The Internet for Small Businesses: an enabling infrastructure for competitiveness.

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Abstract.

In an increasingly global world, both information and information technology are of great significance to organizations of all sizes. Small business, however, suffer from the additional problem of limited resources - financial technological and human. For this group of organizations, information technology and the direct use of information itself can be of crucial use, provided that they can be made use of readily, cheaply and without recourse to expensive expert assistance. The Internet offers such a cost-effective and readily accessible approach to both information technology and the competitive use of information - and offers further benefit by opening up the global marketplace to companies which would normally not have the financial resources to reach potential trading partners or allies.

This paper discusses the opportunities which the Internet makes available to small and medium enterprises (SMEs), building on both the still comparatively limited research available in this area and on the resources currently existing within the Internet itself to draw conclusions about just what a typical SME can hope to achieve from its use. The paper summarizes the range of activities which are available for SMEs and considers the additional benefits which may be obtained from "virtual alliances" with other small (or large) organizations. We discuss the need to align the organization's existing business strategy with its Internet usage strategy and look at the impetus which government initiatives in information infrastructure are providing for the SME group, summarizing the whole-of-government approaches being taken in Australia, Canada, the European Union and the U.S. Finally, the paper concludes with a discussion of the most effective approaches which small businesses wishing to make use of the Internet might consider.

1. Internet Connectivity - an increasingly important strategic tool.

King, Hufnagel and Grover [16] distinguish between the way *information technology* and *information* can be used as a strategic resource. These authors suggest that *information technology* is a collection of hardware and software used to collect, transmit, process and disseminate data (symbols) in an organization, while *information* can be viewed as data which have been evaluated for some purposes. Since in an organization there can be many varieties and levels of 'evaluation filters', clearly there are different types of information for different purposes.

King *et al.* [16] point out that organizations can use information and/or information technology to improve competitive and strategic well-being. Although information technology used alone may improve speed, accessibility and timeliness of already available information, tools which evaluate information have the ability to create new information or enable existing information to be made more useful in new (and perhaps unforeseen) ways; and although information and information technology are often strategically interdependent, their strategic value maybe better understood if they are considered separately. King *et al.* [16] suggest that there is a difference in the strategic purposes for which information technology and information itself can be used. It is therefore important that all organizations recognise the distinction between information *technology* and information itself. While this distinction provides a profound academic insight, companies facing the economic imperative of day-to-day survival (particularly small companies), may see the distinction as too fine to be of any real utility.

The Internet offers a readily available and cost-effective way in which both large and small businesses can make the most of today's information technology infrastructure, as well as making use of information itself (either as a product, or in the form of a reusable building block for subsequent growth). The Internet (known increasingly as 'the information superhighway', or 'the Infobahn'), with its open and extendible network structure, is providing many small businesses with an opportunity to compete on level terms with larger and more sophisticated competitors and trading partners.

The opportunities available from the Internet are not, however, accessible to all the possible users of

this environment. Most small businesses are flexible and adapt to changes readily, but they also suffer from a lack of resources of various kinds [19: p. 48]. Many do not possess the technological background which would enable them to use and evaluate the Internet, or lack the time to explore it. Others may not perceive the ways in which such an information infrastructure could enable them to operate their businesses more efficiently or cost-effectively. Fuller and Jenkins [11], for example, reported that technical problems concerning connectivity and owner/operator commitment were an important, if not actually critical, factor for success. These technical problems can become potentially insuperable barriers for small businesses wishing to use the Internet for business activities and operations.

Recently, however, these problems have been lessened through the substantial increase in the business activities of Internet Service Provider (ISPs) and Internet Presence Providers (IPPs). In Australia alone, the number of ISPs has almost doubled in less than two years [20]. ISPs from other countries are also actively lobbying customers for their services through Usenet newsgroups such as *alt.internet.services*, or *alt.internet.access.wanted*. The connection and service cost for Internet services are also becoming more affordable for small businesses [22][1]. Many ISPs provide self-installing utilities for connecting to the ISP's host computer, allowing users to install and make use of such connections within minutes - an important step in overcoming the connectivity barrier. IPPs, by contrast, offer know-how and expertise to assist in the construction of World-Wide-Web home pages by their clients. An IPP may offer to design, construct and make available clients' home pages to their prospects. Many such efforts (for example, the California-based CommerceNet) aim to become a one-stop-shop for clients' prospects and will include transaction processing in the future. In addition, some IPPs are involved in providing consultancy for business reengineering to enable small businesses to align their business operations so that they can maximize the benefits obtainable from the Internet's information infrastructure.

This paper is primarily concerned with the opportunities available to small and medium enterprises (SMEs) through the Internet. We initially investigate the range of activities which are possible and useful for this group of organizations and discuss the additional benefits which may be gained through 'virtual alliances' with other small trading partners. We then consider the importance of aligning the organization's business strategy with its Internet usage strategy and discuss the impetus being provided by governments around the world to this electronic extension of business strategy. Finally, we suggest the most effective ways for SMEs to take advantage of the manifold opportunities waiting for them in cyberspace.

2. Business Activities by Small Business on the Internet.

For small businesses which have determined to explore and use the Internet for business purposes, Barker [2] identifies the following categories of uses:

- *Finding Customers, through scanning of newsgroups and advertising.*
- *Finding specific and detailed information for marketing purposes.*
- *Obtaining a source of new ideas/opportunities.*
- *Obtaining low cost communications.*
- *Keeping in touch/Networking.*
- *General/global awareness and environmental scanning.*
- *Customer/Supplier support.*
- *Geographic Reach/general accessibility.*
- *More productive communications (less paperwork, greater speed, no telephone tag etc.).*
- *Stature/Experience/Keeping ahead of the competition.*

Fuller and Jenkins [11] in their experimental case study of Internet usage by SMEs in Britain identify six similar themes:

- *Time based competitive advantage.*
- *Productivity Improvement*
- *Business processes re-engineering.*

[1] '...a commercial service [provider] offers ninety-six V.32bis/V.42bis lines. It costs A$25 to join , plus a peak hourly rate of A$8 or A$5/hour off peak'.

- *Empowerment of individual employees.*
- *Creating and maintaining business networks (relationships).*
- *Reaching new markets.*

Combining the Internet uses identified by Barker [2] with those from Fuller and Jenkins [11], the following discussion provides an examination of small business activities on the Internet:

2.1 Customer prospecting and advertising.

Effective advertising and marketing campaigns can be expensive and require marketing experts with a profound understanding of the industry involved. For small businesses access to such expertise is demanding of resources and potentially unattractive, given the available budget of the majority of small business operators. Conversely, localized marketing campaigns are effective in broadcasting the image and product(s) of a small business, but coverage is limited and such campaigns do not necessarily reach their target audience. Scanning Internet newsgroups, by contrast, focusing particularly on the questions and needs posted in individual messages, can provide important leads to potential customers. The difference between such an intelligence-gathering exercise and traditional marketing campaigns is that it is a 'demand pull' approach (as opposed to 'supply push'). In an Internet scanning exercise, customers go looking for information, rather than waiting for information to be pushed out to them by suppliers. Indeed, scanning the signatures of messages can help to build a bigger potential customer database than would be obtained from the exchange of business cards. Such scanning exercises still require the input of significant effort and time, however, and may not be appropriate in industries where products do not have a national or international demand.

2.2 Involvement in specialized groups for knowledge and intelligence exchange.

Apart from newsgroups, there are also specific mailing lists or electronic asynchronous conferences which are important for trade-specific information exchanges. These mailing lists can be more purpose-specific and can be created without going through a concensus-gathering process like that involved in creating non-local Usenet newsgroups. Another important feature of mailing lists is that one can access a list of subscribers by name and, in some cases, by affiliation. Both the newsgroups and the mailing lists contain readers and subscribers who possess specific skills or have access to information which may be useful to other subscribers on the list. Often questions and invitations for comment posted on such forums receive an astonishingly high rate of response. It may be that the lack of physical contact and the fact that respondents are unlikely to meet within a corporate environment in themselves assist in creating this willingness to disseminate information - many net users find the non-threatening nature of electronic communication attractive.

Another type of 'demand-pull' information source is stored using gopher or World-Wide-Web technology. Examples of such information resources for small businesses including the E-Gopher, the Small Business Advancement National Center, and the Small Business Administration efforts. Specific information related to trade regulations and marketing are provided online with the latest updates. Such initiatives allow small businesses to access timely information with minimal access costs.

2.3 Research and development ideas/opportunities.

Time and resources are the major constraint for most small business operators. Yet the need to remain flexible and innovative are the criteria for survival and success for SMEs. Availability of new ideas and the ability to seek opportunities are essential if small businesses are to remain flexible and innovative. The sources of new ideas and opportunities are often freely accessible on the Internet with little time delay. This, in turn, allows small businesses sufficient time to react to business situations and exploit such opportunities. In the OECD report on SME [19: p.41] the authors point out that the effectiveness with which scientific and technological information is transferred to SMEs depends upon (*inter alia*):

- *the quality, density and complementarity of the different existing sources of scientific and technological information;*
- *the availability of the information;*
- *the various types of link between these sources and SMEs;*
- *the SMEs' won dynamism, their ability to seek out and use scientific and technological information (particularly through technology*

watch) and to convert this information into action.

[19: p. 41]

The Internet therefore has a vital role to play in information dissemination and in allowing tighter coupling of processes which create and use information. Further, the Internet allows small businesses to contact a large number of suppliers and buyers individually.

2.4 Efficient communications.

Communications with customers for document exchange purposes can be a significant overhead for small businesses. The expenses of postal and courier services vary according to business sector but are increasing in line with the ever-increasing volume of information exchange. In order to shorten turnaround time for the decision making process, interactive negotiation and group knowledge are essential. The Internet provides an electronic medium for relatively low-cost communication compared with the cost of couriers - and much speedier delivery compared with the postal services. This ability is particularly important for small businesses which need to exchange information in digitized form. For example, designers and manufacturers can exchange specifications drawn up using CAD/CAM technology, where a digitized (or electronic) copy of the specification is important for joint design work. Given the fact that the designer and manufacturer may not be located nearby, using the Internet to exchange documents and specifications becomes a low-cost and effective method of communication. In addition, the MIME extension to electronic mail, which enables the exchange of non-text documents such as graphic images and/or video, instruction and document exchange can occur in tandem with lower connection costs.

2.5 Preparation for the global marketplace.

The growing world marketplace (or market globalization) is increasingly an issue affecting small businesses [10]. Knowledge about the direction and development of such markets will have a profound effect on the survival of small businesses, which must not only produce goods for both local and global markets, but must also understand the requirements of local and global customers. Since the users of the Internet (the so-called 'netizens') are located in a wide variety of geographic regions, this provides an information source for small businesses when carrying out environmental scanning. Usenet newsgroups and specialized mailing lists are prime sources of discussion forum, as is information posted using gopher, WAIS and the World-Wide-Web. Even observing the discussion themes and dynamics can provide helpful insights into the issues affecting a particular special interest group [2].

2.6 On-demand linkage with customers and suppliers.

Customer and supplier support provided by means of communication technology is not new. Large corporations have been investing in communications technology for customer support for a number of years [5], [17]. As an example, Digital Equipment Corporation has begun to set up Usenet newsgroups and file transfer servers for customer support and distribution of documentation, as well as mailing lists (listserv) to keep both business partners and customers informed about product information. In late 1993, Digital set up testing machines which allow potential customers to log in and 'test-drive' Digital products through the Internet. Other IT manufacturers (e.g. Silicon Graphics, Hewlett Packard and Sun Microsystems) also make use of the Internet to provide customer and supplier support [23]. As access to the Internet can be obtained at a much affordable rate and personal computers can be connected to the Internet as easily as their Unix counterparts, it is important for small businesses to explore avenues which were traditionally available only to large IT-oriented organizations. With the current mailing software, even small businesses can afford to set up mailing lists to solicit customer needs and provide user support via the Internet. Also possible is the use of gopher and World-Wide-Web technology to provide answers for customers for frequently asked questions and to enable the acceptance of customers' suggestion and problem reports.

2.7 Geographic reach/general accessibility.

This is particularly important for small businesses which are heavily involved in business activities with clients who are geographically dispersed. Apart from using the public network services offered by telecoms and postal services, the Internet is currently one of the few viable means of information exchange with business partners and customers. A medium which has general accessibility and vast geographic reach, coupled with the ability to ignore political barriers and bureaucratic frameworks, the Internet is increasingly becoming an essential tool for small businesses engaging in market globalization

activities. As the number of Internet Service Providers increases worldwide, individuals are more likely to be connected to the Internet. The potential customer base for small businesses has been enlarging and it is likely to continue to do so over the medium- to long-term. Many small businesses are already experiencing expressions of interest from international prospects who are already Internet users [6].

3. New Kinds of Small Business Network (Virtual Alliance).

Small businesses forming alliances in the form of networks have been described in much of the literature relating to entrepreneurship (see, for example, [8], [12], [13], [15], [21], [25]. These groupings are referred to as *cooperative alliances* [13], *strategic alliances* [21] and *networks* [8]. Members of such groups may share trade information, specific advice concerning a particular issue important to the industry, joint research and advertising efforts, or transportation costs. Membership of such groupings can vary, but may include suppliers, customers, service providers (such as accountants) and even competitors.

Often small business networks are community- or federation-like, the relationships formed between members who do not have the corporate financial backing of national and international corporations. There is normally no established information infrastructure for information and intelligence sharing compared to the majority of national and multinational organizations. Welsh and Cummings [24] point out that small businesses in the 1990's need to be able to compete globally and capture both domestic and international markets. At the same time, however, small businesses need to maintain competitive advantages by having timely access to financial, sales, and market information so that informed decisions can be made.

The Internet, with its open philosophy and worldwide coverage, is an ideal information infrastructure on which small businesses can base alliances for information and intelligence sharing, which we shall refer to as 'virtual alliances'. A virtual alliance transcends national borders, cultures and industrial sectors, while the geographic distribution of membership within such groupings may consist of entirely local small businesses or small businesses worldwide. Such groupings already exist on the Internet in the form of mailing lists, Usenet newsgroups, gopher and anonymous ftp servers, World-Wide-Web pages and bulletin boards. Examples include listserver services such as `inet-marketing@einet.net`, `ENTREP-L@ksuvm.ksu.edu`, `softpub@toolz.atl.ga.us` and `small-business-issues@mailbase.ac.uk`; industry groupings such as CommerceNet `http://www.commerce.net`, IndustryNet `http://www.industry.net`, or E-gopher `gopher://egopher.slu.edu:70` and Entrepreneur Gopher `gopher://gopher.babson.edu:70`; other World-Wide-Web pages such as the U.S. Small Business Administration homepage `http://www.sbaonline.sba.gov` and Small Business Advancement National Center homepage `http://161.31.2.174`. Newsgroups of this type include `alt.business.import-export`, `alt.business.misc`, `misc.entrepreneurs.moderated` and `misc.invest`. An example of an anonymous ftp servers within this category is `ftp://wwwsbanet.uca.edu`, which contains a valuable collection of publications and reports, together with a database of government and trade organizations information. Such collection is an important strategic resource for small businesses.

The mailing lists and Usenet newsgroup method of information exchange allow small businesses to exchange information and then further any special interests if necessary, while the World-Wide-Web and gopher servers are best used for information dissemination and provide a searchable information resource. Although individual members may have less control over the information exchange process in a World-Wide-Web or gopher environment, diversity of information can be better rationalized.

Apart from information exchange, small businesses can also obtain documents and share resources such as software. With the advanced operating systems now available for microcomputers with in-built ability to connect to an Internet service provider, it is also possible to copy files and applications remotely. For example, joint design efforts can be carried out much more easily when a computer-aided design document can be exchanged interactively in digital form. For small businesses which are in co-operation with corporations, information can also be downloaded from centralized servers in a corporation (e.g. tender documents, technical information and specifications). A report titled 'Building a More Innovative Economy' [14] has clearly identified the fact that small businesses in Canada will have to form strategic alliances with other firms internationally to become more competitive in the increasingly global market-place.

4. Aligning Business Strategy and Internet Usage Strategy.

Although the Internet offers a variety of services and tools which can improve both computer-mediated communications and information storage and retrieval, it will not automatically allow small businesses to become more competitive. In fact, the learning curve and overhead involved, together with the financial investment necessary, may disadvantage the normal operations of some small businesses. For example, a small business operator does not normally have the resources available to 'surf' the Internet. Also, at the time of writing this paper, it is still relatively uncommon for the majority of small business operators to own an Internet domain or to have a permanent link with an in-house server, primarily because of the technical knowledge needed to maintain such a set-up and the financial commitment involved. Neither it is effective to try to advertise and sell products unless customers obtain a comparative benefit from going through the Internet for their 'cyber-shopping'. For example, it generally does not provide further convenience for most people to buy groceries via the Internet - and few households would prefer to order a pizza by dialling-in to a network service provider, logging on, and using the ordering form from the World-Wide-Web home page, instead of simply phoning the pizza shop and placing a verbal order directly.

Therefore, it is important for small businesses to set up their business operations in such a way that the Internet as an enabling tool can actually streamline these operations and allow the business to be more effective and efficient. For example, if a small business provides an ordering facility accessible via the Internet, it must also be able to assure the customer that products will be delivered as rapidly and efficiently as if they were ordered in any other way. It is also essential that the delivery process itself be streamlined. No incentive is provided for customers to switch to an ordering process which takes only a few seconds, unless the goods themselves can also be delivered faster than normal.

An example of such an approach is the information brokering business. It is very important that the Internet be used to streamline all parts of the order-to-delivery process so that information-on-demand can be obtained as quickly as the time taken to place an order. Factors such the business sector in which a small business is operating, deliverable characteristics, customers' Internet connection, accessibility and clients' demographic profile are all determinants of the success of the Internet usage strategy.

5. Government Initiatives and Small Business Information Resource Planning.

A major impetus for small businesses to use the Internet as a mainstream business information and intelligence gathering medium comes from government initiatives to provide national information infrastructures, using the Internet as a global information infrastructure model. Governments of countries which are heavy users of the Internet have a vision for an integrated information infrastructure which can eventually encompass all aspects of telecommunications. More importantly, such information infrastructures will be built with the intention that small businesses will be a major user group. Such strategies are explicitly stated in consultant reports on national infrastructure planning published by the Australian, Canadian, European and United States governments. When completed, such national information infrastructures will be more than a communication medium, being also a platform for the delivery of various kinds of information and interactive multimedia services. Small businesses can not only benefit from the delivered products, but can themselves be providers of such services, which in the past involved high initial investments. A review of some national strategies which enable small businesses to use the national information infrastructure affordably, shows that those countries or regions which already use the Internet most heavily are well aware of the implications for SMEs:

5.1 Australia.

Various reports on the subject of Internet potential have been produced by consultants from the Broadband Services Expert Group [3], Bureau of Transport and Communication Economics [4], and the Australian Science and Technology Council [1]. In the ASTEC [1] report, a number of recommendations concern the development and use of research data networks, including the use of such networks for wider community purposes:

'...to promote and fund the use of global electronic information and communication services in selected programs, including AusIndustry and BusinessLink initiatives, to three particular ends:

- *to facilitate better technology diffusion, especially to small and medium-sized enterprises, including improved interaction*

between such enterprises and the research community;

- *to broaden industry and commercial access to national and international markets, including programs aimed at the export of Australian electronic network resources and services;*

- *to stimulate Australian industrial research and development in the generation of new electronic network services.'*

[1: p. viii]

In the report submitted by the BSEG [3] on networking Australia's future, there is an emphasis on the importance of effective networking among business organizations using the to-be built broadband network:

'...to promote strategic alliances amongst content producers and between content producers and multinationals;

to promote cooperation between users and producers so that producers know what consumers need and how to make it user-friendly;

amongst users to disseminate information on useful content and services and to form effective lobby groups to put their views to government, network providers and content producers; and

between government agencies and producers to promote the industry, to encourage firms to enter the market, to gather market intelligence (the Australian Trade Commission, Austrade, could help with overseas markets), to ensure a rational regulatory framework, and to create an awareness in government of issues that affect the industry.'

[3: p. 42]

Similarly, a report by Cutler and Company [9: p. 33] discusses the way in which multimedia and content production can exploit the Internet and can be used as a cost effective way for distribution of multimedia services to both local and global customers.

5.2 USA.

A government report on a study carried out in the USA by the Computer Science and Telecommunications Board (CSTB), was produced in response to a request by the National Science Foundation (NSF). This report [7] reinforces the need for a national information infrastructure (NII) based on an open data network (ODN), which should:

'...provide a seamless web of interconnected, interoperate information networks, computers, databases, and consumer electronics that will eventually link home, workplaces, and public institution together. It can embrace virtually all modes of information generation, transport and use.'

and possess the following characteristics:

'Open to users: It does not force users into closed groups or deny access to any sectors of society, but permits universal connectivity, as does the telephone system.

Open to services providers: It provides an open and accessible environment for competing commercial or intellectual interests. For example, it does not preclude competitive access for information providers.

Open to network providers: It makes it possible for any network provider to meet the necessary requirements to attach and become part of the aggregate of interconnected networks.

Open to change: It permits the introduction of new applications and services over time. It is not limited to only one application, such as TV distribution. It also permits the introduction of new transmission, switching, and control technologies such as these become available in the future.'

The development of commercial use of the Internet in the USA is more advanced than that in other major Internet user countries. The current driving force for small businesses to use the Internet lies in the competition among internet service providers to offer cost effective access and expert support to small business groups. From the small business operator point of view, a determining factor for continued use of the Internet for business applications will be the return on investment (both tangible and intangible) from using such service.

5.3 Canada.

The Canadian Federal Government, together with business enterprises, educators and researchers, created the Canadian Network for the Advancement of Research, Industry and Education (CANARIE) which had 140 members from industry and research sectors by the end of 1994. In the report titled 'Building a More Innovative Economy' [14], it clearly points out that:

'...if Canada is going to markedly improve its mechandize trade surplus, the biggest potential for growth lies in small firms.'

The CANARIE network has an important role for enabling competitiveness of small firms in Canada because the Government recognizes that:

'Canada must compete with other countries not only for global market share but also for investment and technology. Firms needs strategic information on international investment, technology and trade opportunities; the timely provision of such strategic information will be a government priority. Small businesses will have to rely more heavily on strategic alliances with international firms to acquire know-how and strengthen global linkages.'

And eventually, the CANARIE network will facilitate the development of the Canadian version of the information superhighway. The CA*net, together with existing and future networks, will be transformed into a fully integrated national network which is capable of carrying multimedia transmissions efficiently. The report also points out that the Canadian Government will adopt a series of policies and programs to encourage the active participation of both the builders and users of the information highway. The outcome of such an integrated information infrastructure, according to the government, will change the way Canadians work, shop, bank, communicate, obtain public services, educate and entertain themselves.

5.4 European Community.

A report [18] containing recommendations to the European Council on the future of Europe and the global information society, was submitted in May 1994. The report targets specific measures to be taken into consideration by the European Community and the Member States for infrastructures in the sphere of information. It has been identified that there are 12 million SMEs which form the backbone of the European economy and the report suggests that a trans-border information infrastructure is essential to allow SMEs:

'...to be linked to easy access, cost effective networks providing information on production and market openings. The competitiveness of the whole industrial fabric would be sharpened if their relationships with large companies were based on the new technologies.

Networked relationship with universities, research institutes and laboratories would boost their prospects even more by helping to remedy chronic R&D deficiencies. Networking will also diminish the isolation of SMEs in Europe's less advantaged regions, helping them to upgrade their products and find wider markets.'

The report further identifies ten key application areas when a trans-European information infrastructure is formed. One such application is Telematic Services for SMEs and the report suggests that it should:

'Promote the widest possible use of telematic services (E-mail, file transfer, EDI, video conferencing, distance learning, etc.) by European SMEs, with links to public authorities, trade associations, customers and suppliers. Raise the awareness of added-value services, and communications in general, among SMEs. Increase access to trans-European data networks.'

The initial target for this application is:

'Access to Trans-European telematic services for SMEs available by end 1994-1995. 40% of SMEs (firms with more than 50 employees) using telematic networks by 1996. SME links with administration networks prioritized.'

According to the report, the Euro-ISDN's coverage and availability will be extended and a reduction in tariffs is to be expected.

5.5 Implications for Global Small Businesses.

These initiatives from various governments, whose countries account for the majority of the Internet users, on national information infrastructure provides strong support for the view that small businesses will eventually be a major user group of the national information infrastructures. To remain competitive in an information society, small businesses need to prepare for the way in which business will be conducted on the infrastructures previewed by the various government reports. The Internet is often viewed as a precursor of the future information infrastructure. Therefore, having knowledge and experience of conducting business operations in such environment and learning the pros and cons can only improve each organization's competitive ability and help to develop skills which can be made into a competitive advantage. As factors like accessibility, costs and technical feasibility become increasingly viable, there will be further growth in business connections on the Internet (no matter what form it eventually takes).

To be pioneers in using the Internet for business activities is important. Examples abound of systems such as the early United Airlines reservation system and the American Hospital Supply Company (Baxter Healthcare)'s on-line ordering system [17], where the developers all managed to gain initial competitive advantage by being first in their market sector with their innovation. Although subsequent market forces opened up the competition in each case, the 'first-mover' advantage is both real and valuable. If small businesses can manage to secure such competitive advantages by intelligently exploiting a medium like the Internet, it may be possible that such competitive advantages will extend to longer-term strategic advantages when these government initiatives have come to fruition.

6. Conclusion.

The commercialization of the Internet is already a reality, given the widespread business presence on the medium. Indeed, the bulk of the growth in Internet usage over the past two years has come from the commercial sector - academic and research access has increased by a much smaller proportion. Small businesses can gain substantial benefits by using this open and relatively low-cost information infrastructure to gain a competitive advantage against their less entrepreneurial competitors (and even, where they take full advantage of the opportunities available, a longer-term strategic advantage). The potential of the Internet to be exploited by small business is enormous and the benefit to be gained is only limited by the imagination of the business users. Recent research [2], [11] in examining small SME Internet use has revealed that small businesses find such an information infrastructure useful for market coverage, information gathering and product co-ordination. This enabling technology allows small businesses to gain increased market share and attract prospective customers in a way equal to or better than those which large corporations have been able to access - but with only a fraction of the cost. However, it is important for small businesses to align their business activities with their electronic initiatives to gain the maximum benefit from such enabling technology. Also important is to make use of the rich and often unbiased information content from the Internet for decision support.

As the aggregated effort and business know-how among small businesses cannot be underestimated, the formation of virtual alliances spanning national boundaries also has important implications. The amount of information shared, product variety available and coverage of global market has the potential to create a direct contest with larger corporations. Given the flexibility and lack of rigid structure of the environment, small businesses can survive and capture market change more readily.

Government policies from the major industrialized countries simultaneously recognize the importance of allowing small businesses to use such information infrastructures for collaboration and information sharing purposes. These initiatives of building the information infrastructure have been given a very high priority compared with other agenda items in these governments' activities. Small businesses should exploit such opportunities to gain know-how in conducting business within a different environment. The only way to achieve this is by means of 'learning by doing' [11] and small businesses need to be committed to capitalizing on such changes. Although all other channels of doing businesses will still be available despite the imminent changes to the national information infrastructure, it is almost certain that doing business will never be the same again.

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