

Influencing Factors of Disruptive Innovation Diffusion of Virtual Platform Products

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Keywords: Disruptive innovation; Virtual platform products; Innovation diffusion; Technology acceptance model

Abstract: 1) Objective: Virtual platform products rely on the Internet and intelligent terminals, which will have a disruptive influence on existing products. In recent years, virtual platform products (VPP) have appeared frequently, which have the characteristics like one-time research, development and design costs, free from time and space restrictions, low replication and transmission costs. The disruptive innovation diffusion of virtual platform products has the characteristics of fast dissemination speed and wide diffusion range etc. The existing theories cannot completely explain the disruptive innovation of virtual platform products. Thus, it is of great practical significance to explore the disruptive innovation diffusion of virtual platform products and its influencing factors.

2)Methods: Based on the perspective of disruptive innovation diffusion and Technology Acceptance Model (TAM), this paper constructs a model of influential factors of disruptive innovation diffusion of virtual platform products, and analyzes the influential factors of disruptive innovation diffusion of virtual platform products.

3)Results: Through case studies, it is found that perceived usefulness and perceived ease of use are the influencing factors of disruptive innovation diffusion of virtual platform products. In addition, the cost of usage, compatibility, willingness to share, interaction and user social network are also influencing factors. This paper establishes a model of influencing factors of innovation diffusion.

4)Conclusion: This paper enriches the theory of disruptive innovation and proposes the disruptive innovation of virtual platform products. Moreover, it also establishes a model of influencing factors of disruptive innovation diffusion of virtual platform products. This can help companies understand the disruptive innovation diffusion of virtual platform products, help companies deal with the changing market demand in the Internet environment, and provide references for the follow-up research of platform products or other Internet products.

1. Introduction

According to the "42nd Statistical Report on Internet Development in China" issued by China Internet Network Information Center (CNNIC), as of June 2018, the number of online users in China has reached 802 million, and the proportion of mobile Internet users is 98.3%. The huge demand in the Internet market has led to the frequent appearance of Internet-based informational knowledge products and business models, which brings disruptive influence on traditional industries (Edmondson & Harvey, 2017). Virtual platform products are products that are constantly evolving in response to the changing Internet market, which are based on the Internet, without entities. They use intelligent terminals as carriers to provide digital information and service products. The core feature of virtual platform products is to build an ecological platform, which essentially consists of some fixed functions and increasing complementary functions. We can take Wechat as an example, which was just a new product launched by Tencent to seize the mobile social market firstly. However, as time goes by, it has replaced existing products such as Michat and Fetion, and had a certain impact on traditional communication products. From this angle, it confirms Christensen's idea of disruptive innovation. That is, new entrants focusing on low-end or

emerging markets will gradually erode the market share of existing companies and eventually replace their dominant positions.

Disruptive innovation has gradually become an effective approach for late-developing countries or enterprises to catch up with incumbents in the new economic pattern (Christensen, et al., 2018). However, disruptive innovation has strong risks and uncertainties (Osiyevskyy & Dewald, 2015). Thus, the effective dissemination of such products stands for the success of disruptive innovation and is also an urgent need for sustainable development of enterprises. However, the existing research focuses on physical products or face-to-face services. The research, design, manufacturing, and marketing processes for these products or services are in a relatively stable environment and lack research on whether disruptive innovation theory applies to products and services in the Internet environment.

This paper chooses WeChat as a successful platform virtual product, and uses the case study to analyze the influencing factors of disruptive innovation diffusion of virtual platform products. Furthermore, it builds a disruptive innovation diffusion model of virtual platform products based on TAM. This provides references for the follow-up study of virtual platform products and promotes the development of disruptive innovation theory to a certain degree. Thus, based on the theory of disruptive innovation, this paper chooses Wechat as a typical case to analyze the disruptive innovation diffusion of virtual platform products and reveal its influencing factors.

2. Literature Review

2.1 Disruptive Innovation Diffusion. Christensen first proposed disruptive innovation in 1997, which provided new ideas for the company's innovation management. Disruptive innovation refers to products that are lower than mainstream products in some main attributes in the early stage of development, but offer quite "simple, convenient and cheap" new attributes, and gradually erode the mainstream market through continuous improvement in the later stage (Christensen, et al., 2015). Disruptive innovation is different from "radical" or "discontinuous" innovation, which is not represented by revolutionary technological progress, but introduces new value advocacy (Guttentag & Smith, 2017).

Rogers' theory of innovation diffusion points out that the attribute of innovation influences the adoption of users, and that the speed of innovation diffusion is influenced by relative advantages, compatibility, complexity, attempt-ability and observability. Most of the existing researches on disruptive innovation diffusion starts from technology and market. From the angle of technology, the diffusion of disruptive innovation is mainly through technological innovation or simplified breakthrough of existing technology track to meet the needs of different market segments (Christensen & Raynor, 2003). From the angle of the market, it emphasizes that latecomers can diffuse from niche market to mainstream market through disruptive innovation products (Parry & Kawakami, 2017). Moreover, there are few researches on disruptive innovation diffusion in the background of the Internet. Since virtual platform products are different from physical products in terms of non-entity, low cost, one-time research and development cost and almost zero communication cost, the disruptive innovation diffusion of virtual platform products is different from that of general disruptive innovation products.

2.2 Technology Acceptance Model (TAM). TAM was proposed by Davis based on rational behavior theory in 1986, which considers that perceived usefulness and perceived ease of use are two important factors of technology acceptance behavior. The model assumes that the user's usage is determined by the user's willingness to use, and this willingness is determined by the user's usage attitude (perceived usefulness and perceived ease of use).

TAM and innovation diffusion theory analyze users' adoption behavior from different perspectives. With the Internet gradually becoming the mainstream trend in today's society, more and more scholars combine innovation diffusion theory with TAM to study the users' usage of innovation products in the Internet environment. Combining characteristics of innovation products and technological acceptance behavior is helpful to study the influence of characteristics of

Internet-based innovation products on individual adoption behavior, and to explain and predict the influencing factors of the diffusion of innovation products.

3. Research on Influencing Factors Model of Disruptive Innovation Diffusion of Virtual platform products

Most existing researches analyze TAM from the perspectives of perceived usefulness and perceived ease of use, but ignores the influence of other factors. Because of the characteristics of virtual platform products, the influencing factors of disruptive innovation diffusion cannot be completely explained by TAM. Combining TAM and innovation diffusion theory, this paper analyzes the disruptive innovation products, users and innovation strategies of companies through cases, explores the influencing factors of disruptive innovation diffusion of virtual platform products, and constructs its conceptual model.

3.1 Perceived Ease of Use. Perceived ease of use refers to the degree of ease with which users can master and use a new technology or product. Existing studies have proved that perceived ease of use has a significant influence on users' behavioral adoption intentions from different perspectives. Users' perceived ease of use of virtual platform products is mainly reflected in the following aspects: Whether the product itself is convenient to operate; Whether the functional connection between the many functions of the platform product is simple and easy to use; Whether the main function of the product itself is simple and easy to use. The ease of use users perceived of virtual platform products not only affects users' attitude, but also directly affects users' perception of product usefulness.

3.2 Perceived Usefulness. Perceived usefulness refers to the degree to which users perceive whether a new product is useful for their own work and life. Virtual platform products often provide users with simpler and more convenient functions based on intelligent terminals. Moreover, through its own rapid iteration, new functions can be continuously added to meet users' requirements. Taking WeChat as an example, users can realize communication, social communication, trip, information processing, payment and other demands through WeChat, which provides convenience for users' daily life and work. Therefore, perceived usefulness is affected by the functions and characteristics of disruptive innovation products.

3.3 Disruptive Innovation Product. The attributes of platform products will affect users' willingness and behavior. Existing studies think that disruptive innovation products/services tend to enter the market initially with low quality or price. Later, the product enters the mainstream market and becomes dominant through continuous improvement to promote its performance. However, in the initial stage, the price of virtual platform products is very low, even free, and through rapid iteration and improvement, can provide better attributes than the existing mainstream products. Most of these products are free and only charge a small number of users with special needs. With its rapid iteration, virtual platform products continue to integrate new attributes in other values, and create more value for users and increase users' user surplus.

With excellent product design and continuous upgrading, WeChat constantly optimizes its own functions and continuously integrates other functions inside and outside the industry (such as circle of friends, real-time positioning, expression store, WeChat wallet, etc.), which greatly meets the various needs of users. Through rapid iteration, WeChat has become an Internet social platform that integrates instant messaging, video chat, circle of friends, mobile payment, public service and other functions, which has overturned a number of products inside and outside the industry. Lower use cost and higher product attributes increase users' surplus value. The increase in the user's surplus value will reduce the user's criteria for evaluating innovative products.

Thus, we believe that the cost of use is an important factor influencing the users' adoption behavior. The platform products, relying on their own characteristics, continuously integrate multiple functional attributes outside the industry through rapid iteration to meet the needs of users and conform to the definition of compatibility in the theory of innovation diffusion. This is just how well the new technology or product matches the users' own experience or usage habits.

3.4 User. Virtual platform products are different from general disruptive innovation products, because they are not targeted at marginal market users. Its target users may be users in all markets and quickly have a disruptive influence on the entire market at some point. WeChat and QQ are Tencent's instant messaging products. In the initial stage of WeChat, it advertised through QQ and QQ mail to attract users to try. The people who tried the product are Tencent's internal users. They use the company's products with a high degree of loyalty to Tencent products, have the willingness to interact, and recommend such products to other persons. Considering that WeChat is an instant messaging product, when people who try it accept it, they will support it in their own circles to enjoy interaction with friends through WeChat. Others are those who are advised to use WeChat, and those who do not use WeChat voluntarily but only use it after being supported or influenced by others. Later, with the rapid progress of upgrades and iterations, WeChat will rapidly expand with each user as a node.

As WeChat continues to iterate and upgrade, more users will join WeChat. Users can know about more users on WeChat by shaking and other functions, and expand their communication range. On the other hand, users can also change their real social networks into WeChat social networks. They can get the status and messages of friends and family at any time, and share videos, photos, information and other resources with each other. The use of interaction and sharing mechanisms can satisfy any social activities of users on the WeChat platform, thereby increasing the willingness and user stickiness of WeChat users.

Thus, we believe that the existing users' relationship network, user sharing willingness and users' perceived interactivity are important factors influencing users' adoption behavior.

3.5 Company Strategy. In general, the diffusion of general disruptive innovation is to collect profits directly from users. Virtual platform products are often free for most users, and charge for a small number of users with special needs. Moreover, through rapid iteration, new functions and services are constantly integrated to create more values for users, meet their needs and attract more users. The way companies make profits from virtual platform products comes from their higher network externality. The value that virtual platform products can produce relies on the number of users of the product, that is, the effectiveness that each user gets from using the platform. Besides, effectiveness is related to the total number of users of the platform, and the value of single user on the platform is proportional to the total number of users. WeChat makes use of its huge user group to carry out a series of functions or services to get profits such as public accounts, small programs, Didi taxi, WeChat wallet and advertisement. Thus, the company's innovation strategy of virtual platform products often affects the product attributes and the use price to influence the users' adoption behavior. Besides, network externality plays an important role in the disruptive innovation diffusion of virtual platform products. Based on the above research, the model of influencing factors of disruptive innovation diffusion of virtual platform products is constructed.

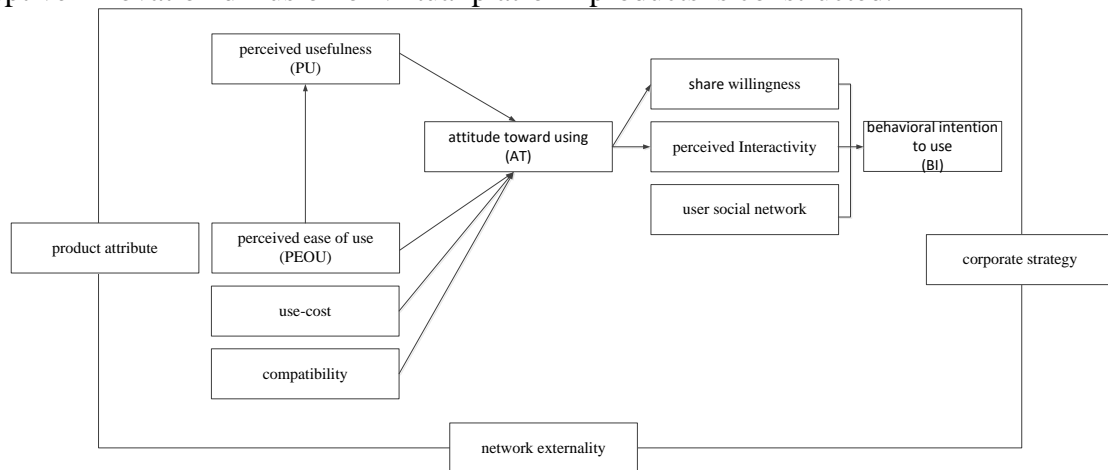


Fig. 1 Model of Influencing Factors of Disruptive Innovation Diffusion in Virtual platform products

Conclusion

On the basis of the theory of innovation diffusion, this paper analyzes the influencing factors of disruptive innovation diffusion of virtual platform products, and constructs the model of influencing factors of innovation diffusion based on the technological adoption model. As shown in Fig. 1, product attributes corporate strategies and the subject of disruptive innovation diffusion of virtual platform products with externalities of external network lead to the appearance of influencing factors of product innovation diffusion. Apart from perceived usefulness and perceived ease of use, because of the characteristics of virtual platform products, it is found that the use cost, compatibility, sharing willingness, interactivity and user social network are the influencing factors of disruptive innovation diffusion of virtual platform products. Among them, perceived ease of use, perceived usefulness, use cost and compatibility will affect users' willingness to use, and users' willingness to use will lead to the generation of users' willingness to share and interaction, and will affect users' behavior together with their own social network. Thus, the rapid diffusion of virtual platform products among users is finally achieved.

This paper enriches the relevant theories of disruptive innovation and proposes disruptive innovations in virtual platform products. This will help companies understand the disruptive innovation diffusion of virtual platform products, help companies deal with the changing market demand in the Internet environment, and provide references for the follow-up research of platform products or other Internet products. This paper is only a preliminary exploration of the disruptive innovation and its diffusion of virtual platform products. The relationship between various influencing factors and the influencing directions still need to be further studied.

Acknowledgment

This research was supported by the National Natural Science Foundation of China (Grants nos. 71573064, 71490724).

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