AFFECTED BY NETWORK EXTERNALITY ON THE SOCIAL NETWORK SITE: THE EMPIRICAL STUDY OF TRANSACTION COST

Yu-Ping Wu

Department of Business Administration, National Dong Hwa University No. 1, sec. 2, Da-Hsueh Rd., Shou-feng, Hualien, Taiwan, R. O. C. <u>annywuice@yahoo.com.tw</u> 886-928748532 Yuh-Yuan Tsai National Dong Hwa University No. 1, sec. 2, Da-Hsueh Rd., Shou-feng, Hualien, Taiwan, R. O. C <u>yytsai@mail.ndhu.edu.tw</u> 886-38635000

ABSTRACT

This study proposes a view of the transaction cost theory to explore the network externalities affect the relationship between social network site and community members. This study is to establish a predictive model to explore the dimensions of community users use social networking sites exclusive stuck with the cost of the antecedent variables of network externalities. Affected by network externalities, increasing the number of members of the community and support of complementary goods to create the value of community members, increase of specific holdup cost of the community website, the customer can possibly be fastened to it.

The results can provide strategic recommendations for website operators.

Keywords: Network Externality, Transaction Costs Theory, Specific Holdup Cost, Brand Loyalty, e WOM

1. Introduction

The rapid emergence of social networking websites, such as Facebook, Twitter, and Plurk, combined with the trend of accessing the Internet using mobile devices, has generated a mobile Internet phenomenon. With the rapid integration of the mobile devices and Internet,

human communication has extended beyond fixed locations. Users can connect to social networks without time or space constraints, increasing social network interactivity. In addition, through the collective force of social networking peers, mobile Internet has launched a social network economy based on managing personal information. According to a survey by Internet World Stats, a U.S. market research agency, the number of Internet users worldwide exceeded 2.4 billion at the end of 2012, with Taiwan demonstrating the highest penetration rate of 42.10%.

Facebook is the largest social networking website in the world, featuring over 1 billion members. With the rapid development of the Internet and mobile devices, Facebook has provided an instant and interactive communication method, expanding users' networks 10 to 100 fold through their friends. Users can instantly share various types of information, such as personal details and entertainment media, with members of their social networks. These interactions stipulate the formation of interpersonal relationship networks and facilitate information exchanges.

[17] proposed the concept of network externality, which emphasizes services based on a single product or system. The value of these services for individual users increases with the number of users, prompting more users to adopt the product or system and increasing the benefits provided to users. Previous studies related to network externalities primarily employed the technology acceptance model (TAM) to investigate the reasons for use and the usage behaviors of users [20]. However, network externality research targeting social networking websites is limited. The essence of network externalities in the benefits created when the membership or adoption of a product or system achieves a specific quantity. Consequently, this concept can be used to determine whether social networking websites provide benefits to users.

Based on the transaction cost theory, this study endeavored to determine the following: (1) whether network externalities can generate specific holdup costs for social networking

websites; and (2) the effect that specific holdup costs have on positive word-of-mouth (WOM).

Based on the above objectives, this study selected the social networking website Facebook, which has the highest number of members and the greatest use in Taiwan, as the research subject. Additionally, transaction cost theory [33] and network externality [17] concepts were adopted as the theoretical bases of the research framework.

2. Theoretical background and preliminary research

2.1 Social Networking Websites

Social networking websites are one form of virtual communities. Users of such websites can publicize personal information and interact and share interests with their existing real-life friends and numerous strangers online. Using Internet services, social networking websites allow users to perform the following three functions: (1) create publicized or semi-publicized personal information; (2) construct lists of users with whom to share information; and (3) view and follow information published by other users [5]. Social networking websites are coined as virtual communities that provide their members with services based on Web 2.0 concepts, such as connecting social networks and sharing media content. These services enable users to maintain their existing social networks and connect to strangers with common interests. The above definition for social networking websites was proposed in 1997 with the introduction of the website, SixDegrees.com. This website provided a platform for users to create personal information and lists of friends. Although social networking websites entered the Internet world in 1997, their growth and popularization did not occur until 2003, following the development of websites such as MySpace, LinkedIn, Flicker, Facebook, and YouTube. In addition to the original social interaction functions, a number of social networking websites further introduced functions that allowed users to share media, for example, functions for uploading pictures and videos. This led to social networking websites attracting worldwide attention, and the number of users began increasing exponentially. The establishment of social networking websites such as Facebook and MySpace has transformed the methods of communication and interaction employed by Internet users worldwide. Currently, Facebook is the world's largest social networking website [5].

2.2 Network Externality

With the ever-changing development of information, the key to successful business model is the network externalities of a specific product attributed by user connection values. The concept of network externalities was initially proposed by [27], who found that when numerous families and businesses used the same product or system, the number of users increased. Network externalities subsequently occur when users subscribe to these products or systems. Extending the concept of network externalities, [17] contended that the utility acquired by consumers from a product or service is not entirely determined by the product or service; instead, utility increases with the number of users. They provided the following definition of network externality: "the utility that a user derives from a product depends on the number of other users" [17]. Furthermore, [17] asserted that two types of network externalities exist: direct and indirect network externalities. Direct network externality increases with the number of consumers (e.g., the value of using the telephone is directly proportional to the increase in the telephone network). Indirect network externality refers to the amount of complementary products compatible to a specific product, that is, an increase in the number of users of a commodity increases the number of compatible complementary products, which consequently increases the value of the commodity. For example, consumer smartphone purchases are influenced by whether other consumers use the same brand or model. Applications can enhance the functionality of mobile devices such as smartphones, and the diversity and number of applications depends on the number of mobile devices owned. Therefore, the number of complementary products or durable goods increases with after-sales services, resulting in users deriving higher utility [17].

Regarding research of social networking websites, [26] found that users of such websites continuously transfer the usage utility users' relatives and friends, thereby achieving an external effect. In addition, users' positive feedback consistently expands the scale of the websites, thereby increasing the platform membership. Consequently, network externalities generate economic benefits while influencing the expansion of social networks. [23] examined the use of social networking websites from the perspective of networking externalities increasing the number of peers. They found that both the number of members and perceived complementarity are crucial elements that influence motivation to use social networking websites. Social networking websites chiefly emphasize the interactive exchanges and emotional connections between users; thus, users are the key factor for the success of these websites. Once the membership of a social networking website reaches a specific number, more benefits are generated for the website, subsequently increasing the number of user subscriptions.

In summary, the integration of social networking websites (e.g., Facebook) and smartphones (e.g., Android and iPhone), combined with compatible complementary products, has stimulated the sales of mobile phones. The competitive strategies of these business models indicate that businesses or products (or service) that possesses several established bases can better enhance the utility of network externalities. Furthermore, the quality and value of use for individual users can generate positive effects, further increasing user value. [20] proposed that more users subscribe to a product or service when its membership reaches a certain scale. For example, when the number of users of a social network reach a particular membership baseline, corresponding benefits are produced, providing a wider usage range for subsequent users and attracting the subscription of third-party businesses (e.g., software development). Therefore, the number of subscribers and complementary products can be influenced by network externalities.

2.3 Transaction Costs

Transaction costs refer to the costs of completing a transaction using the most economical methods. [33] contended that for a company to achieve profit maximization, costs must be minimized. Transaction costs are typically incurred when an information asymmetry exists between the two parties involved in a transaction, creating opportunistic behaviors. Opportunism is observed when a decision maker makes decisions that benefit their self-interests. Additionally, users are not completely rational when making decisions; instead, their rationality is bounded. Bounded rationality implies that both human memory and cognition are limited; humans can neither fully comprehend the information they have, nor use it to develop the most logical conclusion. Based on these two assumptions, transaction cost theory introduces three dimensions: frequency, uncertainty, and asset specificity. Frequency is significantly influential for transaction costs; when the number and frequency of a two-way transaction increase, mutual familiarity is enhanced, and transaction costs decrease. Uncertainty is caused by bounded rationality, information asymmetry, and opportunism. If a transaction occurs in a spot market, the probability of uncertainty decreases; conversely, uncertainty probability increases with longer transaction times. Regarding asset specificity, related issues occur when business relationships are maintained by relying on specific assets. That is, the lower the asset specificity, the greater and more precise the information provided by the market through its basic price mechanism will be. Subsequently, reliance on a single supplier is reduced, and opportunistic behavior is less likely to occur [1]. [33] asserted that

behavioral uncertainty is mainly attributed to the difficulty of monitoring the performance of business partners, which generates concern regarding evaluations. Furthermore, asset specificity issues occur when businesses make transaction-specific investments. [33] defined asset specificity as "a lasting investment that supports specific transactions and incurs low opportunistic costs when effectively employed." Specific assets include concrete and human capital, such as research and development and company-specific knowledge [30] [19]. Based on the definition proposed by [33]. Transaction costs divided into four parts: explicit unit effectiveness costs, information search costs, moral crisis costs, and specific holdup costs. The sum of these four types of cost equals the final total transaction costs. Explicit unit effectiveness costs are defined as the costs incurred by a buyer wishing to acquire a certain benefit without the influence of various factors such as brand or company image and specific holdup costs. Information search costs are incurred when the buyer and the seller are unfamiliar with the bidding object and transaction process, consequently spending time and money to collect information and prevent information asymmetry. Moral crisis costs refer to the costs resulting from users' fear that the product cannot fulfill the functionality and guarantee claimed by the supplier before the transaction. Specific holdup costs originate from the intangible or tangible specific assets produced by the buyer and the seller during the transaction process. These assets are valuable only during the transaction; thus, their value is lost when the buyer or the seller ends the transaction.

The more time and consideration customers invest, the higher their perceived business reliability, and the less likely they are to defect; thus, the business-customer relationship is further maintained [10] [14] [12]. The specific assets explored in this study refer to the resources invested by customers, including the finances, time and consideration, service delivery interactions, accumulated deals, and interpersonal networks created by free business-provided e-mail accounts and a web space. These specific assets are lost when customers switch from businesses; subsequently, customers tend to passively maintain their relationship with the business.

In e-commerce, transaction costs are frequently used to determine users' switching costs, which is a crucial element for the success of businesses operating in an e-commerce environment. Switching costs defined as the time, money, and performance costs customers incur by switching.

[8] asserted that switching costs comprise monetary expenses and non-monetary costs. Non-monetary costs refer to the time and mental effort expended. Specific holdup costs can be explained as follows: regarding transaction costs, the business-customer relationship is maintained when users become familiar with website's transaction methods, increasing their level of usage. Consequently, additional consideration and time is required for users to navigate other websites, increasing users' specific holdup costs for the specific. Users are then held up the initial website. Therefore, compared to switching costs, this study determined that specific holdup costs are more appropriate for investigating the relationship between users and social networking websites from the perspective of network externalities.

In an empirical study on communities in the microprocessor market, [31] contended that the success of this market depends not only on the advantages provided by microprocessors, but also organizational support for this technology and the active expansion of network externalities, which increase returns. Therefore, a community framework can facilitate business success. [9] maintained that the success of the microcomputer system developed by Shen Yang Corporation is primarily because of its open system strategies. By providing a technology that enables easy entry for competitors, Shen Yang established a vast organizational network that supported this product, including microprocessor manufacturers and software suppliers. From the community dimension, [11] asserted that population ecology and networks are highly interconnected, defining a community as an interdependent population group. The population an established community demonstrates structural equivalence because members within the community have relative relationships and resource flow patterns among each other.

Because of network externalities, social networking websites constantly expand and connect, prompting more users to subscribe. Value is created for social networking websites when the number of network community users reaches a specific membership baseline. Concurrently, network users are held up by the website they use, which creates specific holdup costs. Most extant studies have explored the effect that specific holdup costs have on user loyalty, satisfaction, and trust. However, extensive research concerning the causal relationships between specific holdup costs and users is limited. The specific holdup costs for users of a social networking website increase with the network externality established between the users and the website. Based on the above literature, this study proposed the following hypothesis:

H1: Network externality has a significant positive effect on specific holdup costs.

2.4 Brand Loyalty

[8] proposed that customer loyalty can be regarded as the strength of the relationship between individual attitude and subsequent purchase behavior. According to [25], customers are considered loyal when they repeatedly and continuously purchase a specific product or seek a specific service. Loyal customers are unaffected by contextual changes regarding their intentions to continuously use a product or service. Customers can be influenced by various external environment factors and develop a preference for a specific brand, which affects their purchase behaviors. Furthermore, [25] categorized loyalty into two types: attitudinal loyalty and behavioral loyalty. Attitudinal loyalty refers to customers' psychological dimension, and behavioral loyalty refers their actual purchase behaviors. [13] contended that customer loyalty refers to customers' commitment to maintaining a lasting relationship with a specific brand or company, which is manifest in customers' attitude and behavior. In particular, the attitude component of loyalty includes the intention to make subsequent purchases or to purchase other products produced by the company, intentions to make recommendations to others, and the loss reduced by competition. The behavior component includes behaviors such as repeat purchases, purchasing other products produced by the company, and making recommendations to others. [23] defined brand loyalty as customers' positive attitude and commitment towards a particular brand, and their intentions to continue purchasing.

[2] asserted that brand loyalty is exhibited by customers who appreciate, acknowledge, and commit to a brand, and that true loyalty to a brand is predicated by both behavioral and attitudinal inclinations toward a specific brand.

Despite numerous studies examining brand loyalty, related investigations and research conducted in the past 40 years has prompted scholars to assess brand loyalty from the following two perspectives: behavioral loyalty and attitudinal loyalty [4] [8]. Behavioral loyalty refers to the frequency of repeat purchases, and attitudinal loyalty refers to consumers'

mental commitment. Subsequently, purchase behavior, such as purchase intentions, does not necessarily suggest actual repeat purchase behavior [15] [16]. [16] strongly criticized studies investigating tourist loyalty from the perspectives of behavior and attitude because tourists can be loyal to a destination without visiting it. Thus, they defined attitudinal and behavioral loyalty as consumers' intention to inquire or willingness to recommend certain hotels or restaurants. Summarizing previous information, we measured brand loyalty as network members' attitudinal and behavioral loyalty.

Based on the above literature, this study proposed the following hypothesis:

H2: Specific holdup costs have a significantly positive effect on brand loyalty.

2.5 e WOM

Electronic word-of-mouth (e WOM) has been identified as a significant influence during persuasion [29]. Specifically, positive WOM is correlated to the associated brand and organization because network member consumers perceive it to be a comparatively objective source of information. However, in a social network environment, recommendations through peer WOM can influence consumer behavior.

Brand loyalty is primarily determined by the WOM of other social network members [28]. In other words, the WOM of other social network members can influence a persons' recommendation behavior regarding the network.

The compact distribution of social network membership and response messages exhibit the rapid transmission of thoughts and emotional support that result from information sharing behavior [6] [18]. Consequently, when social network members actively participate in additional information sharing activities, they are more likely to promote the network or invite new members to join the network [6].

Based on the above literature, this study proposed the following hypotheses:

H3: Brand loyalty has a significantly positive effect on intentions to provide information.

H4: Brand loyalty has a significantly positive effect on intentions to acquire information.

H5: Brand loyalty has a significantly positive effect on intentions to communicate information.

3.Future Research 3.1 Research Model

Figure 1 presents this study's research model, developed based on network externalities and Transaction Costs Theory. This model considers that network externalities and Transaction Costs Theory are key factors affecting individual's intention to word of mouth. In thisl model, not only online brand community members' intention to exchange information with peer members but also their likelihood of passing information to outsiders is examined.



Figure 1 Research model

3.2 Questionnaire

All of the constructs used in the proposed model were measured using multi-item scales, adapted from previous studies that reported high statistical reliability and validity. The scale for measuring network externalities is adapted from [22]. Brand loyalty is adapted from [3]. The items of these two constructs are based on a 5-point Likert scale. Specific holdup cost is adapted from [21]. E WOM are adapted from [34]. The items of those constructs are measured on a 7-point Likert scale.

3.3 Data Analysis

The collected data are analysed and tested using structural equation modeling (SEM) approach, which allows researchers to perform path analytic modeling with latent variables. The software package employed in this study is AMOS 17.0.

4. Conclusion

It is difficult to be precise about the most appropriate sample size for conducting such research. However, we expect follow-up studies to expand the sample range so that the relevant research might be more representative. The contributions of the study are inferred as follows:

First, the amount of complementary products compatible to a specific product, that is, an increase in the number of users and compatible complementary products, which consequently increases the value of the commodity and resulting in users deriving higher utility. Second, brand loyalty mediates the relationships between specific holdup costs and e WOM. Third, this finding is in line with our prediction drawn from transaction cost theory suggesting that a sense of belonging and shared membership among community members enhance their feeling of loyalty in fellow members' ability and benevolence. That can affect community member customers' intention to contribute to e WOM in favor of the community. For marketers, online brand community members actively engage in e WOM within and beyond their communities and may serve as brand evangelists and effective information's transmitters for viral marketing [7].

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