CHAPTER 3

THE NETWORK ECONOMY

INTRODUCTION

In this chapter, the concept of the network economy is expounded. The idea of a network economy allows fundamental aspects of the new economy to be integrated into one single (organizational and managerial) concept. The information technology revolution has resulted in the development of advanced infrastructural technological networks. These networks enable and induce global communication and information sharing at decreasing cost and at an increasing speed. Knowledge is being transferred through these interconnected ICT applications and it can be said that, taking into account the prominent place of knowledge in the new economy, it functions as the glue that holds networks together.

Speed, intangibles (knowledge), and connectedness are the three key constituting elements of the new, network economy. As a result of these three factors, one can observe the development of widespread and highly developed social, economic, and technological networks – all interconnected and to an increasing extent interdependent. Both ICT, together with the global scope they create, and knowledge, therefore, are central parts of the network economy. The ongoing process of globalization has resulted in the omnipresence of business in the global marketplace. Many firms now have multiple production sites, regional headquarters, and have access to numerous distribution channels at their disposal.

Next to its encompassing conceptual nature, network organization provides a relatively neutral and sufficiently moldable (and therefore managerially viable) perspective, which has been used in a number of disciplines, like computer sciences and sociology. Network organization, therefore, has the potential to acknowledge and integrate contributions from a range of academic fields, resulting in a holistic perspective. As Van Alstyne notes from this point of view:

> *"In computer science it represents the linked processor: 'networking computers' brings to mind issues of communications, errors, protocols, and control architecture. In economics, networks relate to coalitions and externalities: neither market nor hierarchy, they may still concern vertical integration, scale efficiency, firm boundaries, decentralized incentives, and non-cooperative gaming behavior among agents. And in sociology, the word network calls up connections – lines of interpersonal affiliation and political influence: 'networking' at a social function, for example, recognizes the importance of individual persuasion and non-economic aspects of social pressure as the context for group activity"* (Van Alstyne, 1997: 84).

As has appeared from the previous chapter, different developments leading to and within this new economic landscape have, particularly, influenced the emergence of

interlinked business relationships or business networks. The impact of technological developments – especially in the field of ICT – and globalization of both the business, (socio)economic, and the political arena has led to a redefinition of different playing fields, evoking profound changes in competitive forces, corporate behavior, and consumer demands. For instance, deregulation, increased competitive pressure, shorter product lifecycles, the need for mass customization, short time-to-market, lean production, focus on core competencies, and flexibility all have contributed to the genesis of network organization.

This chapter is organized as follows. First, the network perspective is briefly elaborated from a socio-technological point of view by Manuel Castells's informationalism paradigm (Castells, 1996). Subsequently, the focus will be on network technology, network economics, and network dynamics. Next, the network perspective is expounded from an organizational and managerial view. Here, definitions, traits, and appearances of network organization are discussed, followed by looking into the business form of the network mode of organization. Finally, challenges for business schools in the network economy are identified, upon which the following chapters will build.

INFORMATIONALISM: THE NEW SOCIO-ECONOMIC PARADIGM

According to Manuel Castells, the renowned Berkeley socio-geographer, the new economy distinguishes itself from its predecessor by the intertwining of its global and informational features, which has been illustrated in the previous chapter. It is informational because productivity and competitiveness of units or agents fundamentally depend upon their capacity to generate, process, and apply knowledge-based information. It is global because the core activities of production, consumption, and circulation are organized on a global scale (Castells, 1996: 66). At the heart of this transformation towards the new economy lies the information technology revolution, which makes this new economy primarily a network economy or network society. The rapid and pervasive development of information and communication technologies can be seen as the most important enabler for the take-off of the new economy, in his view.

The internet is undoubtedly the most notorious example of a network infrastructure. Besides the abundance of information available, a prominent feature of this complex network architecture is its connectedness: it is made up of numerous computer networks capable of linking up to each other in almost infinite ways. Such a world-encompassing network enables the accumulation of knowledge and is oriented towards higher levels of complexity in information processing (Castells, ibid., p. 17). This lies at the basis of what Castells calls *informationalism*. Informationalism is based on a paradigm of new technologies. The term paradigm refers to the cluster of interrelated technical, organizational, and managerial innovations, which commence new ways of doing business and management. The contemporary change of paradigm can be seen as a shift from a technology based primarily on cheap inputs of energy to one predominantly based on cheap inputs of information derived from advances in microelectronic and telecommunications technology (see Castells,

1996: 60-61). Next to technological structures, it also brings with it new social structures, since it provides an organizational logic of global networks of capital, wealth, power, knowledge, information, and symbols around which important social functions are being organized. Although the shape of this new paradigm is not entirely clear yet, this paradigm is characterized by several features (cf. Boisot, 1998):

- *Ubiquitous impact*
  As information forms an integral part of all human activity, the new information technologies have impact on all human spheres of life. There is hardly any domain of human activity that will be kept untouched by the pervasive effects of information technologies;

- *Flexibility*
  Organizations are able to change constantly and become fluid to a large extend. The ontology of the organization becomes unclear as the boundaries are changing and to a large extend are blurring and reshaped;

- *Convergence*
  A next characteristic is the convergence of specific technologies into a highly integrated, global system. This technological convergence has revolutionized the impact of information technologies during the second half of the 1990s and will continue in the next few years;

- *Network logic*
  The last characteristic of this paradigm refers to the network logic of information technologies as they become integrated in globally connected information systems like the internet.

The use of new technologies has resulted in the internationalization of core economic activities, such as the functioning of financial markets, multinational enterprises, and the production of highly skilled personnel. No part of the globe has to be isolated from the rest of the world anymore. This global interaction now forms the basis for management, productivity, and competition, which are expressed in more divergent ways than has been the case in former times. As a result, new principles for organizing have emerged. These principles (see Castells, 1996) are being revealed by:

- A transition from mass-production to flexible production;
- A crisis for large corporations (traditionally based on vertical integration), and a focus on the vitality and flexibility of (subcontracted) small- and medium-sized enterprises (SMEs);
- New methods of management (many of which have originated within Japanese firms, such as Kanban, Total Quality Control, just-in-time management, multifunctional labor, worker participation, reduction of uncertainty);

- Networking between SMEs, i.e., linking up with each other and being licensed/subcontracted by umbrella corporations;
- The formation of strategic alliances between larger corporations, limited in time and/or by specific markets, products, and processes (not excluding competition in other fields);
- A shift from vertical bureaucracies to horizontal corporations (forming networks within each firm), where the operating unit is the business project rather than the bureaucratic department.

These changed principles bring about new dynamics in the economic landscape and particularly in the business environment. A different scope, different dynamics, and a different mode of organization come into play.

NETWORK TECHNOLOGY, NETWORK ECONOMICS, AND NETWORK DYNAMICS

The term network society is not merely referring to the new media network that has been developed in recent years but more in general to the successor of the mass society that has grown to full maturity in the 20th century. The mass society has been developed interrelated to the industrial revolution during which large concentrations of people came together in industrial towns, schools, armies, and factories (one place, one time) (Van Dijk, 1999: 23-24).

The process of transformation towards an informational economy is complex and can to a large extent be attributed to the rise of new information and communication technologies. Before ICT could revolutionize business environments a process of technical convergence of different communication networks was needed. Van Dijk (1999) has described this process of technical convergence in three convoluted and interrelated developments.

First, there was the revolution in microelectronics, which led to four generations of computers in 30 years. The miniaturization of components underlies this revolution in computer technology. Through the invention of the integrated semiconductor, the chip, it became possible to concentrate hundreds of thousands connections on a plate of a surface of just a few square millimeters. The capacity of these chips increased exponentially (Moore's law). The real value of this chip technology lies in its multifunctionality, in the sense that this technology could be applied to a whole series of electronic media. It could be applied to central telephone exchanges and micro-electronic updates. It also caused a drastic decentralization of computer processing by which data communication became an important phenomenon. Thirdly, chips and processors were used in audiovisual equipment, which enabled transmission and reception of sound and images on a large scale.

The second main development was, what Van Dijk (1999) calls, the gradual digitalization of all data streams between every piece of hardware used in telecommunication, data communication and mass communication. Until that time telecommunication and mass communication were using natural analogue signals

for text and images. The main problems with analogue signals were the slowness and the fact that these were subject to interference and therefore to misinterpretations. With digitalization, signals are chopped in into identical pieces (zeros and ones) which could be transmitted easily and fast.

The third main technical development concerns the lines of transmission, transmission capacity and transmission and reception techniques. ICT advancements account for higher bandwidth, increasing volumes of bytes to be transmitted, and increasingly compatible technologies. As time goes by, an integration of techniques and technologies can also be witnessed.

The main implication of this technical convergence was that all sort of intangible goods can be processed, stored and distributed over the networks in a easy and cheap way. Like Webster (1995) points out, these information networks routes have become the highways of the modern age, akin to the railways, roads and canals of the industrial era. This new ICT based infrastructure can be seen as the physical foundation for the information or network society. Figure 3.1 pictures the convergence of different technologies constituting the network economy's physical foundation.

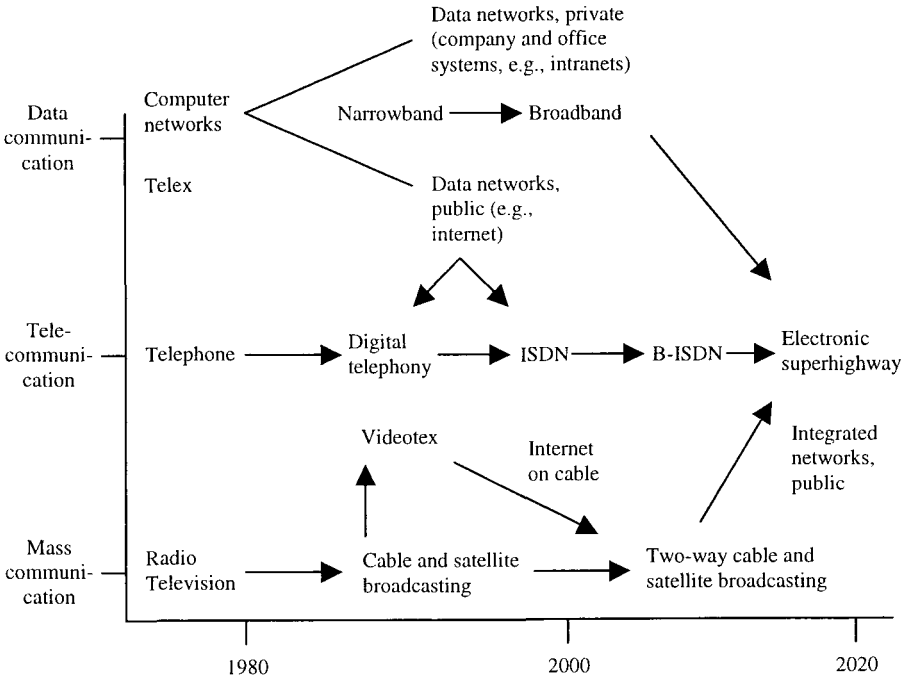

Figure 3.1. Integration of technologies over time.
Source: Van Dijk (1999: 10)

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