1 INTRODUCTION

About this chapter

- This chapter presents basic concepts for the book and for the location of the new digital media in social and communication science.
- It starts with a description of the daily life of people in contemporary developed societies which have become completely dependent on networks as some kind of lifeline.
- Most people think that our life and our mediated world change faster and deeper than ever before. Here it is claimed that the first communications revolution of about a century ago was just as sweeping as the current second communications revolution – the digital. But what constitutes a communications revolution?
- What are the characteristics of the new media that make us call them new? Why do we call them interactive media, multimedia or digital media?
- What are the uses of the new media as compared to the old media? To answer this question in this chapter the concept of communication capacities will be developed.
- What kind of book is this? What is its approach and what are the background theories used by the author?

A NEW INFRASTRUCTURE FOR SOCIETY

The age of networks

A new lifeline is being added to all the ones we already had. Today, we no longer only depend on roads, electricity cables, water pipes, gas lines, sewers, post-boxes, telephone wires and cable television to conduct our daily lives and manage our

households. We now also need networks of electronic communication. Young people in rich countries can no longer imagine a world without mobile telephony, the Internet and Facebook or any of the other social networking sites. Missing them for only a day would cause serious withdrawal symptoms. This dependence does not only apply for individuals. It also goes for organizations and society at large. This observation is the start of this book. How can this dependence have grown so fast? After all, it has only been in the last two decades that the main networks of the Internet and mobile telephony have been used by the majority of people in the developed world.

Contemporary literature abounds with expressions such as 'we live in a connected world', 'a connected age', a 'human web' and a 'web society'. At first sight this dependence seems rather peculiar because simultaneously there is much talk about individualization, social fragmentation, freedom and independence. But on second thought, this coincidence is not that strange because both tendencies might be two sides of the same coin – at least, that is what is argued in this book: 'The world may never have been freer, but it has also never been so interdependent and interconnected' (Mulgan, 1997: 1).

At the individual level the use of networks has come to dominate our lives. Counting the time spent on broadcast networks, telephony and the Internet we can add between five and seven hours of leisure time a day on average in a developed society. Not to mention the hours spent at work or at school. Observing social networking by individuals, we could add several hours spent in all kinds of social networking sites (SNS), chat-boxes, email conversations, texting, instant messaging and blogging. So, individualization and smaller households packed with technology to make us more independent from others, have not made us less social human beings.

Almost every organization in the developed world has become completely dependent on networks of telephony and computers. When they break down, the organization simply stops working. 'The network is down' is an expression needing no further explanation.

At the level of society and on a global scale we can see that media networks, social networks and economic networks reach into the farthest corners and edges of the world. Our world has become truly globally connected. With the swift spread of satellite TV, mobile telephony and the Internet, developing countries such as China and India are rapidly transforming from pre-industrial societies into mass industrial societies and partly even post-industrial network societies. Online communication networks have become so vital for the management of all other infrastructures of society that in future wars it would be far more effective to switch them off than to bombard other material infrastructures.

With little exaggeration, we may call the 21st century the age of networks. Networks are becoming the nervous system of our society, and we can expect this infrastructure to have more influence on our entire social and personal lives than did the construction of roads for the transportation of goods and people in the past. The design of such basic infrastructures is crucial for the opportunities and risks to

follow. In the early 20th century we did not foresee what the consequences would be of our choice of predominantly small-scale private transportation instead of large-scale public transport. But now we are only too well aware of the consequences. Traffic congestion, environmental degradation and global warming are all too evident. The potential consequences of choosing a certain kind of communication infrastructure and embedding this infrastructure in our social and personal lives may be less visible, but it will be just as severe.

Continuing this line of argument, at stake here is not only the ecology of nature – that is, transportation of information and communication will partly replace transportation of goods and people – but also 'social ecology'. When the new media arrived in the 1980s, some people were concerned about the 'pollution' of our social environment by the new media penetrating our private lives. According to them, the new media were reducing, diminishing and even destroying the quality of face-to-face communications and were making human relationships more formal (Kubicek, 1988). They would result in privacy reduction and total control from above. In the 1990s these *dystopian* views were replaced by *utopian* views of the new media substantially improving the quality of life and of communication. A 'new economy' and a new era of prosperity, freedom and online democracy was looming ahead.

In the first Dutch edition of this book (van Dijk, 1991), I championed a wide public debate about such presumed outcomes of the new media. This call was partly heeded. Especially between 1994 and 1998, a huge boost was given to the discussion of the opportunities of the Internet and the perspective of the so-called electronic highway, a term introduced in the United States in 1993 as 'information superhighway'. The discussion in those years was largely theoretical and philosophical. Utopian and dystopian views were listed and opposed in an abstract and rather speculative manner.

In the first decade of the 21st century we have been able to develop a more balanced or *syntopian* view (Katz and Rice, 2002) of new media development after more than 25 years of experience. This time we are able to draw conclusions based on facts and empirical investigations. This is the main objective of this book.

Values at stake

This book demonstrates how the most fundamental values of our society are at issue when it comes to the development of new information and communication technologies, in which networks are already setting the tone.

Social equality is at stake, since certain categories of people participate more than others in the information society. Some profit from its advantages, while others are deprived. Technology allows for a better distribution of knowledge. Its complexity and costs, however, may serve to intensify existing social inequalities, or even create large groups of 'misfits' – people who do not fit in with the information society.

The fact that the new media enable well-informed citizens, employees and consumers to have more direct communication with, and participation in, institutions of decision-making should, in principle, strengthen *democracy*. On the other hand,

because the technology is susceptible to control from above, democracy could be threatened. Some would argue that *freedom* – for example, the freedom of choice for consumers – will increase because of the interactivity offered by this technology. Others paint a more pessimistic picture, predicting that freedom will be endangered by a decrease in privacy for the individual as a registered citizen, a 'transparent' employee and a consumer screened for every personal characteristic, and by the growing opportunities for central control.

For certain groups of people (disabled, sick and elderly people) as well as for society as a whole, *safety* can be improved by all kinds of registration and alarm systems. At the same time, safety seems to decrease because we have become dependent on yet another type of technology, and a very vulnerable technology at that.

The *quantity and quality of social relationships* might improve if communication technology enables us to easily get in touch with almost everybody, even over long distances. On the other hand, our social relationships might decrease because particular people may withdraw into computer and telephone communication and only interact in safe, self-chosen social environments. For example, Sherry Turkle (2011) has observed that many American teenagers no longer call each other, not only because this is more expensive, but also because this is a personal confrontation. Instead, they prefer texting which allows greater control. In this way new media communication may become a complete substitute for face-to-face communication, causing the quality of communication to diminish in certain respects.

The *richness of the human mind* may increase owing to the diversity of impressions we gather through these new media. On the other hand, it may also be reduced because these impressions are offered out of context in schematic, (pre-)programmed and fragmented frames. And because it is available in huge amounts, information can never be fully processed by the recipient.

A SECOND COMMUNICATIONS REVOLUTION

What is a communications revolution?

Most descriptions of media history suggest an evolutionary development of a large number of new media in succession. In reality, media development in the last two centuries has been more like two concentrations of innovations, of which the first can be placed roughly in the last decades of the 19th century and the early decades of the 20th century, and the second is to be observed in the last decade(s) of the 20th century and the first decades of the 21st century. James Beniger was the first to describe and analyse the first concentration and its background in his book *The Control Revolution* (1986); Frederick Williams first identified the second concentration in his book *The Communications Revolution* (1982). I dare to speak of the *first and second communications revolutions of the modern age*. 'Revolution' is a big word, all too readily referred to in the history of industry and technology, whether it is appropriate or not. Every so-called revolution in fact took decades to complete. The major technological developments are seldom revolutionary; the technological process is usually

much more evolutionary. Innovations are preceded by a long process of preparation. It would be misleading to suggest that new technologies arise suddenly. Rather they are a combination of techniques developed earlier. It would be wise to ask ourselves what exactly is new about the new media and why the term 'revolution' can be used here. If there was merely a considerable quantitative acceleration of the arrival of innovations in the two concentrations mentioned before, I would not dare to mention the word 'revolution'. *Structural changes* or *qualitative technical improvements* in mediated communications must take place in order for something to be called a revolution in communications.

A structural communications revolution

In the history of the media, several communications revolutions have taken place. These can be divided into structural and technical communications revolutions. In *structural* revolutions, fundamental changes take place in the coordinates of space and time. Media can be a form of communication fixed in space (in one place) or they may allow communications between different places. Furthermore, they can fix the moment of communication to a certain time or enable us to bridge time.

The switch from communication fixed in space and time to communication bridging space and time marks the two first communications revolutions in the (pre-)history of man: sending smoke, drum and fire signals over long distances, and sending messengers in order to bridge places. Time was transcended by making illustrations on pottery and inside caves – signs that passed to future generations.

The next and presumably most important structural communications revolution was the development of writing, which enabled humans to overcome both space and time. The most recent communications revolution – the subject of this book – is primarily a structural revolution. It signals an end to the distinction between media that are fixed in space and time and media that bridge these dimensions. The new media, after all, can be used for both purposes. Even though the purpose of bridging time and space is predominant, the new media can also be used in offline environments, for example, in consulting an electronic book or a DVD. The new media are a combination of online and offline media, such as the Internet, personal computers, tablets, smart-phones and e-readers. They are a combination of transmission links and artificial memories (filled with text, data, images and/or sounds) that can also be installed in separate devices.

Therefore, the new media require a step outside the scheme of revolutions bridging space and time that have described media history until now (see Figure 1.1). The combination of online and offline applications of the new media, used both in traditional social environments fixed to a particular time and space and in online media environments bridging these dimensions, produces the structurally new characteristics of these media. This book will demonstrate that this combination helps to realize perhaps the most promising social perspective of the new media, which is not a replacement of local face-to-face communication by online mediated communication but a potentially fruitful interplay between them.

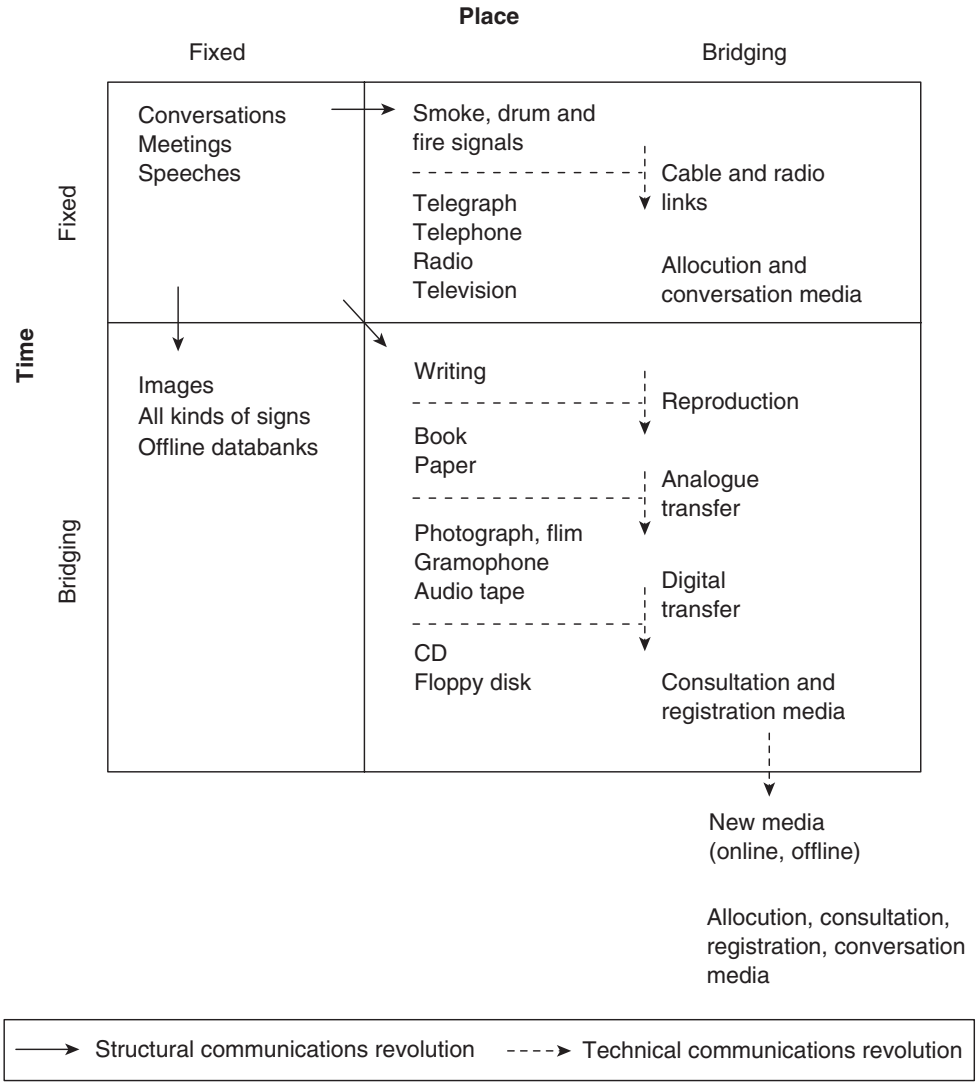

FIGURE 1.1 Communications revolutions in media history

A technical communications revolution

In a technical communications revolution, a fundamental change takes place in the structure of connections, artificial memories and/or the reproduction of their contents. The development of the printing press was a revolution in the reproduction of writing. In the second half of the 19th century, a second revolution took place. It was mainly a technical revolution, based on the invention and construction of long-distance connections by cable and air, the introduction of new analogue artificial memories (photograph, film, gramophone record and audio recording tape), and new techniques for reproduction (the rotary press in particular). Qualitatively new was the development of media for a direct transfer of sound/speech, text/data and images by separate channels and over long distances. The *invention* of the telegraph and telephone date from a long time before the turn of the 19th to the 20th century, and radio and

television started from the years immediately after. Their *innovation*, which means a first introduction in usable form, took place between 1890 and 1925. *Large-scale introduction* needed another 50 years. The most recent technical communications revolution is characterized by the introduction of digital artificial memories, and digital transmission and reproduction. The term 'digital revolution' is appropriate in this context.

Developments in the current communications revolution follow the same pattern. The inventions took place during the past 50 years. In the first decades after the Second World War, large mainframe computers, serving as number-crunching machines or database processors, and satellite telecommunications were fabricated. Then, from the 1960s onwards, smaller and yet more powerful computers were introduced that served as general symbolic machines. They dealt with the interactive manipulation of information and with communication. Increasingly, they were connected in networks.

In the meantime we have passed the phase of innovations through the introduction of several generations of personal computers, computer networks, terminal equipment, programs and services. Currently, their large-scale introduction in workplaces, schools, households and public places is happening all over the world. This process will probably continue until about 2040.

Now we are able to answer the key question: how has quality improved in the current structural and technical communications revolution? It is not because the crucial coordinates of space and time seem to be reduced to insignificant proportions, or because it is possible to communicate with everyone all over the world within seconds if you have access to the means to do so. In other words, it is not the fact that 'the world is turning into a village', to use a popular phrase. This would simply mean an evolutionary development along the axes of space and time, which had already taken place with the communications revolution of the 19th century. It would 'merely' be an acceleration of this evolution. No, the essence of the current revolution can be summarized in the structural terms of *integration* and *interactivity* and in the technical terms of *digital code* and *hypertext* as the defining characteristics of the new media.

CHARACTERISTICS OF THE NEW MEDIA

In this section I characterize the new media in three ways. First, I supply a definition of the new media as a combination of the four characteristics just mentioned; then I discuss the typical patterns of information and communication to be observed in their application; and finally, I describe their strong and weak usage qualities, called communication capacities.

Integration or convergence

The most important *structural* new media characteristic is the integration of telecommunications, data communications and mass communications in a single medium. It is the process of *convergence*. For this reason, new media are often called multimedia. Integration can take place at one or more of the following levels:

1 infrastructure – for example, combining the different transmission links and equipment for telephone and computer (data) communications;

2 transportation – for example, Internet telephony and web TV riding on cable and satellite television;

3 management – for example, a cable company that exploits telephone lines and a telephone company that exploits cable television while both offer Internet connections;

4 services – for example, the combination of contacting services and marketing in social networking sites;

5 types of data – putting together sounds, data, text and images.

This integration has led to a gradual merging of telecommunications, data communications and mass communications; the separate meaning of these terms is already disappearing. We will use terms such as 'multimedia', 'broadband', 'the Internet' or 'the network'. We believe that these terms will also eventually replace the term 'new media'.

The integration process is enabled by two revolutionary techniques:

1 full digitalization of all media (the general use of digital code);

2 broadband transmission through all connections by cable and by air.

While the first technique enables a complete integration of telecommunications and data communications, the second is more relevant for the integration of mass communications in the process of convergence. The concept of integration is summarized in Box 1.1.

BOX 1.1
Levels of integration

1 *Infrastructure*: combining different types of connections.
2 *Transportation*: connections carrying different types of media.
3 *Management*: companies managing different kinds of media.
4 *Services*: media offering a combination of information, communication, transaction and entertainment services.
5 *Types of data*: multimedia containing sound, text, images and data.

Interactivity

The second structural new media characteristic of the current communications revolution is the rise of interactive media. In a very general definition, interactivity is a sequence of action and reaction. It is remarkable how poorly this crucial

concept is (further) defined and made operational for research in media and communication studies. Jensen (1999) has produced an exhaustive account of the laborious search by social and communication scientists for a suitable definition. Jensen himself wishes to reserve the concept of interactivity for mediated communication. Van Dijk and de Vos (2001) offer an operational definition that is supposed to be valid for face-to-face communication as well. These authors define interactivity at four accumulative levels, acknowledging, like many other authors, that this concept is a multidimensional construct. The levels of interactivity are supposed to be appropriate to define how interactive a particular digital medium is.

The most elementary level of interactivity is the possibility of establishing two-sided or multilateral communication. This is the *space* dimension. All digital media offer this possibility to a certain extent. However, most often, the downloaded link or the supply side of websites, interactive television, and computer programs is much wider than the uplink or the retrieval made by their users.

The second level of interactivity is the degree of synchronicity. This is the *time* dimension. It is well known that an uninterrupted sequence of action and reaction usually improves the quality of interaction. However, some interactive media, such as electronic mail (email), are used for their lack of synchronicity. Producing and receiving messages can be done at self-chosen times and places, and one is allowed to think longer about a reply. Yet this goes at the expense of immediate reactions and of the ability to send all kinds of verbal and non-verbal signs simultaneously.

When multilateral and synchronous communication are available, a higher level of control by the interacting parties is possible. So, the third level of interactivity is the extent of control exercised by the interacting parties. This *behavioural* dimension is defined as the ability of the sender and the receiver to switch roles at any moment. Furthermore, it is about the control over the events in the process of interaction. Interactivity in terms of control is the most important dimension in all interactivity definitions of media and communication studies (see Jensen, 1999). It means attention to the division of power in the interface of media and humans or between humans in both mediated and face-to-face communication. At this level, interactivity means, among other things, that the user is able to intervene into the program or representation itself and to make a difference. What the user does has to create a substantial change at the other side – it has to make a difference. As digital media are more interactive than traditional media, potentially they enable a shift in the balance of power to the user.

The fourth and highest level of interactivity is acting and reacting with an understanding of meanings and contexts by all interactors involved. This *mental* dimension is a necessary condition for full interactivity, for example, in physical conversation and computer-mediated communication. Currently, this level of interactivity is reserved for mediated and face-to-face interaction between human beings and animals with a consciousness, except by those who have much confidence in interactions directed by artificial intelligence. The concept of interactivity is summarized in Box 1.2.

BOX 1.2
Levels of interactivity

1 *Place*: multilateral exchange.
2 *Time*: synchronicity and equally long turns.
3 *Action*: equal control in action and reaction.
4 *Mental*: mutual understanding.

Digital code and hypertext

Digital code is a technical media characteristic only defining the form of new media operations. However, it has great substantial consequences for communication. Digital code means that in using computer technology, every item of information and communication can be transformed and transmitted in the form of bytes (strings of 1s and 0s, with every single 1 or 0 being a bit). This artificial code replaces the natural codes of the analogue creation and the transmission of items of information and communication (e.g. by beams of light we can see and vibrations of sound we can hear).

The first substantial effect of the transformation of all media contents in the same digital code is the uniformity and standardization of these contents. Form and substance cannot be separated as easily as many people think they can. Digital code is not a neutral form (see Chapter 8). It starts with initially cutting into pieces a number of undivided analogue items of information and communication (signs) and then recombining them in the digitized forms of images, sounds, texts, and numerical data. These forms are produced using not only the same basic code but also the same languages, such as HTML (hypertext markup language), a graphic code for pages of the World Wide Web (www). The resulting forms are known for their great similarities in menu and navigation structures when they are programmed in computer software. Another effect of using uniform digital code is the increase in the quantity of items of information and communication. This code makes their production, recording and distribution much easier. Supported by the exponentially rising storage capacity of computers and their disks, unlimited amounts of items are produced.

A final and perhaps most important effect of using digital code is the break-up of the traditional linear order of large units of information and communication, such as texts, images, sounds, and audiovisual programs, in such a way that they can be transformed into hyperlinks of items liable to be perceived and processed in the order that the reader, viewer, or listener wants. This transformation from linear to hypertext media would have been impossible without digital code. However, it is fully justified to call the hypertext form a second technical characteristic defining the new media. The social and cultural consequences of the 'hypertext revolution' in media production and use will be big. They will be fully described in this book, primarily in Chapters 8 and 9. The concepts of digital code and hypertext are summarized in Box 1.3.

BOX 1.3
Digital code and hypertext

1 *Digital code*: uniform code of bits and bytes for all types of data in digital media.
2 *Hypertext*: uniform code for linking different chunks of all types of data in digital media.

Finally, we can say that the new media be defined by all four characteristics simultaneously: they are media at the turn of the 20th and 21st centuries which are both integrated and interactive and use digital code and hypertext as technical means. It follows that their most common alternative names are multimedia, interactive media and digital media. By using this definition it is easy to identify media as old or new. For example, traditional television is integrated as it contains images, sound and text, but it is not interactive or based on digital code. The plain old telephone was interactive, but not integrated as it only transmitted speech and sounds and it did not work with digital code. In contrast, the new medium of interactive television adds interactivity and digital code. Additionally, the new generations of mobile or fixed telephony are fully digitalized and integrated as they add text, pictures or video and they are connected to the Internet.

Information traffic patterns

As stated, the first level of interactivity is two-sided or multilateral communication. Bordewijk and Van Kaam (1982) had this concept in mind when they designed their typology of the four *information traffic patterns* of allocution, consultation, registration and conversation. They have proved very useful in social and communication science, as will be shown in this book. They illuminate the structures of communication and the aspects of power these structures contain. Finally, they show that the new media evolve from the pattern of allocution, characterizing the old media, to the patterns of consultation, registration and conversation. In this way they become more interactive and more integrated as they converge into fully integrated networks.

In the 20th century, the pattern of *allocution* has gained most importance in communication media. Radio, television and other mediated performances have come to the fore in this century of scale extension and massification. They perform important coordinating functions in society, because they are based on a pattern of allocution: *the simultaneous distribution of information to an audience of local units by a centre that serves as the source and decision agency in respect of its subject matter, time and speed* (Figure 1.2a). The new media do not enhance this pattern, though sometimes new allocution media are introduced such as weblogs and Twitter. The only exceptions are where 'old' broadcasting media offer more opportunities of choice for viewers and listeners,

such as by means of pay-per-view and video on demand with feedback channels at freely chosen times. Here, within the limits and menus offered, the local unit is able to co-decide about the information to be received: the subject, the time the information is consumed, and the agenda of future broadcasting. Further, reactions to current programmes and answers to questions posed in the mass media become possible. However, these innovations do more to damage the pattern of allocution than to enhance it. Therefore this pattern transforms into the next one in the new media environment.

The pattern of *consultation* certainly is enhanced by the new media. Consultation is *the selection of information by (primarily) local units, which decide upon the subject matter, time and speed, at a centre which remains its source* (Figure 1.2b). Old consultative media are books, newspapers, magazines, audio and video. Examples of new consultative media are CDs or DVDs with information sources such as encyclopaedias, electronic program guides in digital and interactive television and, of course, numerous online information sites. Because they add new routes and a seemingly endless number of sources, these media are to be viewed as a basic improvement to the pattern of consultation. Often they are online connections enabling more consultation at the centre than the old media. For example, the gigantic, ever-expanding Wikipedia offers many more search terms and pages than classical encyclopaedias.

The opportunities for *registration* also grow in the new media. Registration is the *collection of information by a centre that determines the subject matter, time and speed of information sent by a number of local units, who are the sources of the information and who sometimes take the initiative for this collection themselves (to realize a transaction or reservation)* (Figure 1.2c). In old media and data collection instruments, often the centre not only decides but also takes the initiative and requests the transfer of information. Examples of these media and instruments are enquiries, elections, examinations, archives and visual observation by cameras. To a large extent, these activities were already performed by the old media. The new media offer more opportunities for registration as they are built on computers. The initiative often comes from the centre that offers a web questionnaire or asks for votes and opinions in an online referendum. The new media, however, offer even more chances of registration by the centre at the initiative of the local units, for example, in electronic reservations, online shopping and Internet banking. A more serious problem arises when the reverse is the case – when the registration initiative is taken by the centre, without the agreement of the local units. This might be the case with privacy intruding tracking technologies, electronic surveillance from a distance and all other kinds of observations of personal data without the individual concerned knowing or wanting it.

The most fundamental change takes place in the pattern of *conversation*. Conversation is *an exchange of information by two or more local units, addressing a shared medium instead of a centre, and determining the subject matter, time and speed of information and communication themselves* (Figure 1.2d). In the new media, the existing channels for conversation are not only enlarged, but they can also contain more kinds of data. The old media (telegraph and telephone) only offered room for speech and a limited amount of data. Local computer networks and data communication over

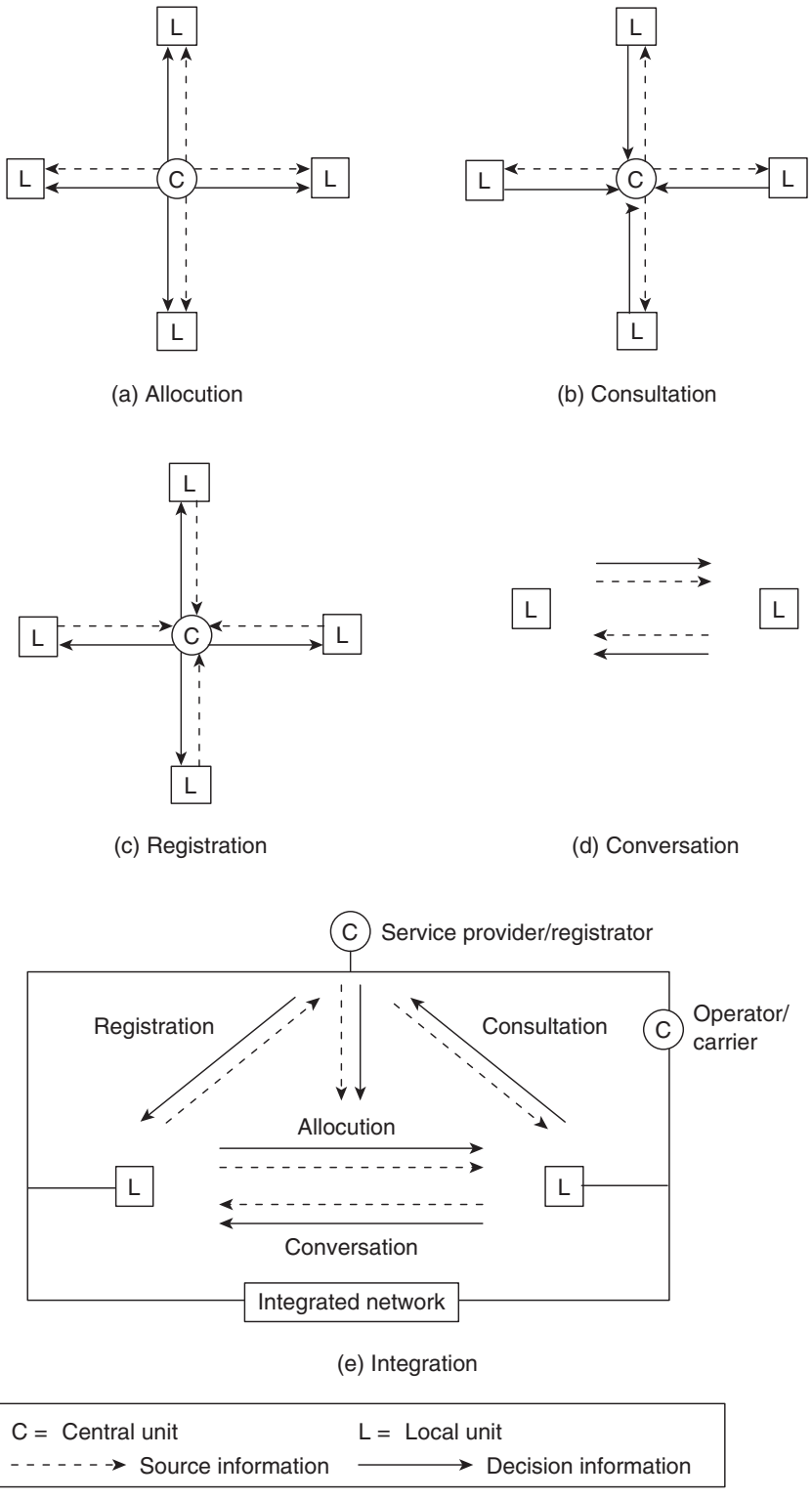

FIGURE 1.2 The integration of information traffic patterns in networks

telephone lines caused an explosive growth in the capabilities for transporting data and text. The new media added a substantial new quality: the possibility to *combine* speech, data and text *in one message*. Then pictures could be added, and since a number of decades we can even add moving images to these messages. This qualitative enlargement of the range of options for conversation is enabled by broadband facilities.

The birth of integrated networks for telephony, broadcasting and Internet implies a combination of allocution, consultation, registration and conversation in a single medium (Figure 1.2e). This would make such a medium important enough in social communications to enable us to speak of a communications revolution, the results of which will be the central theme of this book.

The evolution of the four information traffic patterns involves a clear shift of patterns towards local units. The new media cause a shift from allocution towards consultation, registration and conversation. The initiative and selection by local units, and the interactivity between these local units and the centre, and between these local units themselves, have increased the opportunities in communications. They will cause a revolution in mediated communications, and perhaps even in all communications in our society. *For the first time in history, the new media will enable us to make a deliberate choice between mediated and face-to-face communication in a large number of social activities.* The implications of this choice will form a prime focus of this book.

COMMUNICATION CAPACITIES OF THE NEW MEDIA

Approaches to mediated communication

In the last 25 years, a lot of research has been carried out on the opportunities and limitations of mediated communication as compared with face-to-face communication. In social-psychological experiments among small groups using different media, the modes of communication and the accomplishment of tasks have been investigated systematically. Two approaches are prevalent. The first takes the *objective* characteristics of media and channels as a point of departure. The second emphasizes the *(inter)subjective* characteristics of the use of them, mainly as a reaction to the first approach. In this book, an *integrated* (objective and subjective) approach is taken to develop the concept of communication capacities. This concept is developed to answer the question of what can be done with the new media. What are the special characteristics of new media compared with the old media? The general properties of integration and interactivity have been described in the previous section. Nine so-called communication capacities of the new media will now be introduced, but first the origin of the concept of communications capacities must be briefly explained.

The oldest social-psychological approach in this area mainly stresses the limitations of all media and channels as compared with face-to-face communication.

It emphasizes that all media take away or filter cues as compared to face-to-face communication. Short et al. (1976) introduced the influential concept of *social presence*. This refers to the sociability, warmth, personal information and sensitivity of face-to-face communication that media are only able to transmit in a limited way. By means of these characteristics, presumed to be objective, all media and face-to-face communications produce a different experience of presence among communication partners. For example, the video-phone offers more social presence than the audio-phone.

An almost identical approach is the one that refers to the so-called *reduced social context cues* of the media of telecommunications and network computing (Kiesler and Sproull, 1992; Kiesler et al., 1984; Sproull and Kiesler, 1986, 1991). According to the psychologists concerned, media more or less lack the space for crucial non-verbal and contextual signs. In the somewhat further elaborated concept of *information or media richness,* Daft and Lengel (1984) have distinguished the following four objective characteristics of media: feedback capacity (immediate, fast, slow); channel used (audio, visual); nature of the source (personal, impersonal); and language richness (spoken, written and/or body language).

In the second half of the 1980s this kind of classical social-psychological research was increasingly criticized. A large number of phenomena could not be explained using its objective approach. It appeared that media which are lacking in social presence and information richness, e.g. email and SMS-messaging, are frequently used for social-emotional and even erotic communications. The same phenomenon arose with phone sex and phone helplines. After a period of habituation, the quantity of informal and intimate communications in computer networks increases (Rice and Love, 1987; Walther, 1992). Eventually there arises a (sub)culture of electronic communication with new norms, language and behaviour.

In reaction to the social-psychological approaches just described, largely confining social reality to communication that is interpersonal and tied to place, a more social-cultural or sociological approach emphasizing (inter)subjective social construction processes has appeared. Fulk et al. (1987) were the first to develop a *social information processing model*. They wanted to know how the media are really used in daily practice and how humans shape them (inter)subjectively in their social information processing. This is supposed to be conditioned by the opinions about and attitudes towards media of people themselves and of others in their immediate social environment, most often colleagues at work, in the early phase of computer-mediated communications (CMC). See Fulk and Steinfield (1990) for a summary of this view.

Walther (1992; 1996) has presented a comparable approach. In his *relational perspective,* the media are used differently in relation to particular functions (tasks, goals) and contexts. According to the results of his experiments, after some time the quality of CMC approaches that of face-to-face communications. This conclusion is diametrically opposed to the claims of the social presence and reduced social context cues approaches.

The experiments of Spears and Lea (1992) support Walther's conclusion. According to their *social identity theory*, the reason for the approximate equivalence

of mediated and face-to-face communication is that people take their whole social, cultural, personal and groups identity with them as baggage into computer network communications. The smallest cue is then sufficient to compensate for the limitations of the medium, using the mental construction and imaginative power derived from this identity.

I have proposed an integrated approach, one that is both objective and (inter) subjective (van Dijk, 1993b). According to this view, it remains important to start the analysis with the structural, more or less objective properties of the media, old and new. Their (inter)subjective interpretation and their use in practice differ too much to allow any kind of generalization. Besides, the suggestion that media have no objective characteristics is incorrect. One event in an American computer discussion of women about intimate female affairs should be convincing enough: When it transpired, after some time, that a male psychiatrist using the pseudonym 'Julie' had been taking part, the women were extremely shocked and insulted (see Stone, 1991: 82ff). In most other media this event just could not have happened.

So, media do have particular potentialities and limitations that cannot be removed (inter)subjectively. In this book they are called communication capacities – a concept which carries the connotation of both defining (objective) and enabling (subjective) features. Using the following nine communication capacities, we are able to compare old and new media in a systematic way: speed, reach, storage capacity, accuracy, selectivity, interactivity, stimuli richness, complexity and privacy protection. A short introduction to these capacities follows. Old and new media are compared in Table 1.1 in terms of these capacities.

TABLE 1.1 Communication capacities of old and new media

	Old Media				New Media	
Communication capacity	**Face-to-face**	**Print**	**Broadcasting**	**Telephone**	**Internet**	**Multimedia (offline)**
Speed	Low	Low/ medium	High	High	High	High
Reach (geographical)	Low	Medium	High	High	High	Low
Reach (social)	Low	Medium	Variable	Variable	Variable	Low
Storage capacity	Low	Medium	Medium	Variable	High	Medium
Accuracy	Low	High	Low/medium	Variable	High	High
Selectivity	Low	Low	Low	High	High	High
Interactivity	High	Low	Low	Medium	Medium	Medium
Stimuli richness	High	Low	Medium	Variable	Medium	Medium
Complexity	High	High	Medium	Medium	Medium	Medium
Privacy protection	High	Medium	Medium/High	Low	Low	High

The *speed* of bridging large distances in communication is one of the strongest capacities of the new media. In this respect they are similar to the telephone and broadcasting. Using the Internet and email, one is able to send a message to the other side of the world within one minute. Face-to-face communication and print media are only able to connect quickly to proximate others.

The potential *geographical and social reach* of the new media is very large. The whole world might be connected to them and with them in the future. Geographic reach indicates the number or places you can reach with the medium, and social reach the number of people. Currently, almost every place in the world is connected to the Internet. However, the social reach of the Internet is variable – it ranges from less than 5 per cent home access in some developing countries, to more than 90 per cent in some developed countries. Social telephone reach also remains very unequally divided in the world, though currently developing countries are catching up fast via the diffusion of mobile telephony.

Another strong quality of the new media is their huge *storage potential*. This potential is low in face-to-face communication, which depends on inadequate human memory. It was also low in telephony before the invention of answering devices. Presently, it is variable as we have both very simple mobile phones, and smart phones that are actually computers. In digital media one can store much more than in printed media and analogue broadcast media.

The *accuracy* or exactness of the information transmitted is an important advantage of the new media as compared with the traditional telephone and face-to-face communication. Signals in the latter media are often ambiguous. Historically, accuracy has also been an advantage of print media. The new media add the exactness of data or numbers and the informativeness of images. Both the storage capacity and the accuracy of the new media enable governments, politicians and managers to control the rising complexity of society and organizations. Without ICT, many processes would become out of control and bogged down in paperwork and bureaucracy (see Chapters 4 and 5).

The *selectivity* of messages and addresses is another strong capacity of the new media, contrasting with face-to-face communication of groups and other collectives, in which it is rather low. Here individuals have to make appointments and separate themselves from each other. Much of the communication using print media is not addressed, except for personal letters of course. The same goes for broadcasting. The telephone was the first fully selective medium used to address people. The new media advance this capacity by enabling us to systematically select (parts of) groups using email lists and the like. In this way, one can address very specific target groups. This is a capacity that is already used frequently in the corporate world (telemarketing) and Internet politics.

One refers to the new media as interactive, but actually their *interactivity* does not reach the high level that can be attained in face-to-face communication. The new media's general characteristic of interactivity described earlier has to be specified in terms of the concrete levels and types of interactive capacities to be observed in old and new media. Some new media do not offer anything more than two-way traffic

and a central store-and-forward agency serving as some kind of answering device or voicemail. Clearly this goes for email. In other new media such as the interactive press and broadcasting, or digital information services, the user has very little control over content. Though ever more room is made for user-generated content, most users do not take this opportunity. The majority does not (inter)act much; instead it chooses from menus, consumes and reacts. Moreover, fully fledged new media conversation that is equal to face-to-face communication is still lacking. One is not able to exchange all the signals (often) desired. Even video conferences, which partly enable the participants to see each other, have their limitations. So-called kinaesthesis (the sense of movement) is largely absent and the sense of distance between conference people is still present.

In terms of *stimuli richness,* no other medium is able to beat face-to-face communication. The reason is clear: all current new media are sensory poor in natural human perception. This is especially so for computer networks transmitting only lines of text and data. Multimedia offer a greater richness of stimuli, often even an overload, in all kinds of combinations: images, sounds, data and text. However, the combination of these stimuli is not natural but artificial. Some stimuli can be strengthened while others recede, but there is still a clear lack of the movement and body language provided by someone who is close. So the most advanced kind of teleshopping will remain different from going to shop in town for a day.

As a consequence of the last two capacities described, the *complexity* that one is able to achieve collectively by using them is not high. Research indicates that one is able to make contacts, ask questions, exchange information and make appointments very well using computer networks, but it appears to be difficult to negotiate, decide, explain difficult issues and really get to know someone (see Rice, 1998).

The biggest minus of the present design of the new media is the low capacity for *privacy protection* that they offer. Face-to-face communication can be secluded to a large degree. Current broadcasting and the press can be received anonymously. This does not apply for the new interactive broadcasting and electronic press media. In fact, all usage, and often the personal characteristics of users, are registered in the new media. This is certainly the case for computer networks. For stand-alone computers and multimedia it is less so, because they are under the control of the user, but these media have internal memories which can be accessed.

THE NATURE AND DESIGN OF THIS BOOK

An interdisciplinary outline of social aspects

This book contains an outline of a large number of social aspects of the new media compiled in a particular framework. For the original first Dutch edition of this book, written at the end of the 1980s, an inventory was made of all social aspects that appeared to be relevant at that time. With every new edition, the inventory was extended and reduced. At the time of writing (2011) it is scarcely possible anymore to be complete. The new media have merged so much in society that they touch

about every aspect of it. So, this book is no encyclopaedia of new media social aspects. It is very comprehensive, but it does not discuss all the literature. It has been updated, but the overview simply cannot be complete. A library full of books and articles on the topic of this book has been published in the past two decades.

What I do attempt is to be extremely interdisciplinary in the treatment of social aspects. This is for fundamental reasons. I will explain that in the network society the so-called micro, meso and macro levels are closely connected and that many dividing lines between the fields of disciplines simply dissolve. To get a grip on the causes and consequences of the introduction and use of the new media in contemporary society one simply has to be interdisciplinary. Of course, this will provoke the comment of specialists in technology, economy, political science, law, culture and psychology that the treatment is not complete. I am prepared to take this risk for the benefit of reaching a better understanding of the whole picture.

Theoretical Framework

The outline is made against the background of a theoretical framework that has been made more explicit in this edition as compared to previous ones. This framework has found sources of inspiration in four theories of social and communication science.

The first source of *inspiration* is network theory. This has been known for decades now in social and communication science, but in the last fifteen years it has made considerable progress. Social scientists have reached for the help of natural scientists and mathematicians in discovering the 'laws' or regularities of networks. In the following chapter I will also present a number of 'laws' of the Web that will return in about every chapter. The latest versions of network theory have made it possible to extend the framework linking the social aspects and to improve the coherence of the book. Here I defend a moderate network approach in social science. It is moderate because I not only focus on relations, but also on the characteristics of the units that are related in networks (people, groups, organizations and societies).

The second source is *(adaptive) structuration theory*. The axiom of this theory is that social structures and communicative action are mutually changing each other (structures are adapted continually). My general view of technology is that it is both defining and enabling, and that technologies and human beings are mutually shaping. These assumptions define another part of the nature of this book. Again and again both the opportunities and risks, optimistic and pessimistic views or utopian and dystopian perspectives of the new media for man, society and organization, are portrayed. The assumptions also explain why this book not only contains observation and analysis, but also policy perspectives based upon a number of explicit social values.

The third insight comes from so-called *medium theory* (inspired by Innis, Ong and Meyrowitz). This theory says that media and technologies in history are not only enabling but also defining. They have a number of objective characteristics that must have a particular influence on users in their social environments. The communication

capacities elaborated above provide an example. The core argument is that media and technologies themselves are social environments. This clearly goes for media networks. The clearest case in this book is the Internet, which has become a society by itself. The fact that social and media networks are becoming a single reality is one of the main statements in this book.

The final source of inspiration is contemporary *modernization theory* (note that this is not the one followed in the 1950s and 1960s hailing the superiority of western civilization). Current modernization theory observes the conflict of western and other cultures in the world (see, for example, Barber, 1996 and Castells, 1997, 1998). In this book, modernization theory appears in basic statements about networks linking global and local social relations and processes of scale extension and reduction in society.

Chapter division

The book contains three parts. In the first part, comprising Chapters 1 to 3, basic terms and statements are explained. Chapter 1 contains the basic terms. Chapter 2 provides the most important part of the theoretical framework: network theory and an explanation of the network society concept. Chapter 3 describes the technological infrastructure of the network society. I have tried to do this in a manner that should be understandable for a non-technical reader.

The heart of the book is the exposition of the social aspects of the new media in several spheres and levels of society: the economy, politics, the law, the social infrastructure of society, culture and individuals (psychology). In this third English edition, I have added chapter contents and conclusions to the chapters and provided them with explanation and listing boxes. I hope this will improve the coherence and didactic quality of the book.

Every book I have published in this field contains policy perspectives at the end. I am not satisfied with only providing scientific analysis to my readers. I do not want them to feel helpless after they have grasped the overwhelming impact of the new media on their society. The opportunities of the new media for society can be taken and the risks can be reduced.

- Communication networks have become a lifeline for people in modern society. Increasingly, they are merging with social networks in the offline world, in this way creating a network society.
- The rise of the new media constitutes a second communications revolution. The influence on society and daily life of the first revolution, which brought the mass media about a century ago, was just as sweeping as the impact of this second revolution. New media technology is revolutionary. However, their impact on society rather is evolutionary, reinforcing existing trends in society.

- The new media can be defined by four characteristics, two structural and two technical: they are media at the turn of the 20th and 21st centuries which are both *integrated* (multimedia) and *interactive*, and use *digital code* and *hypertext* as technical means.
- In the new media, the information traffic patterns of allocution, consultation, registration and conversation come together, making them very powerful in information retrieval, processing and exchange.
- The new media are also characterized by a number of communication capacities that are both enabling and defining their use. Strong capacities are speed, geographical reach, storage capacity, accuracy and selectivity. Weak capacities are (full) interactivity, (natural) stimuli richness, complexity of tasks to be achieved with them and privacy protection.
- This is an interdisciplinary book that explains what is going on in the new media in many domains and with several theories: network theory, structuration theory, medium theory and modernization theory.