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Role of Information Technology and Communication Systems in Implementing Enterprise Resource Planning Systems in Indian Industries

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Abstract

Information Technology and Communication Systems play an extremely significant role in efficiently implementing Enterprise Resource Planning (ERP) system in Indian Industries. The purpose of this paper is to shed light on the objective of effective implementation of ERP system by the use of Information Technology and Communication Systems, as far as the entrepreneurs and the society is concerned. The methodology adopted for this topic (paper) is the right selection of ERP package (system) and a good implementation team. The findings indicate that the Information Technology and Communications Systems help to increase the efficacies of ERP implementation program (system). Conclusions drawn can be used for implementing and validating the ERP System.

Keyword: Communication Systems, Enterprise Resource Planning (ERP), ERP Package, Implementation, Information Technology, Program

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1. Introduction

ERP is a software based business management system that integrates all the components of business, including planning, manufacturing, sales and marketing etc.

It is an information system that supports and intertwines many facets of a business. A major hurdle for ERP implementation is how to bridge the gap between the ERP system and an organization's business processes by customizing either the system or the business processes of the organization or both.

For effective ERP system to be implemented, the organization should take into account the human resources and management problems into consideration. Users of these technologies, such as Information Systems/Information Technology (IS/IT) are at the heart of such undertakings. Hence, it is important to allow these entities to participate in the implementation process. User participation has traditionally been identified as an important component in IS/IT implementation.

The introduction of a novel information system such as an ERP system definitely alters the way people function. A new platform with different interfaces, data entry which is changed and reports formats are not the same.

To be successful and effective, an ERP implementation must conform to certain criteria:

- It should be managed by a cross-functional team from operations, finance, and Information Technology.
- Implementation results are measured including ROI (Return on Investment) and operational impact.
- Close collaboration with an implementation partner experienced in manufacturing ERP
- It should be in tune with the industry and be able to grow as a company changes to meet its demand.

An ERP implementation is an organizational innovation process. It includes the utilization of IT systems and technology, communication, and complimentary business and human resources development.

The important objective of an ERP system is to automate business devices, to improve interactions and communications

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through-out an organization and to overcome the factors to legacy systems for customization.

The data is centrally stored in a singular database. This database operates as a hub that stores, shares, and circulates data from within different departments and business functions. ERP systems are one of the most adopted Information Technology (IT) solutions in organizations. Implementation of ERP system is a complex IT-related social phenomenon with a large body of knowledge (Sarkar and Lee, 2003). Amoako – Gyampah, (2007) asserts that this undertaking involves large expenditures, lengthy periods, and organizational commitment.

The reasons as to why the continuous growth of ERP projects is to be accepted because of IT and Communication Systems are –

- The ERP vendors are incessantly diversifying the versatility of their packages by adding useful functionality for new business tools such as Sales force automation, Supply-chain, Customer Relationship Management, Order management, Data warehousing, Maintenance repair-and-overhaul etc.
- The ERP vendors are changing to web based applications. This may lead to fluid information flow in the logistics chain, and thus, many ERP customers will need these Web-based ERP systems consolidating the use of IT.
- The introduction of E-commerce also accrues the demand for Web-based ERP systems.
- The ERP systems' share in peculiar geographical markets such as in the Indian Sub-continent is uncommon.

In Manufacturing Sector, ERP implementation increases inventories from 15 to 35 %. The most essentials of ERP are its efficacies to:

- Integrate and automate the business tools across organizational functions and locations;
- Enable implementation of all variations of business practices, increasing productivity;
- Share common data and practices through-out the organization in order to minimize errors (data management efficacy), and
- Furnish and access information in a real-time environment to help speed up taking better decisions with cost reductions.

An ERP system covers established ways of doing business. Studies have shown that an ERP system is an organizational infrastructure that influences how people work, imposing its own logic on a company's strategy, organization, and culture. For example, SAP R/3, as one of the major ERP vendors, currently stores over 1,000 predefined processes that represent financial, logistics and human resources' best practices in a system called "business engineer".

1.1 Background

Information System/Technology has transitioned from mainframe-based computing through the era of client/server to the Internet era. Earlier the ERP systems were developed only to work with huge mainframe computers. Most of the current ERP systems are based on the client/server solution model. Here, the server stores the data, maintains their integrity, consistency and processes the requests of the user from the client. The work load of the data processing & application is shared by the server and the client. Thus, ERP vendors are (as many other software vendors) inclined to move from a conventional client/server to browser/Web server architecture in order to deliver E-business capabilities. These systems were built with a clear separation of functional facets. The user interface implemented using GUI (Graphical User Interface) techniques was deployed on client machines. The databases were built using relational database technology. Relational database systems had empowered the vendors to put in the necessary flexibility in terms of business logic and data structures to support parallel business practice implementations. These technologies in general had enabled the users to architect the system in a way that installation, customization and extensions were possible in smaller timeframes.

2. Communication Systems

Nearly 72 % of organizations make use of some form of social technology within the organization, and hardly many are realizing the complete value of social tools. Social technologies have the potential to increase the productivity of interaction by about 20 to 25%, if done well. Hence, the best tools to implement for ERP applications are communication monitoring, built-in security, internal social networks and more.

2.1 Communication System Failure

Information being routed from location to location over communication lines is vulnerable to accidental failures and to intentional interception and modification by unauthorized parties.

3. Implementation Approaches

From the management perspective, the nature of the ERP implementation problem includes strategic, organizational and technical factors. Hence, ERP implementation involves the amalgamation of Business Process Change (BPC) and software configuration to conform the software package to the business processes.

There are two stages of ERP software implementation - in the first stage, an organization has to re-engineer the business process to accommodate the functionality of the ERP system

and the other stage is customization of the software to match the existing processes of an organization.

The latest generation of ERP systems provides reference models that take into account the best current business practices.

The three approaches to implementing an ERP system include –

- Enterprise-wide full installation
- Unit by Unit, and
- Key–Process Installation

Additionally, the widely discussed ERP implementation strategies are –

- Big bang – Implementation happens in a single instance. All users move to the new system on a given date.
- Phased rollout - Changeover occurs in phases over an extended time-fame. Users move onto new system in a series of steps.
- Parallel adoption – Both the legacy and the new system, run at the same time. Users learn the new system while working on the old.

4. Role of IT in Implementing ERP System

Information Technology (IT) such as Electronic Data Interchange (EDI), Radio Frequency Identification Technology (RFID), wireless, the Internet (World Wide Web WWW), & Information Systems (IS) such as Electronic Commerce (E-Commerce) systems and Enterprise Resource Planning (ERP) systems has a major impact in education, healthcare, manufacturing, transportation, retailing, services, notwithstanding. Many organizations shifted to IT/IS to help them secure their targets.

IT investment studies are important, especially in the current business environment, because of the large sums of money brandished on IT/IS projects. The benefits are expected to have strategic value.

The use of traditional appraisal techniques to justify investments in IT & IS has garnered a lot of attention for the past 10-12 years. This is due to the spiking of worldwide investment in IT/IS projects. Industries need to justify the investment in IT/IS, taking into account costs and benefits, both short-term and long-term.

Information systems can improve organizational efficiency and effectiveness, thus, providing a competitive edge. Many companies experience difficulty in IT/IS implementation due to their poor experience in evaluating implementation performance. Evaluation of the implementation of IT/IS projects has failed to be given due consideration as managers often fail to recognize the implications of evaluation and justification during the implementation of IT/IS projects.

Criteria used in evaluating and the implementation of IT/IS projects can be categorized as follow-

(i) Financial,
(ii) Non-financial,
(iii) Tangibles, and
(iv) In-tangibles.

5. An Evaluation Criterion Emphasized for Justifying IT/IS Projects

Most studies of IT/IS project justification suggest that one should weigh up the performance measures and metrics that can be categorized as financial, non-financial, tangible and intangible.

In evaluating IT/IS projects investment, it is essential to define the objectives of such an evaluation, considering organizational mission, strategy and goals. Some companies fail to understand the purpose of IT/IS validation. A fundamental reason for evaluating IT/IS projects before diving into them, is to be sure that they, in some way, benefit the organization.

Suitable criteria for IT/IS evaluation must align with the nature of the system – is its impact strategic, tactical or operational? Thus, the evaluation criteria must be derived from a sound understanding of an organization's vision, mission, strategy and goals. Projects must be approved by someone, possibly by a group such as a steering committee or by a single individual, before they are implemented. Projects that have failed to be approved and implemented, cannot improve efficiency, effectiveness, or organizational competitiveness.

A 'to do' list can be given for the above –

- Develop a comprehensive methodology
- Develop a holistic and integrated approach to IT/IS justification capable of assessing large –scale IT/IS projects/initiatives (like e-business, m-commerce or systems to support virtual organizations and integrated SCM) within which are embedded many smaller projects.
- Examine the concept of 'success' with IT/IS projects to see how organizations arrive at the conclusion that an undertaking is successful or unsuccessful.
- Develop a framework for IT/IS project risks evaluation in large-scale undertaking.
- Design and develop intelligent DSS (Decision Support System) possibly incorporating fuzzy logic and/or neural networks to support IT/IS evaluation.
- Utilize data mining technology to discover possible influences on or impacts of, IT/IS projects that have been overlooked.

The above framework should be examined meticulously to discover weaknesses, then assessed in terms of the remaining gaps in knowledge about how best to validate IT/IS projects.

6. Implementation Methodology

Assuming a decision on an ERP has been taken, the implementation normally consists of five stages:

1. Design
2. Implementation
3. Stabilization
4. Continuous improvement
5. Transformation

Thus, the implementation strategy is relying on a foundation of people, processes and product.

6.1 Elements of ERP Implementation Planning

- Finalization of business.
- Finding True Cost of Ownership (TCO).
- Design of ERP.
- Requirements and system capabilities gap.
- Requirements of consumer configuration.
- ERP project management includes project governance framework.
- Business process reengineering and its requirements.
- Organizational change management needs (e.g. communications, training, stakeholder alignment etc.).
- ERP integration with legacy systems initiatives.
- Phasing strategies.
- Strategy of Data migration.
- Determination of internal and external resource requirements.
- Explanation of roles and responsibilities (Care Team, Executive Steering Committee, Subject Matter Experts, ERP Vendors, System Integrator).

A well-developed IT & ERP Systems strategy grows on and goes hand in hand with the company's overarching business strategy. To sustain (and benefit from) technologies over time, IT strategies must be driven by defined and agreed upon organizational goals. Conforming IT strategy to enterprise systems strategy is an important goal for overall planning.

IT strategies need to consider an integrated view of information and business processes across the industry.

An entire methodology organizes the approach into five distinct phases during the implementation project lifecycle –

- Analysis
- Design

Table 1. Implementation Project Lifecycle

Analysis	Design	Development	Deployment	Operation	
1	–	–	–	–	–
2	–	–	–	–	–
3	–	–	–	–	–
4	–	–	–	–	–
5	–	–	–	–	–
6	–	–	–	–	–
7	–	–	–	–	–
8	–	–	–	–	–
9	–	–	–	–	–
10	–	–	–	–	–
11	–	–	–	–	–

- Development
- Deployment
- Operation

The standard set of template is available depending on the type of projects. The most common project types are listed as:

- Standard Implementation (Normal)
- Enterprise Implementation (ES)
- Agile Implementation (Active)
- Rapid Implementation (Quick or Fast)

6.2 Monitoring and Functioning of ERP

For effective functioning of an IT system, it is vital that the management put in place effective monitoring mechanism which would help identify early detection techniques and rectify the deficiencies.

7. Common ERP Mistakes and How to Avoid Making Them for Monitoring and Effective Functioning of ERP System

1. Get upper management support.
2. Make a clear & extensive list of requirements before one starts looking at vendors.
3. Carefully evaluate one's opinions before selecting ERP System.
4. Think before one customizes.
5. Change management factor
6. Appoint an internal product champion – and surround him or her with good people.

7. Provide the necessary time & resources for training on the ERP System.
8. Get References, and
9. Information Security.

8. Findings

The findings entail that the role of Information Technology and Communications System helps to increase the efficacy of the ERP implementation program (system).

9. Conclusion

Thus, the following conclusions are drawn from the paper.

- ERP System plays a starring role in IT and Communication system, and vice-versa.
- Evaluation criteria are based on which entity emphasizes more for justifying IT/IS projects.
- There are three implementation approaches for implementing ERP Systems, they are-
- Enterprise-wide full installation,
- Unit by Unit, and
- Key –Process Installation.

There are three most widely discussed ERP implementation strategies, they are –

- Big bang,
- Phased rollout, and
- Parallel adoption.

10. Future Scope

There is a good scope for the IT & Communication System for ERP Systems to expand in implementation activities in Indian Industries in the future.

As of today, only some companies have gone for ERP implementation in India. Having said that, new researchers can further study in this area and this could be useful for them and for the society as a whole.

11. References

1. Nwankpa JK. ERP system usage and benefit: A model of antecedents and outcomes. Computers in Human Behavior. 2015 Apr; 45:335–44.
2. Matende S, Ogao P. ERP system implementation: a case for user participation. Procedia Technology. 2013; 9:518–26.
3. Nofal MI, et al. Integration of business intelligence and ERP within Organizations. Procedia Technology. 2013; 11:658–65.
4. Prouty K, Cantellina N. To ERP or Not to ERP, In Manufacturing, It Isn't Even a Question. 2011.
5. Pacheco-Comer AA, et al. Procedia Technology. 2012; 3:292–303.
6. Elragal A, et al. The future of ERP systems: look backward before moving forward. Procedia Technology. 2012; 5: 21–30.
7. Shehab EM, et al. Enterprise resource planning: an integrative review. BPMJ. 2003; 10(4).
8. Gunasekaran A, et al. Information technology and systems justification: a review for research and applications. European Journal of Operational Research. 2006; 173:957–983.
9. Alshawi S, Irani Z, Baldwin L. Benchmarking information technology investment and benefits extraction. Benchmarking: An International Journal. 2003; 10(4):414–423.
10. Kazanjian A, Green CJ. Beyond effectiveness: the evaluation of information systems using a comprehensive health technology assessment framework. Computers in Biology and Medicine. 2002; 32:165–177.
11. Kumar K. Post implementation evaluation of computer – based information systems: Current practices. Communications of the ACM. 1990; 33(2):203–12.
12. Lu C-S, Yang C-C. An evaluation of the investment environment in international logistics zones: a Taiwanese manufacturer's perspective. International Journal of Production Economics. 2007; 107:279–300.
13. Sarkis J, Sundarraj RP. Factors for strategic evaluation of enterprise information technologies. International Journal of Physical Distribution and Logistics Management. 2000; 30(3-4):196–220.
14. Auditing in ERP environment: an ERP implementation case studies of Indian industries, introduction to ERP by Department of Service Information Systems Engineering/Education/Bachelor's Program. 2014.

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