The Societal Impact of the World Wide Web–Key Challenges for the 21st Century

JANICE M. BURN, Edith Cowan University, Australia
KAREN D. LOCH, Georgia State University, USA

This paper addresses the impact of information technology (IT) and the World Wide Web (WWW) on the 21st Century and the challenges which we will face as responsible members of a dynamically changing society. Reviewing the spread of potentially alienating technology, the paper highlights the implications for change with reference to the "haves" and the "have nots"- developing societies, economically disadvantaged groups, women and children. The authors argue that organisational, sociological and cultural factors may inhibit an effective transformation to a global Information Society. Particular consideration is given to policies, infrastructure, human resources and development responsibilities in developing societies.

INTRODUCTION

Many lessons from history offer strong evidence that technology can have a definite effect on the social and political aspects of human life. At times it is difficult to grasp how supposedly neutral technology might lead to social upheavals, mass migrations of people, and shifts in wealth and power. Yet a quick retrospective look at the last few centuries finds that various technologies have done just that, challenging the notion of the neutrality of technology. Some examples include the printing press, railways, and the telephone.

The effects of these technologies usually begin in our minds by changing the way we view time and space. Railways made the world seem smaller by enabling us to send goods, people, and information to many parts of the world in a fraction of the time it took before. Telephones changed the way we think about both time and distance, enabling us to stay connected without needing to be physically displaced. While new technologies create new opportunities for certain individuals or groups to gain wealth, there are other economic implications with a wider ranging impact, political and social. Eventually, as the technology matures, social upheavals, mass migrations, and shifts in economic and political power can be observed. We find concrete examples of this dynamic phenomenon

during the Reformation, the industrial revolution, and more recently, as we witness the on-going information technology revolution.

Before the Reformation, the church controlled an effective monopoly on knowledge and education. The introduction of the printing press in Western Europe in the mid-15th century made knowledge and ideas in book form widely available to a great many more people. Printing hastened the Reformation, and the Reformation spread printing further. By the early 16th century, when Martin Luther posted his 95 theses on the castle church, the political movement was well underway. The printing press changed the way in which we collected, transmitted, and preserved information prior to that time. Mass production and dissemination of new ideas, and more rapid response from others were instrumental in launching a worldwide social phenomenon.

Dramatic changes in the economic and social structures in the 18th century characterized the industrial revolution. Technological innovations were made in transportation and communication with the development of the steam engine, steam shipping, and the telegraph. These inventions and technological innovations were integral in creating the factory system and large-scale machine production. Owners of factories were the new wealthy. The laboring population, formerly employed predominantly in agriculture, moved in mass to the factory urban centers. This led

to social changes as women and children were introduced into the workforce. Factory labor separated work from the home and there was a decline of skilled crafts as work became more specialized along the assembly line.

The inventions of the telegraph and telephone dramatically changed the manner in which we conduct business and live our daily lives. They allowed the collection, validation, and dissemination of information in a timely and financially efficient manner. More recently, we are experiencing the information technology revolution, led by the introduction of computers. The rate of change has accelerated from previous times – with generations of technology passing us by in matters of months rather than decades. We are witnessing significant shifts in wealth and power before our eyes. Small start-up high technology and Internet companies, and their young owners, represent a very wealthy class – and an extremely powerful one. Small countries such as Singapore and Ireland, through the strategic use of information technology and aggressive national policy, have transformed their respective economies and positioned themselves in the competitive global economy.

The Internet, a complex network of networks, is frequently spoken of as a tool for countries to do likewise. The Internet removes the geographical and time limitations of operating in a global economy. The banking industry has been revolutionized with Internet banks who can collect, validate, and disseminate information and services to any people group – internal to the organization and external to its customers–in a timely and financially efficient manner. Similar scenarios exist in the worlds of retail, healthcare, and transportation.

There is an underlying assumption in the popular belief that the Internet may be the savior to the developing countries of the world. Such thinking is dependent on a single premise: the belief that access to information gives access to the global marketplace which in turn leads to economic growth. Information is power; knowledge is wealth. The vehicle for access is information technology and communications infrastructure (ITC). Mohammad Nasim, the minister for post and telecommunications in Bangladesh, one of the poorest countries in the world, restated the premise, saying "We know full well how important a role telecommunications play in a country's economic development (Zaman, 1999). The converse is also true. Lack of IT access leads to an increased inability to compete in the global market place which leads to further economic poverty. What we are witnessing is therefore either an upward or downward spiral phenomenon. This raises some interesting and important questions for society, such as: What is the current information access through the Internet? Who are the "haves" and the "have-nots" of information access? How can the Internet address the societal challenges?

This paper attempts to address these questions and related issues. In the first section we document the current state of information technology diffusion and connectivity, and related factors such as GDP, population density, and cultural attitudes. The second section examines more fully the question of who comprises the "haves" and the "have-nots" so frequently mentioned. Across and within country comparisons are made, noting in particular disadvantaged groups, urban vs. rural communities, and women and children as groups that are frequently forgotten, but who are vital to true transformation to a global information society. The third section offers some concrete suggestions as to how the Internet may be used to address the growing gap between those who have and those who don't. We report some country examples which illustrate both the progress and the magnitude of the challenge as societies, governments, and other key change agents attempt to redress the problem. Finally, we make two observations. One is that for those who don't have, there is little demand *to have*, as well. This is in large part explained by the second observation, which is that a multi-level complex challenge must be overcome in order to leverage technology-based services, such as offered by the Internet, as a sociological tool to reduce economic disparity. We challenge the reader to look inward for each one's individual responsibility in this big picture.

INFORMATION TECHNOLOGY ACCESS

In 1995, the world IT market as measured by the revenue of primary vendors was worth an estimated US$527.9 billion. Between 1987 and 1994, its growth rate averaged nearly twice that of GDP worldwide. It was particularly high in Asia climbing from 17.5% to 20.9% of world share during that time. Nevertheless this strong growth did little to redress the geographical imbalance in the world IT market—*markets outside Asia and the OECD area (ROW) accounted for only 4% of the world total*.

From a world population of 5.53 billion, *ROW accounts for 82.6%* of the total population yet from a world GDP of US$25,223 billion, *ROW accounts for only 19.2%* (decreasing >2% over the last 7 years) and from a total IT market of US$455 billion, *ROW accounts for only 8.4%* . See Figure 1.

The IT market has remained concentrated within the G7 countries at around 88%, with the United States accounting for 46% of the market. In terms of installed PC base the US was by far the world leader with 86.3 million units, well ahead of Japan (19.1m), Germany (13.5m) and the UK (10.9m). In the US this averages at 32.8 PCs per 100 inhabitants. The Internet now reaches into every part of the globe with the number of host computers connected to the Internet increasing from 3.2 million in July 1994 to 6.6 million in July 1995, 12.9 million in 1996, 16.1 million by January 1997 and 29.7 million by January 1998 (Network Wizards). This is more than a tenfold increase since July 1993 as shown in Figure 2.

Recent estimates indicate that some 90 countries, just under 5 million machines and some 100 million users worldwide are connected to the Internet (NUA Internets Survey, 1998). However, Internet hosts per 1 million inhabitants by country income show huge differences between the rich and the poor, with 31,046 hosts for the highest income countries and only 9

Related Content

Software Development Methodologies in Organizations: Field Investigation of Use, Acceptance, and Application
Charles J. Kacmar, Denise J. McManus, Evan W. Duggan, Joanne E. Haleand David P. Hale (2009). *Information Resources Management Journal (pp. 16-39).*
www.irma-international.org/article/software-development-methodologies-organizations/1363

Blended Approach Environment Shift in Higher Education
Hanafizan Hussain (2009). *Encyclopedia of Information Communication Technology (pp. 69-74).*
www.irma-international.org/chapter/blended-approach-environment-shift-higher/13341

An Evaluation Study of User Authentication in the Malaysian FinTech Industry With uAuth Security Analytics Framework
Soo Fun Tanand Gwo Chin Chung (2023). *Journal of Cases on Information Technology (pp. 1-27).*
www.irma-international.org/article/an-evaluation-study-of-user-authentication-in-the-malaysian-fintech-industry-with-uauth-security-analytics-framework/318703

A New Technique for Estimating the Distribution of a Stochastic Project Makespan
Yuval Cohenand Ofer Zwikael (2012). *Project Management Techniques and Innovations in Information Technology (pp. 33-47).*
www.irma-international.org/chapter/new-technique-estimating-distribution-stochastic/64953

A Methodological Approach for Mining the User Requirements Using Apriori Algorithm
Anuja Soni, Anand Saxenaand Parul Bajaj (2020). *Journal of Cases on Information Technology (pp. 1-30).*
www.irma-international.org/article/a-methodological-approach-for-mining-the-user-requirements-using-apriori-algorithm/263289