Chapter 9 considers the impacts of new media upon the political sphere. It approaches the issues at three levels. First, after an evaluation of the democratic possibilities of ICTs that have been identified by various writers, it looks at how new media have been applied by governments and other political organisations in order to extend the possibilities for democratic participation by citizens in the political process, and some of the achievements and limitations of such initiatives. Second, it considers the responses by governments and policy-makers in four countries—the USA, Australia, Singapore, and China—to new issues about content regulation arising from the development of the Internet as a globally networked communications medium. Finally, it looks at the relationship of new media to globalisation, with particular reference to the rise of anti-globalisation movements and the innovative use of new media for political activism, such as culture-jamming and cyber-squatting, and assesses some of the factors that lie behind the rise of these movements and how they may develop in the future. The chapter points to two important paradoxes. One is for policy makers, who seek to apply forms of control over Internet content as an element of traditional prerogatives of government to engage in the moral management of national populations, while simultaneously seeking to promote electronic commerce and citizen participation in the global knowledge economy. The other is for political activists who use globally networked technologies such as the Internet to promote and organise anti-globalisation and other movements: can they simultaneously take advantage of the opportunities presented by such new media while denouncing the impacts of globalisation?

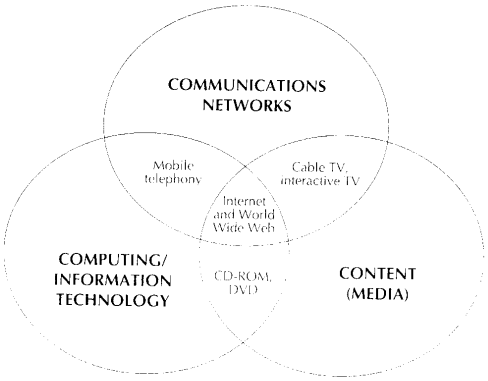
1 Terry Flew

What's New About 'New Media'?

In any discussion of new media, a question that needs to be addressed is why some media are considered to be 'new'. There is a temptation to simply list the latest developments in media technologies and call these new. Yet this approach is inadequate, partly because the rate of change in media technologies, services, and uses has been so rapid that any list of this sort will quickly become dated. Moreover, it prevents an understanding of what may be different degrees of 'newness' among and across various media. For instance, the technology of the digital video disc (DVD) is new when compared with the video cassette recorder (VCR), but appears less new when compared with the compact disc (CD), whose principal features it extends into audiovisual media. Similarly, there are new developments within particular media that extend but do not transform how that medium operates. An example is the capacity of cable and satellite delivery systems to allow multichannel television, leading to the development of subscription-based (pay) television services, and other forms such as pay-per-view and near-video-on-demand. These developments have dramatically changed the range of television options available to the subscribing viewer, and have led to important changes in the forms of television, such as specialist and niche channels, when compared with the aggregative, broad-appeal programming models of limited-channel, free-to-air broadcast television. At the same time, they have not dramatically changed the experience of television to its viewers. Whether TV viewers have access to five, 50 or 500 channels, TV has remained a medium where someone other than the viewer determines the available menu of content options at any given time.

An approach to new media that simply catalogues the technologies themselves, and fails to ask questions about the social and cultural contexts of their use and their broader impacts, ignores the central question of why there is a need to look at new media in the first place. There is a need, as Sonia Livingstone has noted, to ask 'what's new *for society* about the new media?' rather than simply 'what are the new media?' (Livingstone 1999: 60). We can define new media as those forms that combine the three Cs: *computing* and information technology (IT), *communications* networks, and digitised media and information *content* (Miles 1997; Rice 1999; Barr 2000), arising out of another process beginning with a 'C', that of *convergence*. This still leaves open, however, the question of what is new *for society* from the new media. The broad social focus taken in this book towards new media is consistent with a study of media technologies that stresses the need to be aware of how the mediation of communications through technological forms renders communications a form of social practice.

Figure 1.1 The three Cs of convergent media



The new media can also be thought of as digital media. Digital media are forms of media content that combine and integrate data, text, sound, and images of all kinds; are stored in digital formats; and are increasingly distributed through networks such as those based upon broadband fibre-optic cables, satellites, and microwave transmission systems. Such media, or forms of digital information,[1] have the characteristics of being:

- *manipulable*—digital information is easily changeable and adaptable, at all stages of creation, storage, delivery, and use

- *networkable*—digital information can be shared and exchanged among large numbers of users simultaneously, and across enormous distances
- *dense*—very large amounts of digital information can be stored in small physical spaces (for example compact discs) or on network servers
- *compressible*—the amount of capacity that digital information takes up on any network can be reduced dramatically through compression, and decompressed when needed
- *impartial*—digital information carried across networks is indifferent to what forms it represents, who owns or created them, or how they are used. A passage from the Bible, an academic paper, a pornographic image, or an audio or video news segment streamed from CNN Online or the BBC World Service Online are all simply a combination of zeros and ones in the digital media environment (Feldman 1997).

What are the new media?

The idea of 'new media' captures both the development of unique forms of digital media, and the remaking of more traditional media forms to adopt and adapt to the new media technologies. Indeed, the lines between 'new' and 'old' media are hard to draw. The content of new media such as that on World Wide Web sites is frequently *recombinant*—derived from already existing media content developed in other formats (printed text, photographs, films, recorded music, television)—and reproduced in a digital format, rather than involving the generation of new content (Bolter and Grusin 2000). New media development has also involved the giants of traditional media establishing a digital presence and revising their established media products, as well as new media content, and the emergence of new media players. The development of the Internet and the digitisation of older media forms such as newspapers and news services, cinema, and radio can be taken as being illustrative of this duality in the development of new media, involving what Bolter and Grusin (2000: 5) describe as 'the rapid development of new digital media and the nearly as rapid response by traditional media'.

The Internet

The Internet represents the newest, most widely discussed, and perhaps most significant manifestation of new media. When terms such as 'cyberspace', the 'virtual world', the 'network society' and the 'information superhighway' are used in relation to new media, they typically refer to the

new possibilities arising from the development of the Internet. The Internet constitutes the electronic network of networks that link people and information through computers, and increasingly through other digital media technologies, and allow for both interpersonal communication and information retrieval (DiMaggio et al. 2001). It is essential to note that the Internet refers to both a technical infrastructure of computers and other digital devices permanently connected through high-speed telecommunications networks, and to the forms of content, communication, and information sharing that occur through these networks. Internet usage involves person-to-person communication, group communication, and global publishing and information provision, through electronic mail (e-mail), news groups, chat rooms, mailing lists, and the World Wide Web. In some commentaries, the Internet has acquired almost a mystical quality, as when author William Gibson referred to cyberspace as a 'consensual hallucination' in *Neuromancer* (Gibson 1984: 67), or when Nicholas Negroponte, Director of the Media Lab at the Massachusetts Institute of Technology (MIT), said that 'Computing is not about computing any more. It is about living.' (Negroponte 1995: 6). Such statements remind me of the episode of *The Simpsons* where Homer Simpson decides to go on the Internet, only to be surprised that you have to go on to a computer in order to be on the Internet!

The history of the Internet has been well documented, and will not be presented in detail here.[2] Three elements of this history are, nonetheless, worth dwelling upon. First, while the commitment to developing an integrated communications network arose in the USA as a consequence of the Cold War with the Soviet Union, the priorities of the Advanced Research Projects Agency (ARPA)—established in 1957 after the Soviets launched the Sputnik satellite—were arguably driven as much by the desire of the American scientific community to perfect mechanisms of communicating with one another as by the demands of the military.[3] The most significant development to come from ARPA in the 1960s was *packet switching*. Packet switching meant that long messages could be broken down into smaller 'packets'; messages could be re-routed if there was a blockage at one message route or point of interconnection between two computers; and messages would be sent in an *asynchronous* mode, meaning that the receiver would not receive the message until some time after the message was originally sent. Not only did packet switching overcome limitations of the telephone system, such as the potential for access to be blocked by heavy use by others, but it also established the principle of a decentralised network with no single point from which control can be exercised, which has been so central to the Internet's development

(Gillies and Cailliau 2000: 18–25). With the establishment of ARPANET as a national long-distance computer network in the USA in 1969, packet switching became central to this network, with the transfer of electronic mail being perhaps the major communications innovation arising from this development.

The second major development in Internet history was a common set of networking protocols, which enabled researchers in the various local area networks (LANs) to communicate with one another, through the interconnection of these LANs into a wide area network (WAN). The major breakthrough came in 1974, with the proposal by Robert Kahn and Vinton Cerf to develop a common switching protocol that could meet the needs of an open-architecture network environment, which came to be known as TCP/IP (Transmission Control Protocol/Internet Protocol). The quasi-privatisation of ARPANET in 1983, which allowed universities and commercial interests to play an increasing role on the network and which marked the commencement of the Internet proper, was premised upon the adoption of TCP/IP as a common interconnection protocol. In sharp contrast to other media, the Internet would become both a public and a global communications medium, as all computers and computer networks could communicate with one another in a common language, whether they were Apples, PCs, or mainframes, or whatever local or national computing network they were operating within. As Internet usage spread from outside of its core constituency of the United States government and military, scientists, and defence contractors in the 1980s, the significance of TCP/IP being established as a common Internet protocol would be of increasing significance to more and more people worldwide.

The World Wide Web in the 1990s was the third major development that has made the Internet what it is today. While developments such as TCP/IP and packet switching provided the means through which networks could connect with networks, and computers could connect with computers, the question of how people could connect with other people through such electronic networks had not received as much attention. The conception of the World Wide Web by Tim Berners-Lee in 1989, and its development by Berners-Lee and colleagues at CERN (Conseil Européen pour la Recherche Nucléaire, or European Organisation for Nuclear Research) from 1991 onwards would dramatically change the communications capabilities of the Internet. The significance of developing the World Wide Web became even more apparent in 1993 when Marc Andreesen of the National

Centre for Supercomputer Application (NCSA) developed Mosaic as the first Web browser. Andreesen went on to become one of the founders of Netscape Communication, which developed Netscape, the first major commercial Web browser. The impacts of the World Wide Web on the number of people using the Internet worldwide was phenomenal, as seen in table 1.1, indicating the number of Internet hosts worldwide, or the number of sites worldwide from which the Internet is accessed.[4] Notably, the fastest rates of growth occurred in 1994–96, the period when Mosaic and then Netscape become widely available on personal computers.

Table 1.1 Estimated Internet hosts worldwide

Year	*Estimated number of Internet hosts worldwide*	*Annual rate of growth (per cent)*
1991	376 000	
1992	727 000	96.4
1993	1 313 000	80.6
1994	2 217 000	68.8
1995	4 852 000	188.5
1996	9 472 000	95.2
1997	16 416 000	73.3
1998	29 670 000	80.7
1999	43 230 000	45.7
2000	72 398 092	67.5
2001	109 574 429	51.3

Yearly figures are for January.

Source: Internet Software Consortium <http://www.isc.org>, accessed 16 January 2002.

Four features of the World Wide Web were particularly important in the popularisation of the Internet. First, it allowed for the display of colourful pictures, music, and audio as well as data and text, and introduced multimedia capability to the Internet. Second, it was based upon *hypertext* principles. Hypertext allows for the linking of information, where links from one information source provide simple point-and-click access to related information available from other sources. The concept of *hypertext* had circulated in various domains since the publication of Vannevar Bush's article 'As We May Think' in 1945, which proposed the development of a computational machine (the 'Memex'), that could not only store vast amounts of information, but could allow users to create ancillary 'thought trails' (Bush 1996). Ted Nelson's experimentations with hypertext through 'Project Xanadu' in the 1960s and early 1970s pointed to the possibilities of interconnected electronic writing, and both the French Minitel system (developed as a national teletext system in 1983) and the Hypercard storage system available on all Apple computers from 1987 to 1990 drew upon hypertext principles in different ways. Third, the value of hypertext became even more apparent with the development of Web browsers such as Netscape Navigator and Microsoft Explorer, as well as search engines such as Alta Vista, Yahoo, and Google, as they provided vast and easy-to-use databases of all information stored on the Internet. Finally, the World Wide Web was associated with the development of both the common Hypertext Transfer Protocol (http), which provided a platform-independent means of interconnection between Web sites, and Hypertext Markup Language (HTML) as a relatively straightforward means of writing source code for the World Wide Web. As a result, a much wider range of people could become producers as well as consumers of content on the World Wide Web. This trend would accelerate as commercial software for developing Web pages became increasingly available, such as Macromedia Dreamweaver and Microsoft Front Page.

The Internet has thus become the fastest growing medium ever recorded. It is estimated that as of August 2001 there were 513 410 000 Internet users worldwide, having grown from 30 590 000 in 1995, or by more than 1600 per cent over a six-year period (NUA 2002). Taking another indicator of the Internet's rapid growth, the period between the Internet becoming widely available to consumers and its having 50 million users in the USA was five years, as compared to 13 years for television and 38 years for radio (Green 2001: 28). The question of why people use the Internet may no longer be one worth asking, as for so many people worldwide, Internet use is no longer a novelty but a part of their everyday reality of media and communications usage, like turning on the television or making a telephone call. Nonetheless, early studies of the possibilities of the Internet provide useful insights into its points of difference with other media. Ryder and Wilson (1995), in an early study of the implications of 'virtual learning', understood the Internet in terms of a series of *affordances* it presented for users, or the range of potential uses that a person saw for that item. They also noted that affordances could also be *constraints*, as the awareness of new possibilities arising from a new media technology also draws attention to practical limitations in achieving these gains.

Table 1.2 Affordances and constraints of the Internet

Issue	*Affordances*	*Constraints*
1 Freedom and personal control	Unprecedented access to information from multiple sources, and opportunities for free expression	Ability to participate limited in practice by literacy, access to technology, and differing communicative competencies
2 Cultural forms and status	Possibility of barriers to participation based upon gender, age, race, nationality, disability or economic status being less relevant in online environments	Culture principally constructed by middle-class white males, predominantly from North America; low status of newcomers ('newbies') into online environments
3 Rapid growth	Value of participation in a network grows exponentially as more people are on the network, and as more information is made available through the network	New security issues arise, such as privacy concerns and the threat of computer viruses
4 Hypertext Web structure	Ability to access multiple and interconnected information sources	Non-linear browsing presents issues of choice, and problems of being 'lost in cyberspace'
5 Multiple information sources	Ability to augment 'local' sources of information with resources from multiple localities, and to compare conflicting points of view	User increasingly required to assess value and validity of online information in absence of filters and gatekeepers
6 Dynamic information	Online information sources are current and timely	Problem of 'disappearing information' as sites are no longer functional, or information is removed
7 Intimacy and locality	Possibility of 'safe' communicative and other relationships conducted online and over distances	Difficulties in maintaining remote associations; variances between 'online' and 'off-line' personas

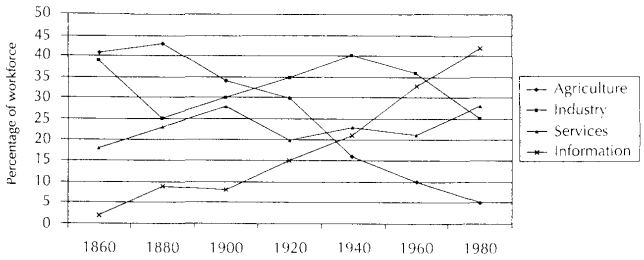
Source: Ryder and Wilson 1995.

Digitisation and convergence: The keys to understanding new media

The new media that are the focus of this book are those associated with digitisation and convergence. The major shift in media technologies has been from the storage, delivery and reception of information in analog formats, to storage, delivery, and reception in a digitised form. Digitisation means that diverse forms of information, including text, sound, image, and voice, are encoded in a single 0-1 binary code. Digital information exists in only one of two forms—0 or 1—which are called bits (a contraction of 'binary digits'), and the sequences of 0s and 1s that constitute information are called *bytes*. The computing systems that carry digital information are indifferent to the forms that were initially transformed into digits, or what the digits represent when accessed by the end-user.

The impacts of digitisation are both pervasive and cumulative. The accelerated, pervasive, and cumulative impact of digital media is an element of the growing 'informatisation' of society. The 'informatisation' of society is marked by both the comparatively faster growth of those sectors associated with the production and distribution of information and communication, and by the generalised use of information and communication technologies (ICTs) in all areas of economic activity. In their study of the rise of an information society, Simon Nora and Alain Minc (1981) observed the long-term decline in employment in agriculture and industry in the second half of the twentieth century, and the rise of employment in the services and information sectors (see figure 1.2).

Figure 1.2 Employment in the United States labour force, 1860–1980



Source: Nora and Minc 1981.

Castells and Aoyama (1994) found that the proportion of the population involved in the handling of information, as distinct from the handling of goods, had grown by 80 per cent between 1920 and 1990 in the USA, and constituted 48.3 per cent of the workforce in 1990. The United States Department of Commerce found that during the 1990s, the fastest growing occupations in the United States economy were all ICT-related, including computer engineers, computer support specialists, systems analysts, database administrators, and desktop publishing specialists, and that the ICT sector contributed to a third of United States economic growth between 1995 and 1999 (United States Department of Commerce 2000). The USA is the world's leading information economy, but economies such as the United Kingdom and Australia are following the trend towards what Diane Coyle has termed a 'weightless' economy, increasingly based upon the production of 'intangibles' or *dematerialised output*, such as code, media, content, design, information, and services (Coyle 1999; cf. Rifkin 2000: 30–55; Green 2001: 86–8).

The major development that has occurred in tandem with digitisation, and is closely associated with it, is *convergence*, which in this sense means the bringing together of the computing, telecommunications, and media and information sectors. Convergence can be understood as occurring at three levels (Barr 2000: 22–8). First, there is *functional convergence*, as information and media content is increasingly processed through computer-based information technology systems, and carried to its end-users across broadband telecommunications networks (Miles 1997). If one looks back at the dominant forms of telecommunications, computing, and media in the mid-1970s, what is striking is that the operation of none of these depended upon the others. Television and radio signals were carried over the airwaves; telephony was carried across single-form networks and exchanges; and computers either took the form of stand-alone mainframes or battery-operated forms such as pocket calculators. By the mid-1980s, there had been significant advances in the range and sophistication of computing, telecommunications, and media services, with the emergence of mobile telephones, fax machines, compact discs, cable and satellite TV, personal computers, and video games, but the range of services available that entailed convergence across any of these sectors was still limited, both in its range of uses and in the number of people who had access to them. The 1990s hailed the rise of convergent media, led by the rapid growth of the Internet and personal computing. A dramatically increased range of forms of digitised content (text, images, sound, video) would be carried across telecommunications networks, in order to be accessed by users via their personal computers, as a single media platform able to deal with multiple media forms. For much of the 1990s, the Internet was a predominantly text-based and still-image-based medium, but in the first decade of the twenty-first century, the Internet is increasingly associated with the transmission of audio and video, and will be increasingly accessed from a range of devices, from mobile telephones to digital television.

Industry convergence has involved a series of takeovers, mergers, and strategic alliances that strengthened linkages between the computing and IT industries, telecommunications companies, and the media sector. The *telecommunications* industry experienced rapid change in the 1980s and 1990s, moving from being public monopolies or highly regulated companies providing 'plain old telephone services' (POTS) on the principle of universal provision of basic services, to becoming a sector involved in the delivery of a complex range of value-added network services (VANS), in an environment characterised by privatisation of public carriers, liberalisation of entry, and deregulation (Barr 2000). In the 1960s, the AT&T telephone company had rejected packet switching, which would form a core element of the Internet (Cairncross 1998: 92–3); by the 1990s, telecommunications companies worldwide were asset-rich, cashed-up, and keen to establish strategic alliances with content creators. The traditional media sector had mixed views about the Internet environment. While the possibilities of cost reduction, value adding and better market targeting were widely observed, major media companies such as Disney and News Corporation remained sceptical about the business models associated with the Internet and media convergence, particularly as other major media companies such as Time-Warner had made bad investments, such as the Orlando Full Service Network and the Pathfinder Web site.[5] In contrast to the telecommunications and broadcast media sectors, which had either monopolistic (characterised by a single seller) or oligopolistic (characterised by few sellers), the computing and IT sectors were highly fluid and dynamic, with major players sometimes experiencing dramatic reversals in fortune, such as IBM in 1992–93 and Apple in 1997–98. It was also a sector where the nature of the 'market' and 'industry' was prone to dramatic structural changes, as with the Web browser market emerging in 1994 with the mass distribution of Netscape.

Table 1.3 tracks the major takeovers and mergers across the three sectors in the period 1989–2000, when the merger of Time Inc. and Warner Communications to form Time-Warner was the world's largest media merger, to the US$350 billion merger between America On Line (AOL) and Time-Warner announced in January 2000, which was the largest merger in corporate history.[6]

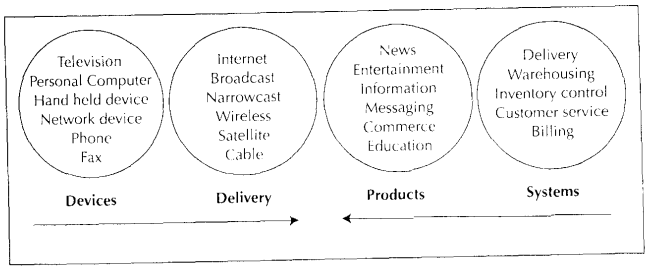
Table 1.3 Major takeovers and mergers in media, telecommunications, and computing, 1989–2000

Year	
1989	Merger of Time Inc. and Warner Communications for $14.1bn
1994	Viacom purchases Paramount Comm. ($9.6bn) and Blockbuster Entertainment ($8.4bn)
1995	Disney purchases Capital Cities/ABC for $19bn
	Merger of Time Warner and Turner Broadcasting
1996	SBC Comm. buys out Pacific Telesis for $16.5bn
	Bell Atlantic buys out NYNEX for $22.1bn
	Microsoft and NBC establish MSNBC online site and cable channel
1997	WorldCom buys out MCI for $37bn
1998	AT&T buys out TCI for $45bn
	AOL buys Netscape for $4.2bn
1999	$35bn merger of Viacom and CBS
2000	$350bn merger of AOL and Time-Warner

Convergent products and services are forms of media and information content that take advantage of a networked broadband infrastructure, the capabilities provided by digitisation, and the scope for interactivity and user customisation of services. Significant innovations have occurred across the business or intermediate services sectors and the domestic or consumer service sectors, across the fields of entertainment, communications, and information. Developments during the 1980s such as electronic data interchange, electronic funds transfer, and electronic credit/debit charge transactions were early examples of the applications of convergent media to the delivery of business services. A significant trend during the 1990s was the development of a series of services that supported both the SOHO (Small Office, Home Office) sector and teleworking, where workers acquired a greater capacity to work from home or remotely through the capacity to access and deliver services electronically (Hearn et al. 1998: 84–90). These included fax machines, voice mail, laptop computers, and mobile telephones, as well as the range of services provided through the Internet, such as e-mail and home pages for electronic commerce, with networking capacity and Web housing provided by Internet Service Providers (ISPs). During the 2000s, convergent products and services are increasingly being directed to consumers, such as the capacity to access e-mail and other Internet services through Short Message Service (SMS)-enabled mobile

telephones, networked games consoles such as Sony's Playstation 2 and Microsoft's X-Box, or through digital television. The significance of convergent products and services arises at the supply as well as the demand end, as indicated by News Limited in its submission to the Productivity Commission's inquiry into Australian broadcasting, that convergence entailed the merging of access devices, delivery systems, products and services, and commercial systems.

Figure 1.3 Convergence: News Limited's view



Source: Productivity Commission 2000: 107.

Interactivity and networks

Convergence and digitisation are strongly linked to two other features of new media: interactivity and the development of networks. Interactive media are those that give users a degree of choice in the information system, both in terms of choice of access to information sources and control over the outcomes of using that system and making those choices. The World Wide Web, as an electronic database of text, images, sound, video, and voice communication, is the exemplar of interactivity in new media technologies, where each pattern of use leads the user down a distinctive 'pathway', creating what is termed a *hypertext*, or a text made up of other texts. Interactivity has long been a characteristic of electronic games, where the choices made by each individual player, combined with their skill levels in playing the game, mean that each session of use is a different experience for the user in a multi-layered programming environment. Interactivity is also enabled

by the combination of digital media forms, where text-based communications formats such as electronic mail or Internet Relay Chat (IRC) can co-exist with other, Web-based, formats, creating the possibility for feedback loops and return paths between producers and users, and forms of simultaneous (synchronous) or slightly delayed (asynchronous) many-to-many communication.

Interactivity is a central concept in understanding new media, but different media forms possess different degrees of interactivity, and some forms of digitised and converged media are not in fact interactive at all. Sheizaf Rafaeli defines interactivity as 'the extent to which communication reflects back on itself, feeds on and responds to the past' (in Newhagen and Rafaeli 1996: 6). Internet communication is highly interactive in this respect, since the access to content and communication online creates archives, databases, and new forms of content, as seen in the example of archived contributions to discussion lists. As a point of contrast, Tony Feldman (1997) considers digital satellite television as an example of a new media technology that uses digital compression to dramatically increase the number of television channels that can be delivered, and which changes the nature of what can be offered through the service, but does not transform the experience of television from the user's point of view, as it lacks an interactive dimension. In other words, there is a quantitative expansion in viewer choice, and a move from broadcasting to niche broadcasting or narrowcasting, but not a qualitative change in the communicative experience of viewing television. Similarly, McQuire (1997) has traced the transformations in film production arising from digital media technologies, which transform the films themselves, but do not in themselves change the experience of viewing films from the audience point-of-view. There are strong tendencies towards enhancing the interactivity of all media, particularly with the exponential growth in bandwidth capacity currently occurring, but it remains the case that interactivity is not an inherent characteristic of all new media technologies, unlike digitisation and convergence.

It is important to break down the concept of interactivity into two component elements—interconnectivity and interoperability—and to recognise that true interactivity only arises when both are in place. *Interconnectivity* refers to the capacity to easily connect interactions across different networks, while *interoperability* refers to the capacity to access all available forms of information and media content using different operating systems. One of the unique achievements in the history of the Internet was the way in which the adoption of Transmission Control Protocol/Internet Protocol (TCP/IP) as a common switching protocol for interconnecting networks promoted both interconnectivity and interoperability. Access to Web pages is rarely blocked by whether one is using Microsoft Explorer or Netscape Navigator, or a PC or an Apple computer, and it rarely differs across different national telecommunications infrastructures. The achievement of a common protocol for interconnecting networks based upon interoperability has been more difficult to achieve in telecommunications, where much of the energy of regulatory agencies is now focused upon the terms on which so-called 'third parties' or new service providers access the networks developed by telecommunications agencies with a longer history, such as the former public monopoly providers (Collins and Murroni 1996). The development of networked environments in new fields such as digital television is hampered by the development of incompatible operating systems for various forms of Web TV and interactive TV, and the difficulty in achieving comparable standards across the North American, European, and Asian broadcasting systems. Unless these difficulties are resolved, the claims for interactivity that are made for the Internet will not be able to be made for other forms of digital media.

The other major development associated with new media technologies is networking, or the capacity to carry large amounts of information to a series of interconnected points. The network could take a physical form, such as broadband cable or ISDN (Integrated Switched Digital Network), but digitised information can be carried through other means of carriage, such as satellites or wireless telephony. Such networks are ideally based upon full interconnectivity and interoperability, so that capacity to exchange information is indifferent to both the source of that information and to the means of its reception. The exemplar of such an interconnected and interactive network is the Internet. The development of packet switching and common interconnection protocols distinguished the Internet as a network from that of telephony systems, which have been based upon circuit switching and geographically limited networks. Under a circuit switching system, sometimes also called a *hub-and-spoke* system, the various telephones are connected with one another through their linkage to a common distribution point or 'switch', which transfers messages from senders to receivers; when connections are sought from outside of the local network, there are physical mechanisms for connecting these switching points. By contrast, what has developed with the Internet is a *matrix* structure, where all senders and receivers are interconnected through a

sub-network of routing systems or servers, which distribute messages as a series of 'packets', indifferent to the initial representational form encoded by the signal and decoded by the end-user.

This concept of networking based upon the Internet has been at the centre of claims that the current phase marks the emergence of a 'new economy', or what Manuel Castells (1996a, 2000b) terms a *network society*. Castells's argument, which will be considered in more detail in chapter 3, is that: 'Networks constitute the new social morphology of our societies, and the diffusion of networking logic substantially modifies the operation and outcomes in processes of production, experience, power and culture' (Castells 1996a: 469).

Castells defines a network as a set of interconnected nodes through which communication flows occur, and are open, flexible and adaptable forms able to expand without limits as long as communicative codes are shared within the network. While networks are a longstanding form of social organisation, they have been subordinated to more centralised and hierarchical forms of organisation on the basis of the capacity of the latter forms to maximise control. For Castells, the development of a global and decentralised communications network with the Internet, combined with the growing importance of information and knowledge as the basis of competitive advantage in the economy as well as other spheres, means that the network form increasingly shapes the logic of social interaction across diverse spheres of social interaction. As Castells has argued, 'the new economy is organised around global networks of capital, management, and information, whose access to technological know-how is at the roots of productivity and competitiveness' (Castells 1996a; 471).

The concept of networks as global social morphologies can be understood in a different way through consideration of the terrorist attacks on 11 September 2001 on New York and Washington, which led to the destruction of the twin towers of the World Trade Center and a section of the Pentagon, the loss of over 3000 lives, and a subsequent USA-led 'War on Terrorism' in Afghanistan and elsewhere. The attacks involved the hijacking of American domestic passenger planes that were then flown into the buildings, and were apparently orchestrated through the al-Qa'ida movement, headed by Osama bin Laden from the remote mountain ranges of impoverished and war-ridden Afghanistan. The fact that al-Qa'ida could organise an attack on American cities from Afghanistan was dependent upon both a network of Islamic activists that had developed over a decade around a common opposition to American foreign policy and Western cultural influence, and utilisation of communications technologies, most notably the distribution of videos, that could convey

messages to this decentralised global network. The attacks were motivated in part by a belief that symbolic actions against well-defined citadels of global economic and political power could trigger a wider crisis in United States economic and political hegemony, as seen in the crises of the global airline and insurance industries in the period immediately following these attacks. The impact of the attacks was conveyed worldwide through global communications media networks, as billions of people watched the repeated images of the planes crashing into the World Trade Center towers in New York City, the collapse of the towers, and the subsequent clearing of bodies from what has come to be known as 'Ground Zero', on a day that is now known simply as 9-11 or S11.[7] The American-led response to these attacks, which led to the overthrow of the Taliban regime in Afghanistan but not to the capture of bin Laden, itself involved the bringing together of political networks as a coalition, including those nations that typically supported United States foreign policy (such as the United Kingdom and Australia), nations that had an interest in suppressing Islamic insurgent movements within their own territories (such as Russia, Uzbekistan, and the Philippines), and nations such as Pakistan, which had previously supported the Taliban, but whose support was critical in light of their geographical proximity to Afghanistan.

Virtuality and globalisation

The promotion of 'virtual reality', virtual communities, and virtual identities has been one of the most significant possibilities arising from new media technologies such as the Internet. The widely used term *cyberspace* has been identified both as a form of 'navigable space' (derived from the Greek word *kyber* (to navigate)), and as a form of *conceptual space* enabled by the Internet and computer-mediated communication (CMC). Its development is premised upon the possibility of occupying spaces and adopting *personas* that are other than those that individuals occupy in the 'real world' (Kitchin 1998; Dodge and Kitchin 2001). Gordon Graham describes the momentum that drives cyberspace thought as 'the suggestion that we are on the verge of a new kind of reality—virtual reality—in which we will become possessed of the power to create for ourselves a world of experience which is free from the limits of ordinary contingency' (Graham 1999: 19–20). Early experiments in virtual reality (VR) in the 1990s, involving the creation of immersive, computer-generated environments that were accessed by users through wearing wired bodysuits and head-mounted goggles, remained a peripheral activity—akin to

3D cinema in the 1950s or Sensurround in the 1970s.[8] Nonetheless, the rapid development of the Internet and advances in digital media technologies have heightened interest in the extent to which virtuality is becoming a characteristic feature of cultures where computer-mediated communication is central.

Early work on *virtual communities* emphasised the extent to which networked media enabled forms of community to emerge that transcended geographical barriers. In the late 1960s, J. R. Licklider and R.W.Taylor anticipated the emergence of such communities, observing that computer-mediated communities would be 'not of common location, but of common interest', and that 'Life would be happier for the on-line individual because the people with whom one interacts most strongly would be selected more by commonality of interests and goals than by accidents of proximity' (quoted in Jones 1998a: 19). With the development of the Internet in the 1990s, and particularly with the development of online discussion lists and newsgroups (Hauben and Hauben 1997), a number of Internet theorists and activist-entrepreneurs saw the possibility that new forms of online community were emerging. In perhaps the most famous early account of CMC-based online cultures, Howard Rheingold defined virtual communities as 'social aggregations that emerge from the Net when enough people carry on those public discussions [using the Internet] long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace' (Rheingold 1994: 5). Drawing extensively upon his personal experience as a participant on the Whole Earth 'Lectronic Link (the WELL), Rheingold argued that the decentralised nature of networked CMC presented, in a way very different from one-to-many mass media, the possibility to 'piggyback alternate networks on the mainstream infrastructure' and 'use CMC to create alternative planetary information networks' (Rheingold 1994: 14). Along with other activist-entrepreneurs who promoted the democratic and participatory affordances of virtual communities (Schuler 1996; Graham 1996), Rheingold saw in virtual communities, and their modes of participation, the possibility of a reinvigorated sense of community-building and citizen participation in public life.

Virtuality has also pointed to the possibility of a greater fluidity in identities and *personas*, where it is possible to engage in play and simulation in online communication in ways that would be less possible, and in some cases impossible, in the geographically and culturally defined contexts in which social interaction otherwise occurs. Sherry Turkle (1995: 9) argued that computers were not simply a tool for communication, but also were a mirror that 'offers us both new models of mind and a new medium on which to project our ideas and fantasies'. Most importantly, for Turkle and for many others, the networked culture of the Internet meant not only that communications media could be used to construct and imagine other forms of the self, but that this could fruitfully interact with myriad other projects of self-formation in the parallel universe enabled by the Internet and CMC. What Turkle termed 'taking things at interface value' referred to a wider engagement with a postmodern culture, or what (with reference to the work of French philosopher Jean Baudrillard, to be considered in chapter 2) Turkle saw as the *culture of simulation*, where the capacity to identify an underlying 'reality' that existed independently of its forms of representation through networked electronic media had become increasingly difficult to sustain. Feminist political theorist Donna Haraway (1991) drew upon similar conceptions of identities that were blurred in the face (or the interface) of new technologies, in arguing against political strategies that presented itself as an 'other' to new technologies and scientific culture, in favour of identifying with the figure of the *cyborg*, or cybernetic organism, who was 'a hybrid of machine and organism, a creature of social reality as well as a creature of fiction' (Haraway 1991: 149). For Haraway, such 'cyborg identities' afford a greater potential for engaging with the politics of new media technologies than those that rely upon a pre-given or 'natural' conception of gendered identities, or what it is to be 'female' or 'male', which are based upon binary oppositions (that is, female = nurturing, emotional, non-violent, versus male = calculating, rational, violent).

Globalisation has also been identified as a series of trends related to the development of new media technologies. While the reduced significance of distance to electronic communication has been a characteristic of new media since the development of the telegraph in the 1840s (Carey 1992b), the development of the Internet has particularly promoted globalisation and the 'death of distance' (Cairncross 1998), through the existence of common worldwide Internet protocols, the ability of broadband networks to transmit a diverse range of digitised signals across vast distances, and the value of the Internet to its users as a global media and information archive. Like all media, new media are central to globalisation, in three ways. First, media constitute the technologies and service delivery platforms through which international flows are transacted. Second, convergent media industries are leaders in the push towards global expansion and integration. Finally, media provide informational content and images of the world through

which people seek to make sense of events in distant places. Media are central to globalisation partly because of their role as communications technologies that enable the international distribution of messages and meanings, but global media also derive a particular importance from their perceived role in weakening the cultural bonds that tie people to nation-states and national communities.

The globalisation of new media can present the possibility of a *global village* to emerge, where technologies that enable greater communication across borders promote heightened inter-cultural awareness and communication, and a resistance to wars between societies on the basis of their perceived 'difference' (McLuhan and Fiore 1967). Critics argue that such developments mark the latest and most insidious phase of *cultural imperialism*, where technologies developed by and for the economically dominant powers are used to exercise new forms of 'soft power', defined by Joseph S. Nye jun., Assistant Secretary for International Affairs in the Clinton Administration, as: 'the ability to achieve desired outcomes in international affairs through attraction rather than coercion. It works by convincing others to follow, or getting them to agree to, norms and institutions that produce the desired behaviour. Soft power can rest upon the appeal of one's ideas or the ability to set the agenda in ways that shape the preferences of others' (quoted in Thussu 1998, pp. 66–7).

Conclusion

This chapter has explored the central features of new media, avoiding a tendency to attribute 'newness' simply to the recentness of discovery and development of a new technology. Rather, following Sonia Livingstone's injunction to ask 'What is new *for society* about the new media?', the chapter has drawn attention to the relationships that new media have to three interrelated social and technological processes:

- digitisation and convergence
- interactivity and networks
- virtuality and globalisation.

The argument presented in this chapter, which is supported by the history of the Internet, is that technological changes should not be understood independently of other social, cultural, economic, and political changes. The next two chapters of this book will explore these linkages in more detail, with chapter 2 considering the implications of thinking about new media as cultural technologies, and chapter 3 critically evaluating claims that we now live in an age of the 'new economy' and the 'network society'.

Useful Web sites

A Brief History of the Internet <www.isoc.org/internet-history/brief.html> A classic account of the development of the Internet, by people who were involved in the process from an early stage.

Nerds 2.0.1 <www.pbs.org/opb/nerds2.0.1/> This site accompanies a television program hosted by Robert Cringely, which first screened on the United States Public Broadcasting Service in 1999.

NUA Internet Surveys <www.nua.com/surveys/> Site provides comprehensive and up-to-date data on Internet users worldwide.