CHAPTER 2:   LITERATURE REVIEW

This report focuses on the effectiveness implementation of ERP system in most of the companies in Malaysia. Business environment is rapidly changing. Companies in Malaysia facing high competition among them compared to foreign multinational companies. This increase the pressure on companies to lower total costs in the entire supply chain, shorten throughout times, drastically reduce inventories, expand product choice, provide more reliable delivery dates and better customer service, improve quality, and efficiently coordinate global demand, supply, and production   (Umble). The report covers the various kinds of areas such as manufacturing, services, educational sector, and trading industries. There were still few businesses units using their old systems not integrated with the ERP system.

Several authors cite gaps in the research on ERP system effectiveness, issues and problems regarding this study. Given these limitations of effectiveness to organization research, the main purpose of this study is to address how ERP system can effectively influence employee's daily behavior and what is the impact towards employees without this system. The gap in empirical research by examining the relationship between ERP system and their effectiveness towards organization factors (operational, HR, economic and technology will support and recognition for learning, resources to perform the job, teams, and knowledge management) and the organizational outcomes of change adaptation, innovation, and bottom-line performance.

The effectiveness of this system is related to several critical success factors (CSF). The CSF method has three steps such as listing the goals and objectives, identifying the CSF necessary to achieve the goals and objectives and suggesting ways in which the CSF are to be measured. On the other hand, the factors for CSF will include top management support, clear goal and objective, communication, effective project management, business process re-engineering, data accuracy and integrity, suitability of software and hardware, vendor support, education and training, and user involvement (Bullen).

By implement the said factors into the implementation of ERP system, I believe the effectiveness will be much higher. Furthermore, the weaknesses of implementation flow can be reduced to minimum level of acceptance.

Enterprise Resource Planning has taken the business community's opportunities to new heights. The holistic integrated transaction and business analysis afforded by the ERP paradigm has provided the synergy needed to keep the business process as dynamic as possible and cut down the reaction time to customer needs.

The process of implementation of ERP solutions will require a different tack as compared to traditional IT software projects. This is largely due to the character of ERP solutions, which requires business process reengineering as a precursor to its introduction because ERP systems are, a centered round world best practice business rule.

The reengineering process affects the people and process in a profound way and to enlist the co-operation of employees at all levels of the organization a strategic approach to change management is necessary. Leader in the ERP implementation race like department of defense has involved the people from functional areas in contributing to the success of their projects. While ERP IT vendors have provided assistance with the technical aspects of implementing the software (through procedure model and accelerate SAP in the case of SAP) there is no framework available to handle the change management and human side of the implementation process.

As significant cost is associated with the implementation process, a proven framework to address the key issues concerning people and process is past over-due. This gap need addressing at the very early stage as otherwise the cost of implementation may become a major deterrent in seeking ERP based solutions particularly in companies with small budget (R. Appuswamy).

There are few issues that confront ERP implementation such as people, hardware, software, and etc is actually bringing a lot of problems to this system. The major problem is making this system to be more complicated. The effect of the problem would question most companies on how effective the system is. What is the most effective method to resolve the problem and how does it affect the general management flow in the organization.

One of the example issues is traditionalises IT projects versus ERP software projects. Different technology may have their dynamic strategies and advantages. The intention to shift from old style management skill to new skill may take lots of time and arguments. People may resist this circumstances and some of them may refuse to change because they may not able to handle it in the proper manner and effectively. The resistance to change will give impact to organization in order to reduce the effectiveness for the whole management executing system.

Effective implementation of ERP requires establishing five core competencies, among which is the use of change management strategies to promote the infusion of ERP in the workplace Although some studies tried to address this problem by identifying change management strategies that facilitate the success of ERP implementation, many ERP systems still face resistance, and ultimately, failure. (Al-Mashari, M. and Zairi, M)

Past ERP implementation research may be described as factor research, which involves identifying the factors or variables that are critical for implementing ERP successfully. Although factor research is valuable that are critical for advancing our understanding of ERP implementation success, it adopts a rather static view, which limits its adequacy in explaining the dynamics of the implementation process. Thus, factor research alone is not adequate for explaining how the transition from resistance to success has happened. Unlike factor research help us understand how ERP

implementation efforts have happened; it therefore gives a moving picture about how we got from time 1 to time 2 (Adel M. Aladwani).

On the organizational level, there were two major change drivers: political problems, which resulted from changes in structures and distribution of power and organizational changes, which resulted from process changes and re-organization of work within the group. On the individual level, changes in work roles and tasks, the required increased use of ERP system in job tasks and the resulting knowledge changes were the main change drivers.

As the implementation methodology and the approach taken to manage the implementation process were lacking from a realistic understanding of such human-oriented issues, the problems encountered appeared as unexpected consequences global company considering to perform a radical, large-scale ERP implementation should carefully assesses its culture and capabilities. The lack of understanding of the ERP implementation as a fundamental, strategic change process, the lack of leadership and commitment within the top management were the key reasons (Kemppainen).

There are four ideal types of planned change processes such as commanding, engineering, teaching and socializing. Commanding is appropriate for changing formal structures episodically, whereas engineering is appropriate for changing work processes on a more continuous basis. Teaching can be used for changing beliefs episodically; whereas social relationship is best changed through socializing which usually requires longer

time. Large-scale changes require alterations of multiple organizational elements, thus calling for the use of several ideal intervention types can be identified (Huy, Q.N).

Management needs to decide on the key related implementation and business issues and how to proceed. ERP is not suitable for companies that are experiencing rapid growth and change in an unstable environment are undergoing change in the corporate management and philosophy, or that will be experiencing merger or liquidation in the near future. They will be more foreseeable system integration problems if one of the merging companies is in the midst of an ERP upgrade because it must deal with scalability, a new IT infrastructure, and a different corporate culture simultaneously (Radcliff, eborah, and Alice plante).

People related issues such as corporate philosophy and leadership style can play an important role in the ERP implementation process. Research has concluded that achieve top management support and commitment are essential to the success of any system implementation. Frequently, executive councils and steering committees consisting of top managers are developed to plan and manage the IT initiatives (Ross, Geanne and Peter).

ERP implementation requires organizations to reengineering their key business processes in fundamental ways, revamping old ways of conducting business, redefining job responsibilities, and restructuring the organization. For major multinational corporations (MNC), the ERP systems must be

customized to address global issues where different countries have different ways of doing business, and to incorporate country-specific business practices pertaining to accounting, tax requirements, environmental regulations, human resources, manufacturing, and currency conversion into the integrated system.

While integrating the information systems across various countries, three type of misfits (relating to data, process and output) can occur due to incompatibilities between software functionality and organizational requirements as well as differences in cultural and regulatory environments (Poh, Cristina, Piew and Goanne Tay).

An ERP implementation is a huge commitment from the organization, causing millions of dollars and can take up to several years to complete. However, when it is integrated successfully, the benefits can be enormous. A well-designed and properly integrated ERP system allows the most updated information to be shared among various business functions, thereby resulting in tremendous cost savings and increased efficiency. Then making the implementation decision, management must considered fundamental issues such as the organization's readiness and dramatic change, the degree of integration, key business processes to be implemented, e-business applications to be included, and whether or not new hardware need to be acquired.

In order to increase the chance of user acceptance, employees must be consulted and be involved in all stages of the implementations process. Providing proper education and appropriate training are also two important strategies to increase the end user acceptance rate.

The organization is also going being restructured, and job responsibilities being redefined. To facilitate the change process, managers are encouraged to utilize the eight level organizational change processes. Managers can implement their ERP system in several ways, which include the whole integration, the franchise approach, and the single-module approach (Dr. Linda K. Lau).

ERP systems are applications packages including several modules supporting all operation areas: planning, production, sale, marketing, distribution, accounting, financial, human resources, project management, stocks, service and maintenance, logistics and e-business. System architecture facilitates transparent module integration, guaranteeing, at the same time, the information flow between all enterprise functions in an extremely transparent manner. The choice of an adequate ERP system enables the benefit to implement a single integrated system. There is no successful ERP without process reengineering (Fotache D., Hurbean L).

The public information systems set up in the 90s, but their integration aspiration became visible at the end of the 20th century. ERP public system involves most of the business ERP but also have distinctive features as we

described in the paper. The improvements triggered by integrated system (ERP) implementation in public organizations are: processes become visible, job broadens, organizational boundaries begin to dissolve and fade away, authority moves to the front line.

All users can have access to all information and processes not only become visible, they become standardized. The level of complexity of governments, in general, and the fast rate of social change, has brought bureaucratic administrations to the point of total breakdown.

Efficient and effective technological infrastructures are necessary to enable new forms of business. ERP system might be view as the first step in the right direction. Each ERP implementation is unique and presents its own challenges, sacrifices, and accomplishments. Each implementation is a lesson to learn and the key of success is the sum of these lessons. The issues are as never assuming anything, ownership of project is the key, change management is the key to success, and good project management is not just a Gantt chart (Hurbean, Luminita).

Critical success factors may ensure effective ERP implementation and a realization of the promised benefits. Factors affecting ERP implementation are complex and abundant. A total of 10 critical success factors for ERP implementation have been identified based on a review of the related literature. Two factors such as 'Top management support', 'clear goals and objectives' have been shown to be the extremely important factors for ERP

implementation in Malaysia (S.M. Jafari, M.R. Osman, R.M. Yusuff and S.H Tang).

Based on the implementation experience of a few companies like Cable Systems International, Amoco Corp, McKesson Corp, BCAG, Ansett Australia the issues that confront ERP implementation are people, business process reengineering, data migration, hardware and network topology and configuration issues, enormity of the effect (i.e. interruptions to production processes) of go-live on production, integration of existing legacy systems to ERP and above all the massive cost associated with the ERP project which may result in cost overruns.

The overwhelming effect of some or all of these issues has resulted in abandoning the ERP software midstream by a number of companies. Therefore there is enormous risk associated with such bold initiative. As in all projects, risk management of ERP project will need extreme attention in project management strategy. A quick appraisal of project management strategies required for ERP implementation compared to traditional IT project is not out of place (Jesitus, John).

ERP provides a total, integrated software solution to manage an organization's core business and information-processing needs. It supports a process-oriented view of the business, and increase the efficiency and effectiveness of enterprise-wide business processes despite the promise of

ERP, difficulties and high failure rates in implementing ERP system have been widely reported.

Although some of these problems arise from the technical aspects of the system, the majority of these problems arise from management, social, and organizational issues. For ERP implementation to be successful, these issues must be managed. This special issue will address these issues by focusing on the study of relationships and interactions between humans and computers in the ERP context (Fiona Fui-Hoon Nah).

The working relationship among the implementer, consultants and the impact on ERP implementation outcomes will be discussed accordingly. ERP implementations involve not only internal personnel (information systems staff, functional core members, managers and users), but also external parties such as ERP vendors, third party vendors, and consultants.

The partnership and working relationships between the different parties can have a significant impact on ERP implementation. The role of consultants, and the relationships between the consultant's levels of involvement and ERP implementer's level of knowledge can effect consultant's behavior and the project outcomes. Their study not only increase our understanding of the challenges involved in managing ERP projects but also provides a better understanding of the implementer-consultant relationships based on the agency theory (Haines, M. N., & Goodhue, D.L).

An ERP system is likely to have a profound effect on both the way that an organization functions and the manner in which it affects its employees. ERP implementation success is found in modifying the organizational culture. Achieving business benefit requires the organization to experiment with new process models, and this requires an orientation towards risk taking, rather than risk avoidance.

Each of these aspects requires effective leadership in the management structure, and appropriate involvement and empowerment of the system users. The development of an organizational readiness benchmark will assist in identifying potential blockages to effectiveness ERP implementation.

Organization now seeking to upgrade their ERP or to extract further business benefits and this work is requiring further ERP implementation. Thus, improvements in the implementation process will reduce the costs and increase business benefits. We seek to develop a benchmarking approach to characterizing organizational implementation practices and from that benchmark, recommend changes that must be effected before embarking on the actual implementation. We think these results will benefit:1) organizations seeking to achieve business benefit from ERP implementations, 2) consultants seeking to work on these projects, and 3) researchers seeking to understand some of the barriers to successful ERP implementation, and subsequent exploration of such system (Glenn Stewart, Michael Milford, Tony Jewels, Therese Hunter).

The recipe for effective leadership is clarity of vision, credible communication and interpersonal skills, sincerity, generosity & self-mastery and high levels of motivation and physical energy.

There are four competencies of leadership, which is management of attention-ability to draw others to them because they have their vision, a dream, a set of intentions, an agenda, and a frame of reference. Management of meaning – make dreams apparent to others, and to align people with them, leaders must communicate their visions. Management of trust-main determinant of trust is reliability must know constancy and focus, and management of self- knowing one's skills and deploying them effectively (Cooper, R.B., and Robert W. Zmud).

From the origin in material requirements planning, ERP systems have evolved into software packages that support coordination of different actors in a company. Current ERP systems contain modules not only for material management, but also for accounting, human resource management and all other functions that support business operations.

In the past years, the role of ERP systems as coordination support has been extended to cross-organizational coordination. By 'cross-organizational' we mean that the ERP system is used by different independent, or nearly independent, businesses. For example, businesses cooperate with their customers, suppliers, and other stakeholders to form value webs.

Large companies have structured themselves as sets of nearly independent business units, each responsible for their own profit and loss. ERP implementation is considerably more difficult in such a networked context than in an intra-organizational context because in a networked context, we have different business actors who make decisions based on their own local criteria. Different businesses have different infrastructures, different enterprise systems, different business processes, and different semantics of data, different authorization hierarchies, and different decision centers.

If these businesses decide to cooperate for a particular purpose, all these differences still exist and none of the participating businesses will be prepared to change their infrastructure, business processes, and semantics, just for this particular cooperation, or to reveal the confidential business rules embedded in their processes and applications.

ERP implementation is the customization and introduction of an ERP system in a (possibly networked) business. One of the most crucial tasks in such a project is requirement engineering, in which the properties of the ERP system to be implemented are aligned to the requirements of the businesses that will use it. ERP vendors and their consulting partners offer standard RE processes for ERP projects.

Recent research in ERP has identified flaws with these standard processes and proposed creative solutions to reduce the cost of ERP RE by avoiding

scope creep, involving the right stakeholders, allocating sufficient resources, and enlisting vendors' and consultants' support to problems.

Nevertheless, the main problem of ERP implementation still exists: to find a match between the flexibility often required by the business, and the rigidity usually imposed by the ERP system. This problem is aggravated in a cross-organizational context because, as we will see, the rigidity of the ERP system is imposed by built-in assumptions about business semantics, business processes, business communication channels and business goals. If these hidden assumptions do not match the business, the business will experience the ERP system as being rigid and unable to meet the business requirements. In a networked context, there is a mismatch between the ERP and each of the participating businesses.

The paper proposes to tackle this problem from the point of view of coordination theory and find a solution with recommendations on how to resole this problem. Since ERP systems are coordination support systems, we should be able to identify the coordination mechanisms supported by an ERP system. If we explicitly specify these mechanisms in a cross-organizational setting, then the requirements engineer should be able to find a match between the coordination support offered by the ERP system and the coordination mechanisms selected by the cooperating companies.

I will present an inventory of coordination mechanisms implicitly assumed by ERP systems, and analyze the role that selection of these mechanisms plays

in balancing rigidity imposed by an ERP system against the flexibility is required by the cooperating organizations.

We will see that rigidity will allow the benefits of cross-organizational cooperation to be reaped, whereas flexibility will decrease the benefits and, at the same time, increase the cost of implementing and maintaining the ERP system.

We attempted to show what the role of the undocumented built-in ERP assumptions is in inter-organizational ERP. We took an inventory of existing coordination mechanisms and mapped them onto typically encountered problems identified in empirical studies. We presented a perspective that, we believe, helps the requirements engineers to develop an understanding of the opportunities and issues associated with the ERP coordination mechanisms as undocumented assumptions: First, our problem
Dependency map is a problem domain theory; it allows the requirements engineers to reason about the impact of choices. Second, the undocumented assumptions make the coordination choices more explicit. Our library not only can facilitate interdisciplinary transfer of knowledge about ERP-supported coordination, it provides a guide for analyzing organization-specific coordination needs and generating alternative ways to fulfilling them.

The variety of coordination mechanisms that we analyzed and included in our library is not found in previous research. Also, we provided a start in the direction of how to organize these coordination mechanisms. In addition, we

used real life examples to motivate our analyses. Each directed arrow in our problem dependency map represents a hypothesis that can become a subject of future empirical validation studies.

Thus, for this study, we formulated 5 hypotheses with a very preliminary analysis that indicates that it will be useful to do this research. We believe that our approach provides a meaningful starting point in classifying ERP misalignments and the effect of their implementation in organizations. However, for the framework to be useful at application and project level in the long-term and to progress from its current state, more analytic capabilities need to be built-in.

Therefore, the immediate plans are to use it as a vehicle to explain typical misalignment phenomena in cross-organizational implementations and to refine it based on experiences we will collect in case studies. As my proposal rests on cases from the ERP implementation practice, we are interested in knowing if our ideas can be extended to projects implementing other technologies for inter-organizational integration, like data warehouses, workflow management systems, or Enterprise Application Integration middleware.

This will be subject to validation in field research too. Given ERP coordination mechanisms support a variety of intra- and inter-organizational interactions, to design a new RE process for cross-organizational ERP implementations, it will

be useful to consider alternative coordination mechanisms that could be used to manage data and process sharing.

One question that comes out of this paper and, we think, seems worth exploring, is: In what ways an ERP system can be arranged differently while achieving the same goals? Understanding the coordination problems addressed by a networked business suggests alternative coordination mechanisms that could be used, thus creating a space of possible business process designs (Maya Daneva, Roel Wieringa).

Challenges of ERP system in the mid market may consist of path treaded by an organization from identifying the need for an ERP till the implementation. This involves identification of business needs, budgeting for the procurement of product and services, evaluation of various products to suite its business needs, staring the implementation journey and finally adopting the ERP as an organization wide solution. The challenges that an organization goes through in the ERP journey is primarily:

a) Choice of solution

   This is a critical decision that an organization needs to take. However it is imperative to consider the size of the business operations, the projected scaling in the years to come, geographical spread, nature of business and investment figures as key factors in determining the choice of solution to be adopted.

The key considerations evaluation and selection of an ERP are:

a)   Scalability - ERP solutions are designed to grow with the company. Unlike some stand-alone applications, they do not succumb to volume and change pressures, leaving you to start over from scratch. Vendor management— managing a plethora of vendors for customer service is not easy. An integrated suite gives you one solution supplier to work with.

b)   Functionality—Access to the functionality required to run the business over time—at an affordable price point. It may not be the cheapest choice at first—but it will usually be the most economical in the long run as your business needs grow and change.

c)   Reliable service and support—ability to access affordable service and support is critical. It is easier to support an integrated ERP environment than a mixture of different applications.

Depending on company's individual situation, to improve company business and financial performance and reduce application lifecycle costs, we need to do one of the following:

- Implement an Enterprise Resource Planning (ERP) system to replace your legacy business system
- Merge multiple ERP systems
- Expand the usage of your ERP system

The challenge is to complete these tasks on time and within company's budget without impacting business operations. Company has to find a partner who possesses:

- The strategic vision to guide an effective ERP system
- The skills needed to support an ERP project
- The processes and tools to support disciplined project management

Built on a foundation of proven capabilities including trained and certified resources, EDS solutions provide you with the flexibility and responsiveness you need to accommodate your company's growth and objectives while addressing ongoing business and technology changes. We can complete the task on time and within your budget without impacting your business operations. As a result, you'll achieve improved business processes and optimize your operational costs.

Large system development requires user involvement in order to be successful. This involvement occurs from the very beginning of the project feasibility study and continues through detailed design, testing and deployment.

The role of the user involvement in an ERP implementation is quantitatively different from that in the large system build, as there is limited scope in influencing the final products look and feel, and limited control over the range of process models to be considered for implementation. This change in decision input may lead to a sense of impotency in the user community, which is exacerbated by the number of interfaces between functional groups.

A sense of satisfying may become pervasive and this may affect the perfection of system success in meeting business unit requirements. This pessimism also influences the organizational culture in that the users may feel less empowered to make effective decisions benefiting their group.

The literature appears to emphasize the importance of user empowerment in the structure and maintenance of corporate cultures, and this loss of power may have a negative impact on the operant culture, despite the desire to achieve a better corporate level integrated business system. Stated corporate objectives and policy and corporate reality can be quite different, so it is unlikely that accepting what management believes and states to be the culture is in fact the case. Thus, successful implementation must address the benefits and seek to move the organizational culture to a state in which business benefits are seen and are achieved.

Thus, in both initial ERP implementations and ERP upgrades, I suggest that the issues of organizational culture relating to risk orientation and user involvement are key ERP implementation variables. Leadership practices within the change management programs are important in overcoming resistance, but leadership alone may not overcome other cultural aspects impeding the adopting and exploitation of and ERP. As a result, a research program to identify organizational barriers to ERP implementation that commences with a review of organizational culture, leadership and risk orientation should be carried out.

A quick review of ERP research revealed different strategies for implementing ERP successfully. One can classify these strategies into organizational, technical, and people strategies. Organizational strategies for promoting ERP implementation success include change strategy development and deployment, change management techniques, project management, organizational structure and resources, managerial style and ideology, communication and coordination characteristics.

Some of the technical strategies that have been proposed to determine ERP success include technical aspects of ERP installation, ERP complexity, adequacy of in-house technical expertise, and time and cost of implementation. Examples of people strategies include staff and management attitudes, involvement, and training. Past ERP implementation research may be described as factor research, which involves identifying the factors or variables that are critical for implementing ERP successfully.

Although factor research is valuable for advancing our understanding of ERP implementation success, it adopts a rather static view, which limits its adequacy in explaining the dynamics of the implementation process. Thus, factor research alone is not adequate for explaining how the transition from resistance to success has happened. Unlike factor research, process research helps us understand how ERP implementation efforts have happened; it therefore gives a moving picture about how we got from time 1 to

time 2. To benefit from the two perspectives, in this study, I will adopt an integrated view to ERP implementation

Successfully implementing ERP the first time requires a structured methodology that is strategy-people and process-focused. This is the only way to manage the risk effectively. A good methodology covers all the bases, but when the unexpected pops up, as it usually does, we will be prepared to handle these exceptions without severe negative consequences.

One very common mistake is not having employees prepared to use the new processes and support system. The consequence here can range all the way to total failure, but they are avoidable. Evaluate business strategy and ERP plan before commit to software acquisition and installation. Doing it right the first time is the only cost-effective way to go. Many people out there wish they had paused to evaluate their direction. The following questions do not cover every possible contingency, but should be helpful to stimulate thought and discussion.

1) How do we want to run our business?
2) What business problems need to be solved?
3) Do we know and understand our priorities?
4) Do we fully understand our condition versus our could-be/should be processes?
5) Have we carefully defined an action plan for pre-implementation preparation activities?
6) What tasks will be accomplished and when?

7) What are the missing links in our current system and our software of choice?

8) What are the real costs, benefits and timetable going to be?

9) Do we have an executive-level ERP champion to provide the necessary link to top management?

10) Who will implement ERP and make it work?

ERP and supply chain management systems implementations are, in fact, projects without an end. After all, the supply chain is, to a large extent, the very life-blood of a manufacturing company. For the well-prepared, new supply chain management systems based on ERP have become significant competitive differentiators. Implementing ERP can become a mind-altering experience for those involved. Following a sound methodology will greatly increase the likelihood of success the first time. Yet, it will not guarantee success.

The above issue and problem are able to explain why ERP system continues to become an increasingly important subject in corporate field. The effectiveness of ERP system can be appropriately define as a deliberate non-obligatory act of disclosure, which gets onto public record and is made by a person who has or had privileged access to data or information of an organization. Thus, we need to identify the effectiveness of the ERP in order to reduce the risk of implementation and in term to increase efficiency and capabilities.