ERP Systems : New-fangled Approach to Manage Technology for Competitive Advantage

Dr. Subodh Kesharwani *

Abstract

Presently, a large portion of technology resources is being devoted to complying with ever changing regulatory requirements from a myriad of sources. Being competitive in this scenario requires adoption of new technology and management methodologies, such as just-in-time, electronic data communications, work order-less scheduling, billing, supply chain management, knowledge management, customer relationship management, ERP Systems and many more latest buzzwords which advent from day-by-day. Packaged ERP systems are now incorporating functionality to support these new methodologies as it had got new-fangled approach to integrate & amalgamate in order to bring them under one roof and also to make the process streamlined. This paper explores ERP as an ambivalent technology of power on the one hand; it may tighten management control by bringing a new level of panoptic visibility to organizational activities; on the other hand. The embedded business model within the ERP may drive empowerment of employees and greater control relaxation through the configuration of new process design. For most enterprise, ERP systems are the vital backbone of all of their business transactions and communications, ERP systems nowadays are increasingly becoming beyond simply being the core of transaction processing for large, complex enterprises, they are often the launch pad for entrepreneurial initiatives such as e-business and B2B commerce.

Objective: The objective of this paper is to answer the question, "How does an ERP system influence competitive advantage?" The work for this paper focused on four objectives: determining ERP systems role in competitive advantage, determining technology management capabilities in leveraging the enterprise competencies, evaluating ERP systems pros and cons by putting a flavour of technology and at last look after how technology affect competitive advantage by shaking hands with ERP systems. For the purposes of this paper, competitive advantage is perceived as a strength that provides a market advantage relative to a competitor. Often competitive advantage is related to the core competencies of the organisation, which are frequently based on implicit know-how or tacit knowledge. Recognizing technology as a competitive resource that requires new management principles to end in business growth is the reason for the current interest in technology management. Japanese organisations have long understood the value of developing technology assets and managing intellectual capital. They have applied innovative management techniques to promote tacit knowledge sharing and the creation of new competitive technology.

* Dr Subodh Kesharwani
School of Management Studies, Indira
Gandhi National Open University
New Delhi

Keywords:

❖ **Technology:** The discipline dealing with the art or science of applying scientific knowledge to practical problems Technology focuses on finding solutions to problems and meeting needs in the real world. It includes products, processes and systems; and takes into account the environment in which it is developed and deployed. Major characteristics of Technology is in a form of human cultural activity which aims at practical ends or purposes. It involves choice - in choosing problems and design approach (these in turn are influenced by culture). In the end technology *transforms* the material world with certain tools and procedures.

❖ **Innovation:** Innovations are new *improvements made in things already invented.* Imitation may or may not be the sincerest form of flattery - but it is surely the route that innovation most frequently follows into an enterprise. (Technology Mgt, June 2002).

❖ **Management:** Focuses on strategy and organization that make technology choices for an enterprise: identification and development of technological capabilities (core, support) needed for competitive advantage; deployment of technological capability into sellable products and/or services; management of interactions with other functional groups.

❖ **ERP systems:** Enterprise Resource Planning (ERP) software system integrates key business and management processes within and beyond a firm's boundary.

❖ **Information:** a scientific technique of achieving a practical purpose. Technology is not an independent science, having a set of doctrines of its own, but consists of applications of the principles.

❖ **Competitive advantage:** Condition, which enables a company to operate in an extra competent or otherwise higher-quality mode than the companies, it competes with, and which domino effect in benefits accruing to that corporation.

Preamble : Business accomplishment in the 21st century will be progressively more dependent on the effectual development and deployment of technology. This trust presents a multifaceted challenge and emphasizes that in the solutions too numerous business problems rely on the convergence of a number of technologies and their proper alignment with customer requirements and various other business elements. As a result, the aptitude to administer technology innovatively is vital for attractive business competitiveness. In illumination of these challenges, the training of cutting-edge technology when utilized effectively, flourish as a prevailing apparatus for enhancing enterprise competitiveness. Technology management is the application of managerial techniques mainly suitable for and ensuring that the technological factor is exploited for accomplishment of an enterprise's goals. A significant part of this move lies in accurate implementation of appropriate practices related to technology and innovation management at enterprise level. Within this modus operandi, a fundamental prerequisite for improving enterprise competitiveness is the identification of critical technological needs. An ERP package is a "product" as a business may have to modify a whole host of its processes, before it can execute an ERP package successfully. Even though, ERP application developers may authorize some degree of customization to its standard package (like SAP, People soft, BaaN, Oracle, etc.), the modification itself would cost a bulky package to the buying organization. An economical and efficient way would be to go for a tailor made "solution", possibly a web based one (based on Internet technologies) that would be built around an organization's processes.

A. Determining ERP Systems Role in Competitiveness: Information is supremacy and — more often than not — it is the deciding feature in a company's success. Before going into the depth of ERP systems role in competitive advantage let's have a glimpse on what ERP is really. Enterprise Resource Planning as an appearance derives from Material Resource Planning generally known as MRP-1. Enterprise resource planning systems (ERP) are management information systems that integrate and mechanize many of the business practices associated with the operations or production aspects of a company. These typically comprise manufacturing, logistics, distribution, inventory, shipping, invoicing, and accounting. ERP software can support in an

organization several business activities, like sales, delivery, billing, production, inventory management, and human resource management systems. They are continually called back office systems indicating that customers and the general public are not directly involved. This is contrasted with front office systems like customer relationship management systems that deal directly with the customer. ERPs are cross-functional, enterprise wide and linked all functional departments that are implicated in operations or production into one system. In addition to manufacturing, warehousing, and shipping, this would squeeze accounting, human resources, marketing, and strategic management. In the early days of business computing, corporations used to write their own software to systematize their business processes. This is a classy approach, since many of these processes take place in common across various types of businesses, common reusable software may endow with cost-effective alternatives to custom software. Thus ERP software furnishes to an extensive range of industries from service sectors like software vendors and hospitals to manufacturing industries and even to government departments.

Enterprise applications are at the compassion of business activity today. What's more, the world they occupy looks set to become yet more demanding. Take the manufacturing industry, for example. Increased use of supply chain software provides businesses with enhanced production efficiencies and better communication with customers and suppliers. For the automotive industry, temporarily, E-Business applications are the thread connecting all aspects of a customer engagement - including the Web; call center, field organizations and partner networks. Whether it's physical resources, human resources, software, or services, each element appears to play a requisite role. What's more, in a world where change is a constant, limited resources leave petite room for error and your capability to respond instantly and assertively are dangerous to success. The dilemma is a complex one - as you look for a solution that not only enables cost reductions but also permits you to fabricate a more adaptive infrastructure for improved business agility. One way to build an adaptive infrastructure is through IT consolidation, which optimizes your people, processes, and systems to be more competent and effectual. As a result, more and more companies have turned to Enterprise Resource Planning (ERP) to

provide their decision makers with speedy, exact access to a unified view of their operational and financial information.

B. Determining technology management capabilities in leveraging the enterprise competencies: An ERP system bridges a gap between Technology and Management. Technology Management is one of the principal drivers of competition. It plays a major role in industry structural change, as well as in creating new industries. It is also a great equalizer, eroding the competitive advantage of even well entrenched firms & propelling others to the fore front **(Porter 1985).** In global competitive situation we need speed and punctuality, that is why the role and function of sophisticated Information Technology becomes a main bridge which connects an individual with another one, a group with another one, which shorten the distance and time, management solution will be faster and smarter, so that everything becomes more effective and efficient. We could say that technology consist of computer/ personal computer as 'Terminal', Software (among others ERP, Expert System). The explanation is ERP, a business management system that integrates all facets of the business, including planning, manufacturing, sales, and marketing **(Kesharwani 2003).** As the ERP methodology has become more popular, software applications have emerged to help business managers implement ERP. Because of their wide scope of application within the firm, ERP software systems rely on some of the largest bodies of software ever written. Implementing such a complex and gigantic software system in a company usually involves a large number of analysts, programmers, and users, and frequently comprises a multi-million-dollar/yen/euro project in itself for bigger companies, particularly transnational. Enterprise resource planning systems are habitually closely tied to supply chain management systems. Supply chain management software can extend the ERP system to include links with suppliers. To implement ERP systems, companies often hunt for the help of an ERP vendor or of third-party consulting companies. Consulting in ERP involves two levels, specifically business consulting and technical consulting. A business consultant studies an organization's current business processes and matches them to the corresponding processes in the ERP system, thus 'configuring' the ERP system to the organization's needs. Technical consulting often

involves programming. Most ERP vendors allow changing their software to suit the business needs of their customer. ERP streamlines business processes to provide a significant competitive advantage. These solutions offer proven, best-practice processes for your business functions, including finance, human resources, manufacturing, logistics, and sales and planning. Appropriately implemented, ERP delivers optimal efficiency and productivity, while reducing your information management system costs. *Thus technology management is not important for its own sake, but it is important if its affects competetive & industry structure. Technology however, pervades enterprise value chain & extends beyond these technologies associated directly with the products. Any enterprise involves a large number of technologies. Everything an enterprise does involves technologies of some sort, despite the fact that one or more technologies may appear to dominate the product or the production process. The significance of a technology for competition is not a function of its scientific merit or its prominence in the physical product. Any of the technologies involved in a firm can have a significant impact on competetion. A technology is important for competition if it significantly affects a firm's competetive advantage or industry structure.*

Technology & ERP : The basic tools for understanding the role of technology in competitive advantage is the ERP Systems. An Enterprise as a combination of activities in a collection of technologies. Technology is embodied in every activity which moves towards integration in an enterprise, and technological change can affect competition through its impact on virtually any activity. This virtual activity is nothing but ERP systems. Every ERP systems uses some technology to combine purchased & human resources to produce some output. This technology may be as mundane as a simple set of procedures for personnel, and typically involves several scientific disciplines or sub-technologies. The material handling technology used in logistics, for example may involve such discplines as industrial engineering, electronics and materials technology. The tecchnology of an ERP Systems represents one combination of these sub-technologies. Technologies are embodied not only in primary activities but in support activities as well. Computer Aided Design (CAD) is an example of a technology just coming into use in product development that is

replacing traditional ways of developing new products. Technology, there, is pervasive in an enterprise & depends in part on both the buyers channels & suppliers technology. As a result, the development of a technology encompasses areas well outside the boundaries traditionally established for R&D, inherently involves suppliers & buyers. Some of the technologies embodied in the ERP Systems are industry specific, to varying degrees, but may are not. Office automation & transportation are just two areas where vital technologies, in large part are not industry specific. Hence enterprise often takes places in other industries. All these characteristics of technology have implication for the role of technology in competitive advantage.

C. Evaluating ERP Systems Pros & Cons by putting a flavour of technology : The pros & cons of any systems would be interpreted when it is thouroughly checked from every aspect and to analyse this we have to start from scratch and can initialise from buzzword known as technology. Investments in technology are an important focus for innovation but, like other forms of change, they also carry risk. The risk associated with a poor decision in part depends on the number of processes impacted by the technology, ranging from low with a small and reversible production line enhancement, to high with the irreversible implementation of an enterprise wide information system. In terms of competitiveness, just as a local innovation can remove efficiency sapping bottlenecks from a wide range of related business processes, so can the same business processes amplify any negative effects.

To create an innovative organization, culture, structure, development projects and job design are serious.

Technology affects competitive advantage if it has a significant role in determining relative cost position or differentiation. Since technology is embodied in every integrated activity (ERP systems) and is involved in achieving linkages among activities, it can have a powerful effect on both cost & differentiation. Technological development can raise or lower scale economies, make inter-relationship possible where they were not before, create the opportunity for advantages in timings, and influence nearly any of the other drivers of cost or uniqueness (**Lucas & Elson**

1994). Thus a firm can use technological development to alter drivers in a way that favour it, or to be the first & perhaps only enterprise to exploit a particular driver. **(Turban, Mclean & Wetherto 2003)**

D. How Technology affects competitive Advantage by shaking hands with ERP systems:
The term competition is frequently used in the context of innovation and industrial economics. The meaning and intent of the term is generally understood even though an exact description of the term is not usually given explicitly. The interaction between technologies is, however, often not one of competition in the strict sense of the word, for there are many cases where technologies interact in a relationship that is not confrontational. A more general approach is therefore warranted. Competitive Advantage introduces a powerful tool that the strategist needs in order to diagnose and enhance competitive advantage with ERP Systems. ERP Systems analysis allows the manager to separate the underlying activities an enterprise performs in designing, producing, marketing, and distributing its product or service all in one roof i.e. integrating every thing. Competitive Advantage shows managers how to evaluate their competitive position and implement the specific action steps necessary to improve it **(Antonucci 1997).** One of the best reasons to embrace technology is its ability to make your business more competitive. If you haven't already done so as part of your strategic planning process, develop a list of your current activities or a mini-management audit and if possible incorporate the new information technology system which in general now-a-days known as ERP systems or integrated systems.

The ERP System USP: ERP systems recommend an influential combination of specialist E-Business skills and bottomless industry knowledge, and have developed an exclusively flexible service portfolio – ranging from tailor-made consultancy to the development of fully-managed, end-to-end, hosted solutions. ERP systems are a rapid implementation methodology, which allows applications to be deployed in a fraction of the time required for traditional implementations **(Davenport 1998).** ERP systems focus on the delivery of business critical information to the right people at the right time, through the channel or device of their choice – whether the user

is a customer, supplier, partner or employee **(Lithicum 2000).** Uniting disparate sources of data across the extended enterprise, ERP Systems can help you unlock the value of your information. What will ERP systems do? A true Enterprise Portal will provide a single and complete view of customers, partners or employees across all systems channels and devices, as well as a set of web-based facilities to provide:

✓ A consistent user interface
✓ A single, secure user log-on
✓ Identical 'look and feel' on any device
✓ Accessibility from multiple devices (PC, laptop, PDA)
✓ Integration with other back office systems
✓ The ability to integrate with other Web services
✓ The ability to personalize how information is delivered and viewed

To make this goal a reality, all relevant information needs to be aggregated into a unified experience that efficiently connects disparate systems, departments and functions, getting the right information to the right people, whenever they need to see it. The ERP systems permit the extended enterprise, including customers, suppliers, partners and employees, to use standard tools, access information, perform transactions, communicate and collaborate in a highly personalized way, using a range of devices (eg. laptop, PDA, mobile phone) – at any time or place (Shastri 1998). The benefits from enterprise resource planning are claimed to include reduction in inventory carrying costs; ordering costs; production costs; reduce accounting and record keeping costs; transportation costs; investment in equipment; investment in plant ; investment in land ; assembly-line down-times. It further and provides more flexible production processes ; more efficient lot sizes and scheduling ; reduced errors due to poor co-ordination;the cost and efficiency improvements (mentioned above) could increase profitability or increase market share (at a lower price); reduced number of stock-outs reduced fulfillment times increase process transparency for the customer; allow greater product customization, and thereby better match the exact needs of the customer; the customer satisfaction improvements (mentioned above) could increase sales volume, increase sales revenue (due to a higher effective price , ie. - no discounts), increase market share, and increase

profitability.

Results: The consequences of above write-up is that ERP systems solutions focus on the three areas of Transaction, Collaboration and technology Management for customers, suppliers and employees, and are integrated with the customer's back office systems **(Hadle & Koulopoulos 1999)**. These solutions address the steady challenges of reducing cost throughout the enterprise while at the same time seeking to maximize revenue, improve customer loyalty and satisfaction, and increase staff productivity. The approach of integrating portal technology into back office systems for transactional, collaborative and knowledge management systems enables us to offer end-to-end information flow across the enterprise not including necessitating the rewriting of legacy accounting, billing and inventory systems, at a fraction of the cost and in a fraction of the time previously required. ERP systems permit users to perform multiple **transaction** types, across disparate systems using the channel or device of their preference **(Ben 2001)**. **Collaborative** tools such as team rooms enhance employee communication and productivity; chat sessions and web casts serve to disseminate information across the organisation in real-time; e-Learning capabilities via self service portals reduce the cost of training as well as increasing the effectiveness of delivery. **Technology Management** applications assist to merge and allocate the combined asset that is an organization's business information. Using spontaneous search engines, which understand natural language instructions, customers, suppliers and employees have fast, reliable access to relevant, up-to-date information that is conveyed to them in a personalized, user-friendly form.

Conclusion: In the world of networked markets, to be innovative, one needs not only to think out of the box, but also think more importantly about reaching equilibrium. Business applications represent huge investments of capital for enterprises large and small; networks too are extremely costly to setup and maintain. Ensuring high return on these investments must, therefore, be a business priority. ERP Systems helps organizations to maximize their growth & potential. A consultative approach, led by experts from Professional Services, means that traditional techniques for bandwidth optimization and application

performance management are by no means ignored, but implemented within the framework of a more progressive, application aware service. Consequently, the ERP service is tailored to the individual needs of each company, and the network is then managed to work at optimal efficiency. Providing a means for companies to establish policies that ensure efficient performance at the application layer of their corporate network, ERP Systems ensures applications operate at their optimal effectiveness. In turn, this means that these applications can deliver maximum value to the enterprise. Thus technology is a podium that can be simulated by those skilled in the ability to produce value. Conversely, an innovative use of a technology podium to produce value is creativity.

References :

- Antonucci (1994), Achieving competitive Advantage through Process Reengineering & Information technology: A white paper, Widener University working paper.

- Davenport T. H. (1998), Putting the Enterprise in to the Enterprise system, Harvard Business Review pp121-131 July.

- David J Teece (2003) Essays in Technology management & Policy, Imperial College Press, United Kingdom.

- Dillard, J.F., & Burris, B.H. (1993). "Technocracy and Management Control Systems," Accounting, Management and Information Technology, Vol. 3, No. 3, pp. 151-171.

- Efrain Turban, Ephraim Mclean & James Wetherto (2003) Information Technology for Management, John Wiley & sons (Asia) Pte Ltd Singapore

- Frederick Betz (2003), Managing Technological Innovation: Competitive Advantage from Change, John Wiley & Sons, Canada.

- Huber, G. P. (1990), "A Theory of the Effects of Advanced Information Technologies on Organizational Design, Intelligence and Decision- Making," Academy of Management Review, Vol. 15, No. 1, pp. 47 - 71.

- Light Ben (2000) ERP & Best of Breed: A Competitive analysis, Business Process Management Journal Vol.7 No.3 pp 216-224

- Lithicum David (2000), Enterprise Application Integration- Addison Wesley

- Lucas, H.C. Jr., & Olson, M.H. (1994). "The Impact of IT on Organizational Flexibility," Journal of Organizational Computing, Vol. 4, No. 2, pp. 155-176.

- Michael E. Porter (1985), Competitive Advantage- Creating & sustaining superior performance, The Free Pess Macmillan New York.

- MVS Peri Shastri (1998) Making ERP effective, Economic Times, Jan 30

- Reynolds Hadle & Tom Koulopoulos (1999), Enterprise Knowledge has a face, Intelligent Enterprise Vol.2 no.5 March 30

- Subodh kesharwani (2003), ERP Systems Application Experience & Upsurge, Pragati Prakashan, India.

- V.K. Narayanan (2000), Managing Technology & Innovation For Competitive Advantage, Pearson Education, Canada

- Jean Micol Centre de Management de la Technologie – CMT Ecole Poly technique Federale de Lausanne - EPFLCH-1015 Lausanne