Internet applications in the information economy

M. Sutton
Leaders Unlimited
Post Graduate Diploma in Information Management
RAU University
melaniedalesutton@hotmail.com

Contents

1 Introduction

The Internet and the affordability of technology have created a global marketplace for many to participate in. The information society has used these opportunities to manipulate the fast growing amounts of data to their advantage, which has in turn spurred the creation of new information-related organizations and career opportunities. Organizations can manipulate information to innovate, strategize and create a competitive advantage in the market place.

The new economy or information economy is an economy where information rich goods and services make up the greatest proportion of the GDP and/or where information workers constitute the majority of the workforce. Today most products and services have a high information component. Research and development costs are escalating as companies try to gain a competitive edge through innovation. Information and hence information workers have become central to most of the work performed in the modern economy. In an increasingly knowledge-based economy, information is becoming at least as important as land and physical capital.

Successful companies in the new economy know how to make proper use of information, employees' knowledge, processes, relationships and other non-traditional assets, which are

now creating value for them. These intangibles now account for the difference between a company's book value and the market value. The importance lies in the fact that there is a universally recognized shift in the value placed on intangible assets and the vital role that assets play in the fast moving knowledge economy. To succeed in the knowledge economy, regions, nations, organizations and individuals need to both accept and adapt to an environment where these intangible assets are a key driver in the economy. They need to develop new processes, cultures and behaviours that encourage the creation of new knowledge, the sharing of existing experience and know-how and the efficient utilization of those assets for the benefit of all.

This article is a report on research that examines the following questions: If technology has to a large extent created the knowledge economy and if the knowledge economy dictates that employees become knowledge workers, then to what extent can applications such as the Internet, intranets, extranets, portals and teleworking assist knowledge workers to be productive in this new economy? Furthermore, should organizations embrace these applications as a means to empower their employees to become knowledge workers in the new economy and to achieve a competitive advantage?

Heidrick and Struggles, a global executive search company, is one such organization that has embraced both intranet and extranet technologies and this case study examines how these applications are working in practice.

2 Information economy

The term information economy refers to a new global economic structure in which the production of information goods and services dominates wealth and job creation and which is underpinned by the use of information and communication technologies, and a global information infrastructure.

Grulke (1997) asserts that the 'old' or industrial economy has entered the end of its life cycle and that, in the United States, less than 30% of employment is now in the traditional industrial business with the balance being in service and information businesses. Analysts now estimate that 90% of the USA's gross domestic profit (GDP) will come from service and information businesses.

What implications does this have for businesses in the information economy?

- According to Van Zanten (2000), transparency of information is vital to value creation as technology makes information more readily available and more transparent to all stakeholders. Information access appears to have been the first phase of the commercial development of the Internet. Businesses now have to provide new levels of service; customers and suppliers now expect direct access to a company's operational information and systems. This has clearly become the Internet's second phase of commercial development. According to Grulke (1997), Federal Express was one of the first to do this by giving their customers direct access to parcel tracking information on the Internet, improving service and cutting costs in the process.
- According to Oxbrow (2000), the very essence of doing business is changing. Collaboration and cooperation have become key issues, thus enabling organizations to share and utilize knowledge and expertise of their partners, suppliers and customers. Some companies find themselves collaborating with another company in another market and fiercely competing with the same company in yet another market – a phenomenon known as coopetition. Organizational structures need to change to

reflect the reliance on people, knowledge and information. The value to the organization of creating, sharing and utilizing knowledge and information has to be explicitly recognised. Motivation and reward systems have to be developed that would give people permission to reflect, time to assimilate information, to communicate with colleagues, brainstorm new ideas, make better decisions and add value to the services and products offered to the customer.

- Modern information and communications technology must be harnessed, with a clear focus on providing knowledge and information flows.
- Speed is of the essence. The capability to reduce product or service time to market, innovate and make quick decisions and to react fast to changes in the market, new technologies and new competition are all factors that ensure success in the new economy.
- Knowledge-enhanced products or services can command price premiums over comparable products with low embedded knowledge or knowledge intensity.
- According to David Skryme Associates (1997), knowledge when locked into systems or processes have higher inherent value than when it can 'walk out the door' in people's heads.
- People's ability to communicate will be a major determining factor in the shape of future trade, economics and development. According to Holderness (1997), developments in communication technology and capacity are creating exciting new opportunities both for trade and for participation in civil society.
- The rise of the global information economy in turn is transforming human life, nationally, regionally, locally and within the family. Today, everything is changing because of telecommunications – the nature of work, relationships with people, media, messages and patterns of political life (Holderness 1997).
- The key features of the new technologies is the possibility they offer of low cost, many to many communication through computer networks. The possibility of high speed global communication raises interesting practical questions too about future trends in trade and economics (Holderness 1997).

3 New skills for knowledge workers

Both development economists and economists who try to understand the implications of a world where information is a primary item of trade increasingly appeal to the concept of human capital. The UN Development Report estimates that 80% of all economic activity in countries such as Germany and Japan are founded on human capital – skills and knowledge (Holderness 1997).

The skills required in knowledge environments can be categorized by three groups, namely core competencies, survival skills and knowledge management enablers:

• Core competencies comprise education, professional and technical background and expertise of the individual, plus their experience and development.

• Survival skills comprise the set of skills required in any role in order that core competencies can be applied effectively. They include communication, project management, team working, business process understanding and the ability to work across organizational barriers and within complex relationships.

• Knowledge management enabling skills are a mix of change management skills and those associated with information and resource management skills. Information management skills underpin many knowledge management activities while an understanding of the

knowledge process and the principles of the organization of knowledge are vital.

Competencies for knowledge management practitioners are being developed and they focus on business understanding, team working, knowledge management awareness and innovation, project management and planning, client focus, leadership, learning and development, and technical skills.

Although most of the skills are those of good management and team work, it is evident that a good understanding of the complex information flows that underpin any enterprise is a prerequisite for designing information strategies to support a knowledge management environment.

4 Internet

The Internet is best known for its vastness of available information. Any information placed on the public Web server can be viewed by any other individual with Web access using a browser such as Internet Explorer or Netscape Navigator. The Internet in its many-to-many form of interface has been lauded repeatedly as the next great means of communicating that benefits from and contributes to the Internet's migration and mass acceptance.

The Internet is more of a concept than a thing. It is a set of rules that allows rapid transfer of information between computers, more than it is a physical machine that one can touch. It is also best thought of as a new means of transport for information – the tracks over which actual information services run. The arrival of the Internet and is successors makes new information services possible. Holderness (1997) states that the fundamental property of the Internet is that it is a many to many communication medium.

Furthermore, the Internet provides a robust foundation on which business applications can be built. According to Bliven and Eibes (2002), there are four building blocks that provide the benefits:

- Web browsers;
- a single network protocol, that is the TCP/IP protocol that extends beyond the Web as the standard networking platform for all applications such as mainframe access, database queries and file and print services;
- ubiquity in that users can access data and services from any worldwide location. An employee telecommuting from home can just as easily obtain corporate data as at the office; and
- security – technology advances in encryption, authentication and firewalls now make it possible to construct an Internet-based network that is more secure than a private legacy network.

According to Holderenss (1997) the new communication technologies open up a range of economic and social possibilities. Particularly when we consider trade in information itself, the quantitative increase in speed and ease of transport and replication is sufficient to generate qualitative changes in the kinds of transactions that are possible.

The Internet can potentially enable organizations to profoundly transform the way they conduct business. Through its vast network, it can assist organizations to communicate better with employees, customers, suppliers and distributors. Organizations that apply this technology appropriately can lower business costs and forge closer relationships with partners and customers. In an era of heightened competition, those companies with the best

partner communications will attain a competitive advantage in the marketplace (Bliven and Eibes 2002).

According to Grulke (1997), the Internet is an integral part of the global capitalism and it is estimated that it will link 125% of the world's population by 2003. Goods and services can be developed, bought, sold and even delivered over electronic networks. According to Skryme (1997), electronic commerce offers many advantages in terms of costs savings, efficiencies and market reach over traditional physical methods.

5 Intranets

5.1 Definition and characteristics
An intranet is a network of computers within a corporation. The computers are connected to each other by means of an Internet Protocol. This internal network is separated from other networks and computers outside by 'firewalls'. Firewalls, in effect, act as a moat separating the intranet from other networks and computers. The firewall is a means of preventing unauthorized access to the internal network from the outside. The intranet is a protected neighbourhood of computers within the larger city of the Internet (Brown and Candler 1999).

An intranet is a corporate network designed around Internet metaphors, protocols and technology. Like a collection of shared folders on a server, an intranet gives organizations the ability to save a file, content or information in a central location where others can find, view and/or modify it.

Intranets are corporate networks constructed on open public standards that allow organizations to quickly deploy internal applications without the barriers of costly proprietary implementations. They should help employees collaborate on business processes such as product development or order fulfilment which create value for a company and its customers. Specifically, intranets centralize the business process in an easily accessible, platform-independent virtual space. Successful intranets enable employees from a variety of departments to contribute the different skills necessary to carry out a particular process. Intranets should be organized primarily around the business processes they help employees carry out, rather than the organizational chart of the company. Focusing on business processes rather than departments is a widely hailed business trend. Recent shifts in corporate structure point to the emergence of communities of process. Management gurus are helping companies move away from vertical, hierarchical organizational lines towards horizontal, process oriented groups that link cross functional teams focused on the same sets of business tasks. However, this requires significant interaction between departments, functions and even countries. According to Davis and Schneider (2000), the intranet provides the ideal vehicle for creating and empowering process-based corporate communities.

What is new about intranets is the use of IP software and standards on private networks. Some intranets comprise only a few Web servers and IP client software, but they more often encompass a range of new IP tools including firewalls, virtual private networks (VPN) devices and load balancers. In addition, many intranets span multiple locations, moving IP traffic over several different types of WAN links. Federico and Wynd (2000) state that increasingly the trend is for companies to place all their internal computing resources on an intranet.

In addition, intranets now also handle mission critical applications – so a problem with the

network can translate into big trouble for business. Implications for management are staggering when valuable business applications depend on the intranet (Federico and Wynd 2000).

5.2 Business implications

With intranets, business case issues are more important than ever before. Network managers today have more new tools at their disposal and the pace of product roll-outs will only accelerate. With the explosion in Internet-related products, corporate networkers cannot possibly deploy every new technology that comes along. The only way to control the chaos is to implement guidelines for evaluating how each new product or service will serve the organization's core business (Federico and Wynd 2000).

Given the intranet's impact on business, a full understanding of the business drivers is also necessary. What shapes the way an organization operates? Business factors like acquisitions and consolidations play a role, as do technology considerations (Federico and Wynd 2000).

Defining a strategic direction for network management is also crucial. As part of the strategy, companies typically formulate guidelines for recommended technologies, preferred vendors and selective outsourcing (Federico and Wynd 2000).

To avoid endangering business operations because of intranet problems, organizations need to define clear goals for managing intranet performance.

With the growing popularity of the Internet, businesses have also chosen to create intranets or networks that use TCP/IP for sharing information only within the corporation. Using the Web in conjunction with TCP/IP networks enables companies to more easily maintain a single user interface to many applications as well as simplify the distribution of the new client software.

5.3 Examples of applications

- Creating an organization-wide base of knowledge and repository of information. Information is available through an accessible, user-friendly interface and can be organized in ways that make the most sense for a variety of audiences.
- Developing online communities – the strength of the Internet or intranet model is that communication can flow not only from the top but also from the bottom and laterally throughout the network. Taking advantage of the intranet's ability to encourage interaction and feedback and foster communications among traditionally separate groups is an important advantage.
- Improving work flow – an intranet can help to accelerate decision making, shorten communication cycles and reduce costs throughout an organization.
- Helping to shape employees' thinking about their companies as intranets is one of the most significant developments in internal communications and can help to mold employees' perception of their organization.
- Human resources departments can publish employee manuals, benefits administration and related information online, reducing printing costs and paperwork.
- Sales, vendor and customer information can be made available through databases, providing opportunities for enhanced customer relations and other services. Strategic information can help sales staff identify new business opportunities and trends and help customer support provide informed service.
- By using online discussion groups, teams can share their intellectual capital, overcoming common difficulties through team efforts and overall productivity and services can be enhanced through robust information exchange.
- Converting internal communications for intranet delivery also has the significant

advantage of simplifying the integration of diverse materials regardless of format. An audio or video message from the chief executive officer could be embedded in the organization's mission statement or an employee phone directory can include links to the appropriate department's home page or and send e-mail to an individual (Brown 1996).

5.4 Benefits of intranets for knowledge workers

The benefits include the ability to quickly search through many documents and find information, the ability to hyperlink from one resource to related resources and the ability to navigate from one part of the server to another part more easily because of the navigation metaphors used on the Internet.

Fast access to information is another key intranet cost saving. If an intranet means that every employee in an organization can save ten minutes a day, the cumulative cost saving is enormous, in fact much greater than savings from reduced printing and mailing costs (McGrath and Schneider 1997).

An example is a firm of management consultants who established a knowledge database of best practices, job histories, resumes, threaded messages and ideas for clients accessible to all employees. The organization calculated that over a three-year period it saved US$ 390k through the elimination of phone calls, overnight couriers and faxes. In addition, the company saved an estimated US$22m by reducing the time required to find and access employee data and collaborative information (McGrath and Schneider 1997).

Productivity increases from intranets arise from more rapid and easier access and exchange of information. Intranets also provide flexibility in the time of delivery of information. By making training materials accessible through an intranet to the desktop, employees can schedule training during lull times rather than be interrupted during key projects (McGrath and Schneider 1997).

Sales support is the arena in which intranets may ultimately generate the greatest return of investment. Many companies are using intranets to efficiently connect the field sales force personnel to the home office and link sales representatives to each other to obtain product information or collaborate on pursuing sales leads (McGrath and Schneider 1997).

Intranets can also bring together employees and partners who are geographically dispersed to work on common problems. Intranets facilitate a global exchange of information that enables true organizational productivity.

Developed effectively, an intranet can enhance the speed and focus of employee communications, reduce the number of meetings and use of printed documents, and allow people at remote sites to work together on projects from their respective desktops, expanding productivity (Brown 1996).

5.5 Benefits of intranets to organizations

- Intranets are useful places to get information not available elsewhere. Benefits, information, claim forms and news about events such as the company picnic are only useful if they are up to date.
- Intranets offer benefits over e-mail attachments as the amount of server space taken up by redundant attachments escalates quickly. Posting a document on the intranet and sending a hyperlink in e-mail eliminates this redundancy.
- Intranets offer benefits over printed documents. Analysts estimate that 18% of corporate printed material becomes outdated within 30 days and that printing

documents and making copies increase costs significantly. Using the intranet as your primary 'printer' reduces costs considerably. While it is not only the publishing but the updating of information that leads to saving, it is more efficient to modify or revise electronic documents than printed documents. Intranets permit information to be rapidly and economically deployed to a dispersed group of employees. A marketing planner for a global pharmaceutical concern notes that before the deployment of an intranet his division was spending US$ 30k per month on information mailings to sales representatives. By the time the information reached the representatives, the material was out of date (McGrath and Schneider 1997).

- Intranets offer benefits over shared folders, giving users the ability to search quickly within documents to find the information needed. Intranets give the ability to hyperlink from one resource to other related resources (Bliven and Eibes 2002).
- Intranets have been widely adopted as a cost effective way of distributing information throughout the enterprise. Web servers and e-mail are becoming standard ways of accessing information and networked applications.

5.6 Challenges of intranets

- It is important that intranet content should not be allowed to become stale. If users find out that some information in a certain area of the intranet is correct, they assume that the other content is inaccurate as well. Periodic redesign of the site is essential to create a different look and feel to reinforce the notion that the intranet is changing with the times and is not a repository of old data.
- Intranets can cause information overload with outdated information stored on the intranet or worse, irrelevant information that clutters up the intranet.
- There are hidden costs involved in poorly organized intranets, such as poor productivity.
- Intranets lose their flavour when curiosity runs out or the true purpose of the intranet is unknown to employees.
- There are maintenance issues as some organizations do not have dedicated staff to run the intranet.
- Potential security risks develop if sensitive information is not protected and proper security measures like passwords and firewalls are not utilized.
- It may be potentially difficult and expensive to integrate data resources from different platforms into corporate LANs.
- There is a potential for chaos if the intranet is not managed effectively.

6 Extranets

6.1 Definition and characteristics

Extranets or an extended Internet is a private business network of several cooperating organizations located outside the corporate firewall. An extranet service uses existing Internet interactive infrastructure, including standard servers, e-mail clients and Web browsers. This makes an extranet far more economical than the creation and maintenance of a proprietary network.

An extranet is a collaborative network that uses Internet technology to link businesses with their suppliers, customers and other businesses that share common goals. An extranet can be viewed either as part of a company's intranet that is made accessible to other companies or as a collaborative Internet connection with other companies (Bliven and Eibes 2002).

Extranets open up designated parts of a corporate intranet to remote employees and external

partners. Extranets provide scalable, secure, managed access over the Internet to interconnect individuals and companies. This access can be personalized, based on the unique requirements of individual users (Bliven and Eibes 2002).

An extranet usually requires a degree of security and privacy from competitors. According to Bliven and Eibes (2002), this can be achieved either by ensuring that the transmission lines are privately owned or leased, by tunneling through the Internet or by using the Internet with password authorization. Access security is at the foundation of the extranet concept. Secure connections between computers create a virtual private network using inexpensive and ubiquitous public lines. Standard password protection provided by Internet browsers is adequate to preserve the integrity of data stored on the site. Sites that require a higher level of protection could use more complex protocol tunneling technology. An Internet tunnel can securely transport data between its input and output points by encapsulating the packets of one protocol into another. Tunnel technology can also be used to individualize the extranet site, providing access only to features that a particular user is entitled to.

The demand for access is increasing and is driven by two key factors, namely the need to be closer to customers (extranets increases service and loyalty and strengthens relationships) and the demand for constant employee connectivity when away from the office (for traveling professionals, day extenders and telecommuters) (Bliven and Eibes 2002).

The conceptual differences between these two layers in the hierarchy are few. However, from the corporate standpoint, access to one does not naturally preclude access to both. While the basic premise of the extranet involves the sharing of internal information with external entities such as suppliers or customers, an intranet is strictly for internal company employees. Organizations do not wish to give universal access to internal information to every supplier or customer. In fact, most companies are quite selective when building their extranets to ensure that only authorized users are obtaining the necessary information relevant to the transaction. Extranets and intranets, though often running on the same IP network, are separated by firewalls and access codes from each other. According to Bullock, Heilig, Henke, Stricker and Suwansaranya (1997), it is also vital that clients are not given access to sensitive company information that would only be accessible from within the company by employees on the intranet.

6.2 Examples of extranet applications

- Private newsgroups that cooperating companies use to share valuable experiences and ideas
- Groupware in which several companies collaborate in developing a new application program they can all use
- Training programs or other educational material that companies could develop and share
- Shared product catalogs accessible only to wholesalers
- Project management and control for companies that are part of a common work project.

6.3 Benefits of extranets for knowledge workers and organizations
Extranets are about using computers and the Internet to link businesses together around the country and all over the world. Extranets allow companies to increase their competitiveness by streams and service opportunities, decrease turnaround times, reduced costs and better cooperation with partners and suppliers. According to Bliven and Eibes (2002), extranets are creating a wealth of new opportunities for gaining competitive advantages.

The development costs of extranets are directly proportional to the cost of Web pages, since an extranet is an Internet-driven technology. According to Bliven and Eibes (2002), additional costs incurred when developing extranets are primarily security costs to keep the site on a limited access basis.

Extranets increase the efficacy with which partners collaborate by linking intranets for immediate access to critical information. A travelling salesperson no longer calls a distributor for product information. Instead of wasting time waiting for a call back or searching for the appropriate contact at a distributor, information is accessed quickly and securely over the Internet.

An extranet provides immediate access to information in a cost-efficient way. Companies spend small fortunes creating and printing information for suppliers, distributors and customers. Publishing material on extranets cuts those costs significantly.

While managing traditional remote access can be fraught with problems, extranets eliminate these frustrations by allowing IT managers to outsource the cumbersome parts such as modems and physical infrastructure, while retaining control of the critical part, namely security and user management.

A key advantage of extranets is the compatibility of computer hardware and the fact that they are built on the platforms of the Internet. To access an extranet, users need to have Internet access on a computer. Open architecture means that the Internet protocols are based on open, agreed-upon standards set by global governing bodies. This gives organizations the power to publish data once trapped in legacy databases.

An extranet provides the chance of communicating directly with stakeholders in a business, which is of immeasurable value to firms in today's global economy.

Extranets have both strategic and business implications. In the short term, extranet applications that connect organizations directly to suppliers should be viewed as a business advantage. The same basic advantages also apply to suppliers. Suppliers willing to participate in extranets with large customers generally lower the cost of doing business with those customers because extranet participants are probably given purchasing preference. Done properly, extranets are a win-win tool for both the supplier and the customer.

The Web browser can become the one universal interface between different applications. Training time and costs are reduced because users need only learn one interface. In addition, extranets connect across disparate platforms, in other words, a UNIX user can communicate with a MAC user using a Web browser.

Information that is housed online can be accessed independently by customers.

Material can be updated with greater ease and less cost.

Knowledge stored on an extranet can be accessed from any TCP/IP network in the world as long as the user is authorized to connect to the secure extranet.

Extranets can publish text, graphics, audio and video, thus providing another powerful communications and learning tool for collaborating organizations.

An extranet reduces the reliance on costly meetings, travel and telephone time.

Extranets tighten the relationship between a business and all of its supply chain partners.

The term supply chain partners include suppliers, distributors, customers and any other business partner with which a company may be associated and wish to share information. An extranet enables companies to communicate much more freely and at a much faster pace by linking up their internal systems operations with those of their key business partners (Bullock *et al.* 1997).

Many manual processes, paper and faxes can be eliminated. Therefore, costs can be significantly reduced at all levels of the supply chain. Reducing costs in these areas by streamlining and automating the process via an extranet can make a difference to profits on the bottom line (Bullock *et al.* 1997).

By sharing up to the minute demand forecasts and production information, partners all along the supply chain can make more informed production decisions (Bullock *et al.* 1997).

As the Web has no boundaries, companies employing an extranet are able to reach beyond their area or region to find the best suppliers for its needs. Conversely, suppliers now are better positioned to compete with even the largest of competition and are no longer constrained by distance (Bullock *et al.* 1997).

The efficiencies gained from a more finely tuned supply chain, allows companies to bring new products to market much quicker than before. They can gain first-mover advantages and match competitors' offerings much quicker than others (Bullock *et al.* 1997).

6.4 Challenges of extranets
The benefits of extranets, such as reduced time to market, cost reductions and faster access to partner information, may be outweighed by the costs of security, Web servers and development, legacy systems integration, ongoing support and maintenance. Extranets require a large amount of time and energy, much more than what it takes to get an intranet or Web site up and running, which may place it at the bottom of organization's to-do list (Wailgum 1998).

An issue impeding the adoption of extranets is the fact that, before implementing such a system, a company must have a very well defined process for each internal operation. Currently, many companies simply don't have this level of control or understanding of their processes. This is a critical first step for any company interested in implementing an extranet and requires a very strong commitment to achieve it (Bullock *et al.* 1997).

Another issue impeding the acceptance of extranets as a viable business tool is the issue of security. A secure extranet does not start at the firewall, but starts even deeper within the corporation at the level of basic company policy. Though firewalls are indeed effective tools against unauthorized access, they are only as effective as the other links in the security chain protecting firms. Only a sound corporate policy for security, which includes management and rotation of passwords and a verification system for remote users, will create a secure environment (Bullock *et al.* 1997).

Aside from the growing concern that an extranet divulges private information, many people also question the legitimacy of information exchanged through extranets. When a company attempts to solicit bids for important supplies, it must verify that the vendor who has offered the bid is legitimate (Bullock *et al.* 1997).

A further concern in adopting extranet systems is the potential that it creates to bypass traditional distributors by communicating and selling directly to the end-user or the retailer. Companies must look at their internal processes to ensure that they are indeed ready before taking on the tasks traditionally done by middlemen (Bullock *et al.* 1997).

Extranets are more complicated to establish than intranets or corporate Web sites. One reason is that many organizations already have legacy infrastructures in place (Bullock *et al.* 1997).

---

7 Portals

7.1 Defining portals

Whereas Web sites provide companies an entry to the development of content and exchanges that span the supply chain, portals offer next generation electronic collaboration, content and commerce. The corporate portal is a personalized, single point of access for the internal and external user where the company's Web channels come together (the Internet, the intranet, extranet and marketplace exchanges) to exploit the cumulative information, knowledge and data that will enable greater business efficiencies.

Rowley (2000) suggests that a portal is a Web site that provides an entry point to the Internet and offers value-added services such as directories, searching, information news and links to related Web sites. It can be viewed as a virtual reference library directing Web surfers to desired destinations.

Portals can range in size from a one-page information brochure site to detailed information sites such as Yahoo! Any site that gives a user access to information is a portal. Every Web site has a potential to become a portal as it offers links to other Web sites subsequently acting as a door to other resources. Portals can generally be categorized into three significant groups, namely those with a customer and commercial focus, those with an internal focus and those with a public service orientation (Rowley 2000).

Defining characteristics of portals are content, communication, a community and often also commerce (Rowley 2000). Portals offer organizations a wide variety of information sources directly from the desktop. By functioning as an underlying Web infrastructure for information management, portals can provide firms with a shared information workspace that facilitates access to information content, organizational communications and group collaboration.

7.2 Portals and intranets

The distinction between corporate portals and intranets is not always clear as both typically give different levels of access to shared organizational data and resources. At one time, the distinction may have been purely geographical with intranets being LAN-based but with the Internet high-speed communications and security developments allow intranets to become extranets and it is not uncommon for aspects of these networks to be shared with suppliers and customers.

Company intranets, originally meant to give agility to the knowledge management process, have started to become disorganized and chaotic as the information glut in organizations increases. Many intranets suffer from unmanaged content and ad hoc site development. Enterprise portals have evolved from intranet self-service development to become irreplaceable enterprise tools (Language 2001).

Corporate portals differ from intranets in that a portal's primary function is to provide a transparent directory of information already available elsewhere and not act as a separate source of information itself. In this way, corporate portals provide access not only to the underlying network but also to the information content, services and applications built on top of that network infrastructure and located across a company's vast array of information

resources (Detlor 2000:95). Many organizations see portals as a way of combining their intranets. Marketing, sales, manufacturing, finance, human resources and other lines of business have deployed their own intranets, but organizations are looking to increase knowledge sharing, so they are deploying portals as a kind of super intranet.

7.3 Corporate or enterprise portals
Definitions of enterprise portals vary but may be seen as software that manages end-user access to multiple applications and information sources on the corporate intranet. Moreover, a portal is a common look and feel graphical user interface (GUI), which is made available to employees, clients and partners and allows access to all enterprise applications, services and information, as well as selected or requested real time data updates from the Web according to the users' profiles. Objectives for these types of portals include facilitating communication, sharing information, promoting participation, improving efficiency and reducing latency. Corporate portals allow access to internal corporate information such as documents from a variety of sources (Language 2001).

The Gartner Group defines enterprise portals as portals deployed for the benefit of an individual enterprise in order to deal with the touch points of an enterprise. These may be internal or external and, because they deal with a variety of different communicaties of interest, they face multiple directions. They can be horizontal in nature, covering the breadth of information, applications and processes of the enterprise or vertical, focusing on a specific business process, function or application (Language 2001).

There are three enterprise portal segments:

- Enterprise information portals focus on the organization of and access to information with expertise in one or more of the following arenas: structured and unstructured data retrieval, data management and integration, and document management.
- Enterprise knowledge portals focus on collaboration and information sharing as well as expertise or knowledge capture.
- Enterprise application portals are specialized to a particular business, for example sales (Language 2001).

7.4 How can corporate portals give an enterprise a competitive advantage?
Better information leads directly to improved decision making, which clearly effects the bottom line. Greater access to information from multiple applications in a single GUI format, which can easily, speedily and automatically be updated or manipulated according to the demands or real time processes, leads to increased productivity.

A single interface which is customizable and secure and is able to service the information needs of different viewers (for example particular staff members, customers and partners) while you remove the need for human interaction drives down labour costs, improve efficiencies and increase customer satisfaction and service levels.

Corporate portals can help organizations with improved information storage and retrieval. Owing to their platform independent nature, portals can provide organizations with increased access to a wide variety of information sources such as databases, legacy systems and Web file servers that reside within and outside the company. Furthermore, access to diverse sets of information sources is in a convenient form as portals allow users to search and browse for information directly from individual desktops. This convenience can promote the acquisition and use of information throughout the organization as individuals tend to use information characterized by high accessibility (Detlor 2000:95).

Corporate portals can help organizational users make better sense of the information they

receive by providing rich information channels that help users engage in conversations and negotiations with others in the firm so that shared interpretations can be made and stored back into the portal's knowledge base for later reuse. Increased learning occurs when more varied interpretations have been developed and when more organizational units understand the nature of the various interpretations held by others (Detlor 2000:96).

Corporate portals also give organizational participants the ability to manage the flow of information necessary for cooperative action between various organizational units. By providing the necessary context for articulation work, tasks beyond those described by formal procedures such as scheduling, organizing, negotiating, making ad hoc decisions, recovering from errors and assembling resources, are improved (Detlor 2000:97).

Portals help reduce the cost and implementation time for customer relationship management, commerce chain management and employee knowledge strategies. These strategies drive the creation of new business value, which is vital to competitive differentiation.

8 Teleworking

8.1 Defining teleworking

Teleworking refers to the use of information technology to perform job-related work at a location remote from the normal office and at times independent of normal office hours. Telework specifically refers to work performed remotely and augmented by computer and communications technology.

Teleworking involves working at a distance from a usual place of work, often passing work between locations through the Internet. Work may be sent from one office building to another, from a worker's home to a central location or from a mobile location such as a salesman's car.

Teleworking is largely facilitated by the recent rapid advances in the power of enabling technologies coupled with a significant reduction in their prices. These technologies include e-mail, ISDN, PCs, high-speed modems and 'follow me' personal mobile telephone and fax numbers which can be routed through to any other telephone number anywhere in the world. This also includes remote intranet access using a simple remote password or other security feature.

A study showed the proportion of technology used by teleworkers as follows:

- 99% of teleworkers have a PC;
- 95% use the telephone for business calls;
- 87% own a modem;
- 99% use the Internet for research, retrieving information for their job and e-mail;
- 63% use a fax in their teleworking routine;
- 24% use a Photocopier;
- 19% use an ISDN;
- 4% use videoconferencing; and
- 3% use other tools.

There are three types of teleworkers and while only 7% of employees spend 100% of the working time in the company office, 46% spend 25% of their working time at the clients' sites and another 42% spend a quarter of their time elsewhere.

- *Home-based teleworking* includes staff who are otherwise based in the office, but use computers and telecommunications to work from home on a regular basis.
- *Nomadic teleworking* includes field staff who are not normally based in the office, who use computers and telecommunications to improve their communication with the office while increasing their independence from the office.
- *Ad-hoc teleworking* includes staff who are normally based in the office, but use computers and telecommunications to work from home under certain circumstances.

8.2 Benefits of teleworking

There are currently one million employees teleworking in the United Kingdom. Teleworking can benefit employees, employers and society in general by permitting work to be performed in a time- and location-independent manner.

• Teleworking reduces travelling time to and from work, which in effect saves time and money. Teleworkers have control over their time and place of work, that is, they can choose to work at convenient times, in a quiet setting that allows full concentration. Moreover, teleworkers experience responsibility and autonomy by exercising their personal preferences and demonstrating their commitment.

• Teleworking employers can gain through increased productivity, reduced costs and improved morale. Teleworkers are believed to be more productive because they work when they feel like it, they work without interruption, and they put in longer hours. Studies have shown worker productivity gains of between 20% and 40% with some increases reported to be as high as 300%. Employers can save money on expensive office space when work is performed in less costly accommodation or in employees' homes. Teleworkers do not charge their employer for office space, heating, air conditioning or cleaning.

• In addition, some employers have extended their teleworking beyond national boundaries in order to take advantage of cheap labour in developing countries. Finally, the mutual respect and trust that is created when employer and employee enter a teleworking agreement result in improved loyalty and morale in employees.

8.3 Typical information needs of teleworkers

Since many teleworkers are actually full-time employees of enterprises, their needs include all the usual worker needs with slight deviation in terms of delivery of these needs:

- All teleworkers need an effective organizational communication system in which everyone inside and outside of the traditional company office is informed of the latest developments, much of the informal information sharing that provides context and perspective. Teleworkers often find that they are left out of the loop of communications. One teleworker complained that there is a lack of understanding from her office-based work colleagues, who tended to treat her calls to them in a rushed 'low priority' way, indicating that they were busier than she was and did not have time to help her out.
- Teleworkers need access to administrative information such as internal e-mail lists, telephone lists, staff forms, procedure manuals and training manuals.
- Teleworkers need access to client lists, business development initiatives, presentations and correspondence.
- Teleworkers need access to the intranet
- Teleworkers need access to specific company databases.
- Teleworkers need access to information resources. For instance, Heidrick and Struggles (private company) subscribes to different external databases such as Dunn and Bradstreet, as well as company specific resources. Teleworkers need to be able to connect directly to the organization's computer and operate in a remote terminal

mode.

- Teleworkers need to transmit electronic files and database information to ('uploading') and from ('downloading') an organization's computers or file servers; the remote employee can download information to a remote PC, work on it locally and then upload it back to the organization.
- Teleworkers need access to electronic mail, voice mail, automated facsimile and computer teleconferencing systems.
- Teleworkers need access to computer-supported cooperative work systems, also known as group work support systems, which are specialized software systems for team workers in location and time independent situations; the remote employee can contribute effectively as a team member in a project despite being at home; group support systems can be further divided into synchronous or asynchronous, depending on whether the group interaction depends on all (or several) of the participants being connected to the computer at the same time.

8.4 Information portals for teleworkers

Teleworkers are a wired community where using the most recent innovations in technology is recognized as ensuring a working environment equally as efficient as the company office. Businesses need an effective organizational communication system in which everyone inside and outside of the traditional company office is informed of the latest developments. It should also provide for informal information sharing among workers, a process which generally provides context and perspective communication.

Information portals are applications that enable companies to unlock internally and externally stored information, and provide users with a single gateway to personalized information needed to make informed business decisions. Also known are corporate portals or enterprise portals. They provide ready access to information from the data warehouse via the intranet and Internet. But the attraction of information portals is that they can move beyond the delivery of information. They also provide a way to integrate the many disparate systems and processes that are typically used within an enterprise.

Information Portals provide a single point of entry or gateway to these processes via a Web page that is personalized to the needs of each staff member. This offers easy access to the workflow and other processes that staff requires to carry out their jobs.

Information portals connect teleworkers with resources that they may need, with everyone they may need and with all the tools they may need to work together. This means that groupware, e-mail, workflow, desktop applications and critical business applications must all be accessible through the portal. Thus, the portal becomes the desktop, and a teleworker's commuting (to work) becomes a mere phone call away.

Information portals use both push and pull technologies to transmit information to users through a standardized Web-based interface. They provide interactivity and the ability to question and share information on user desktops. Information portals integrate disparate applications including content management, business intelligence, data warehousing, data management and other data external to these applications into a single system that can share, manage and maintain information from one central user interface. An information portal is able to access both external and internal sources of data and information. It is able to support a bi-directional exchange of information with these sources and it is able to use the data and information it acquires for further processing and analysis.

Information portals centralize an organization's information for ease of use and help teleworkers to access and use all types of internal or external information, knowledge and software applications required to perform their jobs. Information portals offer teleworkers a

single interface to work from and require a single login and password. It provides the teleworker with the ability to use the system anywhere, whether in the office, at home, at a client's office or in an Internet café.

9 Case study of Heidrick and Struggles

9.1 Background
Heidrick and Struggles International (HandS) is a global executive search firm whose core business is the placement of senior level executives. HandS was ranked by the Wall Street Journal as the top search firm among 30 competitors for quality of candidates, value of services and overall reputation. A total of 2275 people are employed worldwide in more than 80 locations in 37 countries through the Americas, Europe, Asia, Africa and the Middle East.

The business operates through a series of global practice groups that include the fields of consumer practice, industrial practice, financial services, professional services, IT practice, board practice, diversity practice, healthcare practice, education and not-for-profit practice, and professional temporary (Protem) practice. Each practice group has representation and membership throughout the world and a specialist practice group leader is elected to lead each of the practice groups.

Furthermore, the entire organization uses one global database to manage candidate and client information, and relationships. This database can be accessed remotely.

9.2 Knowledge Orbiter – the HandS intranet
HandS uses their intranet to enable their employees worldwide to collaborate with each other, share resources, build relationships, conduct business development and find information. It is an extremely effective resource for the organization.

Typically, HandS uses Knowledge Orbiter to promote the organization to its employees and therefore global HandS policies and procedures are stored here. There is also substantial training material available on a number of topics including HandS specific practices.

The Global Practice Group also has extensive representation on Knowledge Orbiter. Reference material, member lists, events and conference call and training schedules are published here, as well as information about the industry and the specific assignments that consultants are working on globally. This is especially useful for new employees or for employees who are not familiar with a specific practice group.

Knowledge Orbiter provides a collaborative 'meeting' space for all the information managers of all the offices. It also provides the means to pool resources globally; some international resources are very expensive and not every office needs these expensive resources all the time. Offices that use the resources most purchase the resource and then, if other offices need 'just in time' information, they pay a token fee for the information supplied. This way the need for 'just in case' information is prevented. Also, not everyone is reinventing the wheel and duplicating information and wasting money. The author recalls helping an information manager in Holland who needed access to a global directory of executive search consultants. It happened that the South African office had purchased a copy of this publication and was able to give the information to the information manager.

While Knowledge Orbiter is an extremely useful resource for HandS, the author has one significant criticism and that is that Knowledge Orbiter is very American. HandS is

represented worldwide and, previously, the European business had a separate intranet called Grapevine. The company then consolidated all resources and Knowledge Orbiter – the American intranet – was adopted as the global intranet. To date, Knowledge Orbiter is still significantly American and areas such as emerging markets, the region in which the South African office falls, do not have much representation. Furthermore, the author found that resources that are very useful to colleagues in the overseas offices, such as Lexus Nexus, are of little use to the South African market. Therefore, the full value of the intranet is not really felt. The author is of the opinion that an entirely new intranet that reflects the global culture should have been adopted. At the moment everyone besides the Americans feel like add-on's and that the material is not entirely relevant to them. The intranet should ideally reflect the culture of the whole organization, giving each office and culture some representation.

9.3 Extranet usage

HandS uses their extranet to share information about assignments with both clients and candidates. It is a highly sophisticated and extremely strategic technology. As mentioned above, HandS uses a global customized database to manage information about all their clients and candidates. This database was used strategically to create an extranet.

Employees can set up the extranet information, using the database, by creating unique user passwords for both candidates and clients and stipulating the type of information both parties can access. Candidates can access information that HandS publishes on the extranet, such as the position profile, hotlinks to the client's Web site, reference material such as surveys on the industry or links to news articles. This gives candidates a better understanding of the organization and sector which they are being headhunted for. In addition, they are given hotlinks to all the teams working on the assignment, including all consultants, researchers and support staff.

Clients, on the other hand, are given access to information about candidates. The information about candidates is pulled directly from the database and includes names, profiles, curriculum vitae's and any contact notes which are made by consultants and researchers. HandS however, can and does control access to the type of information they publish, that is, it marks which contact notes it wants its clients to see. In other words, if there is sensitive information which it heard from a prospective candidate, it can choose not to allow clients access to this information.

The extranet places HandS at the forefront of providing clients and candidates with quality service. This feature is used to market HandS globally as a leading executive search organization. In fact, this is part of its competitive edge, especially for the IT practice.

An example of the efficiency of this extranet involved an assignment for a leading IT company in South Africa. The obvious modus operandi for HandS was the utilization of the extranet, firstly to convince this company to appoint HandS as the headhunter and secondly to be in contact with the managing director of this company who travelled extensively and was seldom in South Africa. HandS set up an extranet which gave both the candidates (who were also involved in IT and some of whom were overseas candidates) as well as the client access to all information about the assignment from anywhere in the world. The test for HandS was to keep this information updated on a continuous basis as one slip could have cost the company its integrity. The assignment was successfully completed and both clients and candidates were extremely impressed with the professionalism, confidentiality and convenience that the extranet provided for the duration of this assignment.

10 Conclusion

In the beginning of this article, two questions were posed: can Internet applications such the Internet, intranets, extranets, portals and teleworking assist knowledge workers to be productive in this new economy and should organizations embrace these applications as a means to empower their employees to become knowledge workers in the new economy and to achieve a competitive advantage?

From the above discussion, it is clear Internet applications have indeed assisted knowledge workers to *participate* in the knowledge economy. However, whether these applications make knowledge workers productive is a matter of great debate. The author is of the opinion that while technology can indeed provide the means to be productive, it is still up to the organizations to strategically align and apply these technologies to their own business strategy. One solution does not fit all and people and culture should be an organization's first priority before implementing technology solutions.

The Heidrick and Struggles case study demonstrates the outcomes these applications have in practice. While the intranet, Knowledge Orbiter, is a good idea in theory and has in some aspects been successful in providing a common meeting place, it has failed to embrace and reflect the global culture of the organization. However, the HandS extranet is clearly a very successful and productive application for the organization.

11 References

Extranets. 2002. [Online]. Available WWW: http://dons.usfca.edu/ackesh2/extranets/Introduction.html.

Bliven, B. and Eibes, B. 2002. Extranets: bringing key customers and suppliers into the fold. [Online]. Available WWW: http://www.biz.uiowa.edu/class/6k180_park/Student-Reports/bbliven/.

Brown, P.D. 1996. Intranet can enhance speed, flow of communication among employees at work. [Online]. Available WWW: http://albany.bizjournals.com/albany/stories/1996/10/07/focus5.html?t=printable.

Brown, E. and Candler J.W. 1999. The elements of intranet style. [Online]. Available WWW: http://idm.Internet.com/articles/199911/gs_11_27_99b.html.

Bullock, D. Heilig, D. Henke, P., Stricker, M. and Suwansaranya, O. 1997. The emergence of the extranet in an era of e-commerce. [Online]. Available WWW: http://www2000.ogsm.vanderbilt.edu/research/ papers/html/student_projects/…/extranet.html.

Davis, C and Schneider, A. 2000. Intranet architecture. [Online]. Available WWW: http://www.intrack.com/intranet/iarchi.shtml.

Detlor, B. 2000. The corporate portal as information structure: towards a framework for portal design. *International Journal of Information Management* 20(2): 91–101.

David Skryme Associates. 1997. The global knowledge economy: and its implications for business. [Online]. Available WWW: http://www.skyrme.com/insights/21gke.htm.

Federico, G.V. and Wynd, C. 2000. Monitoring intranet performance: getting a handle on corporate intranet growth means implementing four simple steps. [Online]. Available

WWW http://www.geneva-group.com/ecommerce/12_2000_b2e_a6.html.

Grulke, W.E. 1997. From value chain to marketspace – the impact of network-centric services. [Online]. Available WWW: http://www.futureworld.co.za/tlkafsmi.html.

Holderness. M. 1997. The Internet: enabling whom, when and where? [Online]. Available WWW: http://www.poptel.org.uk/nuj/mike/unu-sout.htm.

Language, C. 2001. Enterprise portals: a window with a view. *Computer Week* September:28–31.

McGrath, G. and Schneider, A. 1997. Measuring intranet return on investment. [Online]. Available WWW: http://www.intrack.com/intranet/iretrun.shtml.

Oxbrow, N. 2000. Skills and competencies to succeed in a knowledge economy. [Online]. Available WWW: http://www.findarticles.com/cf_0/Mofwe/10_4/66276583/print.jhtml.

Rowley, J. 2000. Portal power. *Managing Information* 7(1):62–64

Van Zanten, T. 2000. Techniques used by Arthur Andersen to add value to information. *South African Journal of Information Management* 2(2/3). [Online]. Available WWW: http://general.rau.ac.za/infosci/RAUjournal/default.asp?to=peer11.

Wailgum, T. 1998. What are extranets? [Online]. Available WWW: http://www.cio.com/archive/enterprise/031598_learning_content.html.