

Recommendations for successful SAP implementation in Sri Lankan business industries

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Abstract — many organizations in the world tend to implement Enterprise Resource Planning (ERP) systems to gain the full benefits of their business processes. System Application and Products (SAP) is one of most popular ERP System [18] available in the market. Most of the Sri Lankan organizations also focus on SAP implementation. Unfortunately, a large number of organizations fail to achieve their objectives due to unsuccessful implementation. This paper focuses on providing recommendations for successful SAP implementation in Sri Lankan business industries. It also focuses on implementation issues, role of vendors and consultants in SAP implementation, future trends, learning and emerging issues. Further, this paper will be extended to an in-depth study of SAP systems and its benefits. This paper will be helpful for companies in different industries which are planning to implement SAP.

Keywords—ERP, SAP, Implementation, Issues, Recommend

I. INTRODUCTION

SAP implementation in Sri Lanka has been gradually increasing over the last few years and the core reason was the incapability of system to manage the conversion of year 2000. In addition to that, the factors such as industrial best practices, easy and faster implementation and reasonable cost estimates also stimulate the companies to move to the SAP. Majority of Sri Lankan manufacturers require easy-to-use SAP solutions to meet their specific process requirements, including localization needs to address the continually evolving tax and statutory requirements. The SAP market is steady and growing rapidly. Moreover the business returns growth phase improving economy of the country.

SAP application holds the largest market share globally, although in most of developing countries have faced additional challenges for implementation. Hence SAP system is in its early stages in developing countries due to inadequate Information Technology infrastructure, government policies, small size of companies, lack of IT/ERP experience, and low IT maturity seriously [8]. However, many firms have been badly impacted by implementing SAP application. SAP implementation projects end up with costing considerably more than what was initially budgeted. For instance training, testing, consultancy, maintenance, integration, limit of capital, non-availability of resources, poor management base and absence of IT expertise

are seriously affecting the implementation and adaptation of enterprise system. Therefore it's difficult to reach exact return on investment (ROI) which was expected by the organizations initially.

The main objective of this paper is to find out the main reason for unsuccessful SAP implementations in Sri Lankan business industries. Other objectives of this paper are (1) to identify the business Objectives of SAP implemented companies in Sri Lanka, (2) to identify the barriers faced by companies when implementing SAP, (3) to evaluate the companies' feedback after implementing SAP and (4) finally to prepare the recommendations for companies which plan to implement SAP in future.

II. LITERATURE REVIEW

By reviewing recent literature, there are many leading market providers of ERP system and SAP is one of the market and technology leaders in business software towards structured work and data management in organizations.

SAP not only help enterprises, but also helps with countries especially those who need support and investments; outside business, SAP also uses its technology to make the life for people better [18].

SAP application is integrated ERP software manufactured by SAP targets business software requirements of midsize and large organizations in all industries and sectors. It allows open communication between all company functions. It is the World's largest business software and third highest revenue independent software provider. SAP focuses on six industry sectors such as process industries, discrete industries, consumer industries, service industries, financial services and public services [17].

The ERP software market has always been highly consolidated. In the late 1990s, it was dominated by SAP, Oracle, PeopleSoft, JD Edwards, and Baan, which accounted for more than 50 percent of the total global ERP market. Currently, the top-tier ERP vendors are SAP-AG, Oracle, Microsoft application, IBM. It is important for the project managers to have a proper implementation plan and a strategy helps to success of the ERP implementation [18]

The ERP market plays a key role in industries to make a decision-making processes at the global level. ERP Systems boost competitiveness and improve operating processes in the short and long term. ERP market participants differ by economic stature, industry and operating strategy. SAP helps the businesses to be more effective, efficient and collaborative, as well as non-profit and government agencies [3].

Implementation of an ERP solution delivers the obvious benefits; business process automation, better information accessibility and improved operational efficiencies, due to the numerous interrelated and complex business problems [7]

In general, ERP implementation is expensive and the major challenges for most of the small businesses are Project team structure, Implementation strategy, Database Conversion strategy, Transition Technique, Risk Management strategy and Change management strategy [12].

Eight factors considered during the ERP implementation process; feasibility and critical evaluation of ERP systems, project management principles, human resource development, business process reengineering, cost/budget issues, IT infrastructure, consulting services, and top management support. In addition they demonstrate in five stages of ERP implementation: Project Preparation, Business blueprint, Realization, Final preparation, Go live and support for the successful implementation [5].

There are six major categories of national differences that affect to multinational ERP implementations; Culture and language, management, Style, political background, legal requirements, labour skills and the time zone differences. Further, type and amount of ERP adaption, centralization of implementation decisions, information sharing, project duration, project approach and training programs are the basic factors that affect the multinational ERP implementation. Therefore, it is suggested to have dedicated project management team that consists of multi-cultural group of project managers and team leaders [19].

Many organizations have achieved important business benefits from ERP systems. ERP implementation benefits can be turned into profits [9]. Although, there are a large amount of ERP implementations were failed to provide business benefits for the organization [15],[4] .

Technical issues cause only a small percentage of projects to run late, more commonly, projects are late due organizational, business, and project management challenges [11].

ERP implementation effects the organizational performance. Due to the difficulties that employees often have in adopting the new system and new ways of business processes. This decline is a temporary phase and if the new system is properly utilized, the organization can quickly become more efficient than before the ERP implementation [16].

ERP beneficial realization framework helps to increase the ROI on ERP systems. However, the primary purpose of the framework is to support the development of a realistic agenda of improvement opportunities and maximum level of business value from the SAP system and its environment [6].

Balanced Scorecard tool is used to measure the business unit performance of an organization. In this approach there are 4 perspectives such as Financial, Customer, Internal Business process, Learning and growth [10].

Cautious, evolutionary, bureaucratic implementation process backed with careful change management, network relationships, and cultural readiness can lead to successful ERP implementations [14].

III. DEVELOPING A CONCEPTUAL FRAMEWORK

Methodology is Quantitative and qualitative study based on Descriptive research design. Descriptive research is not limited research method or technique. It can involve analysis of secondary data or primary data, or a combination of both. Quantitative or qualitative methods or both can be used. This method is to test the hypotheses and look the causes, effects and make predictions. The samples were selected randomly. Research onion was used to develop the research design (figure 1).

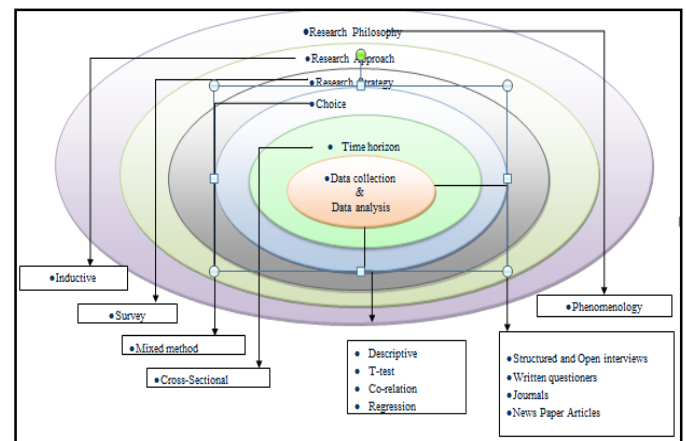


Figure 1: Research onion

First layer research onion shows research philosophy Phenomenology approach highly focuses on the real facts and figures according to the research problem. Second layer shows the inductive research approach makes broad generalizations from specific observations and theories. Third layer shows research strategy is survey, gather the necessary information from the real world observations. Forth layer is Methodological choice is mixed method designs called qualitative then quantitative, quantitative then qualitative and qualitative and quantitative simultaneously .Fifth layer shows time horizons is cross-sectional design which allows collecting data and answers a question or a problem from a cross-section of a population at one point in time. The fifth layer shows various primary and secondary data collection methods, and finally, reliability and validity of the research is measured.

Through the literature review, the researchers identified the dependent, independent variables and the relationships between them and derived a conceptual model for successful SAP implementation (figure 2). The study was initiated with a thorough observation on current SAP implementation and methods in Sri Lanka. Further quantitative and qualitative data were gathered.

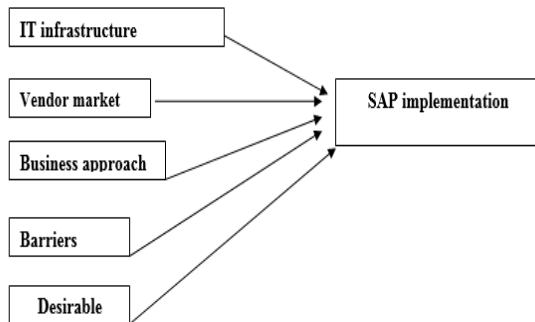


Figure 2: Conceptual Framework

To achieve the framework, have identified six hypotheses are below

Hypothesis 1 -Information technology infrastructure

H0: SAP implementation success does not depend on IT infrastructure of the system

H1: SAP implementation success does depend on IT infrastructure of the system

Identify whether the companies' implementation success depends on infrastructure of the system

Hypothesis 2- Vendor market

H0: SAP implementation success does not depend on vendor support

H1: SAP implementation success depend on vendor support

Identify whether the companies' implementation success depends on vendor market

Hypothesis 3 - Business approach

H0: Companies have not achieved their SAP implementation objectives

H1: Companies have achieved their SAP implementation objectives

Identify whether companies have achieved their SAP implementation objectives

Hypothesis 4- Barriers

H0: Companies have not faced critical issues when implementing SAP

H1: Companies have faced critical issues when implementing SAP

Identify whether the companies have critical issues when implementing SAP

Hypothesis 5 - Desirable

H1: After implementation companies gain great business benefits from SAP

H0: After implementation companies do not gain business benefits from SAP

Identify whether the companies have gain business benefits from SAP.

The target population refers to the entire group of individuals. This study considered SAP implemented companies and SAP solution providers in Sri Lankan business industries to take a broad view of the study. There are 57 Local companies and 19 global companies using SAP application in Sri Lanka.

The primary data was collected through interviews, observations and questionnaires. Research study used structured interview and semi-structured interview approach. Most of the interviewees were in Executive/management level. "www.surveymonkey.com" was the web site which was used to publish the questionnaire. This questionnaire was emailed to SAP using organizations, experts and SAP consultants around Sri Lankan Industries. The secondary data was collected by means of past literature studies, journal articles etc. conceptual model were measured against the results obtained from the survey conducted using a number of participants in Sri Lanka who directly use the system.

The study gathered data from quantitative and qualitative data. The data analysis was conducted by using the statistical methods. The collected data through the questionnaires will be analyzed by using analytical tool SPSS version16.0.

IV. RESULTS

The data analysis was conducted based on the data collected from quantitative and qualitative data through a survey by which the applicability and strength of each dependent variable of the conceptual framework were tested.

The collected data through the questionnaires will be analyzed by using analytical tools. The gathered information were presented through statistical and analytical methods such as frequency, percentage, mean scores, descriptive, co-relation model, regression model and Chi-square, factor analysis and t-test. Subsequent more than 80% of samples have responded for the survey study.

126 responders participating in the study based on their organization type. According to the chart out of valid

questionnaires 56.58% respondents are from local companies and 43.42 % are from global companies.

In Sri Lanka most of private sectors have implemented SAP as their core application. From the response of sample Private sector has implemented SAP 82.89% whereas public sectors 15.79%. Only 1.32% are from government sectors has implemented SAP.

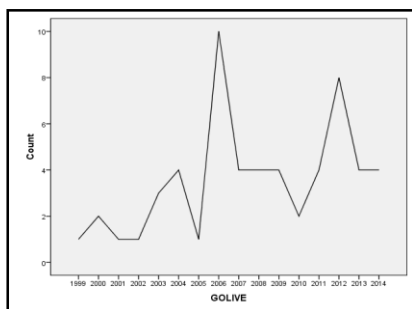


Figure 3: Organization SAP Go-live

Figure 3 describes between 2005 to 2007, there was a high peak of SAP implementation growth in Sri Lanka. Subsequent to that between 2011 and 2013, there were moderate SAP implementations in Sri Lanka. Most of private sectors have implemented SAP as their core application. From the response of sample Private sector has implemented SAP 82.89% whereas public sectors 15.79%. Only 1.32% are from government sectors has implemented SAP.

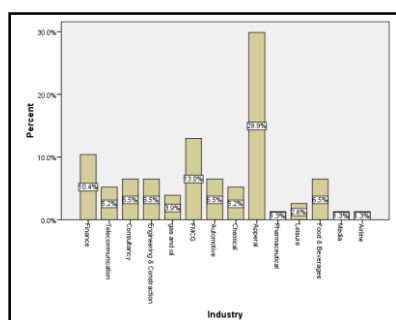


Figure 4: Respondents' industry types

Figure 4 shows the analysis 29.87 % of the organizations are from Appeal industries and least percentage industries are media, Airline and media. Moreover, there are significant numbers of Fast-moving consumer goods industries, automotive industries, and Chemical industries have implemented SAP as their core application. Further, 88.31 % of the organizations operate globally and 7.79% of them operate nationally. Moreover, 3.90% of the organizations operate regionally.

71.43% organizations using SAP applications for more than 5 years. Furthermore, recently also companies have implemented SAP Application/s.

46.67 % of the organizations are using oracle database and 29.33% using SQL database. In addition 17.33% using IBM DB database. Also significant percentage 5.33 %, companies using Sybase database.

In addition, 42.67 % of the organizations run SAP application on IBM AIX based and 33.33% using Windows operating system. In addition 20.00% using Linux and significant percentage 2.67 %, companies using UNIX platform.

There was a high positive relationship Between SAP implementation success and IT Infrastructure of the organization. IT Infrastructure is an essential part of any implementation in order to transform from legacy system to a new sophisticated system.

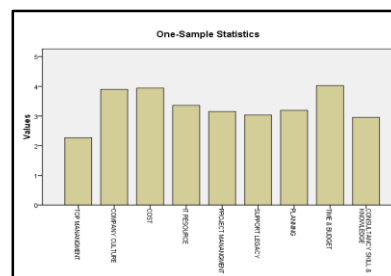


Figure 5: Implementation barriers of one sample statistics

Figure 5 shows that highly affected factors is top management and lowest affecting factor is time and the budget, which means project with in time and the budget while top management is not support much.

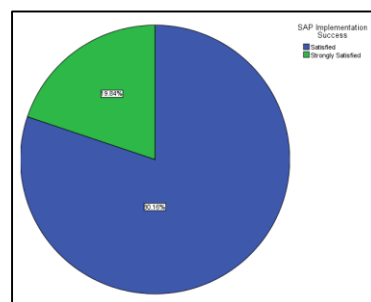


Figure 6: SAP implementation success

Figure 6 describes that 80.16% organizations are satisfied with the SAP implementation and 19.84% are strongly satisfied with application.

The composition of the respondents was then briefly introduced. A detailed illustration of responses according to the different variables was given, with supporting statistical analysis. By using SPSS as a statistical tool that analyses the factors such as Business approach, Vendor market, Barriers, IT infrastructure, desirables.

The research findings helped to fulfill the main objectives of the research work. The research identified 9 critical implementation issues and ranked them according to the severity. Moreover,

using the data collection methods the research has identified 9 major ERP implementation benefits. These benefits are ranked according to their importance. From the literatures and the feedback of experts figured some extra factors which influence the SAP implementation are given below table.

Summary of the findings

Table 1

IT Infrastructure	Consultancy	Approach	Barriers	Desirable
Physical Construction	skill and knowledge	Best Practice	Lack of top management	Reduce Cost
Physical Security access	Service Level	Automated Process	Support Legacy	Globalization
Power Infrastructure	Price of consultancy	Increase Productivity	Project Management	Security
Network Infrastructure		Customer Service	Consultancy Skill and Knowledge	Efficiently
Server Infrastructure		Replace outdated and inefficient IT Architecture	Planning Issue	Integrated
Database		Reduce Operational Cost	IT Resource	Data accessible
Storage and data management		Increase Market Share	Company Culture	Flexible
		Optimize Resource	Operation Cost	Business process
		Centralized	Time and Budget	Strategy planning

Table shows1, SAP implementation is revolving around IT infrastructure of organization, vendor support or market, approaches of organization, implementation barriers, and desirables.

There was a high positive relationship ($r^2 = 0.730$) between SAP implementation success and IT Infrastructure of the organization. Therefore we require a recommended IT infrastructure which should be procured before starts the implementation. Physical construction, strong network infrastructure, server infrastructure, database, physical security access control, power-supply infrastructure, storage and data management capacity should be considered before implement the system.

There was a low positive relationship ($r^2 = 0.416$) between SAP implementation success and vendor support .Vendor Market is a vital part of SAP implementation. Many organizations are unable to choose a suitable consultancy firm or the support team for their business process.

High positive relationship ($r = 1.000$) between implementation success and the organization business objectives. Most of the

organizations motivation and their suggestions are to improve the quality and availability of data and business processes. Thus quickly achieving their business quality, organizations implementing SAP system primarily to improve operating efficiency and reduce costs or strategic focus of changing their business practices, improve sales, and expand their market reach.

Furthermore, Lack of project management, problems with integrating the legacy systems, cultural issues, planning issues and lack of IT resources are also discovered as barriers in implementation process. The findings identified nine significant intangible benefits for the organization from implementing SAP system. Globalization is the top benefit for most of the organizations. Moreover, the research also discovered efficiency, facilitates day to day management, reduces operational cost and supports strategic plan as benefits of SAP implementation.

ERP implementations are complex undertakings because they transform organizations in the longer run. Problems in such projects are unavoidable, unpredictable.

There are many intangible benefits which were found in past researches when implement SAP. However, the research has identified nine important benefits in SAP implementation such as Global business, support strategic planning ,improve business process , secure system, improve efficiency , data accessible and visibility, integrated system , flexible platform and reduce operational cost. There was a high positive relationship ($r = 0.769$) between implementation success and the organization desirables. Furthermore, the research has done a review regarding the SAP benefit measuring frameworks. However, ERP benefit framework is the most accurate and comprehensive framework to measure the ERP benefits [2].

$$\begin{aligned} \mu A \text{ SAP implementation} = & \mu I (\text{IT infrastructure}) \\ \text{Success} & + \mu V (\text{Vendor market}) \\ & + \mu B (\text{Business approach}) \\ & + \mu C (\text{Barriers}) \\ & + \mu D (\text{Desirables}) \end{aligned}$$

The conceptual framework depicts an approach to establish a scientific selection criterion within Sri Lanka. The five dependent variables of the conceptual framework were identified to have a significant influence on the selection criteria. The strength of all the dependent variables were measured against the results derived through the analysis.

Many companies realized that SAP solutions have achieved their business objectives such as standardize the business operations, improve their business Performance, and reduce the working capital, employee jobs easier, automated and integrated business Process ,Increased organization market growth, top management make Better Decision power ,Financial Control and Organizations gain Competitive advantages.

SAP implementation will make a huge impact on organization and employees. The IT infrastructure of organization, vendor support, Identify the Needs of an ERP, keep Milestone of ERP Implementation, Following Implementation Methodology, Top management commitment, good project management team, Monitoring and evaluation of performance, testing and the training of system are important to make a successful of SAP implementation. Therefore it is important for the organizations to evaluate factors before implementing SAP for their organization.

This research have identified the objectives of SAP implementation, their feedback of implementation of SAP, organization faced issued when implementation and also identify the benefits of the system.

V. CONCLUSION

In Sri Lanka many organizations have moved from their existing systems to ERP system. Due to the business and technology reasons such as year conversion problem, reduce data errors and improve inefficient business process. These drawbacks lead the organization management to decide and migrate for a new system that could increase the efficiency in order to achieve the business benefits.

SAP system has become one of the most essential information systems. SAP application has lot of resistance in organizations for implementation due to higher investments and more failures.

This Study has expected to explore the contribution of SAP implementation toward the organization's business process and success for the future implementing organizations. Most of companies have achieved their objectives through SAP implementation. However organizations have faced critical issues when implementing SAP. The study mainly focused on successful SAP implementation for future organization.

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