

Is The Imitation Behaviour of Internet Enterprises a Matter of Expediency?

-The Enlightenment from Species Competition Model

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Abstract

This paper intends to interpret the causes of imitation among Internet enterprises through establishing the competition model of two enterprises based on species competition model. The research shows that imitation is the result of rational choice on the part of an enterprise. The competitive advantages of large Internet enterprises come from the differentiation based on the homogeneity. Imitation is not a matter of expediency. Inheritance innovation strategy plays an important role in product development.

Keywords

Imitation, Species Competition Model, Inheritance and Innovation

INTRODUCTION

As competition among Internet enterprises is becoming ever more intense, Internet product innovation is more and more important to obtain competitive advantages for the enterprises. On the functions of new products, there are three main forms for new product development: imitation, imitation innovation and radical innovation (Burgelman, Maidique and Wheelwright 2001). In the traditional economy, these three kinds of product development practices are very common. Surprisingly imitation or imitative innovation plays an important role for Internet enterprises in China, especially large-scale ones (Xia 2012). Generally, this phenomenon is referred to lack of intellectual property protection in China, thus imitation is very popular (Ying 2012; Sima 2012). However, we can't explain why these taking imitate or approximate imitation products can long-term occupy the dominant position in the market competition. Why the Internet enterprises still keep on these strategies product development, at the same time, there is a consensus that differentiation has been accepted as one of the fundamental strategies for an enterprise to obtain sustainable competitive advantage and premium returns (Porter 1985), just because of their low cost of development or poor innovation ability, perhaps both? In other words, What are the agents that help to bring about the imitation or imitative innovation strategy of Internet enterprises in comparison to other types of enterprises? What is the sufficient condition under which the product development of Internet enterprises can take the imitation or imitative innovation? If imitation or innovation strategies really have an advantage, then, what are the advantages of the Internet enterprises that take the radical innovation? How can they maintain their advantages?

To try to answer these questions is the purpose of writing this paper. On these questions, this paper will use the species competition model in ecology to describe both the possible effect of interaction of two Internet enterprises created in the process of competition and the conditions required of the enterprises for such competition. The conclusions of this paper are quite different from the previous research (Li 2013, Sima 2012; Wang and Zhang 2012; Wu and Zhao 2011; Ying 2012).

LITERATURE REVIEW AND CURRENT CIRCUMSTANCES OF DEVELOPMENT OF PRODUCTS AMONG INTERNET ENTERPRISES

Internet enterprises refer to those profit-making economic organizations that handle major businesses on the internet and whose major profit patterns are founded on electronic-commerce networks.

Literature Review

There are a lot of literatures about new product development of Internet enterprises. Wu and Zhao(2011) studied on cooperative innovation or independent innovation with AJ game model from the subject of R & D of new product, and their study suggested that imitation innovation against the healthy development of Internet industry, and that at present the industry did not form the atmosphere of independent innovation, cooperative innovation is suitable for the industry, but that in the long term, independent innovation is the key for the healthy development and the core competition to compete with international enterprise. Li(2013) analysed three types of technology innovation: leading innovation, following innovation and imitation innovation in mobile Internet industry from the perspective of market competition status, and the innovations are divided into incremental innovation and radical innovation according to incentive degree. His conclusion is that the focus strategy is the key to winning for innovation. Xu and Weng(2003) researched the factors of influencing product development from the perspective of relevance between innovation products. They considered that the innovation firms should understand and identify precisely the relational characteristics of innovation products except for five characteristics of innovation products, which are apperceived by consumer. They suggested that rivalrousness, complementary and derivatives between innovation products should also be taken into consideration in new product development. Wang and Zhang(2012) pointed out that the successful experience of Internet industry in simulating innovation basically reflects in the following respects: quickly accessing to the industry by imitating and making profits; focusing on user experience according to the local user's habits; realizing the innovation of localization, etc. In addition, there are some literatures about the studies on the results of simulating behaviour – the phenomenon of product homogenization(Chen 2004; Ma and Wang 2005; Song and Mao 2006; Wu and Chen 2005).

Although these literatures provide a good perspective to answer the above questions, but these documents mostly give the negative views to imitation or imitative innovation in product development of Internet enterprises. Even though partly positive views, imitation or imitation innovation is considered to be a matter of expediency.

Current Circumstances of Development of Products among China's Internet Enterprises

China Internet Network Information Centre published "The 33rd Statistical Report about Chinese Internet Development" in January 16, 2014 in Beijing. The Report showed that the scale of users had risen up to 618,000,000, while the new Internet users had increased 53,580,000, and Internet penetration rate was 45.8% ending Dec. 31, 2013 (CNNIC 2014). In 2013, the top 10 Internet enterprises ranked on gross income in China in Table 1.

Table 1. The Top 10 Internet Enterprises Ranked on Gross Income

Rank	Enterprise	Industry Type	Main Product	Gross Income (billion RMB Yuan)
1	Alibaba	E-Commerce	Transaction platform	36.96
2	Tencent	Media+Game	instant messaging +Game	32.66
3	Baidu	Media	Search	20.47
4	Sohu	Media	Portal+Game	5.57
5	Neteasy	Media+Game	Portal+Game	5.17
6	Ctrip	Trip	Trip platform	4.00
7	Qihoo360	Media	Antivirus software	3.55
8	Alipay	Payment	Payment platform	2.40

9	Shanda	Game	Game	2.97
10	Sina	Media	Portal	2.39

The above table shows: BAT(Baidu, Alibaba and Tencent shortened as BAT) have obvious oligopoly advantages, their gross income is in the top three.

FEATURES OF NETWORK ECONOMY AND LOTKA-VOLTERRA MODEL

Features of Network Economy

Imitation phenomenon of a wide scope that has penetrated the product development of Internet enterprises has a lot to do with the features of network economy. First, network economy features a typical demand-side economy of scale. Network economy has strong positive network externality or positive network effect(Shapiro and Varian 1999). Positive network externality means that the value produced by accessing a website is determined by the number of other users who have been connected to the same website. For this reason, positive network effect makes the strong stronger and the weak weaker. J. Bain(1956) has proved that if the minimum effective scale is an important part of the industrial demand, the market is only able to allow the existence of a small number of enterprises. Therefore, network economy can only allow a small number of Internet enterprises to exist on each level as a result of competition on each level. Second, network economy also features a typical supply-side economy of scale. Strategic investment in e-commerce, whether initial or subsequent, is huge in amount and typifies the kind of investment that is high at fixed cost and low at marginal cost(Hallikainen, Kivijarvi and Nurmimaki 2002). For such investment to operate normally, production must reach a considerable scale and growth is essential. Eventually, an Internet enterprise will either be eliminated from the market or gradually become a large-scale competitive enterprise. And the number of big-scale enterprises won't be more. Finally, the materialized assets of those enterprises that provide network technologies and network products in network economy are not highly specialized. Besides, the cost for imitating network technologies and network products is low.

Species Competition Model

The Species Competition Model in ecology(Jiang, Xie and Yie 2003) refers to the situation in which two biotic communities compete for one type of limited food and limited space for survival. As has been analyzed above, competition among Internet enterprises, especially among large-scale ones, can almost be considered as between two enterprises. Two large-scale enterprises' competition for limited capital resources and limited market space in order to survive is similar to that between two biotic communities. Based on this, the paper uses the species competition model to discuss the possible effect of the competitive interaction of duopoly for the purpose of interpreting the competition model causes of the imitation phenomenon in product development of Internet enterprises and the principles of product development in Internet enterprises.

For convenience's sake, the symbols and assumptions for discussion are explained as follows:

- (1) $x_1(t)$ and $x_2(t)$ refer to the respective amounts of users competitor 1 and competitor 2 have at a certain point of time t .
- (2) N_1 and N_2 refer to the potential maximum amounts of users of competitor 1 and competitor 2 allowed by environmental resources and their own resources (also called the maximum possible capacity). Suppose N_1 and N_2 are finite constants, generally, $N_1 \neq N_2$.
- (3) r_1 and r_2 stand for the fixed rates of diffusion of the products and services provided by competitor 1 and competitor 2 under circumstances of no competition. Providing that r_1 and r_2 are constants, the products and services of competitor 1 and competitor 2 in their processes of independent diffusion can be described with the Logistic model.
- (4) σ_1 and σ_2 respectively refer to the competitive relation between competitor 1 and competitor 2 and the degree of competition. σ_1 represents the power of attraction possessed by the products and services of competitor 2 to the users of competitor 1. This power of attraction derives from competitor 2's power of depriving competitor 1 of its resources such as human resources, capital resources, and information resources, all of which will eventually turn into competitor 2's power of depriving competitor 1 of its users. Hence, σ_1 reflects the degree of threat presented by competitor 2 to competitor 1, or the degree of ability owned by competitor 2 to handicap competitor 1's progress. Same explanations apply to σ_2 . According to this definition, $\sigma_1 > 0$ and $\sigma_2 > 0$.

When the two Internet enterprises decide to adopt competitive strategies, a math model describing the effect of competition in a duopoly can be established as follows:

$$\begin{cases} \dot{x}_1(t) = r_1 x_1 \left(1 - \frac{x_1}{N_1} - \sigma_1 \frac{x_2}{N_2} \right) \\ \dot{x}_2(t) = r_2 x_2 \left(1 - \sigma_2 \frac{x_1}{N_1} - \frac{x_2}{N_2} \right) \end{cases}$$

In order to study the result of competition between two enterprises, namely, the trends of $x_1(t)$ and $x_2(t)$, at $t \rightarrow \infty$, a stability analysis of differential equation can be done of model (1). Through this analysis, a stable point of balance and the conditions of balance can be obtained (Jiang, Xie and Yie 2003) (See Table 2).

Table 2. Stability and Banance of mutually Competitive Model

Equilibrium point	Stability condition
$P_1 (N_1, 0)$	$\sigma_1 < 1, \sigma_2 > 1$
$P_2 (0, N_2)$	$\sigma_1 > 1, \sigma_2 < 1$
$P_3 \left(\frac{N_1(1-\sigma_1)}{1-\sigma_1\sigma_2}, \frac{N_2(1-\sigma_2)}{1-\sigma_1\sigma_2} \right)$	$\sigma_1 < 1, \sigma_2 < 1$

The above table shows the result of the local stability analysis of the point of stability. When an analysis of the locus is further applied, a result for overall stability can be obtained. These results imply that no matter what the initial circumstances are, the point of balance remains stable(Jiang, Xie and Yie 2003). (See Figure:1-2)

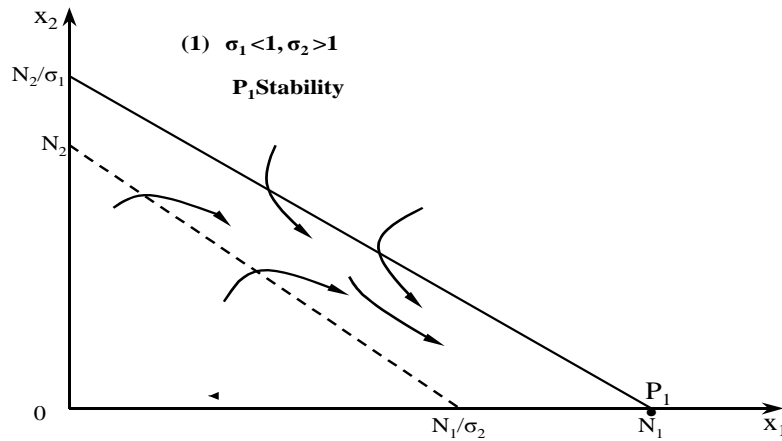


Figure 1: Phase plane analysis of stability for the equilibrium point

Fig.1 shows that when competitor 1 and competitor 2 try to compete for the users of the other, the locus, whichever area it starts, will move toward the point of balance at $t \rightarrow \infty$ as long as $\sigma_1 < 1$ and $\sigma_2 > 1$. Namely, as Fig.1 shows, when competitor 1 has the stronger power of getting hold of various resources than competitor 2, whatever its initial circumstances are, competitor 1 will turn out to be the one that survives competition and monopolizes the whole market. As is seen, the amount of competitor 1's users is close to the potential maximum amounts of users N_1 . Similarly, Fig. 2 shows that when $\sigma_1 > 1$ and $\sigma_2 < 1$, the point of balance $P_2 (0, N_2)$ is stable and that competitor 2 drives competitor 1 out of the market moving the amount of its own users close to the maximum N_2 .

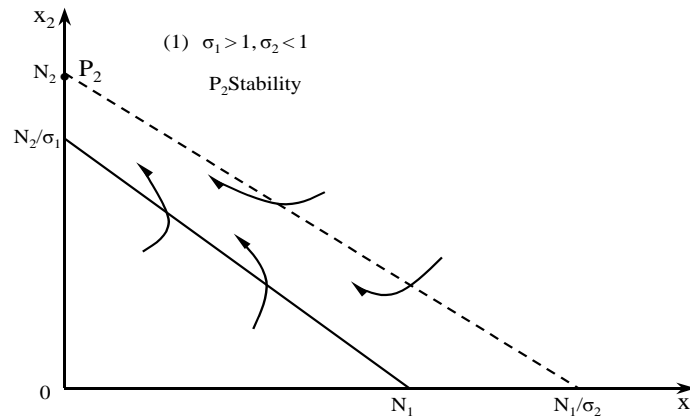


Figure 2: Phase plane analysis of stability for the equilibrium point

What is significant for the issue of network competition and imitation is that when competitor 1's products and services are similar to and can be replaced by those of competitor 2, the result will be $1/N_1 \approx \sigma_1/N_2$ and $\sigma_2/N_1 \approx 1/N_2$. In other words, the one enterprise's ability to prevent the other from diffusion equals its ability to impede its own diffusion. At this moment, if $N_1 > N_2$, then $\sigma_1 < 1$ and $\sigma_2 > 1$, which is the condition under which the point of balance $P_2 (0, N_2)$ remains stable. The above analysis shows that when the products and services of competitor 1 and competitor 2 are similar, the result of their competition will be determined by the maximum possible capacity.

CAUSES OF THE IMITATION OF INTERNET ENTERPRISES AND CONDITIONS FOR THE REALIZATION OF SUCH IMITATION

Imitation or imitation innovation does not only occur to Internet enterprises (Hu 2005; Cleveland 2007; Quattrone and Hopper 2006). The causes of imitation are closely related to the features of the interrelations of enterprises and to the degree of their correlation. The interrelations of enterprises are variously featured by rivalrousness, complementariness, derivativeness, and association among which association is most complicated. Though association is mostly related to complementariness and derivativeness, it may also derive from rivalrousness or have nothing to do with any of the three. Imitation or imitation innovation usually occurs to rivalrous enterprises. At the same time, the scope and degree of imitation is determined by the degree of the interaction of the enterprises..

Meaning of the Maximum Possible Capacity N and Causes of the Imitation of Internet Enterprises

The above analysis of the stability result of the species competition model indicates that under the circumstances that the two enterprises conform to the anticipated conditions of the model, when the two enterprises are not equal in competitive power, the enterprise that is stronger ($\sigma_1 < 1, \sigma_2 > 1$ or $\sigma_1 > 1, \sigma_2 < 1$) will eventually win the competition (P_1 or P_2). In this case, imitation is not the key factor to the success or failure of competition. However, when the two enterprises are equal in competitive power ($1/N_1 \approx \sigma_1/N_2$ and $\sigma_2/N_1 \approx 1/N_2$), the one whose the maximum possible capacity is larger will win the final victory (P_1 or P_2). Then, what is the meaning of maximum possible capacity?

The maximum possible capacity N in species competition model refers to that the biotic communities can reach its largest number under the constraint of environmental resources. The size of N is closely related to the amount of resources and the ways of supply of resources. When enterprise competition follows the species competition model, N refers to the potential maximum possible number of users allowed by the environmental resources and the resources of an enterprise itself, determined by the features, varieties, prices and means of supply of the products and services offered by the enterprise, as well as by customers' brand-name preferences. The richness and inclusiveness of the enterprise's products and services will greatly influence its maximum possible capacity and is in positive relation with this capacity.

The species competition model interprets the causes of the operation homogenization of Internet enterprises in an essential way. As the model shows, the result of the competition between two enterprises of equal

competitive power is determined by the enterprises' maximum possible capacities. In other words, in order to win the competition, the products and services offered by an enterprise to customers must be richer in variety, of higher performance-cost ratio, and supplied through more convenient and efficient channels. Besides, the varieties of these products and services should cover or almost cover those offered by the opponent of the enterprise. Otherwise, the feature of rivalrousness as one of the enterprises' interrelations cannot be applied. In popular terms, this "inclusive" competitive strategy means that I have not only what "you" (competitive opponent) have (products and services) but also what you don't have and that I only need to have a little bit more and to do a little bit better than you do. Thus, it can be inferred that the tendency of the imitation of the scope of content is required by and the essential result of the victory of one enterprise over another in their competition on equal status. Derived from this imitation is the tendency of the imitation of strategy and operation.

Conditions for the Realization of the Imitation of Internet Enterprises

The operation of Internet enterprises has been highly imitated. One of the reasons is that the features of network economy make the interrelations of Internet enterprises more compatible to the preconditions of the species competition model, that is, oligarchy competition is almost equal to duopoly, so that the enterprises internally demand homogenization. The other reason is that the features of network economy endow Internet enterprises the sufficient condition under which operation and product imitation can be realized (Hallikainen, Kivijarvi and Nurmimäki 2002). Song (2006) also points out that in contrast to enterprises in traditional economy, Internet enterprises have a low level of specialization as far as their materialized assets are concerned and that pure software imitation related to the development of network products and services rarely encounters the problem of assets speciality. So, if an enterprise intends to imitate when competing with other enterprises, it can do so on the existing platform of its own technological development so that the cost of inheritance development is comparatively low. The software tools and development language related to the development of network products and network services are highly analogous. The source code used backstage is also highly open. All these, making imitation easy, accelerate the rate of imitation. As far as network products and services are concerned, the chains of supply among Internet enterprises are simple and short. When imitation occurs, other enterprises are rarely involved. Thus, innovation is easy to realize.

STRATEGY OF PRODUCTION DEVELOPMENT OF INTERNET ENTERPRISE

Today competition among enterprises is becoming ever stronger. Differentiation is very often accepted as an effective way of achieving competitive advantage, and innovation is appreciated because of bringing differentiation (Porter 1985; Pan and Chen 2003; Sima 2012; Wang and Zhang 2012). However, how do we think about imitation and homogenization brought by imitation? The above conclusions have demonstrated to Internet enterprises the correct way of competitive thinking: competition among Internet enterprises cannot avoid imitation under the sufficient condition that imitation can be realized at low cost and high rate and with little difficulty. Only by implementing an imitation strategy first and on the basis of it maintaining a competitive balance with the opponent can an enterprise resort to a differentiation strategy to achieve further competitive advantage. What should be specifically noted is that although the part differentiated ($N_i - N_j$) may be small, it is crucial for the final result of competition between two enterprises.

Internet enterprises make different strategies at different stages of development. Small-sized enterprises can adopt the "Niche" strategy making their products and services complementary to or derivative of those of larger companies in order to prevent the positive network externality of these big enterprises from turning into impediments to their own growth. When a small-sized enterprise has become a medium-sized one, competition cannot be avoided and business analogousness or overlapping (homogenization) will become essential and unavoidable. Here, homogenization implies imitation. When a medium-sized enterprise is on its way to becoming a big enterprise, only imitation is not enough, innovation has become the necessary. Must be the disruptive or radical innovation? No, a little innovation is OK, that is, a special type of incremental innovation: inheritance innovation. Inheritance innovation belongs to "inclusive" competitive strategy.

CONCLUSION

To sum up, it is on the basis of imitation that medium and big Internet enterprises can derive their competitive advantage from differentiation. Imitation plays an important role in the growth path of Internet enterprises, and it is not a matter of expediency. As long as the two enterprises are equal in competitive power, these principles are applicable. In product development, Internet enterprises can use inheritance innovation strategy to gain the competitive advantages with small cost.

An analysis of the operation Imitation of Internet enterprises facilitates an understanding of the competition pattern of existing large-scale Internet enterprises in China described as follows. The different types of the

large-scale Internet enterprises imitate are imitating and penetrating each other. For example, Alibaba are entering instant messaging market through the “Wanglai” to compete with Tencent’ “WeChat”. Similarly, Tencent is using “Tenpay” to compete with Alibaba’s Alipay in the payment market. In March 12, 2012, the two network video leader Tudou and Youku merged to Youku-Tudou. Haven’t Alibaba and Tencent realized that the powerful Tencent’ “WeChat” and Alibaba’ Alipay have already existed before them? Tudou and Youku compete in the end, and isn’t this great? In fact, these are all practices of at the principles “inheritance” of inheritance innovation strategy.

An analysis of the operation homogenization of Internet enterprises may also shed light on the future practices and competition results of large-scale Internet enterprises in China. For example, Because there is no difference both between Alibaba’ “Wanglai” and Tencent’ “WeChat” and between Tencent’ “Tenpay” and Alibaba’ “Alipay”(N₁=N₂), if “Wanglai” and “Tenpay” is not successful, it is not surprising.

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