

family members, friends, acquaintances, neighbours, colleagues, fellow sportsmen, and so on. Currently, this level is supported and intensified by the rise of the media networks of the Internet (email) and mobile or fixed telephony.

The second level is that of *group and organizational relations*. Individuals create all kinds of groupings or collective agencies, some of them temporary and loose (such as project teams and mailing lists) and others permanent and fixed (institutions and corporations). All contemporary groupings are supported by telecommunications and computer networks. They tend to loosen fixed group and organizational structures because they enable virtual organizing at every scale. Internally, many organizations have become network organizations of largely independent teams and projects. Externally, they assemble to form network organizations cooperating in the execution of a particular task. They may even become virtual organizations that are more or less independent from spatial, temporal and physical conditions as these conditions are substituted by networks of information and communication technology.

The third is the level of *societal relations*. Individuals, groups and organizations shape a society that is built on, and linked by, social and media networks. This goes for all subsystems of society. One increasingly uses the phrase 'network(ed) economy', which is sometimes called a 'new economy'. In politics, some people talk about a 'network state'. Internally, this state links the bodies and institutions of the government and the public administration at every level. Externally, it maintains strong relationships with organizations of citizens and with semi-autonomous or privatized public institutions (Castells, 1997; Fountain, 2001; Goldsmith and Eggers, 2004; Guéhenno, 1993; van Dijk, 2000a). In the cultural sphere, the Internet has created a vast hyperlink structure of sources and artefacts of human activity (de Kerckhove, 1998). Finally, the societal infrastructure of interpersonal and group relationships has been intensified by the ever-stronger links between social networks and telecommunication networks using email and mobile or fixed telephony (Katz and Rice, 2002; Wellman, 2001; Wellman and Haythornthwaite, 2002).

The final level is the level of *global relations* in the world system of societies and international organizations (Slaughter, 2004; Urry, 2003). We have entered the era of the global web as it was explained in the previous section. This is created by expanding international relations and a scale extension of organization. Both are strongly supported by international broadcasting, telecommunications and computer networking.

## A multilevel theory of networks

It is vital for the understanding of the network society to analyse it in terms of levels of networking. In their helpful overview of contemporary *Theories of Communication Networks* (2003), Monge and Contractor have made a strong argument for multilevel theories of networks. The word theory is used in the plural as they also defend a combination of theories to explain phenomena at the different levels distinguished.

An important part of their argument is that the levels are linked themselves. They build their own theory relating statements at the level of the individual, the dyad, triad, group, organization and at the interorganizational level.

Previously, I also advocated a multilevel theory of the network society (van Dijk, 2001). This advocacy did not only lean on the historical rise of media networks that are used at every level, but also on basic views on the composition and (infra) structure of society. Such a basic view is developed in Kontopoulos' methodological and conceptual book *The Logics of Social Structure* (1993). According to him, the world must be analysed as a level structure: 'Levels are not juxtaposed layers; every level is rooted to lower levels, down to the chemical and physical ones. Therefore, same-level or intra-level analysis must be supplemented and enriched by cross-level or inter-level analysis' (1993: 63). At every level, particular properties emerge that only apply to that level (the individual, group, organization, society, world system). Examples of such properties are the personality of an individual, the measure of formality of a group, the extent of centralization of an organization and the phase of development of a society.

In this book about the network society, such a basic view is needed to explain the character of networks as a particular mode of social organization. Kontopoulos makes a distinction between hierarchical and heterarchical modes of organization of the world. Networks clearly belong to the last mode. In a hierarchical mode, the lower levels are fully included in the higher levels. The units at these levels are simply aggregated to form units at a higher level. Individuals add to groups and organizations and both add to society. A second property of the hierarchical mode is that the lower levels are superseded by the higher ones. This might mean that the higher level controls the lower one. This is the common meaning of the term hierarchy.

In a heterarchical mode of organization, the lower levels are only partially included in the higher levels. The units concerned contain relations and structures that overlap with those at higher levels. Networks belong to these relations and structures. They cut right through all levels, and they connect these levels (see Figure 2.1 again). Networks realize complex interactions within and between levels. In this way, they increase the flexibility of organization.

In terms of determination, the heterarchical mode means that neither the higher nor the lower levels are in control. Instead, a very complicated picture appears of determination from below, determination from above and determination at the semi-autonomous level in focus itself (Kontopoulos, 1993: 55).

Examples of this cutting through all levels of networks are individuals who pass the borders of the units they belong to (families, groups, departments, organizations) to establish links with other individuals in groups, organizations and societies they do not belong to, in this way creating their own structures. The same goes for organizations passing the borders of their societies or nation states.

The use of telecommunication and computer networks strongly supports these practices. They also link the types and levels of interpersonal, organizational and mass communication. For the first time in history we have a medium, called the Internet, directly linking them simultaneously. Telephones, letters, documents,

computer files and meetings served interpersonal and organizational communication, and mass communication was realized by broadcasting and the press. However, with the Internet, this traditional split has dissolved, as it is used for communication at all levels.

So, networks organize relations within and between levels or units of social reality. As has been argued before, every network approach stresses the importance of the relations as compared to the units that are linked. The traditional network approach defends this position in a radical way. It gives priority to forms instead of substances. The social network analysis following this approach emphasizes the morphology of ties and nodes to such an extent that it downplays the attributes of the social units and what happens inside or between them, that is, the communicative action of people who are using and creating rules, resources and meanings. In this book, I reject this formalistic and superficial approach. Instead, I defend a moderate notion of a network approach. This means that, first, not only relations are stressed, but also the characteristics of the units they link. The most interesting things occur when relations and the characteristics of units come into conflict. This happens, for example, when the new digital communication networks, with relations transcending space and time in the global 24-hour economy, collide with the limitations of the biological human organism (unit), with its daily rhythms and routines or needs for rest that cannot fulfil the 24/7-expectations of the technology and economy concerned.

A second qualification of the radical network approach is that, in this book, networks are not supposed to be the basic units of contemporary society as they are in the view of Manuel Castells (1996, 2000, 2001). Instead, these basic units are held to be individuals, households, groups and organizations *increasingly linked by social and media networks*. In modern western societies, the individual is becoming the most important basic unit of society. In others, this frequently is the family, kinship group or local community. The combination of social and media networks produced by both organizational and technological innovation forms the all-embracing network structure of modern societies. This combination justifies the use of the strong metaphor of networks shaping the nervous system of advanced high-tech societies.

## CAUSES OF THE RISE OF NETWORKS

### Historical and social causes

What are the causes of the rise of networks in contemporary societies? It is relatively easy to describe a number of historical and social reasons. It is far more difficult to uncover the basic social infrastructures and modes of organization of societies explaining the rise of network structures. Let us start with the historical and social reasons. The McNeills would explain the current rise of information and communication networks as the last stage of the evolution of the global web. This web is no longer primarily widening, but it is thickening. Ever more persons, animals, plants, diseases, goods, services, pieces of information, messages, new ideas and innovations are exchanged globally and at ever faster rates.