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Empowering business organizations through information and communication technology (ICT) and e-business

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Over the last decade, business organisations have been forced to re-examine the role of Information And Communication Technology (ICT) as a support tool within the organisation and accept that it has become a major driver for business change. E-business is no longer optional and has become the standard mode of operating not only in financial services, publishing and retail where we have already seen rapid and profitable advancement but everywhere business is conducted. Information communication and technology (ICT) refers to a powerful collection of elements which include computer hardware, software, telecommunication networks, workstations, robotics and smart chips. This paper examine how ICT and e-business could be use to empower an organization to achieves their set goals. The paper discusses issues in implementing e-business, ICT and e-business, strategic analysis for e-business solutions and stages for empowering the organisation through ICT and e-business, and conclusion with discussion of ICT and e-business as essential tools in modern business.

Key words: Information Communication and Technology (ICT), e-business, financial services networks, workstations, robotics, elements.

INTRODUCTION

Information Communication and Technology (ICT) refers to a powerful collection of elements which include computer hardware, software, telecommunication networks, workstations, robotics and smart chips (Yekini and Lawal, 2011).

This paper examine how ICT and e-business could be use to empower business organisation. The paper discusses issues in implementing e-business, ICT and e-business, strategic analysis for e-business solutions, and stages for empowering the organisation through ICT and e-business and conclusion with discussion of ICT and e-business as essential tools for empowering modern business organisation to achieves their target objective.

ISSUES IN IMPLEMENTING E-BUSINESS

Organisational issues

As might be expected, putting systems in place across organisations calls for consideration of a wider range of human and technical factors— and consequently greater management planning—than dealing with the needs of a single enterprise. A simple model illustrates this. If a single working parent has one child and that child attends a single school, there are issues of where and when to purchase uniforms and kit, how to arrange transport between home, school, outside venues, and friends’ houses, and the need to plan holidays and leave around the school year. When a family has two working parents and several children attending different schools, not necessarily in the same country, the issues of effective
management become more complex. Several uniforms may be needed, these are not exchangeable across children and the school timetables and calendar may be different. The range of problems, tools required, and need for coordination is greatly extended (Burn and Hackney, 2000).

As organisations seek to extend their reach and/or effectiveness by the use of alliances, partnerships and increasingly close ways of working together, this collaboration requires the establishment of closely tied communications and information systems between the organisations, including but not limited to extranets.

Collaboration calls for the resolution of a wide range of strategic, social and conflict management areas. Before an interorganisational operating system (IOS) can be put in place as the basis for an e-business, the cost of communications and the cost of the technology needed must be justifiable to all parties, while any implementation must rest on congruence with long-range strategic planning. An organisation may have created a strong business case for its own technology and may have stayed on track with its strategic plans, but forming alliances or partnerships changes its landscape of opportunities and strengths, and radical rethinking about this landscape may not be avoidable (Deise et al., 2001).

Against this background, a shared approach to conflict management may need to be formalised, as existing implicit procedures may not suffice. You can appreciate that the means of resolving a conflict in a company founded, owned and run by a single dynamic individual will be far distant from those employed by a publicly owned multinational with partially independent subsidiaries. Even within a single language group or country, many business models may exist. Such issues gain even more importance as organisations of all sizes consider forming transnational or global alliances. Conflicts and disjunctions call for considered investigation and resolution, lest unstated different assumptions wreck collaboration unnecessarily (Karnel-silver, 1998a, b).

Even areas of agreement may need to be plotted: partners may not have the same resources to throw at a project, they may have widely different views on the appropriate levels of responsibility within their reporting structures, and unstated beliefs in the business and social value of technology will affect implementation. Added on to these issues are those relating to the technology to be deployed within any e-business? Any discussion of standards, equipment, networks and the like will quickly throw up the fact that technology is not neutral. What is taken for granted in one company—a perceived value of a networking technology or adherence to proprietary standards—may be dismissed out of hand in another. The choice between proprietary EDI and Internet-enabled EDI alone is one calling for careful consideration and mutual understanding at the outset of any e-business project. The value of the resulting choice is unlikely to be symmetrical across partners, with a concomitant need for conflict resolution—and so it goes on (Davenport, 1997).

Technical issues

Companies today spend an increasing percentage of their IS/IT budget on IOS, that is, applications extending beyond company boundaries. As we have seen in Block One, these typically create a complex web of relationships between a company, its partners, customers, suppliers and its markets. IOS will grow because of the need to integrate disparate organisations or individuals in the same IT-enabled processes, regardless of formal boundaries. Just as process management methodologies look at a process as a set of related activities (independently of functional boundaries), information technology now encourages us to consider and integrate whole value chains independently of geographical or organisational boundaries (Moore, 1997).

Traditionally, these integrations called for high-end, specific and often proprietary technologies (such as EDI systems, value-added networks and specific in-house developments). New technologies are currently smashing the cost of building such inter-organisation systems, thereby providing smaller companies with the opportunity to derive large business benefits from crossing organisational boundaries to include their customers, suppliers or partners in their processes.

These new technologies are less complex to understand and use, therefore demanding less in the way of skilled personnel to manage them. The cost of ownership of these systems is also decreasing, thanks to standard-based client-server technology and open networks replacing mainframe-based, often proprietary technology. The characteristics of inter-enterprise exchanges are the (relatively) few partners involved but the high importance of the information exchanged. The required reliability and security of the link is proportional to the importance of the link to both partners’ businesses. As a general rule, one should consider the security and reliability requirements of the cross-organisational IT systems equal to those of internal operational systems. This means the IT architecture supporting the IOS should offer secure connections (authentication, access control, cryptography) reliability (commit-rollback type of connections, restart after failure, etc.) accountability, and service that is monitored every day, 24 h a day (Kaplan and Norton, 2001).

Proprietary technologies

Lotus Notes is the application that helped popularise the term groupware: that is, computer tools helping people work together and communicate effectively across time or space boundaries. Although there are competitors, it is still the primary and leading tool in this area and
illustrates the inter-enterprise support technologies. There are two possible ways of looking at groupware: business-oriented and technically-oriented. Business users usually see Lotus Notes as a group environment which improves their access to information (through shared replicated databases) and helps teamwork along (through communication features and workflow). For the technically minded, Lotus Notes can be described in terms of its parts (Tapscott, 1998):

1. A distributed document database (a document being a form containing text, images, sounds, video clips or any other object)
2. A development environment, allowing users to build applications (amongst them workflow applications)
3. An electronic mail system, well integrated with the rest of the system security mechanisms, including encryption, authentication and access control
4. A replication mechanism, to synchronise databases on remote sites
5. A set of interfaces to external programs (e-mail, databases, etc.)
6. A platform-independent GUI.

It should be noted that what attracts most users to Lotus Notes is the integration between all these components. This application provides a seamless working environment in which the technical components are hidden. Lotus Notes has been used to build groupware environments, to support teamwork through shared document databases, discussion databases, workflow systems and common project management. It has also been used to build specific applications such as customer support, documentation systems or workflow management systems.

Non-proprietary internet technologies

In a formal sense, the Internet is not a set of technologies but a wide-area network made up of thousands of sites around the world. Nevertheless some technologies were created especially for the Internet and are mainly used in that environment today.

Technologies in use on the Internet include communication, resource sharing and navigation tools. Communication tools are mainly electronic mail and discussion forums (Usenet news); resource sharing includes file transfer (FTP) and remote terminal emulation (Telnet); navigation tools include Gopher (a text-based hypertext system) and the World-Wide Web (WWW), a graphic-oriented hyper-media system. The Web has been a main driving force behind the explosive increase of Internet use. The Web today is the primary front-end tool used by Internet and online-service users, integrating all other tools under a common umbrella. The Web appears to the user through a graphical front-end viewer, allowing him/her to consult multimedia documents stored on servers around the world. These documents can include hypertext links pointing to other documents on the same servers, or on other servers. Popular servers on the Web include presentations of companies, electronic catalogues, information database services and gateways to existing services.

Open technologies and convergence

One main difference between the two sets of technologies presented before is the openness of each environment. Lotus Notes can be considered a proprietary albeit open environment (that is, it is the exclusive property of one company, although it offers various ways to integrate with its data and services). The technologies related to the Internet are most often non-proprietary (having usually been built by volunteers and placed in the public domain), although commercial providers are now gradually taking over. In the context of fast-evolving technologies, being proprietary is sometimes an advantage, as it allows a company to impose standards and offer advanced functionality. This is the case in regard to the security and reliability of the Lotus Notes environment, compared to Internet technologies. As such, it perfectly serves the need of inter-enterprise systems, which demand inherent security and monitoring.

While proprietary systems are moving to seamless integration with Web standards and functionality, the Internet is already well on its way to acquiring more secure functionalities as encryption and authentication standards are progressively adopted by a majority of providers.

Security issues

Taxing issues of security arise for anyone seeking to implement an extranet. There must be communication with outsiders, yet this must be restricted—issues of access control, confidentiality and authentication are beyond the scope of this unit, yet will need to be addressed. While the Internet technologies were designed to be robust, reliable, inexpensive and cross-platform, they were not designed with high security in mind, and ways of addressing this omission are under development, albeit hampered by governments which believe they have a right to eavesdrop on communications.

Managerial issues

Technological issues are rarely the only or even major reason for e-business failures. Failure is far more likely to
arise where there has been a lack of understanding of the managerial, social and cultural issues involved and no clear e-business strategy.

In order to develop such strategies, management needs to review the following:

1. Has there been a clear identification and evaluation of business opportunities for e-business (intranets and extranets) looking at customers, suppliers, competitors and new entrants?
2. Has the new e-business solution been 'sold' to all users?
3. Has there been appropriate education and training? Do employees have a sense of ownership?
4. Is there an evaluation of the appropriate technological infrastructure (considering such things as remote or global access)?
5. Have all the costs been considered and reviewed against benefits (return on income will be considered in greater depth in Block Eight)?
6. Have all the security and control issues been identified?
7. Have all aspects of implementation been fully evaluated and the best solutions- in-house, consultants or outsourcing- been agreed upon?

A major issue is the evolution of e-business services once they are first created. It is rarely possible to foresee all opportunities and weaknesses that may eventually emerge from a new or modified system; therefore staying flexible is the name of the game. When encouraging partners and customers to join the IOS, when discussing the service with customers, when calling for feedback and implementing changes, businesses must emphasise flexibility. Although these technologies can, and should, serve to support a strategy, it is likely that new strategy options will emerge from opportunities uncovered by pilot projects in these areas. Such surprises come from the difficulty of planning the final use of very new technologies whose potential users cannot predict their demand for an unknown service or product (Tapscott et al., 1998).

**Making the business case**

Because relatively few extranets produce a cash flow that can be identified, effective strategic planning and making the business case for making use of such a system generally relies on identifying areas where savings will flow from an extranet. The following checklist can be used to start corporate thinking in the right direction (Seybold, 1998):

1. Reduced paper cost: Electronic documentation can be published more rapidly and at a lesser cost. Information-heavy companies are able to quantify these costs easily.
2. Eliminated private network charges: Huge savings are possible where private networks can be dismantled or supplemented. When access to the Internet is extended and moved.
3. Process efficiency: Workflow redesign is a promising area for savings; businesses can quantify such areas as automatic ordering, reduced transmission time of information, and so on.
4. Outsourced functions: Rapid and inexpensive communications can allow for the outsourcing of intermittent or time-dependent projects; collaborative extranets make this route appealing.
5. Reduced customer service costs: If customers can find the answers to their own problems at a time of their choosing, then staff time, office space and restricted service can be largely replaced by Web sites and database access.
6. Reduced phone and fax costs.
7. Reduced inventory: Supply chain extranets can reduce inventory holding times and storage costs. Supply chain management is proven in many fields to dramatically improve cash flow while providing better service.
8. Reduced procurement time and cost: A secure Web-based order system, possibly combined with electronic delivery of associated documentation, can save money.
9. Diminished training costs: Online training systems are another source of savings.
10. Extended life of legacy systems: In place of replacing legacy systems, many companies are building Web interfaces to extend the useful life of old systems.

The aforementioned are quantifiable—these arguments may be used to advantage when arguing for other, less-easily quantifiable benefits to be expected from an extranet.

These are valid, even when the driving force may in fact be such intangibles as constant real-time access to information, an extended knowledge pool, satisfied customers and partners, retention of satisfied staff, faster time to market, and so on. Turban et al. (1999) classify the benefits from extranets under five headings:

a) Enhanced communication  
b) Productivity enhancements  
c) Business enhancements  
d) Cost reduction  
e) Information delivery  

Not all extranet applications will provide all of these benefits, but the organisation needs to focus on which of these is the most important for the intended strategic direction of the company and how this will affect the company employees, their customers and their suppliers. The company also needs to identify how this will provide a sustainable competitive advantage in the electronic marketplace.
INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) AND E-BUSINESS

Over the last decade, organisations have been forced to re-examine the role of ICT as a support tool within the organisation and accept that it has become a major driver for business change. E-business is no longer optional and has become the standard mode of operating not only in financial services, publishing and retail where we have already seen rapid and profitable advancement but everywhere business is conducted. E-business is fundamental to business strategy and process execution, but new concepts of value require executives to re-examine strategic approaches and ways through which they can exploit the power of e-business. A panorama of e-business change that can be used to redefine corporate strategy rather than merely as a tool to re-engineer and improve processes. This panorama encompasses four stages of change.

i) Use of ICT to enhance sales or buying channels through some form of e-commerce.
ii) The aforementioned stage is followed by the application of ICT within and across value chains, inevitably leading to industry transformation as
iii) Networks of organisations are formed through e-business.
iv) Finally, there will be a convergence where many companies come together and work within the same e-space.

The explanation is illustrated with the diagram in Figure 1. As organisations move from left to right across this panorama they are likely to gain added value but also to encounter much greater risk. Empowering e-business is far less than it is assumed to be about technology application, far more about equipping the people who use it with the business skills to make their business lives more productive and the corporation more successful. Organisations moving through these stages will be looking to make improvements in revenue enhancement, cost reduction and relationship management.

STRATEGIC ANALYSIS FOR E-BUSINESS SOLUTIONS

Technology leadership

Plant (2000b) identifies seven dimensions of an e-commerce strategy: three bonding factors—leadership, infrastructure and organisational learning and four positional factors technology, branding, service and market. He also emphasises that the keys to successful development of e-business strategies are:

1. Develop a strategy before developing a web presence
2. Develop a strategy by focusing on technology, branding, service and market
3. Develop an IT infrastructure capable of matching the strategic objectives
4. Identify and use knowledge in the organisation
5. Focus on added value for customers
6. Continually evolve these strategies
7. Have a senior executive as project champion

For some organisations, the entire strategy will be based on strength and leadership in the area of technology, whereas for others it will play an enabling role, but for all e-businesses, strategy will play a very important role. This is particularly true for those companies developing value Webs, sometimes referred to as extended value networks (EVNs). In EVNs, companies will develop strategies with their business partners in mind, and a whole new breed of IS will be created that integrates the processes and information flows among partners. These will be third-party-provided, web-enabled enterprise resource planning systems (ERPs). Companies such as SAP, Oracle and PeopleSoft do the packaging, integration and marketing of ERPs.
Table 1. Relationship between ‘S’ framework.

<table>
<thead>
<tr>
<th>Strategic variables</th>
<th>E-business focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy</td>
<td>Alignment and Planning</td>
</tr>
<tr>
<td>Structure</td>
<td>Model of an e-business and EVN</td>
</tr>
<tr>
<td>Systems</td>
<td>Technology Integration and ERP</td>
</tr>
<tr>
<td>Staffing</td>
<td>Knowledge empowered employees and CIO</td>
</tr>
<tr>
<td>Skills</td>
<td>CIO and relationship management</td>
</tr>
<tr>
<td>Style</td>
<td>Leadership from the top</td>
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<tr>
<td>Shared values</td>
<td>Technology empower, and leadership for added value</td>
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EVN companies must learn to share their business intelligence about customers and processes, may outsource non-strategic business processes and will explore new ways of conducting business (for example, negotiating the portion of total profit each participant in the EVN will receive from the delivery of goods and services to customers).

The organisation at the centre of the EVN is responsible for managing a network in which information is substituted for inventory at every step of the process of delivering value to customers. Today the network master is typically the large organisation which possesses the resources necessary to pull together business partners and suppliers and instill their standards on the EVN. However, e-business technologies and applications and data mining and analysis may shift the role of the network master out to the organisation closest to the customer. This fundamental power shift makes it imperative for e-businesses to develop technology-based strategies to capture customer knowledge and loyalty and to foster the role of the ‘technology champion’ in the organisation.

The seven ‘S’ framework

Plant (2000a) introduces the seven ‘S’ Framework for technology leadership, identifying the following seven areas: Strategy, Structure, Systems, Staff, Style, Skills, and Shared values. These seven variables together form a web of relationships within the strategic management of the organisation and these can then be aligned towards the e-business strategy as shown in Table 1.

Ironically, for most companies the first challenge in creating an EVN is to put their own house in order internally. They will have to change their systems, processes, organisation and culture to achieve rewards. The Seven ‘S’ Model is one approach which can assist the organisation to move from a functional to a process flow EVN through effective e-leadership. The EVN will provide the ultimate agility and flexibility to adapt to changing market conditions and shift activities to and from business partners in real time. The EVN, then, is the learning organisation based upon a strategic infrastructure to support the e-business evolution.

STAGES FOR EMPOWERING THE ORGANISATION THROUGH ICT AND E-BUSINESS

Stage one: Channel enhancement

Typically an organisation will look to ICT to enhance selling or buying channels. Those that engage primarily in B2C commerce will probably give priority to their sell side to generate increased revenue, better manage customer relationships and reduce costs. This is especially true of the dot-com companies that typically have negligible supply chains and that are driven by a need to gain market share rapidly.

Companies that engage primarily in B2B commerce will tend to give priority to reducing the costs of selling, buying, or both. Increased revenue and enhanced customer relationships are bonuses. B2B e-commerce includes the creation of:

1. E-procurement systems for buying non-production goods
2. Electronic channels to link distribution networks more tightly.

Stage two: Value chain transformation

Having analysed your company’s value chain, it is now time to examine how you can integrate your value chains and information systems more closely with those of suppliers, logistics providers, distributors and retailers to maximise efficiencies and reduce costs. In a mature state, value chain integration allows companies to share real-time planning, cost and production data between enterprise resource planning (ERP) systems such as SAP. Such integration allows for the creation of a ‘fully enabled extraprise,’ a term used to characterise an extended enterprise consisting of the company and its value chain partners. The major decision that the organisation has to make at this stage is to choose its strongest and strategic partners and determine how to link with them.

Let us consider a case where a company employs a
large sales force working from different branch offices across Asia. They source products from a large number of manufacturers in mainland China in several different provinces and throughout India. The headquarters is in Hong Kong and all financial, purchasing and sales procedures are routed through the HQ. These busy communication channels cause long delays in handling transactions. The company has a centralised computer system linking to the branch offices and now wants to extend this system into their suppliers in China and India. They still, however, anticipate delays between the inbound logistics (order processing from sales force and product procurement from suppliers) and outbound logistics (delivery of products to customers). One obvious technology which might be applied is mobile technology. Providing the sales force with handheld computers can allow easier flow of information across the whole network, as shown in Figure 2.

Stage three: Transformation

As companies collaborate along their value chains, the nature of the industry begins to change as organisations decide to outsource some of their traditional functions and focus only on their core competencies. The term ‘going to market’ will no longer be defined as the way a company enters the marketplace but rather it will characterise the way an integrated group of companies creates a set of cascading values to transform the marketplace into a network of value providers. At this stage, companies will make a conscious effort to orient their strategies toward becoming knowledge-based (Knowco) or physical goods-based (Physco) companies. This is not normally a complete transformation but rather an orientation towards one or the other. Knowcos will focus on building brands, capturing ownership of the customer-end market relationship, and investing in knowledge-based core competencies such as marketing and product or service development. They may well expand into providing customer knowledge management services to other companies in their marketplace. Physcos will become hubs of processing expertise. Their success will be based on speed, quality and delivery. So what model should a company adopt, and how will they prepare for this transformation?

Stage four: Convergence

Convergence is the coming together of companies in different industries to provide goods and services to customers and is as much a function of deregulation and globalization as it is of ITC enabled e-business models. An example is the merger of AOL and Time Warner. Virtual business networks will be the ultimate result of an e-enabled economy. These e-markets will be differentiated by the services they offer and will be constantly creating new services based on their digital assets. In this digital world the company that owns the customer relationship and the customer knowledge will be king. These challenges have to be recognized by organisations wishing to succeed and prosper in the 21st century and some basic rules need to be borne in mind.

E-business employs disruptive technology. It can both enhance and disrupt the value chain by changing interactions between companies. E-business success is not about technology; it is about organisational change management and leadership. E-business and e-markets will become increasingly complex. The organisation that survives will be a knowledge-based, strategy-focused organisation.
CONCLUSION

This paper identifies four stages for empowering business organization through ICT and e-business. Typically an organization will look to ICT to enhance selling or buying channels. Those that engage primarily in B2C commerce will probably give priority to their sell side to generate increased revenue, better manage customer relationships and reduce costs. Having analyzed your company’s value chain, it is now time to examine how you can integrate your value chains and information systems more closely with those of suppliers, logistics providers, distributors and retailers to maximize efficiencies and reduce costs. As companies collaborate along their value chains, the nature of the industry begins to change as organizations decide to outsource some of their traditional functions and focus on their core competencies. The term ‘going to market’ will no longer be defined as the way a company enters the marketplace but rather it will characterize the way an integrated group of companies creates a set of cascading values to transform the marketplace into a network of value providers. Convergence is the coming together of companies in different industries to provide goods and services to customers and is as much a function of deregulation and globalization as it is. ICT enabled e-business models. For all the stages to be achieved, there is need for ICT otherwise all forms of automation which is the backbone of e-business will not be possible.

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