

# Chapter IV

## Superior Customer Value and Network Size in Markets Characterized by Network Effects

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### ABSTRACT

*Network effect indicates that the value of connecting to a network is positively associated with the current number of customers connected to that network. Network effect strengthens the strong firms, weakens the weak firms, and may lead to a winner-take-all market. Thus, managing customer perceived value is crucial in markets with network effects. This article models customer perceived value, presents ways to improve the value, and discusses the relationship between customer perceived value and network size. Implications for e-business practitioners are discussed.*

### INTRODUCTION

Information technologies changed business operations and customer behavior. In information economies, network effects involve a “larger gets larger” mechanism, which predicts a theoretical

natural monopoly, urging e-businesses (such as net-enabled organizations and value webs) to exploit network effects.

Network effects indicate the value of connecting to a network positively correlates with the number of customers connected to the network.

Users thus prefer large networks to smaller ones, fostering the growth of larger networks. Network effects take place in physical networks such as telephone networks or virtual networks such as the networks of the members of a Web site. Typical products with network effects are image phone, e-mail, videotape, computer operating system, word processing software, TV game player, and computer keyboard. Network effects are also pervasive in the network sector such as the telecommunication and information industries. With the rise of electronic commerce, network effects are influential in online auctions, e-marketplaces, or online employment Web sites.

It is well known that network effects can tilt the market toward the largest player and result in a natural monopoly (Chou & Shy, 1990; Farrell & Saloner, 1992; Katz & Shapiro, 1986). For instance, “Microsoft’s dominance is simply a manifestation of the network externality [effects], which relentlessly drives computer software to standardization” (Choi, Stahl, & Whinston, 1997, p. 4). Thus, e-businesses actively compete to be the largest to take advantage of network effects. Chen, Chen, and Wu (2005) provided a Simonian perspective that guides e-businesses to gain sustaining competitive advantages.

Inefficiencies in social welfare (the difference between the actual and the optimal social welfare) resulting from network effects were explored (Farrell et al., 1986). Although researchers shifted their research focus to competitive strategies (Tseng, Teng, & Chiang, 2005), their assumptions remain too restrictive. This article presents how to deliver superior value to customers in markets with network effects, and discusses the relationship between customer perceived value and network size.

The remainder of this article is organized as follows. Section 2 reviews the literature. Section 3 then describes the model for describing customer perceived value. Subsequently, section 4 elaborates how to deliver superior customer value, and section 5 states the relationship between customer

perceived value and network size. Finally, section 6 draws conclusions.

## **LITERATURE REVIEW**

### **Terms and Definitions**

Katz and Shapiro (1985) utilized the term *positive consumption externality* to explain network effects as “the utility a user derives from consumption increases with the number of other users consuming the good” (Katz et al., 1985, p. 424) and then called it *positive consumption benefits* (Katz et al., 1986, p. 823). Alternative definition says that “the fact that the value of a unit of the good increases with the number of units sold” (Economides, 1996, p. 678). Choi et al. (1997, p. 4) argued that network externality is better termed *network effect* when a market price already reflects the external benefit or loss. This article agrees with Choi et al.’s suggestion and uses the term *network effect* to describe the phenomenon.

Network effects also have many variations with similar or different definitions such as *congestion externality* (Westland, 1992), *complementary network externality* (Church & Gandal, 1993), *positive demand externality* (Xie & Sirbu, 1995), *indirect network externality* (Gupta, Jain, & Sawhney, 1999), and *cross-consumer externality* (Holcombe & Sobel, 2000). Chiang and Teng (2005) provided detailed definitions and differences between those terms. Understanding those terms helps researchers to create knowledge on network effects.

### **Business Strategies**

E-businesses operating in markets characterized by network effects can use strategies such as building alliances, taking first-mover advantages, managing customer expectations (Shapiro & Varian, 1999), and penetrative pricing (Bensaid

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