and services are significant variables in ICT development.

An analysis on supply change management (SCM) suggests that implementation of the ERP system resulting from coercive pressure offers more benefits to the implementing organisations, also known as the follower, as the adopted organisation, known as the initiator, tends to provide support and technical assistance to ensure successful implementation of the system (Lai, Wong, & Cheng, 2006). The followers are normally guaranteed business opportunities by the initiator. Alternatively, system adoptions arising from mimetic and normative pressures are more complicated and challenging. This is because organisations influenced by normative pressure need to adopt the standards set by the initiator and are less likely to receive additional support and business from the initiator. Similarly, organisations influenced by mimetic pressure have to struggle alone in implementing the system in the hope that by adopting the system, they may enhance business growth and encourage business opportunities with other adopting organisations.

A comparative analysis to examine if there were any significant differences between adoption factors infuencing SMEs and large organisations was conducted (Buonanno, Faverio, Pigni, Ravarini, Sciuto, & Tagliavini, 2005), and the findings suggest that business complexity does not affect an organisation's decision to adopt the ERP system except for the size factor; large organisations are more inclined to adopt the system compared to SMEs. The decision of larger organisations is largely influenced by the need to improve business efficiency, and decisions are mainly made based on implications arising from both internal and external factors. The need to integrate all business functions and resolve management issues and high data redundancy have been the main objectives why the ERP system has been adopted. In addition, it is noted that 38.2 % of larger organisations claim that they are forced by controlling companies to adopt the system (highlighting the influence of coercive pressure).

Studies also acknowledge the notion that technology selection does not always involve a rigorous analytical and evaluation process (Tingling & Parent, 2004). It may be entwined with ceremonial rules and the organisation's culture and experience. In selecting an appropriate system, extensive analysis must be conducted but, at the same time, what is considered acceptable and appropriate in the industry may also influence management's decision.

In summary, the institutional theory provides an alternative explanation for the decision to adopt ERP i.e. the possibility that organisations would adopt a system not entirely based on economic rationality. However, this does not necessarily mean that the organisation could not achieve enhanced efficiency previously (DiMaggio & Powell, 1983) as "rational behaviour, efficiency and effectiveness" (Tingling & Parent, 2004, pp 333) are still the fundamental concern in terms of the institutional theory. The difference lies in the way a subject is viewed as institutional theory concentrates on achieving legitimacy. The theory focuses on building relationship, trust and acceptance with customers, suppliers and other significant resource providers.

Based on the theories and empirical literature reviewed, this study proposes to investigate how both economic- and institutional-based factors may affect management's decision to adopt the ERP system. As the perceived benefits from ERP adoption would aid attainment of organisational economic goals, economic considerations or economic-based factors are expected to influence ERP adoption. The following hypotheses are developed:

H_{1a}: Expected operational benefits of ERP adoption significantly influence the decision to adopt the ERP system.

H_{1b}: Expected managerial benefits of ERP adoption significantly influence the decision to adopt the ERP system.

H_{1c}: Expected strategic benefits of ERP adoption significantly influence the decision to adopt the ERP system.

The pressure from customers, dominant organisations and suppliers could have a strong influence on an organisation's decision to adopt the ERP system (Teo *et al.*, 2003; Krell *et al.*, 2009; Lai *et al.*, 2006), leading to the following hypothesis:

H_{2a}: The greater the coercive pressure experienced by the organisation, the greater the likelihood of the decision to adopt the ERP system by the organisation.

The complexity of the tasks and additional efforts required in making the decision could induce management to resort to a more simplified method in arriving at a decision (Vessey, 1994). One of the most common methods is to mimic the actions of other successful organisations (Ugrin, 2009). Mimicking behaviour boosts the confidence of management that they are making the right decision as their decision is alligned with successful outomes experienced by other organisations in the same industry. This suggests that when management are faced with a high level of uncertainty and the cost and time required to search for the right decision are excessive, there is a high possibility that management will rely on the successful actions of other organisations to legitimise their decision.

The most successful organisations in the field will be held as a benchmark (Gosain, 2004). Benchmarking other successful organisations can be classified as a mimetic process (Ketokivi & Schroeder, 2004). This is supported by Dos Santos and Peffers (1998) who examined the impact of competitor and vendor behaviour on system selection decision-making. Dos Santos and Peffers (1998) find that competitors' success in implementing an innovation encourages organisations to mimic the actions of those competitors that led to their success.

In addition, the risk of making the wrong decision could also lead management to imitate the practices of other organisations that have proven to be successful (Lindley & Topping, 2008). Organisations also adopt mimetic behaviour to gain recognition and acceptance (DiMaggio & Powell, 1983). This commonly occurs when many other organisations value certain information system as essential and feel more comfortable working with organisations that use a similar system (Lai *et al.,* 2006). This will further encourage management to implement similar technology to facilitate the initiation of new business contacts and to enhance business profitability. Thus, the second sub-hypothesis is:

H_{2b}: The greater the mimetic pressure experienced by the organisation, the greater the likelihood of an ERP system adoption decision by the organisation.

In the ERP context, normative isomorphism commonly arises out of the management's association and membership with professional bodies, trade associations and business alliances (Krell *et al.*, 2009). Management are commonly influenced to adopt certain ideology and best practices through communication with people within the same professional networks or during

discussions at trade conventions (Ketokivi & Schroeder, 2004). Professional association has long been offered as a means for managers to exchange views and vision that can help them in shaping the direction of their organisation (Gosain, 2004). The information and new knowledge learnt from these encounters may influence management judgement. Naturally, it is common for people with the same background and education to be more agreeable towards and receptive of one another's ideas and suggestions (Liao, 1996), thus, resulting in normative behavior. Therefore, the following hypothesis is formulated:

H_{2c}: The greater the normative pressure experienced by the organisation, the greater the likelihood for an ERP system adoption decision by the organisation.

The research framework is summarised in Fig.1.

METHODOLOGY

A survey in the form of a questionnaire was used in this study. It is the most appropriate method to measure people attitudes, behaviour, knowledge and opinion (Cooper & Schindler, 2008; Totten, Panacek, & Price, 1999). The questionnaire consisted of a set of questions developed to measure the respondent's perception of factors influencing an organisation's decision to adopt the ERP system and the system's impact on organisational performance. The question items were adapted from previous studies such as Kamhawi (2008), Law and Ngai (2007), and Teo *et al.* (2003). Some modifications were made to the questionnaire items to suit the research objectives and the ERP system setting in Malaysia. The questionnaire was pre-tested on several business managers to gauge the validity of the questionnaire items and to further improve the questionnaire design. Several comments were received and amendments were made accordingly.

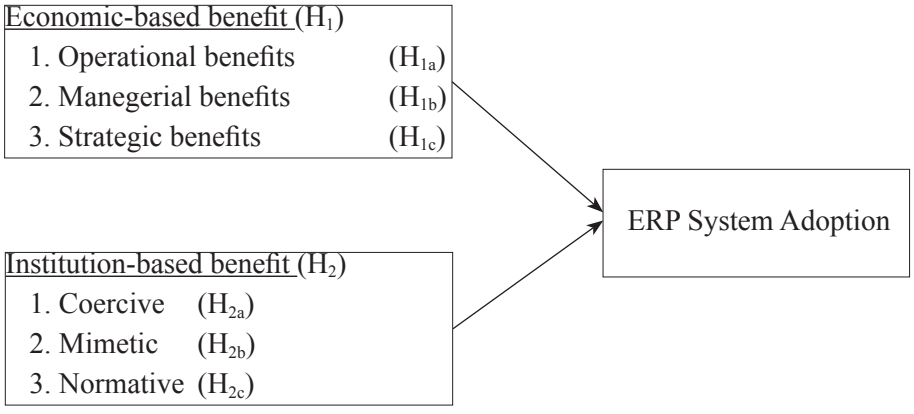

Fig.1: Research Framework of Factors Affecting the Decision to Adopt the ERP System

A reliability test was conducted to measure the reliability of the instrument used in this study. A reliability test gauges the degree to which research results would be similar even if the research were conducted in a different environment (Cooper & Schindler, 2008). As a rule of thumb, a Cronbach Alpha value of 0.70 and above is viewed as acceptable (Nunnaly, 1978).

As indicated in Table 1, the reliability coefficients for *strategic benefits* and *mimetic* are above 0.90, while those of three of the other variables, *operational benefits, managerial benefits* and *coercive,* are above 0.80. The *normative pressure* variable is the only variable with a Cronbach Alpha of less than 0.80 (0.794). Therefore, the Cronbach Alpha coefficients for all of the variables in this study have exceeded the acceptable level required.

TABLE 1
Reliability Coefficient of the Research Variables

Variable	Number of Items	Cronbach Alpha
Operational benefits	8	0.864
Managerial benefits	6	0.867
Strategic benefits	8	0.928
Mimetic	3	0.926
Coercive	6	0.809
Normative	2	0.794

The sample size for this study consisted of all 976 companies listed with BURSA Malaysia. Of this number, 861 companies are listed in the main market of Bursa Malaysia and 115 companies are listed in the ACE market of Bursa Malaysia (Bursa Malaysia, 2010). Questionnaires were also sent to a sample of 200 companies, which were selected based on a systematic sampling procedure from the Federation of Malaysian Manufacturers (FMM) database.

The unit of analysis for this study was the organisational level and senior managers of organisations were the targeted respondents because they were likely to be involved in the ERP system adoption decision-making process. Organisations were selected from various industries and sectors as the ERP system is not exclusive to certain types of organisation.

Questionnaires were mailed out in stages. The first sets of questionnaires were sent in the first week of April. Two weeks later, non-responding organisations were contacted via telephone and reminder emails were sent to them to encourage participation. This process was repeated until all the respondents had been contacted. At this point of time, a webbased questionnaire was also created. This was to provide wider options for managers to choose their preferred method of answering the questionnaire. By the end of June 2011, 136 usable responses were received via mail and email.

Measures

This study uses a five-point rating scale for measurement. The dependent variable of the organisation's adoption level is measured based on the organisation's intention to achieve automate level, informate level or transformate level (Zuboff, 1985). Automate level benefits is defined as replacing the existing system with a better and more

advanced technology that operates the same functions with less cost incurred. Informate, on the other hand, refers to the organisation's capability to analyse and comprehend the information presented by the system to make better and informed decisions. Finally, transformate is the extent to which the ERP system can affect the organisation's strategies and goals. Accordingly, in this study, automate is known as operational benefits focusing on process improvement and cost reduction; informate as tactical or managerial benefits comprising management's ability to make better decisions, correctly identifying customer needs and requirements and increasing the organisation's revenue; and transformate as strategic benefits which refer to the organisation's ability to adapt to changes and improve market value (Chand, Hachey, Hunton, Owhoso & Vasudevan, 2005).

Statistically significant ERP system benefits, empirically proven by Shiau, Hsu and Wang (2009), Kamhawi (2008) and Buonanno *et al.* (2005), were used as items to represent the independent variables. The benefits were subsequently categorised as economic-based factors comprising operational benefits (representing the automate objective), managerial benefits (representing the informate objective) and strategic benefits (representing the transformate objective) and institution-based factors consisting of coercive, mimetic and normative factors. Each benefit is assessed based on its perceived importance.

Coercive pressure is defined as the influence asserted by dominant parties in the adoption of the ERP system. The source of this pressure may be the parent company, suppliers or customers. Mimetic pressures refer to voluntary and conscious action undertaken by an organisation that mimics its competitor's actions (Shi, Shambare, & Wang, 2007). Normative behaviour, on the other hand, is the organisation's unconscious act of imitating the actions and practices of its competitors (Shi *et al.*, 2007; DiMaggio & Powell, 1983). Membership of professional bodies or trade associations was included as a proxy for normative influence. All the questions on institutional pressures were adapted and developed from studies by Teo *et al.* (2003) and Ugrin (2009).

RESULTS

Descriptive data analysis was conducted to provide an overview of the data pattern. Statistical analysis such as mean, median and mode are commonly adopted in this type of analysis.

Respondent profiles

As shown in Table 2, the majority of the respondents (70.59 %) held senior managerial positions such as accounts manager, branch manager, finance manager, human resource manager and information and technology manager. Respondents holding top management positions consisted of Chief Executive Officers, Directors and Vice Presidents and they constituted 26.47 % of the total respondents. About 2.94 % of the responses were from deputy managers or assistant managers and management consultants.

TABLE 2
Profile of Respondents and Organisations

Job Designation	Total	Percentage
Middle Manager	4	2.94
Senior Manager	96	70.59
Top Management	36	26.47
	136	100.00
Work Experience	Total	Percentage
Less than 10 years	30	22.06
11 to 20 years	62	45.59
Above 20 years	44	32.35
	136	100.00
Industry Category	Total	Percentage
Manufacturing	82	60.29
Trading and Services	25	18.38
Construction	18	13.24
Finance and Insurance	7	5.15
Mining and Plantation	4	2.94
	136	100.00
Number of employees	Total	Percentage
Less than 250	59	43.38
251 to 1000	54	39.71
Above 1001	23	16.91
	136	100.00
Legal Structure	Total	Percentage
Unincorporated	29	21.32
Incorporated	107	78.68
Ownership Structure	Total	Percentage
Privately-owned company	46	33.82
Local public-listed	67	49.26
Government-owned/ Controlled	8	5.88
Foreign-owned	15	11.03
	136	100.00

Most of the respondents had many years of working experience; 45.59 % of them had work experience of between 11 and 20 years, 32.35 % had more than 20 years of work experience, and the remaining 22.06 % had less than 10 years of work experience.

The respondents came from five industry sectors: manufacturing sector, trading and services sector, construction sector, finance and insurance sector and mining and plantation sectors. The sample is dominated by organisations from the manufacturing sector, which includes the industrial products and consumer products industry (60.29 %), followed by those in the trading and services sector, which include the technology industry (18.38%), and the construction sector, which includes the property and infrastructure industries (13.24%). Organisations in the finance and insurance industry represented 5.15 % of this study sample. The remaining 2.94 % were from the mining and plantation industry.

In this study, the size of the organisation is measured by the number of employees. About 43.38 % of the respondents were from the small industries sector with less than 250 employees and the remaining 56.62 % were from larger organisations with between 251 and more than 1,000 employees.

With regard to the legal structure, 78.68 % of the organisations were incorporated entities, while the remaining 21.32 % were unincorporated entities. In terms of ownership type, almost half of the sample organisations (49.26 %) were public-listed organisations, while 33.82 % were privately-owned organisations comprising local-family owned and local non-family privately-owned organizations. Foreign-owned organisations and government controlled organisations constituted 11.03 % and 5.88 % of the sample respectively.

Correlation and Logistic regression results

A correlation analysis tests the strength of linear relationships and the association between two variables. A correlation analysis was conducted for economic-based benefits and Institutional factors influencing ERP adoption. Table 3 depicts the correlation results.

The results indicate that there are significant correlations between ERP adoption with all variables except for the normative and coercive pressure variables.

Logistic regression was conducted to investigate the effect of factors affecting the decision to adopt the ERP system. Logistic regression was used due to the categorical nature of the dependent variable. In addition, logistic regression is also designed to predict the probability of the occurrence of an event (Hair *et al.*, 2006).

Before reviewing the results, it is important to ascertain how well the model actually fits the observed data (Hair *et al.*, 2006). Therefore, the Hosmer and Lemershow test was carried out. The subsequent step is to determine the impact of each variable on the decision to adopt ERP. The significance of the variable is indicated by the p-value of the result. However, the direction of the relationship is determined by the positive or negative sign for the beta coefficient (B), while the association between ERP adoption and the independent variables is determined by examining the odds ratio figure (Exp 'B'). The odds ratio indicates the change in odds resulting from a change in predictor variables. As a rule of thumb, an odds ratio of more than 1 indicates a high probability of ERP system adoption and an odds ratio of less than 1 suggests the probability of non-adoption of the ERP system. Table 4 shows the results of logistic regression analysis.

Table 4 highlights that there are only three variables that are statistically significant and the variables are the operational benefits, strategic benefits and mimetic variables ($p<0.1$). However, the strategic benefits variable shows a negative sign, indicating that this variable is negatively associated with ERP system adoption. The chi-square value of 12.761 with a significant p-value of 0.120 further indicates that the model is good.

TABLE 3
Result of Correlation Analysis

	ERP Adoption	Operation	Managerial	Strategic	Mimetic	Normative	Coercive
ERP Adoption	1						
Operational	0.200*	1					
Managerial	0.253**	0.784**	1				
Strategic	0.288**	0.723**	0.735**	1			
Mimetic	0.321**	0.077	0.104	0.116	1		
Normative	0.055	0.240**	0.205**	0.220**	0.541**	1	
Coercive	0.062	0.164*	0.119	0.104	0.596**	0.657**	1

*Correlation is significant at the 0.05 level (1-tailed)
**Correlation is significant at the 0.02 level (1-tailed)

In general, the result shows that only two variables, operational benefits and mimetic pressure, are significantly associated with the decision to adopt the ERP.

Table 5 indicates that the model could correctly classify 75.7 % of ERP system adoption cases.

DISCUSSION

Analysis on economic benefit factors shows that only operational benefits (H_{1a}) is significant in the decision to adopt ERP, while managerial benefits (H_{1b}) and strategic benefits (H_{1c}) are not significant in ERP adoption. For institutional pressure factors, the results indicate that only mimetic pressure (H_{2b}) is significant in ERP adoption. Normative pressure (H_{2c}) and coercive pressure (H_{2a}) are not significant.

Operational benefits have been widely acknowledged as the most important set of factors to influence ERP system adoption (Shiau *et al.*, 2009; Jang *et al.*, 2009). The increasing need to improve internal operations and activities is the prime reason that encourages many organisations to adopt the ERP system. It is also reported that internal requirements rather than the

TABLE 4
Results of the Logistic Regression Analysis

Variables	B	Wald	Sig.	Exp (B)
Constant	-4.837	4.461	0.035	0.008
Organisation size	-0.139	0.302	0.645	0.87
Industry Sector	-0.234	1.549	0.213	0.791
Operational	1.526	6.629	0.01***	4.598
Managerial	0.118	0.065	0.799	1.125
Strategic	-1.291	8.698	0.003***	0.275
Mimetic	0.809	5.92	0.015**	2.245
Normative	0.21	0.311	0.5	1.234
Coercive	0.371	0.52	0.471	1.45

Hosmer and Lemershow test: Chi square=12.761, p=0.120
Cox & Snell R Square=0.218
Nagelkerke R Square=0.306
***Significant at 0.01, **Significant at 0.1

TABLE 5
Summary of Classification Table

Observed		Predicted		
		ERP ADOPTION		Percentage Correct
		Yes	No	
ERP ADOPTION	Yes	84	9	90.3
	No	24	19	44.2
Overall Percentage				75.7

need to remain competitive have driven many organisations towards adoption of the system (Koh *et al.*, 2006). Earlier studies have found that operational benefits such as improvement of processing time, integration of business process and ability to access, monitor and process wider data are among the most cited motivations for adoption of the system (Benders *et al*., 2006; Koh *et al.*, 2006). Similarly, the results from this study indicate that *the need to improve data accuracy and integrity* and to *speed up the preparation of financial reports* has been among the most important operational benefits that motivate ERP system adoption. This suggests that operational benefits are still held as one of the key considerations in an organisation's deliberation on adopting the ERP system.

This study, however, finds that managerial-benefits reasoning is not strong enough to encourage ERP system adoption. This finding indicates that both adopters and non-adopters of ERP system do have a similar perception of the system's ability to enhance decision-making capabilities. Managerial benefits in this study covers the management's decision-making quality in terms of speed and timely decision-making and collaborative performance in the decision-making process. The findings of this study however, are not consistent with previous research that reported improvement in decision-making as one of the important motives for ERP adoption (Kamhawi, 2008; Shiau *et al.*, 2009). Even though managerial-benefits consideration does not significantly impact the decision to adopt ERP in this study, both ERP adopters and non-adopters have ranked managerial benefits as one of the important benefits that can be attained from ERP system adoption (overall mean value = 4.094).

In addition, a statistically significant negative result obtained for strategic benefits indicates that the variable of strategic benefits is not an important consideration in an organisation's decision to adopt the ERP system. This finding suggests that ERP adoption in Malaysia still focuses on improving the organisation's internal operation processes. The advantages that come from positioning itself strategically to face future challenges as may be attained from ERP system adoption are not compelling enough for an organisation to initiate system adoption. This finding is consistent with the finding of Chand *et al.* (2005), whose study noted that automate level benefits are the first to be seen from ERP adoption, followed by informate and transformate level benefits respectively. This study implies that an organisation's key objective in adopting the ERP system is to improve their its internal processes (automate benefits) rather than to improve its capabilities to respond to market changes and build better relationships with customers and suppliers (transformate benefits). Some organisations, however, are usually contented when the automate- and informate-level benefits have been achieved. This further supports the notion that strategic benefits is the last economic factor that organisations expect to achieve with the adoption of the ERP system (Chand *et al.*, 2005).

As for institutional-based factors, the results show that the mimetic pressure hypothesis (H_{2b}) is supported, while the normative pressure (H_{2c}) and coercive pressure (H_{2a}) hypotheses are not supported.

The results of this study indicate that mimetic pressure does influence an organisation's decision to adopt the ERP system. This is consistent with various studies that highlight the existence of competitive pressure in the decision to adopt the ERP system (Ugrin, 2009; Salmeron & Bueno, 2006; Tingling & Parent, 2004). Organisations are known to be very reactive to external pressures, and this has been recognised to be a common motivating factor that influences technological innovation adoption (Benders *et al.*, 2006). Management do look at their competitors for direction in their own decision-making. Thus, to remain competitive, it is important for organisations to be ahead in their technological capabilities. By replicating competitors, management may hope to reduce the risks of uncertainty and to appear more confident about their decision. More importantly, this study highlights the competitive drive of Malaysian organistions in shaping and improving their technological capabilities, particularly in ensuring that they are on par with their competitors.

Finally, the impact of both normative-pressure and coercive pressure are found to be not significant. The findings are consistent with a study conducted by Laukkanen *et al.* (2007), which found out that there was minimal influence received from external parties in the decision to adopt ERP. The majority of the organisations in the sample studied in this work make decisions based on their own independent analysis. Thus, this suggests that Malaysian organisations are not too vulnerable to extenal pressures, particularly from normative and coercive influence, in their decision-making. Pressure from customers, suppliers, parent companies and professional associations has limited impact on their decision to adopt the ERP system. One of the possible reasons for this is that many Malaysian organisations which have adopted the ERP system are still at the early stage of the system implementation (Supramaniam & Kuppusamy, 2010). Thus, they do not have much authority to exert others to follow their lead.

CONCLUSION AND IMPLICATIONS

The conceptual model in this study is based on two theoretical concepts. First, the economic-based transaction cost theory explains the rationale for ERP system adoption. Second, the institutional theory explains the influence of institutional pressure on ERP adoption. The results of this study provide further empirical evidence in addition to previous literature on the importance of a consideration of the economic benefits in management decisions on technology adoption. Even though there is no significant result for a consideration of managerial benefits and strategic benefits, the descriptive statistics indicate its perceived importance. With regard to institution-based factors, the study finds that mimetic pressure is a significant factor that in influencing an organisation's decision-making.

This study highlights some important elements that might impact management's decision-making. Generally, the results suggest that management do make decisions based on rational decision-making. The benefits of adopting the ERP system are carefully weighed and the system's ability to further enhance the organisation's operational objectives is evidently taken into consideration. This implies that management are generally cautious in their contemplation of adopting a technical system that involves huge investments and necessitates changes to their existing organisational activities.

This study also finds evidence of mimetic pressure that may influence the decision to adopt ERP. Even though the results indicate that both coercive pressure and normative pressure do not significantly influence an organisation's decision to adopt the ERP system, they are however somewhat influenced by the need to mimic decisions of successful competitors. Mimicking other successful organisations could lead to various advantages as it minimises the cost of searching for the right information system and also reduces the risk of being the first adopter of any new innovation. In addition, adopting a system proven to be successful by other organisations would definitely lend some confidence to the management in making their own decision.

However, the risk of imitating other organisations cannot be undermined. This is because every organisation is unique in itself with its own flow of operational activities and processes. This also means that each organisation possesses specific needs and requirements. Imitating other organisations that have different requirements could cause major catastrophe. Management should also consider their existing capabilities when adopting a sophisticated information system such as ERP. It is important to be able to measure the organisation's own capabilities prior to imitating another organisation's actions. Therefore, it is particularly crucial for management to be aware of this type of influence. The act of imitating another organisation could be a best alternative, but the imitation must be conducted with caution. An indiscreet and thoughtless imitation could lead an organisation to a disastrous outcome.

Acknowledging the limitations of the study would actually create potential avenues for carrying out prospective future research. As this study only focuses on two types of organisation, public-listed companies and organisations listed with FMM, future studies can be conducted on other types of organisation such as small and medium enterprises, public-sector companies and non-profit organisations.

Only the middle-to-top-management perspective was investigated in this study. Low-level management and employee perception were not taken into consideration, in particular, to determine the level of ERP system usage and the intensity of user satisfaction. Future studies looking at these perspectives may increase the understanding of the overall ERP system impact on organisational performance.

Finally, conducting a case study analysis or qualitative research can further enhance

the value of this study. The variables presented in this study were obtained from prior literature on information system generally and the ERP system specifically. Since the ERP system is a unique and complex system, there is always a possibility that it would also have unique factors. Therefore, case study analysis and in-depth interview with the right authorities may uncover new factors that may affect ERP system adoption and subsequently, the system's impact on organisational performance. It could also further verify the findings of this study, thus providing greater validity for the research results.

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