Communication and Technology: What's New?

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> "As users we will come to rely on our handset as a single device to manage not just communications but much of our lives. It will truly become a 'remote control for life', with massively enhanced capabilities, advanced methods of user interaction and in-built tools … The substantial change that end users are going to witness has become possible more because the underlying infrastructure has become stable than because it is rapidly evolving" (Webb 2007: 35).

Introduction:

This quotation offers a technologist's view of the potential of technological advance for new modes of communicative interaction based, in this instance, around innovations in handset technology. In this view, by the early part of the 21st century technological innovation in the fields of engineering concerned with the underlying communication infrastructure had stabilized, offering a foundation for current and yet-to-be-imagined applications. This observation echoes many of the technologically deterministic views (Gilder 2000) that are frequently criticized in the humanities and social science literature which considers the relationship between communication and technology.

In the humanities and the social sciences it is generally understood that research and theory building in this area must be historically situated. Smythe argued that technology and its relationship to communication is dynamically interrelated and is best understood as having a number of constituent parts:

> 'one part is bureaucracy (in both the private and public sector)...The second part is science which is being taken over increasingly by the third part, capital. The fourth part is tools and machines created by engineers. The fifth part is ideology which provides the raw materials with which the sixth part, propaganda, seeks to mould public opinion to accept the myth' (Smythe 1984: 2).

This definition embraces not only the technical features, but also the human and social dimensions of the relationship between technology and communication. The technologies of communication are those that enable the establishment of communicative relationships by creating a sense of co-presence. Analytically, the implications of the relationship between communication and technology for human development might begin at any point in human history, with, for example, the

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Phoenicians and their development of an alphabet, with the Sumarians and their development of cuneiform writing or, indeed, with the Egyptians and their development of hieroglyphic writing – all between 3500 and 2900 BC. The first wooden printing press was invented in China in 305 AD, with newspapers appearing in Europe in 1450. The first telegraph line was invented in 1793 by Claude Chappe, while 1876 saw the patenting of an office copying machine by Thomas Edison and the electric telephone by Alexander Graham Bell. Marconi transmitted the first radio signals across the Atlantic Ocean in 1902. The Internet (ARPANET) started in 1969, IBM's personal computer was sold in 1981 and the World Wide Web became available in 1994.[2] In this paper, I focus on some of the ways in which the most recent developments have coincided with broader societal changes.

There are many perspectives upon which one can draw to highlight the complex history of the relationships between communication and technology. No single disciplinary approach encompasses all the facets of these relationships. When we ask the question – what is new? – we are often confronted with the musings of the *futurologists*. They offer us forecasts about the timing of inventions that they expect to enter the consumer market. For example, innovations in information and communication technologies have been forecast over periods as long as 60 years. Neild and Pearson (2005) speculate that by the 2030s, learning will be superseded by transparent interfaces to a smart computer; by the 2020s, network based telepathy will be in use; and by 2017, the first bacterial computer will be available.

Such musings take no account of the social dynamics within which technologies become embedded in society. In the social sciences we have a wealth of evidence about contemporary developments in these technologies. This evidence often highlights features overlooked by those who are attracted by ideas like 'the remote control for life'. In this paper, I highlight some recent evidence drawn from work by those conducting research within the media and communications field. As Marvin (1988: 14) observed in *When Old Technologies Were New*, her detailed account of changing communicative practices, 'what is not so easily transferred is the specific cultural setting …'. When new technologies come to the fore and become pervasively available to their users, the historical evidence suggests that we should expect the unexpected. New technologies are rarely appropriated in a straightforward way. We should ensure that any new policy measures designed to control either the technologies or their users are responsive to actual communicative practices, rather than to those which are assumed to be revealed by media speculation. For the purposes of the present analysis, I focus on two important areas of research:

1. Technology and Organisation –insights into personal communication via computer-mediated communication, online media, and personal publishing.

2. Technology and Governance – observations on hactivism and mediated terrorism.

Before highlighting recent findings, I distinguish between two vantage points from which innovations in this area can be examined. Broadly, there are two main

[2] see http://inventors.about.com/library/inventors/bl_history_of_communication.htm

conceptual frameworks that are used to inform research in this area: an exogenous and an endogenous framework.

Communication and Technology: Conceptual Frameworks

Interest in the relationship between information and communication technologies and the potential for new modes of communication has grown since initial efforts to document a shift in the wealthy economies from their reliance predominantly on manufacturing to services (Machlup 1962; Porat 1977). The spread of the Internet and access to the World Wide Web, together with the convergence of communication services around digital platforms since the mid-1990s, has intensified that interest. For some, it is an article of faith that these technologies hold the solutions to economic, political and cultural problems. They argue that if the spread of these technologies makes information easily accessible from multiple sources and on multiple platforms, then the information and communication needs of all segments of the population world-wide potentially can be met.

Others argue that the many different forms of the digital divide make it unlikely that these technologies will alleviate deeply rooted social and economic problems (Golding 2000). In fact, the relationships between communication and technology are embedded in unequal institutionalized power relations. This has implications for the way they become embedded in the workplace and in the everyday lives of users. Such power relations are rarely stable. It is crucial therefore to examine these relationships empirically to understand whether and how they intersect with developments in the offline world (Mansell and Silverstone 1996).

Those who are convinced of the positive contribution of innovation in communication technologies tend to conduct their research within an exogenous conceptual framework. Those more interested in the dynamics of power relations generally work within what I refer to as an endogenous framework.

Exogenous Framework

One school of thought in the social sciences treats information and communication technologies as if they are objects isolated from the social, political and economic environment in which they are produced and consumed (Bell 1973; Drucker 1961). The way in which these technologies come to be integrated within society is assessed within an exogenous framework in terms of whether a particular technology is a progressive, regressive or a neutral force. Sometimes there is an attempt to discover causal relationships between the appearance of new technologies, for example, such as satellite technology, and some aspect of social change (de Sola Pool 1983).

However, this approach isolates technology from its socioeconomic context such that, if a technology such as a computerized database is found to have negative effects, the problem is attributed to the software design. The result is a mythical understanding of technology which is understood for the purposes of analysis to exist in an external relation to society. It is assumed within this type of framework that social relations leading to the production and distribution of new technologies act on society in

rational or logical ways. Is it the human being or 'technology' that directs social change? As information and communication technologies pervade evermore aspects of human endeavor, it is easy to claim that it is technology and not the human being that is 'out of control' (Beniger 1989). If it is technology that is the determining factor in social organization, then what is left for the researcher is merely an observer role. For example, Ellul argues that 'our civilization is constructed *by* technique, *for* technique and *is* exclusively technique' (Ellul 1964: 128). Similarly, Bell who coined the term information society, argued that 'technology is the instrumental mode of rational action… Technology has created a new definition of rationality, a new mode of thought …' (Bell 1979: 15). The emphasis here is on the efficiency and rationality of technology and social, cultural, political and economic factors are relegated to secondary positions.

From this exogenous perspective it may also be assumed that technology has universally similar effects regardless of where it is implemented; that technology is self-generating and goal-oriented (Winner 1977). The goals of efficiency and productivity are seen as being embedded in an autonomous technological system where there is little room for human agency. Research tends to focus on the activities of technicians, engineers and scientists to assess how information and communication technologies are generated rather than on the interests (economic, political, social and cultural) that are at stake. In fact, it is institutions, individuals, and groups that are influential in the development of these technologies.

This exogenous framework tends to be used to attribute responsibility for positive or negative economic, cultural and other effects to each successive wave of technology. Researchers become preoccupied with facilitating the promotion and expansion of technology, without critically assessing the way technologies become woven into the fabric of life – in terms of morality, the economy, culture, or the political. As Williams (1977: 80-81) argued, abstract analytical categories of idealist thought, 'almost unnoticed, become substantive descriptions, which then take habitual priority over the whole social process to which, as analytical categories, they were attempting to speak'.

There is, however, another framework that can inform alternative understandings of innovation in this field. An endogenous framework offers the potential for a critical assessment of the human factors that give rise to potential opportunities and disadvantages associated with each new generation of information and communication technology.

Endogenous Framework

Within an endogenous framework it is feasible to investigate the specific, material conditions under which technology is produced and consumed within society and to examine the everyday aspects of its organization. Technology, in this framework, is regarded as part of the social fabric in which actors sanction certain forms of change and not others. Common to the work of those contributing to this framework is an emphasis on the structural factors, external and internal to a country or region, that result in unequal distributions of power. Power is usually located in the interwoven alignment of state (administrative and military), private capital and civil society interests. In this view, the emphasis is on the way technology mediates human

relationships and on the limiting constraints that distort benefits which might otherwise accrue to those who are not at the centre of economic and political power (Silverstone 2007).

Researchers whose work embraces an endogenous framework tend to emphasize historical and recurrent patterns of information and communication technology innovation. Analysis of power relations in the wider economy is important for understanding whether and how changes in technology are being accompanied by particular changes in the way society is organized (Mansell and Steinmueller 2000). An endogenous framework accommodates analysis of the opportunities and constraints offered by innovative technologies. Thus, for example, rather than assume that open source software and networks automatically give rise to newly empowered virtual communities, researchers working within an endogenous framework will examine how the rise of networks is implicated in changing power relationships (Kubicek and Wagner 2002). This approach allows for the fact that the embedding of technology within communicative relationships may be empowering or disempowering – or both (Freeman 2007). Remaining open to this possibility allows the Janus-faced character of technologically mediated communication relationships to come to the fore.

The results of recent research highlighted here are drawn from contributions commissioned by the writer as lead editor on the theme of technology and communication for the forthcoming *International Encyclopedia of Communication* (Donbach 2008 forthcoming).[3] Most of the research cited below is conduced within an endogenous conceptual framework and is therefore concerned with the material changes in power relationships that accompany the spread of new communication technologies.

Communication, Technology, and Organization

There is no stable definition, but the term virtual community has been applied to online interactions that give rise to new forms of relationships and new organizational forms. Virtual communities of many different kinds lie at the interface between new forms of communication, innovative technologies, and new organizational dynamics and power relationships. These communities offer a new focus for social science research that seeks to understand the new forms of social or communicative relations.

The huge fields of human-computer interaction and personal communication by computer-mediated communication research bear on these issues. Human-computer interaction is the study of how people interact with computational devices and the design implications of digital media. Studies of personal communication via computer-mediated communication (CMC) address the same technologies, but the focus is on the perceived positive and negative features of this mode of

[3] See http://www.communicationencyclopedia.com/. I am grateful to Paul Taylor, University of Leeds; Prasun Sonwalkar, University of the West of England; Wolfgang Schweiger, Ludwig-Maximilians-University of Munich; Joseph Walther, Michigan State University; and David Brake, London School of Economics and Political Science for the material and insights provided by their respective entries in the encyclopedia which I have drawn upon in compiling this short synthesis paper..

communication. This is an area particularly in need of empirical study, especially since issues around user-generated content or 'Web 2.0' applications are being extensively discussed in the trade literature. In this section we look at: 1) online media; 2) personal communication by CMC; and then briefly at 3) personal publishing.

Online Media

Online media refers to communication where digital content is transmitted from any server to distant receivers via the Internet or other digital networks, e.g., mobile services, and presented to the user on a terminal device. There are several distinctive features of online media.

- The direction of communication and the number of communicating partners*:* communication may be between single individuals who mutually exchange messages, e.g., email, chat or Internet telephony; between several individuals, e.g., in MUDs, discussion or chat forums; or between a sender and any number of recipients, e.g., web-sites or web-logs.

- Synchronicity: some interpersonal online media enable synchronous communication, e.g., chat, Internet telephony, video conferences. Other interpersonal online media offer asynchronous communication, e.g., e-mail, voice mailboxes.

- Online media can contain different forms of digital content ranging from text, photographs, drawings, sound clips, videos, animations (multi-media) to any information service or software application.

Until the end of the 1990s, online media were almost exclusively used on computers situated in offices and mainly for informational purposes. Computers are now used as entertainment media and are displacing television and other entertainment media (Bakardjieva and Smith, 2001).

Most online media can be used at any media terminal as long as a fast data connection is available with a terminal and input and output facilities such as a display, loudspeaker, and keypad, e.g. notebooks, PDAs, mobile phones, game paddles, digital music or video players.

Online media are characterised by interactivity: marketplaces like eBay, online communities where users share personal photographs (flickr.com) and videos (youtube.com) and discuss issues. Interactive media are able to detect user needs and interests without user input or awareness. The use of content modularization is increasing, using large numbers of micro elements, e.g. online restaurant guides or games. Personalization is characteristic of online media whereby users select topics, departments, genres and locations.

What's new?

In traditional mass media, almost all news and entertainment content were supplied by professional media companies, institutions, or networks. Despite the increasingly

pervasive online media, they are still mainly produced by established media or publishing houses that provide most of the online news and entertainment content. The majority of today's successful online mass media have been founded by established media or publishing houses. Online start-ups and stand-alone online media are still reasonably rare.

Established media have the infrastructure and know-how to produce content re-using existing media content in their online media and they can produce or purchase content at lower prices. One main trend is towards cross-media utilization, most recently, with the development of new Mobile Web services.

The other main trend is related to the way many online news media make use of 'user-generated content': 'average users' mount personal content at websites which is selected, revised and assembled by professional providers in the form of discussion forums, weblogs, user diaries, personal essays, sound-files, reader ratings and opinion polls (Adoni and Nossek 2001; Bakardjieva and Smith 2001; Lehman-Wilzig and Cohen-Avigdor2004).

How does all this relate to the development of online personal communication?

Online Personal Communication

CMC offers opportunities that appear to enhance communication in personal settings. Research in this area began to flourish in the 1980s when it was initially thought that without nonverbal cues, it would be ineffective in supporting group discussions or interpersonal functions. However, some studies indicated success of personal exchanges, for instance, within organizations and within hobbyist and non-professional bulletin board groups. The early 1990s saw the increased popularity of proprietary networks such as Prodigy, CompuServe, and America Online.

What's new?

The Internet has evolved into a social space for discussion on any topic, personal relationship seeking or support, and anonymous, virtual-only flirtation, relationships, virtual marriage, and sexual simulation. Sproull and Faraj (1997) characterized the 1990s Internet as a field of 'atheism, sex, and databases'.

It has become clear that:

- CMC users translate meanings into verbal behaviors. This translation takes place fluidly, but it requires considerable time and repeated message exchanges to be perceived positively. Communicators use language and paralinguistic cues to create and manage personal impressions (Walther 2006). Online dating and matchmaking systems now provide a venue for initiating relationships.

- As Walther (1996, 2007) has shown, impersonal online communication is most likely when interaction time and/or interpersonal familiarity are restricted. Interpersonal online communication is facilitated by ongoing exchanges and relational longevity. Hyperpersonal communication can

> lead to intimate, satisfying interpersonal evaluations as a result of selective self-presentation, exploiting the editing and timing capacities of CMC.

Online personal communication often leads to more delicate and frank exchanges; more and less superficial self-disclosure and personal questioning; and to the use of blogs as personal diaries (Lenhart and Fox, 2006).

Individuals with skill deficits affecting face-to-face communication appear to experience either gratification or further deterioration when conducting personal relationships online. Depression and other syndromes lead some individuals to withdraw from face-to-face social interaction, preferring instead the distance that online interaction allows in the conduct of meetings and chatting online.

Research has examined the implications of online communication for the presentation of the self online with respect to identity. Studies have examined, for example, whether deception is facilitated in online discourse and the linguistic markers that may be associated with lying (in real-time chat). The evidence is mixed but it suggests that radical behaviour occurs less frequently than popular accounts indicate and that play with identity in online communication may provide therapeutic opportunities (Herring & Martinson 2004).

Personal Publishing

Personal publishing is a form of online communication. It began with personal home pages in the mid 1990s and continued with weblogs, changing most recently into profiles on social networking services such as MySpace and Facebook.

Weblogs are widely discussed as a form of alternative or citizen journalism and as tools for the creation and maintenance of virtual communities (Efimova 2004, Mortensen and Walker 2002), but a survey of webloggers in the United states (Lenhart and Fox 2006) suggests that the most important uses for weblogs are as a means of creative expression and as documentation of a writer's experiences. Furthermore, the idea that bloggers are seeking readers or an audience is called into question by studies that reveal a distancing of the relationship between writers and their desired and actual readers (Gumbrecht 2004; Menchen Trevino 2005). Even when readers are desired, interaction does not necessarily occur. Mishne and Glance (2006) found that while 80 per cent of weblogs they examined allowed for comments, only 28 per cent had received comments.

Overall, in terms of the relationships between communication, technology, and the organization of relationships, the new technologies appear to give rise to a mix of new forms of sociality and relationships that do not differ substantially from those found in offline settings. Clearly, however, distance, time and issues of spatiality, mean that our understandings of the boundaries between public and private are subject to quite radical change. This creates a host of new issues for managing the relations between communication, technology and governance.

Communication, Technology, and Governance

In the social sciences the analysis of disruptive technological innovations is often coupled with debates about the positive or negative implications of these innovations for the global order. Two of the most visible debates to appear in the media in recent years are concerned with the implications of what has been labeled as 'hactivism' and 'cyberterrorism'. In both cases, these issues give rise to discussions about the extent of the threats to citizens and the need for new security measures to reduce the risks.

The governance of online media influences how new technologies become embedded in society. In analyzing the relationships between communication and technology, many authors are concerned with the relationship between globalization, the governance roles of nation states and the deterritorialisation of online media. Different framings of the relationship between globalization and communication technology find echoes in research on the nature of the governance regimes that are required to enable control of online media and computer-mediated personal communication, both locally and globally.

When it comes to the relationships between crime, terrorism and communication technology the issues and the evidence base are strongly contested. There are attempts to control crime and terrorism using law enforcement and the criminal justice system as well as to 'design out' crime through technical measures. The evidence base for claims about the potential for 'cyberterrorism' is particularly weak (Schmid 2004). Thatcher (2006) argues that media coverage of these issues could lead to a 'moral panic' and to actions on the part of governing institutions that are not justified by evidence.

Hactivism

Governance issues arise, for example, when users access computerized systems giving rise to questions about whether there should be sanctions for 'bad' behaviour associated with 'hactivism'. Hacking refers to techniques that are combined with political strategies, but whether hacktivism is seen as legal or illegal is a question of values. Hacktivism is the conjunction of hacking techniques with the values and communicative strategies of political activism in line with the agendas of new globalized social movements (Taylor 1999; Jordan and Taylor 2004):

- Hacktivism has coincided with an increasing number of social movements seeking to engage with politics.
- It includes methods of electronic vandalism such as computer worms, viruses, trojan horses, email bombs and the defacement of websites.
- Hackers reverse engineer the functionality of a range of artifacts (of which computers are merely the most evident).
- Examples are Virtual Sit-ins and Denial of Service (DOS) attacks; electronic civil disobedience; Electronic Disturbance Theatre (EDT); and Culture Jamming - reverse engineering of corporate advertising.

What's new?

Hacktivism relies on technological means and research has identified two strands of

activity, referred to as ‘mass action’ and ‘digitally correct’ hacktivism.

‘Mass action’ hacktivism emulates traditional forms of protest and applies them in mediated electronic spaces. Electronic Civil Disobedience, for example, involves large numbers of people who carry out acts that are technologically simple but gain strength from the weight of the numbers of people involved. In a mass action denial-of-service attack, large numbers of people will seek to crash computer servers by simultaneously requesting information from a targeted site.

‘Digitally correct’ hacktivism uses the technical features of online media to amplify a message without disrupting the communicative potential of the Internet, that is, the technology is not subordinated to the desired social goals.

However, hacktivists face the problem of maintaining a critical and radical stance. Some argue that the net effect may be a reduction in political impact since it is translated into the images and stories of the media. Gunkel (2001: 5) suggests that hactivism is a parasitic position: '.. a structurally unique position that is neither simply inside nor simply outside.’ Similarly, Hardt and Negri (2000: 46) argue that ‘we should be done once and for all with the search for an outside, a standpoint that imagines a purity for our politics’.

Research indicates that, despite the new opportunities created by the Internet and online media and communication, there are constraints to the actions of those seeking to appropriate the technology for political purposes. In this case, the arguments for new governance measures to control the use of technologies in order to avert threats, but which infringe on civil liberties as a result, may be misguided. The context in which greatest attention has been given to this issue is with respect to governance measures to address the relationship between terrorism, communication and technology.

Terrorism, Communication and Technology

The discourse of terrorism has become linked to online media as state and non-state actors seek to exploit technological advances to promote their causes. Schmid and de Graaf (1982: 9; Schmid 2004) have observed that ‘without communication there can be no terrorism’. Those branded by states as terrorists use online communication to orchestrate events and ensure that news about them is communicated through the media. They use technologies such as the printing press, photocopiers, satellite phones, video, email, chat-rooms, websites, blogs, and encryption software; in fact, their activities are similar to those of the hactivists.

The definition of terrorism is of course controversial. As Nacos (2002: 16) argues, the same act of violence can be evaluated ‘as either the evil deed of ruthless terrorists or the justifiable act of freedom fighters and/or warriors of god’. And as Laqueur (1976: 104) observes ‘the success of a terrorist operation depends almost entirely on the amount of publicity it receives’.

What’s new?

- The potential for propaganda increases exponentially with advances in communication technology with the Web and its chat-rooms, ICQs, blogs and email; mobile technology, and technologies that combine text, audio and video elements.

- The Internet has become a site of dispute between contending ideologies and groups. Khatib (2003: 389) suggests, for example, that the Internet is used by Islamic fundamentalist groups as a 'portable homeland' and that, in the news media, 'Islamic fundamentalism' is frequently conflated with 'Islamic terrorism'.

- Netwar now refers to offensive acts carried out by geographically separate, diverse, interconnected non-state actors (Whine 1999). Cyber-terrorism is seen as a convergence between non-state actors and communication technologies involving hackers or hactivists as highlighted above.

- Nevertheless, the evidence is that terrorists do make full use of online communication but that they have not yet engaged in cyberterrorism (Ronfeldt 1999; Whine 1999a; Whine 1999b; Arquilla, Ronfeldt et al. 2000; Denning 2000a,b; Green 2002). Thatcher's (2006) research demonstrates how the hacker is being repackaged as a terrorist in the media and that ordinary cybercrime is being relabeled as cyberterrorism. She suggests that hackers, terrorists and, now, cyberterrorists, are being successfully constituted by the media as contemporary 'folk devils' (Cohen 2002), with online communication technology at the centre of their activities.

Conclusion

All of the developments reviewed in this paper, together with many others, are creating the parameters for what some envisage as a new age of ubiquitous computing. This refers to networking and computing technologies that are small, fast, interconnected and cheap enough to be embedded in the environment and in everyday objects. Yet, the extent and direction of social change accompanying these developments as well as those considered in this paper is only beginning to come to light. As in the case of debates about the potential of Web 2.0, there is much hype and speculation with far too little systematic empirical research on the ways in which the technologies are being appropriated. Research demonstrates that the turn to governance and control of new communicative spaces by the state in instances where there are suggestions of threats either to groups or to individuals is based on media stories that, when challenged, are found to be lacking in empirical substance (Thatcher 2006).

Some social science approaches to technology assessment embrace critical examinations of the underlying values and norms that are becoming part of the fabric of everyday online communicative life. Technology assessment methodologies, informed by theories from across the social sciences and by endogenous perspectives on technological innovation, are sensitive to the dynamics of power relations. These are the essential tools required to uncover the changing relationships between communication and technology within society. Absent research of this kind we continue to encounter the folk devils and heroes of contemporary mediated spaces.

Such encounters, as portrayed in the media, offer little if any guidance on questions about whether policy or regulatory action is warranted in order to address the perceived threats associated with 'cyberterrorism'. Such actions are often intrusive, breaching existing norms with respect to the boundaries between citizen's private and public lives.

There is an obligation, therefore, for the social science community to investigate the actual threats arising from new forms of online communication, rather than simply relying on accounts of the media's portrayal of them. Research of this kind is clearly challenging, requiring access to information that is often subject to privacy protections or to strong security controls. There is a need for dialogue within the research community to establish the ethical foundations for such research.

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