

# **The Internet and its likely Impact upon Society, Business and the Economy**

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## **Abstract**

This paper considers the major implications of the growth of the Internet for society, business and the economy. It begins by tracing the development of the various technologies which form the Internet from their origins to the current state. Some 10% of the world's population now has access to this vast resource of billions of interlinked documents covering every imaginable topic. The Internet presents both opportunity and challenge for business. Profit can no longer be guaranteed from price differential alone, but for those able to adapt and innovate huge potential rewards exist.

The Internet provides numerous opportunities for small business start-ups. Those whose work is essentially information processing or production are now able to work from the comfort of their own homes, freeing them from the drudgery of commuting and office politics. The Internet is seen as an integral part of the trend towards globalization and the diminishing significance of the concept of nation state.

For all its promise of bringing equality and liberation a number of hurdles remain before the information revolution may be considered as complete. The availability of information in such vast quantities leads to the problem of sifting that which is of relevance and value from that which is not. Issues such as security and privacy (both real and perceived) prevent many from adopting the 'net as their prime channel for conducting business. There are also huge differences in levels of access between different countries.

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## 1. Introduction

This paper presents a personal view of some of the main implications of the growth of the Internet for society, business and the economy. It also suggests some ways in which the information age might develop. It is not intended as a definitive reader on any of these issues, rather as a stimulus for further debate.

Just as the proliferation of machinery irreversibly changed the primary focus of human activity from agriculture to manufacturing so the development and growth of computer technology is predicted to have a similarly dramatic impact upon society.

## 2. Definitions

The Internet is the global network of computers and computer networks interconnected by the common TCP/IP protocol. The World Wide Web (Web) is an Internet application consisting of billions of documents (web pages) connected and navigable by means of hyperlinks.

Electronic commerce (e-commerce) is the process of trading across the Internet, i.e. a buyer visits a seller's website and makes a transaction there. Less rigidly it includes deals where the Internet plays some role, e.g. assisting the buyer in locating or comparing products and/or sellers.

## 3. Origins

One of the first applications of computer technology was the attempt to decode German military intelligence during World War II. The earliest commercially available computers were prohibitively expensive to all but the wealthiest corporations and public bodies. They were enormous in size and miniscule in processing power. Continued exponential improvement in technology has seen processing power increase many-fold while price and size of hardware have plummeted.

With the exponential improvement in technology came change in the nature of the technology. In the corporate world the dumb terminals on every desk which were connected to a centralised "brain" were replaced with autonomous personal computers (individual "brains") - on every desk. In our homes intelligent but isolated boxes gained the ability to communicate with the wider world, first through dial-up modems, and now increasingly by permanent broadband connection.

In the late 1960s the U.S. Defense Department developed a secure and robust communications network (ARPANET) linking organisations engaged in defence research, which was designed to be able to continue functioning even if part of it was damaged, e.g. by nuclear attack. During the 1970s ARPANET became increasingly used by academics for sharing research material and eventually evolved into the Internet.

In 1989 Tim Berners Lee proposed the World Wide Web (WWW or web) while working at CERN, the Swiss based scientific organisation for research into subnuclear physics. Berners Lee initially envisaged a text based global hypertext system enabling fast and efficient communication between scientists located around the world and released the first text based browser in January 1992.

In addition to the dramatic developments and improvements in the technology the nature of our interaction with it also changed.

The 1990s saw the advent of affordable desktop computers together with the emergence of Microsoft's Windows as the dominant personal computer (PC) operating system. Its point-and-click graphical interface replaced the previous blank screen with flashing cursor. Windows utilised

a set of (supposedly) universally understandable icons to represent tasks such as file management and printing. Essentially, computing's potential and power became accessible to the masses.

September 1992 saw the release of Mosaic. Developed by Marc Andreessen and others at the National Center for Supercomputing Applications at the University of Illinois. Mosaic was the first web browser with a graphical interface. The web started to become the familiar face of the Internet, providing easy access to a wealth of text and images, and later, animation, sound and video too.

#### **4. Current position**

The Internet is not the first medium of mass communication. That came with the invention of the printing press, aided by widespread education. Radio and television followed. What differentiates the Internet from its predecessors is not only the sheer convenience of having such a vast range of resources (leading search engine Google claimed to index over 3 billion web pages at the end of November 2002) available on demand from one's desktop, but also the ease with which content consumers may become content providers.

Global Reach estimated 619 million people, some 10% of the world's population, had Internet access as of September 2002. There can now be few in the developed world who do not have access to Internet-connected computers at home, work, or through facilities such as public libraries and cybercafes. It cannot, however, be said that this applies to humanity in its entirety, as shall be discussed further under the heading of the digital divide.

#### **5. Non-commercialism**

The governmental and academic (i.e. non-commercial) origins of the Internet continue to have an important impact on its nature and development. Most users have become familiar with the availability of a vast quantity of free, quality content. Such expectations represent a significant barrier for those seeking to charge for access to their Internet-based content. To profit from such a model requires content of sufficient quality, quantity and uniqueness, and that is in demand by sufficient numbers.

#### **6. The changing business environment**

For the consumer the Internet provides an environment of near perfect competition in which prices from many suppliers can be compared within seconds. Leading IT business consultant Robin Bloor [the electronic b@zaar; Nicholas Brealey Publishing 2000] predicts that "Arbitrage will become a fact of life in the electronic economy. Nowhere will artificially high prices be sustainable". Numerous sites such as Shopper.com, DealTime and mySimon already enable consumers to find the best online deal for whatever they want - free of charge. The implication is that whilst transit and delivery charges for physical goods will still apply (for digitisable products physical distance becomes irrelevant) consumers will generally get a better deal as a result of increased, global, competition. Since suppliers will be forced to lower their charges to remain competitive they will be forced to innovate in other ways, e.g. service standards or other forms of added value, in order to win and retain market share.

For the elderly, disabled or those simply short of time, e-commerce offers the convenience of goods being ordered online and delivered to their doorstep.

e-commerce increases the variety of ways in which business may be transacted. The use of auction has become increasingly common with sites such as eBay permitting anyone to auction anything in a variety of auction styles. An interesting variation is provided by Priceline.com, where customers enter the price they are willing to pay for air tickets, the company then surveys the major airlines to find if one is willing to sell at that price. These alternative business methods would not be possible without the real-time information sharing capabilities of the Internet.

## 7. Agents

Agents are intelligent computer programs which are able to represent the interests of, and act on behalf of, their human owners. DealTime and mySimon are examples of a form of agent called the shopbot. Given a user's requirements they are able to enquire of many suppliers and so recommend the best deal. A further type of agent, the pricebot, is described by Kephart et al. as one which adjusts "prices automatically on the seller's behalf in response to changing market conditions". Books.com is quoted as an example, it uses an agent to slightly undercut the prices of its leading competitors. Bloor reports that "some websites have chosen to bar access to the robots that obtain comparison prices". He describes this as foolish and likens it to "turning customers away".

The Information Economies group at IBM research carries out simulations using agents programmed with various strategies. The work is described by Kephart et al. who predict that over the next decade "the global economy and the Internet will merge into an information economy bustling with billions of autonomous software agents that exchange information goods and services with humans and other agents". This report also predicts a role for agents in personalised filtering and bundling of information as a response to the problem of information overload described below.

## 8. Opportunity

Cyberspace means business is no longer constrained by physical distance. The Internet provides access to a potential global audience of over 600 million, which is growing daily. Savings in overheads will be made as retail outlets and office space become redundant. Many more workers will be freed from the daily drudgery of commuting and office politics as home working becomes increasingly widespread. In this respect technology is acting as a liberator, enabling a return to the more natural cottage industry of the pre-industrial age.

The UK government report Teleworking in the UK states that "the total number of teleworkers in the UK in spring 2001 was 2.2 million, or about 7.4 per cent of all in employment." It found that "since 1997 the number of teleworkers has increased, on average, by 13 per cent a year." It goes on to make international comparisons and of the USA states "it is generally recognised that teleworking developments are some years ahead of the UK and the rest of the EU." The report uses the Labour Force Survey definition of teleworkers as "people who do some paid or unpaid work in their own home and who use both a telephone and computer."

Home, or tele, workers may be either employees or self-employed freelance workers. In both cases the arrangement is beneficial both to the individual and their employer/client. Where technology enables a job to be done remotely it is sensible that it is done so, thus saving both on corporate real estate costs and on commuting time, fuel and pollution. There is likely to be increasing outsourcing of peripheral functions (I.T., cleaning, enquiry handling etc.) by corporations enabling more focus to be applied to key business areas.

The concept of the "job-for-life" has all but disappeared from most industrialised nations and that of the salaried employee is increasingly becoming an anachronism. An hourly paid employee is

actually being rewarded for making a job take as long as possible! The successful information age corporation will typically have a flatter structure in order to facilitate rapid change. It will also utilise temporary, "virtual" teams, formed to meet the requirements of a specific project and disbanded on its conclusion, in the recognition that no two project's requirements are the same. In an earlier era being on the payroll of an established firm may have bought employee loyalty, but since continuing employment is no longer guaranteed so staff mobility has increased.

The new medium provides unprecedented opportunity for small operators. Whittle writes "The web site of a small company fills just as much of an individual's screen as the web site of a multi-national conglomerate". 'Net shapers such as Yahoo, Netscape, Amazon and even Microsoft all started small.

For those that can best innovate new business models the potential rewards of the information age are great. The very survival of those that simply ignore the challenge is in doubt.

## 9. Advertising

Many providers of valuable free content on the web derive most or all of their revenue from advertising. According to content and media analyst Beauvillain, popular search engine Yahoo! "gets 90 per cent of its revenues from advertising".

Banner advertising involves sites making a small area of their page available to other sites in return for payment, or a reciprocal arrangement. A particularly irritating variant involves the use of JavaScript to spawn a multitude of regenerating pop-up windows upon loading a particular page. A form of marketing unique to the web is the affiliate program. First introduced by Amazon, it involves links to a company's site being posted on numerous other affiliate sites. For example, a photography website may link to Amazon (as a supplier of photographic books), photographic stores, processing houses etc. When a sale arises from one of these links the owner of the affiliate site earns commission.

Corporate websites are advertisements, but the most successful offer valuable content alongside the sales pitch e.g. a supermarket providing free recipes. Whittle predicts a blurring of the distinction between information and advertising in Cyberspace along with users being able to determine what kind(s) of advertising they are subjected to.

The most controversial form of Cyber advertising is spam, the e-mail equivalent of direct (junk) mail. The 'net makes it easy and cheap for advertisers to mail millions of recipients. Programs trawl Cyberspace collecting e-mail addresses, which are traded on huge lists. The result is that anyone who has published his e-mail address is bombarded with worthless messages like:

*Sell 1 million products on your website.  
GUARANTEED LOWEST CAR PRICING ON LINE (NEW)\$\$\$\$\$\$\$\$ 7085  
Re: Winning Confirmation n7 17746  
No Flame Lighters Hottest Christmas Gift and More (200)  
You'll Be Amazed!! What a Great Adult Site!!*

to quote but a few examples from my own mailbox. Every such message has to be transmitted and then downloaded before it can be discarded, given the number of recipients that implies a huge amount of wasted time. Many e-mail services such as Yahoo and Hotmail now offer "filters" to automatically delete such messages.

## 10. New strategies

Peter Small, a former electronic system design engineer and fashion entrepreneur, proposes a radical new strategy for the e-business. Small likens recent developments in information technology to the invention of machines, which led to the industrial revolution, and suggests we are currently in the transition period between the industrial and information ages.

Small believes methodologies which were successful in the industrial age are no longer applicable due to the inherent unpredictability of rapidly changing technology. "It is not just that there are new rules or that some of the rules have changed. The new rules which apply in the digital world of communications and e-commerce are sometimes the exact opposite of the proven and accepted dogmas which apply in the conventional world". He goes on to suggest a process of evolutionary design as an alternative to traditional planning. In this model a business develops and changes in response to the market, technological advancement, user feedback etc.

Small describes the limitations, in the information age, of the traditional managed team operating as part of a rigid hierarchy. Instead he proposes the concept of temporary, virtual teams, brought together by an initiator, someone able to "identify a win-win situation where cooperation can produce benefits" and "produce enough evidence that profits will result from [the] proposed cooperation". Such teams aren't "held together by rules, but by benefits of mutual advantage." Of the Internet, Small states "It isn't about technology, it is about communicating with people". The 'net thus provides the perfect environment for the formation of virtual teams.

## 11. Digital Content

The ease with which digitisable material may be disseminated has inescapable consequences for the creators and rights-owners of such material. That which may be digitised may be copied and re-copied an unlimited number of times without degradation and may now be distributed, digitally, by anyone, from anywhere, to the world. National copyright legislation is struggling to catch up with the technological reality of the information age, and in any case such efforts may be in vain given the ease with which digital content may be switched from server to server, from one side of the globe to the other, in seconds. The Internet is effectively beyond any individual government's control.

The rise of the Internet has also witnessed the development of the open source software movement. Open source software is made freely available by its creators for others to use and modify as they see fit, with the caveat that any modifications made also become open source. Quality open source products include the Linux operating system and StarOffice.

Alongside the open source movement, software and other digital material piracy has thrived. Latest versions of top software programs and new releases from major recording artists are available for free but illegal download shortly after (or even before) they arrive in the shops.

It is interesting to observe that in the educational world the renowned Massachusetts Institute of Technology is making its course materials freely available under its OpenCourseWare pilot. It is unclear as to whether its motives are purely philanthropic, or whether it intends to generate income through charged professorial support.

In the extreme there will be no incentive for the production of creative or intellectual property other than the kudos of doing so. Alternative scenarios include the free dissemination of content as a marketing tool for charged support, content producers being remunerated by high volumes of micro-payments, or global laws covering the transmission of bits from, to and via anywhere. Aside from the unlikelihood of the required universal cooperation required for the latter, even if it were to exist there remains a question over the practicality of enforcing such laws given the



widely distributed nature of the Internet and the availability of peer-to-peer technologies such as Napster, now acquired by Roxio, which enable thousands of users to share the contents of their hard disks with one another.

## 12. Challenges

For the full potential of e-commerce to be realised a number of challenges remain to be overcome.

According to Fleming "for most shoppers, feeling secure about entering financial information is the most important consideration in shopping on line". She justifies her assertion by making reference to the 8th GYU User Survey in which "shoppers overwhelmingly listed security as a concern". Consumers who would happily mail their credit card number, read it down a telephone line or even hand it across a bar, hesitate before typing it into a browser screen. Although confidence is beginning to grow, fears are reignited by news reports of hacking such as the attacks on 'net giants Yahoo [Electronic Telegraph; 10 February 2000; Hackers cripple web sites with 'junk' messages] and Microsoft [Electronic Telegraph; 28 October 2000; Microsoft humiliated as hackers crack Windows], and the teenager who illegally obtained thousands of names, addresses and credit card details including those of Bill Gates [Electronic Telegraph, 7 July 2001; Anti-Gates hacker spared jail].

E-commerce currently offers secure server and encryption technology as a solution to the security risks associated with transmitting data through Cyberspace. Encryption involves encoding information into a form that only the intended recipient can interpret. The commonly used public key encryption involves two keys for each user; a public one, made freely available, and a private one known only to the user. Sensitive information (e.g. a credit card number) is encoded using the intended recipient's public key before transmission, even if intercepted by a hacker it is thus useless without the corresponding private key [Whittle].

Whilst it is certain that security technologies will continue to improve, it is at least, if not more, important to reassure consumers that the online transactions in which they are engaging are secure. An informative and easy-to-read explanation of a site's security features forms an important part of its promotional strategy. Over time it is likely there will be a shift in cultural perception and that online shopping will be as natural as buying across the counter.

Every Internet connection may be used just as easily to transmit as to receive, and the audience of any such transmission is, potentially, the world. This dictates the need to be more rigorous in evaluating the integrity of information found on the Internet compared to more traditional sources.

The ease with which individuals may represent themselves misleadingly also gives cause for concern. Before entering a credit card number consumers demand reassurance they are dealing with a legitimate supplier that will meet its side of the bargain rather than a confidence trickster operating an online fraud. Digital certificates, issued by a trusted third party, may provide authentication of an online trader's identity.

Consumers are likely to be more willing to deal with well-established names, either those with a familiar physical presence or with everyday names such as Amazon [<http://www.amazon.com>], or with companies at the very least having a physical presence from which damages could be sought if the transaction is not fulfilled satisfactorily.

Closely related to the issue of security is that of privacy. Quoting the 8th GYU User Survey, Fleming states "Privacy is second only to security in most shoppers' minds". The process of requesting and storing personal information is one where the interests of site providers and visitors are seemingly at odds. Web users are naturally concerned about the potential invasion of privacy associated with providing information online. Visitors to bricks and mortar stores are not asked personal questions when making purchases, let alone browsing. The provider wishes to

gather data to more effectively understand his visitors. This may be for purposes of providing more appropriate content or displaying targeted advertising. Some e-tailers, such as Amazon, are able to make recommendations based upon customers past purchasing patterns.

The inability of individual governments to control the Internet means the medium is used to disseminate unsavoury material such as pornography, racial or religious bigotry and libellous statements. It is also used as a communications conduit with relative impunity by criminals, terrorists and others with less than wholesome motives.

### **13. Representation**

Some products cannot be represented in Cyberspace as effectively as others. Books, CDs and software sell well across the 'net because the customer has a clear idea of the nature of the product. Frequently authors publish sample chapters of their books on the web, and MP3 song samples are a common feature of online music stores. Goods such as clothes and audio equipment fare less well because consumers like to experience them (by trying them on or listening to them) before buying.

This may account for why only an estimated 2.7% of new-car sales in America in 1999 took place over the Internet while as many as 40% involved the 'net at some point, e.g. for information gathering [Economist.com; 24 February 2000; Define and sell]. The consequence may be the development of more sophisticated ways of representing products online e.g. three-dimensional graphics and virtual reality environments. There may also be more manufacturer's showrooms, such as the Sony Centre in Tokyo, where visitors can peruse, but not purchase, the company's latest gadgetry.

### **14. Information overload**

The Internet promises, potentially if not yet actually, to make available the sum total of human knowledge to every individual. As such, it could become the greatest tool of empowerment, liberation and equalisation in human history. However, the sheer volume of available information brings its own difficulties, not least that of information overload. A query of "Einstein's relativity" made to Google returned 220,000 results. Obviously there is a need for more intelligent retrieval technology, as well as for user education. Although all the answers are out there somewhere, locating them is far from straightforward.

### **15. Internet business models**

The Internet offers numerous opportunities for the small entrepreneur. A number of these are:

- The Web as a shop window for goods and services, either
  - to inform prospective clients/customers of product lines, or
  - to enable products to be purchased online.
- The sale of high quality content delivered through the web.
- Offering high quality content free of charge, and
  - accepting banner ads, and/or
  - acting as an affiliate for relevant businesses.
- Operating a portal, or one stop gateway to sources of valuable content, and
  - accepting banner ads, and/or
  - acting as an affiliate for relevant businesses, and/or
  - charging a commission on sales resulting from traffic delivered via the portal.
- Operating an online community, and
  - accepting banner ads, and/or

- acting as an affiliate for relevant businesses, and/or
- offering a facility for members to sell content (for a commission), and/or
- allowing selected corporate partners, for a fee, to provide valuable content alongside links to their products.
- Offering Web-related services, e.g. visual design, navigational design, information structure design, programming, multimedia production, server hosting/administration, consultancy.
- Offering other services, e.g. secretarial, translation, accountancy, graphic design, publishing.

To name but a few.

In all cases a high level of visibility is essential to generate sufficient levels of traffic. The Web is vast, there are few unique sites. The most successful of a group of similar sites are those which feature higher in search engine rankings, and are most frequently linked to by other quality sites. A whole industry has grown around optimising Web sites for high search engine placement.

## 16. Socialization

Previously individuals were limited to meeting others by chance and physical proximity, e.g. co-workers, neighbours etc. The Internet enables people to contact others with similar interests from anywhere in the world and to engage in ongoing asynchronous and synchronous communications with them. Such communications may build friendships, romance or business partnerships.

## 17. Globalization

Globalization has been defined as "the process of denationalization of markets, politics and legal systems, i.e., the rise of the so-called global economy." [Globalization.com]. The trend towards globalization hastened during the latter part of the 20th century and may be viewed in parallel with the rise of the multinational corporation.

Multinational corporations are large corporations which operate across a number of countries. The United Nations Research Institute for Social Development (UNIRSD) report "Visible Hands: Taking Responsibility for Social Development" states that "In 1998 the top five corporations had annual revenues that were more than double the total GDP of the 100 poorest countries."

Multinational corporations generally organize their operations and finance so as to maximize profit, e.g. moving operations to regions offering the cheapest labour costs while managing finance so as to minimize taxation liability. Recent years have seen violent mass demonstrations against globalization in Seattle, London, Genoa, Washington etc. Critics of globalization believe the trend exploits workers in the poorest countries, fuels job losses locally and encourages unethical practices from the multinational corporations. Globalization is also cited as a threat to democracy given the economic strength of major multinationals which are accountable only to their shareholders, are often beyond the control of any national government and are driven by the fundamental goal of profit maximisation.

Information Technology advancements are likely to intensify the trend towards globalization e.g. the BBC reports an increasing number of UK company call centre jobs being moved to India [More UK call centres to move to India] to quote but one example. It is not the purpose of this paper to argue the pros and cons of globalization, merely to comment that it represents an irresistible force in that firms which choose to operate in inefficient ways will be replaced by those that take advantage of the global economy. In the best case scenario globalization will see a reduction in inequality by encouraging the flow of investment from the rich to the poor. The

challenge for the world is to ensure that the information age really does bring about the greater good.

The growth of the Internet must be considered an integral part of increasing globalization, both as an enabling and driving force, and as an inevitable consequence of that trend. Technology makes it easier than ever to globally outsource an increasing variety of information processing and production work to those able to provide greatest value for money. Governmental attempts to obstruct this process will result only in uncompetitiveness and loss of inward investment.

1999 saw the launch of the single European currency (euro). Since that time there has been much debate as to whether and when the UK should join. It is likely that the global impact of technological developments will soon render the question irrelevant. Bloor predicts that "ultimately, there is room only for a single world currency.... If there is any attempt to impose more than one, then the more stable currency will drive out the less stable. A national currency will come to be seen as a tax on international transactions and where tax can be avoided, it will." Where economic integration occurs, so political integration is likely to follow.

The concept of nation state is one that is so ingrained within our psyche that its status as a human invention rather than the natural state of affairs is rarely questioned. Increasing globalization combined with increasing access and use of new technologies are already diminishing the role of the nation state. The Internet, like the multinational corporation, operates frictionlessly across national boundaries relatively unhindered by the currently prevailing laws of individual countries. Any attempt to regulate either requires cooperation on a worldwide scale, something which dictates a radically different and lessened concept of nationhood. Obviously, something as integral to human identity as the nation state will not disappear overnight, but it would be unsurprising if the concept remained only as a historical relic at the beginning of the 21st Century.

## **18. The digital divide**

Much has been said of the potential of technology to bridge national, social and economic differences and its potential to act as both liberator and equalizer. Much has been said of the global nature of the Internet's audience and participants. However, whilst 10% of the world's population has Internet access it is sobering to reflect that 90% do not. And this 90% are largely the poorest and least privileged.

International, non-profit organisation, Bridges.org provides the following statistics: "In the entire continent of Africa, there are a mere 14 million phone lines... fewer than in either Manhattan or Tokyo" (Nkrumah). "One in two Americans is online, compared with only one in 250 Africans. In Bangladesh a computer costs the equivalent of eight years average pay" (Economist). "There is a wide disparity in access to phones. In 1998 there were 146 telephones per thousand people in the world, but only 19 per 1000 in South Asia, and only 3 per 1000 in countries such as Uganda" (World Bank 2001a; 1998 Data). "Basic access to computers is usually measured against the total number of computers in a country, or number per capita -- both of which illustrate stark divisions. For example, for the world, there were 70.6 PCs per 1,000 people, with 311.2 per 1,000 in developed countries, 7.5 / 10000 in Sub-Saharan Africa, 2.9 / 1000 in South Asia, and only 0.7 / 1000 in countries such as Mali" (World Bank 2001a; 1998 Data).

There is thus a very real danger that, far from bringing liberty and equality, the Internet will increasingly disadvantage a very large number of the world's population. It is a matter of conscience for the technologically advantaged as to whether they wish to include their less privileged brethren in the brave new information world. It is a matter for the concerned to convince them that they should.

## 19. Conclusions

The emergence of the Internet represents a major new phase in human development, one in which potentially all knowledge is available to all citizens. It differs from other mass media both in its global nature and in that it supports participation from all with access, i.e. it is a truly many-to-many medium. The Internet is predicted to be as radical a development as the industrial revolution.

Internet access continues to expand rapidly, bringing both challenges and opportunities to both business and society as a whole. Its potential to liberate and generate greater equality must be balanced against the reality that 90% of the world's population do not have Internet access.

Smaller organizations and those with flatter structures are better able to adapt rapidly to the inevitable change of the information age. There is now a whole range of opportunities available to the small operation and lone entrepreneur.

The non-commercial origins of the Internet have created an expectation amongst 'net users of valuable content, free of charge. It is thus incumbent upon Internet content providers to persuade customers that their material is valuable enough to pay for and/or to obtain revenue from alternative sources, such as advertising.

As it becomes increasingly difficult to attain business success through pricing, or market share through physical convenience alone, differentiation through added value is essential to commercial success in the information age.

A further challenge comes from the difficulties in enforcing intellectual property rights over digitisable media.

The Internet is part of the irresistible trend towards globalization. The ease with which information may be transmitted and trade conducted across the 'net, transcending national borders, combined with the difficulties of any individual governmental regulation of 'net activity implies the inevitable diminishing importance of national borders.

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