A Comparative Analysis of Issues Affecting ERP Implementation in Developed and Developing Countries

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Abstract: Enterprise Resource Planning (ERP) is a business management system that integrates all facets of business. Many organizations are adopting ERP systems for improving information flow as well as order processing efficiency. In the past ERP was accepted by the developed countries. But, today this adoption of ERP is no longer restricted to developed countries as the developing countries now days are adopting such information systems. Issues which are considered more important for developed countries may not be of equal importance for developing countries and hence replicating the implementation experience which holds for developed economy may not be a wise approach on the part of the implementation vendors targeting developing economy. The purpose of this paper is to present the findings of the study based on comprehensive compilation of literature and analysis of ERP implementation success issues in context to developed and developing countries. The researchers applied Pareto analysis to identify the key issues for both developed and developing countries and thus a comparative analysis has been done to identify issues applicable for developing countries but not for developed countries.

Keywords: ERP, Implementation, Developed countries, Developing countries, Pareto analysis, Issues

I. INTRODUCTION

Enterprise Resource Planning (ERP) is a novel information management system consisting of software support modules. There is an increasing demand for this system in both developed and developing countries. But it has been seen that this system has been widely adopted by organizations of developed countries such as USA, Canada, United Kingdom, Australia, and developing countries are lagging behind. Being evolved from MRP systems it has played a crucial role in IT applications for several decades and still continuing to be a strategic tool of information in every business sector of any magnitude. Organizations of different sector like in manufacturing, service, pharma, energy etc. have adopted and adopting such novel solution to automate the deployment and management of material, finance and human resources, streamlining processes and achieving process improvement in order to achieve global competitiveness. ERP has widely used in developed countries all over the world to automate the deployment, streamline processes and for achieving process improvement and global competitiveness. But in recent years ERP vendors are trying to overcome the economic cultural and basic infrastructural barrier related to developing economy. For developing countries ERP system is in its early stage. It has been found that reasons like 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 particularly in Asian developing countries compared to the developed countries. Although ERP systems can bring competitive advantages to organizations, the high failure rate in implementing such systems is a major concern [1]. A number of cases exist where organizations inspite of spending high amount on ERP implementation have not been able to reap any benefits out of it. A survey based in United States revealed that 70% of the companies implementing ERP consider the project successful [2]. The very fact that about 60-70% of all ERP implementations end up with failure [3, 4]. So unless the differences developed and developing countries are clearly conceived, the ERP project would never reach to positive outcome [5].

Critical issues for implementation of ERP in developed country may differ substantially from ERP implementations in developing countries. The resource and other technological advancement of developed countries are totally different from developing countries as well from the point of economy. So during such implementation of Enterprise planning system the managers and the implementers must keep in mind the issues that are applicable for developed countries may not be applicable for developing countries. This paper thus attempt to

make a comparative study of critical issues between developed and developing countries to let the managers and implementers keep in mind for the implementation to run smooth without any disruption.

II. LITERATURE REVIEW

In this section the review of literature has been done in context to developed and developing countries:

Review of Literature of ERP implementation issues in context to developed economy:

A research study based on content analysis of published articles reporting the implementation of SAP identified six common issues that would actually lead to implementation of ERP successful. Those six issues are: Proper project team, Support from top management, clearly defined goals and objectives, Role of external consultant, Proper training and education, Organizational diversity, Proper budget, Adequate testing [6].

A research study carried out in Belgium SMEs, the researchers on the basis of detailed survey in these companies verified if the ERP success factors, discovered in the literature, are relevant for these companies. After extensive literature review the researchers divided the identified critical success issues into five groups according to the theme These include: Clearly defined goals and scope of objectives, Organizational culture, Effective communication, Support from top management, IT infrastructure, Proper implementation strategy, proper project management [7].

In a research study on ERP implementation issues the researchers on the basis of responses from 86 organizations a broad list of 22 critical issues have been identified, out of which the most important critical issues were ranked which include: top management support, project team competence, interdepartmental cooperation, clear goals and objectives, project management, and interdepartmental communication [8].

A research carried out in Poland regarding ERP implementation identified some issues which would lead to implementation of ERP successful which include: Top Management Support, Team Involvement, System Reliability, Team Composition, Detailed Schedule, IT Infrastructure, Financial Budget, Work time schedule [9].

A research work on enterprise resource planning (ERP) system characteristics particularly relevant for Australian Small to Medium Enterprises (SMEs) and by the qualitative analysis done on the response received from the target enterprises the researchers have identified some of the crucial issues that can be proved to be helpful for implementing ERP. The identified issues are Clear idea about requirements, project champion, proper implementation strategy and clearly defined scope of implementation [10].

In a research study the researchers explored the critical issues of enterprise resource planning (ERP) system implementation at Canadian Small and Medium sized Enterprises (SMEs). The outcome of the research identified issues that lead to implementation of ERP successful which include: Operational process discipline, Project team, Project management capabilities, User training and education, Support from management, Role of qualified external consultant [11].

Review of Literature of ERP implementation issues in context to developing economy:

A research carried out in Indian small and medium scale enterprises revealed that for ensuring successful implementation of ERP systems the following issues play vital role, those are: proper education and training, competency of project implementation team, change management, adequate vendor support and role of external consultant [12].

In a research study after reviewing 28 articles identified ten success factors or issues in implementing ERP system in Malaysian companies which are: Support from top management, Clear goals and objectives, Communication, Effective project management, Business process engineering, Data accuracy, Suitability of software and hardware, Support from vendor, Education and training and User involvement [13].

By conducting a study on ERP implementation issues a major Chinese enterprise named Electronic Co from initial implementation problems to final success. The purpose was to provide Chinese enterprises with the knowledge about the critical issues in ERP implementation. From this study the researcher presented six critical issues which are as follows: top management support, project team, project management, process change, education and training, and communication [14].

A researcher identified and validates the critical success factors empirically for ensuring successful implementation of Enterprise Resource Planning (ERP) packages in context to retail industry in India. The identified issues or factors are: Top management commitment, Product selection, Project management, Team composition, Training and education [15].

A study conducted in SME sector of China based on based on the analysis of the character of ERP marketing and nature of SMEs of China, the researchers identified six critical issues, which include: Top management support, Great competence project team, Right implementation scope, Change management, Data accuracy, Education & training [16].

According to a research work ten success issues have been identified by analyzing ten selective articles which are: ERP teamwork and composition, Top management support, Business plan and vision, Effective communication, Project management, Appropriate business and legacy system, Software development, Testing and troubleshooting, Effective – decision making, Effective training [17].

III. METHODOLOGY

Based on the review of literature certain issues leading to successful implementation of ERP, and on the basis of frequency of citations made by authors in context to developed and developing countries, 20 issues have been identified for developed countries and 22 issues have been identified for developing countries. However for identifying key or critical issues for both developed and developing countries the researchers here applied Pareto analysis (80-20 Rule) i.e. how many times the issues are mentioned by authors in the literature and arranged them in descending manner, hence the key issues are extracted by applying Pareto analysis.

Data Collection Procedure

The data collection phase for compilation of review of literature involved exhaustive search of esteemed Management information system (MIS) journals including that the researchers could access, but not limited to those that include: Journal of Enterprise Information Management, Journal of Manufacturing Technology Management, International Journal of Computer Science and Information Security, European Journal of Information Systems, IEEE journal, European Journal of Operational Research , Business Process Management Journal , International Journal of Operations and Production Management . In addition to the above mentioned journals, some conference papers and articles were also accessed as well as, the following databases were searched like: Emerald, Science Direct, Ebsco, J Stor, Springer etc.

IV. DATA ANALYSIS

For identifying the key or critical issues for developed countries Pareto analysis has been applied. For this purpose, each issues mentioned by authors at least once in the literature are listed down with the frequency of each issues. From the frequency calculated for each issue the percentage contribution of each issue is computed, hence the cumulative percentage contributions of issues are also calculated. It has been found that only 12 issues out of 20 are contributing 80% of the total percentage contribution. Hence, these 12 issues are regarded as the critical issues being extracted from the review section in context to developed countries.

Table1. Pareto Analysis

Issues mentioned in the literature	Number of instances cited in the literature	Percent ae contribution of each	Cumula tive percentage of issues
Top management support	5	12.5%	12.5%
Clearly defined goals & objectives	5	12.5%	25%
Project team competence/champ ion	4	10%	35%
Proper project management	3	7.5%	42.5%
Education & training	2	5%	47.5%
Role of External consultant	2	5%	52.5%
Effective communication	2	5%	57.5%
IT infrastructure	2	5%	62.5%
Proper implementation	2	5%	67.5%

Issues	Number	Percent	Cumulative
strategy			
Proper budget	2	5%	72.5%
Organization al culture	2	5%	77.5%
Interdepartm ental cooperation	1	2.5%	80%
Project team involvement	1	2.5%	82.5%
System reliability	1	2.5%	85%
Project team composition	1	2.5%	87.5%
Detailed schedule	1	2.5%	90%
Work time schedule	1	2.5%	92.5%
Clearly defined scope of implementation	1	2.5%	95%
Operational process discipline	1	2.5%	97.5%
Adequate testing	1	2.5%	100%
Total	40	100% (approx)	100% (approx)

Similarly, for developing countries 14 issues have been found which is contributing 80% of the total percentage contribution of issues. Hence, these 14 issues are identified as critical issues for developing countries (See Table 2.).

Table2. (Pareto Analysis)

Issues mentioned in the literature	Numb er of instances cited in the literature	Percentag e contribution of each	Cumulati ve percentage of issues
Education & training	6	15%	15%
Top management support	4	10%	25%
Proper project management	4	10%	35%
Project team competence	4	10%	45%
Effective communication	3	7.5%	52.5%
Change management	2	5%	57.5%

Adequate vendor support	2	5%	62.5%
Role of external consultant	1	2.5%	65%
Clearly defined goals objectives	1	2.5%	67.5%
Effective decision making	1	2.5%	70%
BPR	1	2.5%	72.5%
Data accuracy	1	2.5%	75%
Suitability of H/W & S/W	1	2.5%	77.5%
User involvement	1	2.5%	80%
Process change	1	2.5%	82.5%
Product selection	1	2.5%	85%
Team composition	1	2.5%	87.5%
Right implementation scope	1	2.5%	90%
Business plan & vision	1	2.5%	92.5%
Appropriate business legacy	1	2.5%	95%
S/w Development	1	2.5%	97.5%
Testing & troubleshooting	1	2.5%	100%
Total	40	100% (approx)	100% (approx)

V. FINDINGS AND DISCUSSION

From the literature review and by applying Pareto analysis it has been found that 12 issues are identified as the critical issues responsible for successful implementation of ERP in developed countries and 14 issues in developing countries as those are contributing more than 80% of the total percentage contribution. But some issues that are found to be critical for developing countries may not be critical or assumes much importance for developing countries. The objective of this paper is to find out those critical issues that have appeared exclusively for developing countries but not for developed countries. Those issues that are only applicable to the developing countries are listed below:

    a.   Change management
    b.   Adequate vendor support
    c.   Effective decision making
    d.   Business Process Re-engineering

    e.   Data Accuracy
    f.   Suitability of H/W and S/W
    g.   User Involvement

Change Management: Implementation of Enterprise information system inevitably leads to change management program. The obstacle in implementing such system actually comes from change management program. Management of business of any magnitude particularly in developing countries must commit to facilitate necessary changes to make positive outcome of the implementation process. The acceptance of change brought about by the implementation is crucial, starting from project phase and continuing throughout the entire life cycle. Organizational culture and change in structure must be managed [18], which include people, organization and change in culture [19]. The management has to deal with the change management very effectively and strategically which include internal politics and resistance to implementation. As part of change management program the users should be engaged in designing and implementing business processes, and above all formal education and training should be given [20, 21].

Adequate vendor support: Vendor support can be considered as important crucial issue in successful implementation of ERP. Enterprise information system in the form of ERP gives oxygen for the growth of organization and is lifeblood to the organizations of developing economy. There will always be the need of implementing new modules and version that suits better to be achieved between business and system. The vendor should provide the implementation and post implementation support. The policy and practices of the vendor's regarding updates and versions must be acceptable. Hence, support from vendor is considered as crucial issue with any packaged software that includes updates, technical queries, user training and education.

Effective decision making: Effective decision making requires enunciating business plan and vision to the organization, identifying scope and objectives, and identifying clear connection between business goals and Information system strategy. All vital decisions should be measurable [22] and blended with a certain degree of risk and quality management [23] and finally should involve targeting internal and external best practices for implementation of ERP [24].

Business Process Re-engineering: The outcome of BPR results in complete chronicle of how the business will regulate and continue once the package is in use [25, 17, 20, 22, 26, 27, 28] with the mission of matching the requirements to the implemented system [29, 30, 31, 32, 33]. The new business model and reengineering that drives technology choice is an enabling issue which lead to implementation of ERP successful.

Data accuracy: Data and information is considered as crucial driver of business, so it is one of the reason to implement ERP system for making accuracy of data as because only the accurate and complete data can upgrade the standard of the business. According to the researchers the ultimate success of the system depends on the degree of data accuracy made during the conversion process. It has been found that most of the organizations particularly of small scale industries the data is either incomplete or inaccurate. So it is more needed for the industries of developing countries in particular to adopt a system that can make the data responsible

for operating the business complete, efficient and accurate [16].

Suitability of H/W and S/W: The suitability of hardware and software refers to the fit between the selected ERP system and the hardware. In developing countries "suitability of h/w and s/w" is considered as crucial issue in successful implementation of ERP. The overall architecture of the Enterprise system should be established before deployment, taking into account the most important requirements of the implementation. This actually would prevent the reconfiguration at every stage of implementation [34].

User Involvement: It refers to how the users will be participating in the ERP systems. Once the system gets implemented it relies on the user so that the end users concern can be significant in implementation of ERP [35] classified user involvement into two areas as:

(1)   User involvement in defining company's need
(2)   User participation in implementing ERP systems

User involvement and participation refers to behavior and activity that users perform during the system process. The organization must know how to promote user involvement to ensure long term ERP process. User involvement in the earlier phase of implementation makes it easier to correct mistakes. It has been considered User involvement as one of the critical issue towards successful implementation of ERP [36].

VI. CONCLUSION AND FUTURE RESEARCH

ERP market in today's world is a mixed bag of great expectations, expecting great and rich results. The above findings would reflect the perspective of managers and implementers and holds significance for any organization in developing countries. This study provides a partial support for the explanation of issues applicable for developed and developing economy. The issues mentioned above are only applicable for developing countries, thus from managerial point of view while implementing the above issues must be taken into account, as issues that are applicable for developed countries may not be a wise approach while implementing enterprise information system for developing countries always. The managers and users can be benefited from this study by identifying those key issues to make the implementation procedure smooth without any disruption. Further ERP vendors can take inputs from this study to change their implementation approach while targeting organizations of developing countries.

The findings of this paper are based on qualitative technique. So there is a need for quantitative technique and surveys in order to get more generalized result. There may be other issues that can be explored. It would be more value achieved to combine the technique both qualitatively and quantitatively in future. There is a scope to enhance to this study by taking different industries into consideration.

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