

Network Effects of Knowledge Diffusion in Network Economy

Zhang Li

Harbin Institute of Technology, China

Yao Xiao

Harbin Institute of Technology, China

Jia Qiong

Harbin Institute of Technology, China

INTRODUCTION

Network industries are the central nervous system of the 21st century economy. During this time the newly developing “network economy” will act as the engine that will drive world development (Bao, 2001). The most valuable commodity in this economy has become information, and the economics of networks applies to almost all information products and services. Information can be consumed by more than one person. Most importantly, the total social value of information increases as it is shared with more consumers. Consumers of computers and software programs, cellular phones, faxes, and Internet services all have more valuable products as the use of these products by others increases. Whether we call this an “information economy” or a “network economy,” the implication is the same—network economics accounts for an increasingly larger share of the economy. It is also the driving force behind many of the innovations and technological changes that occur (Balto, 2001).

At the same time, knowledge is nowadays considered to be a fundamental asset of the organizations. Although this concept is not new, in the few last years increasing attention has been devoted to knowledge and knowledge management (KM) issues within organizations. In fact, due to environmental factors such as the market globalization, the increased product complexity, and the turbulence of competitive scenarios, the powerful role of knowledge as a source of sustainable advantage has been considerably emphasized (Zack, 1999). The knowledge economy represents a strategic new era that human beings are entering. In this new environment of social and economic development, knowledge and information are recognized as being at least as important as physical capital, financial capital, and natural resources as a source of economic growth.

Network economy has provided an equal platform for the participation of all of society. It creates unique values and establishes an operational system in the globalization context, depending on the knowledge as core resource, utilizing the

network as the fundamental mode, and taking the information industry as leadership. However, in the knowledge economy, networks are adapted better to knowledge-rich environments because of their superior information-processing capabilities. They minimize idiosyncratic investments in fixed assets and technology, and thus are more flexible and responsive to change. “In an economy where the only certainty is uncertainty, the only sure source of lasting competitive advantage is knowledge” (Nonaka, 1994). And one of the most important aspects is that network economy needs to utilize the knowledge diffusion to create more value. Because knowledge diffusion is the core process of knowledge management to explore more network effects and knowledge diffusion is important for total factor productivity, it is also important for international competitiveness. In consequence, knowledge diffusion should be regarded as one of the companies’ core competencies.

BACKGROUND

Although interest in how knowledge diffusion plays a role during the network economy era is relatively new, considerable work has been done in the past on related topics. The study of knowledge diffusion and technology transfer is rooted in agriculture, the military, and education (Backer, 1991; Glaser, Abelson, & Garrison, 1983; Rogers, 1983, 1988, 1995). Perhaps one of the best known of technology transfer formulations is Rogers’s (1983, 1995) “Diffusion of Innovations” theory. Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 1995, p. 5) The field of knowledge diffusion and technology transfer explores the strategies by which knowledge is disseminated and put to use, its benefits and shortcomings, and the policy and practice implications stemming from its application (Backer, 1991). This field represents a cross-disciplinary body of work that has produced an estimated

10,000 literature citations (Backer, 1991) and is widely used in the public health, education, and agricultural fields (Rogers, 1995). Initially conceptualized as a linear process, theories of diffusion and technology transfer have been modified to reflect the dynamic, interactive nature of knowledge dissemination and application (Smale, 1993). Moreover, the knowledge diffusion field has developed a number of important premises or conceptual frameworks. That can be useful in addressing the ways in which innovations or new technology is spread. Dunn, Holzner, and Zaltman (1985), backed by a body of literature and experiences in the field of knowledge diffusion dating back to Merton (1968), formulated the following four premises: (1) knowledge use is interpretative, (2) knowledge use is socially constrained, (3) knowledge use is systemic, and (4) knowledge use is transactive.

Network Economy and Knowledge Diffusion

The network economy means that, in view of the widespread use of computer networks in the socioeconomic era, all economic activities are based on the unification of the information transmission and processing in Internet platform, and the economic information cost sharply drops down. This phenomenon is leading to the idea that the information which replaces capital plays a dominant role in economy management and eventually becomes a globalization economic form of the core economic resources. It does not narrowly refer to the industries that are centering on the computer networks, or vigorous developing industries concerned, or the emerging industries. It also includes the combination and infiltration of computer networks and traditional industries, as well as the economic form that is reducing production and transaction costs and increasing productivity level; the result is information has turned to the most important power of industrial development and innovation. The greatest advantage of the network economy lies in accelerating the flow of information and reducing information costs. This influence penetrates the economic life of production, exchange, distribution, and consumption, which have changed the cost structure and other features of these links.

In the process of endogenous growth of knowledge, the endogenous economic growth model stressed the role of the transfer of knowledge. But many of the current studies focused on the role of technology transfer; it has not paid enough attention to the knowledge—the origin of technology. In terms of the implication of the knowledge economy, it includes four basic economics areas: knowledge production, knowledge accumulation, knowledge exchange, and knowledge distribution. These four basic aspects are inseparable from knowledge diffusion. The nature of the knowledge determines the knowledge production bred in the process of

the dissemination and the use of knowledge. The knowledge exchange is only a typical state of knowledge diffusion, while the distribution and accumulation of knowledge is only the result of the knowledge diffusion.

There is an authoritative view that nobody will be able to develop better resources and have more wealth without more and better knowledge. Knowledge is not only a symbol of wealth, but also a source of wealth. Only when people can use their own comprehensive grasp of scientific knowledge can knowledge be transformed into wealth.

Tapscott, Lowy, and Ticoll (1998) thought the operational system of the network economy had the following characteristics:

- It is the knowledgeable and digital economic network that is gradually changing the economic metabolism of the world, changing the type of the organization and the institution and nature of economic activities.
- It is the molecular formula structure network.
- All stratifications of the network economic society already transformed from centralized form to discrete form.
- The individual dynamic portfolio gradually substitutes for the old large enterprise, and companies are weaving increasingly complex webs for each other in order to obtain more wealth.
- It is the globalization innovation network and the integration of production and consumption.
- The communication and the cooperation own the instantaneity.

In brief, “the network” and “the knowledge” already became the fundamental mode and the core soul of the network economy.

Network Effects of Knowledge Diffusion

Knowledge may be classified into various categories depending on the purpose of its use. Polanyi (1962) classified knowledge into explicit and tacit knowledge. Explicit knowledge refers to knowledge that is codified in formal, systematic language (encoded knowledge). It is knowledge that can be combined, stored, retrieved, and transmitted with relative ease and through various mechanisms. Tacit knowledge refers to knowledge that is so deeply rooted in the human body and mind that it is hard to codify and communicate. It is knowledge that can only be expressed through action, commitment, and involvement in a specific context and locality. Tacit and explicit knowledge are often treated as separate entities, but it is unlikely that a piece of knowledge will be exclusively explicit or tacit. Knowledge can exist in both forms simultaneously throughout an organization. Knowledge diffusion occurs routinely within organizations.

3 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/network-effects-knowledge-diffusion-network/13981

Related Content

Formation of Managers of Biotechnology Companies: A "Presentual" (Presential and Virtual) Environment for Learning

María José Peset Gonzalez and César Ullastres García (2014). *Journal of Cases on Information Technology* (pp. 13-23).

www.irma-international.org/article/formation-of-managers-of-biotechnology-companies/120701

Bridging the Academic Research and Business Practice with the New Media

James K. Ho (2000). *Information Resources Management Journal* (pp. 6-14).

www.irma-international.org/article/bridging-academic-research-business-practice/1208

The Effect of Culture and Product Categories on the Level of Use of Buy-It-Now (BIN) Auctions by Sellers

Kevin K.W. Ho, Byungjoon Yoo, Seunghee Yu and Kar Yan Tam (2009). *Handbook of Research on Information Management and the Global Landscape* (pp. 98-112).

www.irma-international.org/chapter/effect-culture-product-categories-level/20616

Web-Based System to Improve Resource Efficiency in University Departments

Elias Melchor-Ferrer and Dionisio Buendía-Carrillo (2016). *Journal of Cases on Information Technology* (pp. 1-16).

www.irma-international.org/article/web-based-system-to-improve-resource-efficiency-in-university-departments/159261

Social Institutional Explanations of Global Internet Diffusion: A Cross-Country Analysis

Hongxin Zhao, Seung Kim, Taewon Suh and Jianjun Du (2009). *Handbook of Research on Information Management and the Global Landscape* (pp. 59-81).

www.irma-international.org/chapter/social-institutional-explanations-global-internet/20614