

Strengths, Weakness, Opportunities and Challenges for Organizational Change in relation to implementing an Enterprise Resource Planning in Sri Lankan Organizations

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Abstract— ERP replaces bunch of isolated software, applied to each business functions and provide a single comprehensive integrated software solution. Even though as a product ERP is all in one, feature rich solution, challenges still remain with proper implementation and adaption steps. The paper discusses the implementation challenges and opportunities for ERP seen in the Developing Asian countries considering Sri Lanka. Also paper identifies strength and weakness of ERP in Sri Lankan context. Needs of BPR, Vendor and Product Selection, Change management and Resistance management are mainly discussed areas. Note that the study was done on 2011, hence socio-economic and political environment discussed here is about early 2011.

Index Terms—BPR, Change Management, Enterprise Resource Planning, ERP, ERP implementation Projects, Sri Lankan Organizations,

I. INTRODUCTION

To do the business properly and compete with peers, a company needs a healthy and accurate information system. For this purpose a bunch of software systems used to serve the business but gradually they were replaced by a single package of software called ERP (Enterprise Resource Planning) which integrate and compute information and give a better out view.

Despite of how rich it is with facilities, still ERP faces some challenges with implementation projects which are time consuming, tiring and risky. This fact is further strengthened by the higher number of failed projects in ERP implementation which cause losses for the client and disrepute for the vendor.

Three main objectives are stated in this study. First, to critically analyze the challenges arise at the implementation of ERP. Second, to identify strengths

and weaknesses of ERP implementation projects in Sri Lankan context. Finally, to identify the opportunities gained by Sri Lankan companies implementing ERPs.

For the analysis of this study, both qualitative and quantitative data are used appropriately. The quantitative data is taken by official sources of government and non-government organizations such as department of Census and Statics. Library study enriched of qualitative data.

Considering several definitions, this paper derived a general description for the ERP. It also pays a considerable attention on discussing the evolution and the history of ERP with respect to global economic context. Then the discussion is narrowed down to Asian and analyses how ERP works in Asia context. Finally, it focuses on challenges, strengths, weaknesses and opportunities of ERP implementation in Sri Lanka.

In this study the socio-economic factors such as high growth rate of economy, fast industrialization, increasing the number of IT professionals, end of the 30 year civil war, political stability and infrastructure development determined as factors which create opportunities for ERP implementation in Sri Lanka. Business opportunities created by ERP is another segment of opportunities. They make export and import trading easier while providing chances to follow international business practices and build up information exchange platform.

Employees' resistance to change, poor infrastructure in remote areas, lack of exposure to the western business practice and lack of skillful ERP consultants

are the main weak points affect ERP implementation in Sri Lanka. Overcoming these weaknesses is the challenge faced by ERP implementers. Unstructured domestic business practices, legal barriers and cultural barriers are also challenges faced by ERP implementation. However, high level of literacy and increasing IT literacy, technological infrastructure improvement and foreign direct investment (FDI) on export oriented companies provide considerable strength for ERP usage.

Organization culture can act as either strength or a weakness accepting an ERP. Also the most important strength of ERP implementation project is the management support. Setting up a proper steering committee and project management skills are essential parts of an ERP implementation project.

This article also discusses recent formation of political and economic landscape, new trends in ERP arena and past experiences. Importance and applicability of this study depend on cultural differences, management practices and scale of business and category of ERP. ERP is an alien concept from western world. Therefore, findings of this study present a set of recommendations and suggestions about selection, implementation and adoption of ERPs suitable for Sri Lankan organizations.

II. DEFINITION OF ERP

Different definitions could be found on literature related to ERP where a quite similar meaning gives.

Davenport (1998) defines an ERP system as “a packaged software product that can be bought ‘off-the-shelf’ by an organization in order to integrate and share its information and related business processes within and across functional areas”[6].

According to Deloitte (1998), an ERP system is a packaged business software system that allows a company to [6]:

- 1) automate and integrate the majority of its business processes
- 2) share common data and practices across the entire enterprise
- 3) produce and access information in a real-time environment

Esteves and Pastor (2001) propose ERP systems as software packages composed of several modules, such as human resources, sales finance and

production, providing cross-organization integration of data through embedded business processes [13].

Chen (2001) states an ERP system helps the different parts of the organization and distribution with external suppliers and customers into a tightly integrated system with shared data and visibility [13]. By analysing all the definitions we can derive an idea for ERP definition. ERP is a packaged software solution which has to buy as a single solution to cover most of the functional areas of the business. With ERP systems business process shares common data stream and standardizes business practices. Most of the definitions are stated before 2000. Currently ERP’s are extending their functionalities beyond their definitions and support vertical and horizontal activities along the value chain incorporating CRM and SCM. More ever ERP now go in to web, mobile and cloud computing.

III. EVOLUTION OF ERP

With the industrial revolution manufacturing led economies require better handling their inventories. With IT involvement, inventory control systems were began and grown up to MRP in 1950. At this era IT was expensive and its utilization was limited only to most big companies. They use MRP to keep track and make projection with their material demands. After two decades MRP became MRP11 adding process controlling integrating. Covering more and more business functions within a single package by 1990, MRP11 was transformed into ERP.

By this time generally ERP covered most of the business scope as accounting, inventory, production, sales and purchase. Today it is extending functionalities with e-commerce, m-commerce to cater global business needs. Also today’s ERP integrate two major specific areas called CRM and SCM to stream line the value chain.

Some ERP analyses divide ERP market into three tiers. Whereas ERP giants like SAP, ORACLE and Microsoft located in tier 1, medium size ERPs are in tier 2 and rest will lie in tier 3. Also there is an emerging trend with open source ERP. Well known ERPs are nearly saturated on macro business and likely to penetrate the SME market.

IV. ERP UTILIZATION IN ASIAN COUNTRY BUSINESS

While there is a wide adoption of ERP systems in Europe and North America, developing countries lag far behind [17]. Also Huang and Palvia state “ERP technology faces additional challenges in developing countries related to economic, cultural, and basic infrastructure issues.”

ERP spreading is correlated with world economy. Through last decade, world economy is shifting towards the Asian region. India and China reported a growth rate over 8% continually while China became the world’s second economy.

Since 2007, western economies are facing a series of problems like credit crunch. USA, the largest economy and most of the European economies are still shrinking or reporting low growth rate. All these forces pressure more and more enterprises to move towards Asia.

Meanwhile number of Asian IT professionals dramatically increase over last decades where India attract most software companies to put their branches.

Comparing to past, hardware prices came to a more affordable level. This made even the developing companies more and more IT enabled. For example type writers have been almost obsolete in today’s companies.

This environment has pushed ERP market towards south Asian region more and more.

V. OPPORTUNITIES CREATED BY THE INDUSTRIALIZATION IN SRI LANKA

Parallel to western world Sri Lanka also have economic and political influence and inspiration since its colonial stage. 1950, the government adopted a national policy of imports substitution and that was the first private sector industrialization motivation. In 1969 Industrial Development Board was created with the intention of implementing policies of the government in respect to the SME’s. With the acceptance of open economy by the economic reforms in 1977, industrialization is boosted and various incentive schemes were introduced to attract foreign investors.

Manufacturing and the factories are the ground for ERP. Reviewing the trend and positions

manufacturing hold in the country economy, we can get a better idea of opportunities to ERP.

According to the annual survey of industries for 2009, manufacturing has taken a 90% of total industry establishment. 94.6% persons engaged with manufacturing out of total industry division [3]. According to the Review Activities 2010- Ministry of Industry and commerce, industrial export growth between Januarys –August 2010 was recorded as 6.1% and the annual growth of Industrial sector is 6.6%. This figures highlight the manufacturing has a better future in Sri Lanka.

Most of the macro businesses are import/export oriented. There are altogether 19 export zones and industrial parks in Sri Lanka where main focus is to manufacturing to export market. There are new challenges when extending a business to global market.

- 1) Industrial norms, rules, disciplines and standards are highly demanded.
- 2) Accounting practices and naming convention have to consider.
- 3) Data exchange mechanism has to consider.
- 4) Same time Porter’s Five Force’s impact remains as a challenge.

We can see the ERP as a good pipe line to overcome above challenges in growing manufacturing field.

Several economical political highlights can be identified which has a positive impact for industrialization.

- 1) Finishing 30 year civil war
- 2) Rapid infrastructure development
- 3) Maintaining political stability over a decade
- 4) Extending and strengthen political cooperation with booming countries like China, India and Russia.
- 5) Country has been able to report over 7% growth rate for past three consecutive years.
- 6) Open economy policy

All the above conditions have created a brighter future for industrialization as well as manufacturing sector.

VI. ERP IMPLEMENTATION CHALLENGES IN SRI LANKAN BUSINESS

In a business, challenges are initially discussed in top level management where strategies formulate according to company vision and mission. When a business is exposed to the global market it wants to

maintain a competitive advantage over the others. According to Porter's strategic positioning, it means performing different activities from rivals' or performing similar activities in different ways. This is where the decision of "going to ERP" has to be taken. Businesses have to assess how far ERP makes a competitive advantage to the company.

As mentioned above, creating and sustaining a competitive edge is the first motive to go for ERP. Then the internal and external environment scans need to be done. Various analysis tools such as SWOT, PEST can be utilized at this stage.

Implementing an ERP is a huge change to a business where resistance can be expected at any stage of the project. Managing the resistance is the most important challenge of ERP implementation. Resistance can be visualized in many forms like strikes, physical damages and loss of support. Sources of resistance are hard to distinguish. It can be dignity, security, knowledge gap, age or even the pricing commission to officers. The factors that can be sources of resistance will be discussed below in this paper.

As an initial company can review for any BPR needs and adequate Business Process Redesign (BPR) is the predominant step of successful ERP implementation projects. Comprehensive BPR is related with the alignment between business processes and the ERP business model and associated best practices [5].

A. *The needs of business process redesign (BPR)*

Common scenario of ERP in Sri Lanka is just facilitating a tool for existing business process. This is same as classical business automation where large amount of manual work load going to do with computers. Reduce the amount of paper work and time to search and process information is highlighted benefits. According to Porter, strategy is not operational effectiveness. Operational effectiveness is necessary but not enough (HBR-November-December 1996). Most of the firms in Sri Lanka implement ERP or Computer application intending to increase operational effectiveness.

BPR is a strategic decision of company taken after value chain analysis to create competitive edge. Since BPR and ERP implementation is strategically

decision, theories and concern of strategy formulation is also common to successful ERP implementation.

Business process redesigning is a nightmare to lethargic mind set in top to bottom of the company who want not even to think about ERP. Generally redesign of process is comes prior to ERP implementation. It is a good practice to do independently, at any given time of the business life cycle. BPR is where change management is first practiced.

Poor quality of BPR made with different reasons. Company culture is unwilling to expose the business process to external consultancy to greater extent. Followings are some of the reasons drive this problem.

- 1) Threat of losing competitive advantage – exposing business process to external entity is vulnerable to imitate the products and make loop holes for head hunting.
- 2) Threat of losing jobs – By automation there can less work and lay off. Convincing the employees with job assurance, high compensation VSR packages, job redesign can be remedies for this problem.
- 3) Lack of communication skills both consultancy experts as well as employees- This can be due to the lack of domain knowledge as well as lack of soft skills.
- 4) Not having enough time – the importance of the understanding business is neglected or under estimated by company and vendors. The projects are try to implement in tight schedules other than that poor project work breakdown structure and lack of project management experience cause this problem.
- 5) Sometime local experts are not welcome and neglected by the employees- This can be a result of colonial mindset. There should be prestige name for the consultancy firm and outgoing personality should have with consultants.
- 6) Lack of domain knowledge to make tricky question. With the time and nature of the business, employees build jargons, short cuts, assumptions and sub culture where external consultancy can't understand with academically. This can be a worst to foreign consultant.

- 7) Losing the respect and bargaining power of employees – This is one of departmental wise and individual problem in requirement gathering phase. There are many circumstance employees having pretending work overload and reviling the exact business process has a true threat with them.
- 8) In Sri Lankan context many businesses don't keep well maintained documents. Though there are recent drive to go with ISO certifications still companies are suffering from manual, specification and track of changes.

Apart from the knowledge gathering, proper analyzing and creative redesign highly subjective to professional experience and skill fullness. Mapping the business process with ERP and documenting with BPML (business process modeling language) is still neglected since its hard work for consultancy. Domestically, lack of opportunity to gain experience and brain drain make shortage of professional.

B. Challenges with BPR

According to Hammer and Champy BPR is “The fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed” [5] [9].

A process is “a lateral or horizontal organizational form that encapsulates the interdependence of tasks, roles, people, departments and functions required providing a customer with a product or service” [11]. A business process is “comprised of the people who conduct it, the tools they use to assist them, the procedures they follow and the flows of material and information between the various people, groups and sub-activities” [4] [5].

Some organizations use ERP systems to promote a BPR (e.g. Martin and Cheung 2000), while others are driven into BPR during the implementation of an ERP system. A survey made to 220 European companies implementing SAP showed that simultaneous implementation of BPR and SAP has proved to be the most effective and powerful method for business improvement (Chemical Marketing Reporter 1996) [5].

Based on a survey, Jarrar and Aspinwall (1999) defined a set of CSFs for a successful BPR project categorized in four main aspects: culture, structure, and process and information technology [5].

Asian developing countries including Sri Lanka have common challenges with above aspects.

Studies in Asia, mainly in China, suggest that the key problems are related to cost, culture, incompatible process models, change management, limited national IT infrastructure and lack of knowledge of ERP system concepts [5].

Unprofessional consultancy ends with exhausted, tired workarounds relate to business process mismatch. If the BPR doesn't improve the business or at least doesn't match the existing business two repercussions can be happen. Vendor can't convince the steering committee to go ahead with the project. Or else ERP configuration can be out of the business. This will leads to long project life cycle and severe damage to both parties.

C. Choosing the right ERP

Careful business analysis gives two dimensions to BPR

- scale of change effort
- Magnitude of change (BPR in ERP implementation)

This will help to choose most suitable ERP which is another success factor. There are poor BA facilities to identify strategically importance of the ERP, no clear idea of the magnitude of change. Sometimes scale of change effort draws back the project. Also business analyst should have updated knowledge about ERP market.

Selecting the right ERP depends on various factors like Budget, resources, sector, infrastructure vendor support, product maturity etc. All these factors behave duality in different scenarios.

- The annual turnover of a company is a vital point of the choosing an ERP. Still ERP implementation is a highly expensive project. ERP systems are expensive compared to the small size of organizations in developing countries. For example, out of 240 listed companies in Sri Lanka (which, of course, excludes subsidiaries of Multi-

National Companies) only two companies have annual turnover above US \$ 200 [8].

- Resources should be exist and available. Still some parts of the country suffer from lack of vendor support for high end servers, network equipment and expertise. Most of the well-known ERP have recommended hardware and need good administration. Out sourcing, maintain internal department or going for cloud is some of the possible remedies.
- It's ERP's plus point, ability to accommodate the changes in business process with minimum effort. Careful business analysis and review is essential in ERP that would highlight the need of process redesign.
- ERP have their own expertise over special sectors. For Example Oracle is famous for financial sector and SAP is well known for logistics. Considering the sector when choosing the ERP can reduce the risk and changes as well. Sector more close to product maturity. SAP and Oracle are most stable and matured product but not only.

Hence careful selection can minimize the resistance as well as the change effort but cannot completely wipe off. Choosing an ERP and implementing it, is a huge change process to a company. Hence change management is the most important critical success factor in an ERP implementation project. Even though the company doesn't meet the financial requirement to adapt a reputed ERP with intention to go ERP in future they can take number low cost and less risk foundation steps.

Then they can go for low cost ERP for practice. Since most of the ERP cover common set of basic functionalities it's good to go for affordable solution. Meanwhile today's ERP is going to cloud computing and afford rent based service with trouble free administration. In Sri Lankan context going for open source ERP and tailoring it will be one of the most advisable and affordable solution for SME/Macro sector. Adapting to ERP environment early as possible company can have benefits.

- Early adoption will slow down labor turn over. Since the labors couldn't find the similar environment, it reduces the mobility.

- Can get "early birds benefit" when competing with rivals.
- ERP practice will help in future complex. Expensive and risky ERP project go more smoothly. Lack of ERP experience and low IT maturity in developing countries may inhibit adoption.
- Identifying and getting the precautions to resistant forces more early.
- Give better understanding for what is possible, what is to be improved and what can be expected from an ERP. This is wise approach rather than trapped in ERP Marketing Guru's fairy tales.

D. Management support

There is a lack of ERP awareness among most of the Sri Lankan top managers since most of them have their tough times without IT and still believe on legacy systems. They have no confident over what ERP can deliver to them. Its ERP marketer's duty and challenge to convince them, but again promising undeliverable result will damage ERP goodwill. When managers have no prior experience or knowledge about the power of ERP, only inspiration is vendor or consultant demonstration. In such scenarios implementation team have risk of losing management interest over the project by the time since results are yet to come [1].

Knowledge gathering phase is vital to identify what are the resistance forces and what are the supporting forces. Convincing the management early as possible and keeping the management interest throughout the projects must do task in a project. In local context managers impact on organizational culture is huge.

According to Jayantha Rajapakse and Peter B. Seddon survey one of the failure point of ERP implementation in Sri Lanka manager's attitude. In Sri Lanka, promotions are mostly based on seniority. Hence, most of the working populations are accustomed to being employed by one organization for a long period of time, and often to working within a particular function within that organization. With Experience, they become managers and owners of departments, not team players. Again, this goes

against ERP culture, which promotes shared environments [8].

As long-term remedies, promotional criteria's and personal development programs have to be thoroughly revised. Sometimes hard decisions like retirement with compensation or job redesigning have to be undertaken. Even though there is threat of losing the tacit knowledge keeping with them. It's trade of project to put effort to win them and adapt to the new system.

Introducing modern management concept to traditional managers is time taking effort. Since the ERP born in western world and adhere most modern management disciplines it's essential part of management awareness of modern management principle to get maximum output of the system.

E. Organization culture

In Sri Lankan context, trust on paper based reports, unstructured decision taking, roles ambiguity and changing, centralized decisions taking conflict with modern management techniques. Instead ERP promotes, decision taking at every level, knowledge sharing and transparency.

Organizational culture and knowledge highly restricted to department and many organizations have interdepartmental cold wars. ERP promotes process wise thinking and success of a process depends on collaboration between departments. This induces well planned series of user adaptation program. Same Time Companies have opportunity to go with fresh bloods with new requirement. Concept of Collective responsibility on duties is easy to plant in fresher than older people.

Using Workflows, EDI reduce paper work and support go green also expose to state of art business practice. Standardized accounting system across the organization will help to better auditing and international trading. Hence employee education and development program may necessary in any situation of project.

F. Employee's education

Majority of employed persons have obtained grade 5 to 9 education level over years. Also that percentage of employed persons with G.C.E.(O/L), G.C.E.(A/L)/HNCE and above educational levels

show an increasing trend over the years, which is opposite for below grade 5 education group which implies the increasing trend of level of education of employed population as a whole [2]. Hence country can keep expectation on future managers as well as easily adaptable work force.

ERP implantations highly suffered from employee's computer literacy. End users are the key stakeholders of maintaining proper ERP. Sri Lankan labor incentive industries still seeking cheap labors obviously have less literacy. Work flow data entry operators need necessary PC skill and HR recruitment and development policy have to concern on it.

On the other hand product user friendliness can minimize the gap of user and the system. Language support, symbolic notation and most of the rich feature can concern in product selection.

Increasing the computer literacy of the end users, promote good discipline with computer use, punctual and accurate data feeding are need to run a healthy ERP system. Strong HR intervention and IT intervention can shift the carder in to satisfactory level.

Once a system on live, whole business will depend on it and further maintaining, improving and administrating too are necessary.

G. Skillful project management

Project management is one of the critical factors and the experienced, qualified and smart project manager is right behind the success full project. Since Sri Lanka doesn't record much proper ERP implementation finding an enterprise project manager domestically is a challenge. This is one off the great obstacle SME sector to move with ERP and reason of failed projects.

Companies tend to hire foreign expertise mainly Indian expertise as a solution, but still there are cultural deficits with their knowledge and practice. Coordination and maintaining relationship with engaged parties rely on understanding culture, people and technology. Throughout the implementation project manager role is a vital factor to success.

Sri Lanka, as a rapidly growing country, has a thirst in SME sector with expanding existing business and new comers. Also number of IT expertise of the country growing fast and it will help to make skilled

project managers by the time. Exposure for working with ERP implementation team at foreign projects will shape the local expertise with successful project implementation experience. This is the best way to make project managers and run successful projects.

H. Infrastructure

Internet and telecommunication are not equally distributed over the country. Factories established in remote areas can be suffered from infrastructure difficulties. Computers and network supporting services are also rare in remote areas. When a vendor sends support teams from Colombo to a factory in Monaragala, it will take over one day to recover back the system. Most of the time, factories have to maintain backup resources to meet the situation.

I. Steering comity

Steering committee consists with several parties and they should have one or more following characteristics

- Interpersonal skills
- Personality
- Analytical skills and creativity
- Negotiation skills
- Update knowledge of ERP market
- IT knowledge

This team can consist of the company influencing parties. It can be union leaders, department heads, management and from vendors. Vendor agents should have proper knowledge about their product as well as most of the above characteristics.

Implementation consultant is expensive but profitable at long run by adding to the team. Their previous experience will help to mitigate most of downfalls. Steering committee should have clear goal and objective, team players, proper plan.

VII. BUILDING CHANGE MANAGEMENT PROCESS

Propose change management process should have following sequence of steps.

- 1) System study – this will include studying of the political, economic, social and technological (PEST) environment.

Strength, weakness, opportunities and threat SWOT of the current business.

- 2) Desired situation – setting up the goals where to be in future
- 3) Identify the gap- identify the gap of desired situation and current situation
- 4) BPR- identifying the business process changes to fill the gap and match product
- 5) Product study- do the product survey to choose best fitted product
- 6) Identifying the influencing groups- identify rebels, early adaptors, follower, internal politics, most seniors, literacy level
- 7) Setting up project steering committee- it should nominate every aspect of business and agent from influencing groups.
- 8) Extracting the tacit knowledge- should fallow series of workshops and discussion
- 9) Implementing the product and configuring- steering committee active participation. Building the feeling that project is their project. Success of project should satisfaction and respect for them and it will convert them as the guardian of the system.
- 10) Authority and Role delegation- choose the responsible people, make proper auditing plan
- 11) User training and Knowledge transfer- heavy HR involvement needed. ERP success depend on ultimate end users accuracy and efficiency

VIII. CONCLUSIONS

I draw the conclusion along with two areas whereas for ERP venders and ERP clients.

- In each case I recommend the local consultant to be occupied. In vendor scenario they have to train local expertise with foreign ERP implementation projects. Clients have to choose them.
- If ERP develop from the scratch it's better to realize their domain familiarity as well as the past success stories. I would not recommend in house IT team to develop the ERP system. IT department doesn't have enough resources, state of art technology and experience to give the optimized product. But they should closely work with the ERP vendors.

- Because most of the Sri Lanka companies have capital problem to go for reputed commercial product I would recommend the open source ERP such as “Compire”. Cloud service, growing IT professionals, proven frame work where freedom to tailor the best fitted solution.
- I would recommend BPR should be taken as the first step in ERP implementation in Sri Lanka. This would support by many ways.
 - a. First the change process will be familiarized with employees as well as steering committee. This wills landscape the business future ERP implementation. Identifying resistant forces and supportive forces in advance will give ample of benefits.
 - b. Secondly it is low cost remedy to boost the business.
 - c. Thirdly it will shorten the down time and disturbance to the business process in implementation project.
- The business analysis will highlight expanding and penetrating opportunities, vertical and horizontal integration. These strategic choices may postpone the ERP implementation projects. But still it’s better to go with change of organization
- Venders’ perspective of Sri Lankan Developer is a golden opportunity to cater the developing countries business. The tacit knowledge, cultural understanding will make competitive advantage over the giants of ERP. On the other hand cheap labor cost of the IT professionals will make cost leadership of ERP market.
- There are a number of positive thinking programs and well known counselor such as Lal Fonseka, Kuma Iddamaldena, Athukorala and Nalaka Hewamadduama. It’s better to make awareness programs and landscape the mind set of employees with them.
- Depending on the field where business operates, the time taken to project life cycle must be adjusted dynamically otherwise the changing nature will make the process obsolete once when the project is successfully completed.
- Continuous development and tweaking should be maintained. Maintaining high quality IT unit and

Business analysis team could be responsible for it.

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