Business Models, Symbionts and Business Ecosystem: A Case Study from E-commerce Industry in China

Wei Wei, Wuxiang Zhu, and Guiping Lin

Abstract. The essence of a business model defines a transaction structure that involves stakeholders. This article examines the transactional features that exist between stakeholders, such as relationships and form. We also introduce the new concept of "symbiont" and analyze the aggregation of the focal firm's and stakeholders' business models. By proposing this innovative concept, we seek to bridge the gap between the macro Business Ecosystem and micro Business Model, and as such expand our ideas about business models. The concept of "symbiont" in the business model that we have created provides a shared coordination system for different business models under the same business ecosystem, making direct comparison between them possible. Moreover, it allows us to analyze a focal firm's business model from a micro perspective, which may clarify how to precisely and scientifically restructure or reform the focal firm based on the anatomic picture of the company. To explain this theory, our research focuses on China's E-commerce industry.

Keywords: Business Model, Symbionts, Business Ecosystem, Stakeholders.

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1 Introduction

Traditional management research studies the organizational structure of enterprises, the relationships between various departments and staff, and the nature of specific business and management activities. The micro perspective focuses on staff while the macro perspective centers on the organization and industry. The corresponding evaluation criteria comprise various operational indicators that can be summarized into capabilities that in turn are able to fully utilize existing resources.

Research into business models studies the transaction structure, specifically the relationships and modes that bind the focal enterprise and stakeholders. The research perspective can be narrowed to focus on an enterprise's internal stakeholders, for example, internal logistics, information and payment platforms (with independent investments/profits), specific parties' interests, and rights allocation. These items can be broadened to cover the entire business ecosystem, including the external stakeholders that exist under the focal enterprise, such as suppliers, partners, customers, and competitors. We can also include the stakeholders of the focal enterprise's stakeholders, such as the suppliers and customers of its suppliers and customers, as well as its competitors' partners. The evaluation criteria represent the value and efficiency that is thus created. We can observe how value is created and transferred among stakeholders, and how much is acquired by the focal enterprise.

Expanding our perspective offers the following three benefits: (1) It defines the source of focal enterprise value and the value transfer path that runs through macro structures such as the business ecosystem; (2) It analyzes the focal enterprise from a micro perspective (internal and external stakeholders) to optimize the enterprise; (3) Unlike the previous comparison models of enterprises in the same sector or with the same industry background, the symbiont perspective creates a universal coordination system that can compare the varied business models operated by different enterprises.

The key to connecting the micro perspective – the business models of the focal enterprise - with the macro view involves creating a 'middle' research perspective. This is the focal point of our research: the symbiont prospective.

As an industry that has emerged rapidly over the past few years, e-business provides an ideal research subject for the following reasons:

The Internet and mobile Internet represent the future direction of business development. E-business will play a key role in this process;

Multiple typical business models have been created as e-business continues to evolve, providing an ideal background for the study.

2 Literature Review

Business models are highly important in both the business and investment sectors (IBM, 2008). However, related academic study remains sluggish due the lack of precise definitions (Zott, Amit & Massa, 2011). Some scholars define business models as the logic of value exchange and creation (Linder&Cantrell, 2000; Gordijn&Akkermans, 2001; Petrovic, Kittl&Teksten, 2001; Osterwalder, 2004),

while others define them as the transaction relationship between enterprises and various stakeholders (Weill &Vitale, 2001; Amit&Zott, 2001). Recent research, Zott and Amit (2008) defines the transaction relationship as a system that comprises detailed activity systems implemented by the focal enterprise or its partners, the connection mode of these activities, and the stakeholders responsible for the operation and management systems. Wei & Zhu (2007) defined business models for the first time as transaction structures that involve stakeholders, and proposed in their latest research that business models mainly comprise transaction subjects, content, modes and pricing strategies (Wei, Zhu & Lin, 2012).

Wei, Zhu & Lin (2012) expanded the organizational, legal and corporate governance borders of the stakeholder's perspective to connect to previous research. Stakeholder theory mainly applies to corporate governance, and its primary purpose is to specify enterprises' social responsibilities. Stakeholder theory believes that enterprises should pay attention not only to related shareholders and creditors, but also to the customers, staff, communities and governments to whom they assume charitable, moral and legal responsibilities. (Freeman, 1984; Carroll, 1993)

Opinions are widely divided over the definition of stakeholders. Unlike the theory that applies to the corporate governance field, Wei, Zhu & Lin (2012) refined the definition of a stakeholder as a party that has independent interest demands and resources and is involved in transactions with the focal enterprise.

Defining the border of what constitutes stakeholders also varies among scholars, ranging from core stakeholders that directly work with enterprises to the entire business ecosystem (Moore, 1993). The business ecosystem concept comprises both the business activity and the ecosystem. It holds that the business ecosystem is very similar to the bio-ecosystem in terms of self-organization, self-adaptation, co-evolution and emergence (Peltoniemi and Vuori, 2004). Initially, the business ecosystem included "4P3S", i.e. people, place, product, process, structure, shareowner and society (Moore, 1996); in recent years, it has begun to incorporate business models (Tian, et al, 2008).

We believe that it is necessary to establish a suitable border for stakeholders that lie between the narrow definition of core stakeholders and the broader view that covers all the stakeholders in the entire business ecosystem. In this article, we define the stakeholder border point as the ‘symbiont border’.

Like the business ecosystem, the concept of symbiont originated from biology and is used to describe creatures of different kinds that co-exist, co-evolve or restrain each other (Ahmadjian, 1986). In recent years, it has become a philosophical concept and an independent discipline that focuses on symbiont units, modes, and environments. The theory is widely used in urban design (Kisho Kurokawa, 1987) and global competition (LEE, Seung-ryul, 2005). Unlike symbiont theory, the symbiont concept proposed in this article mainly focuses on the general transaction structure created by the focal enterprise and their stakeholders to co-exist and evolve, and is closer to the biological meaning.

It differs from the strategic alliance concept, the definition of which still varies widely among scholars. Some define it as the scope of the value chain that connects enterprises (Porter, 1997), while others view it as a transitional governance structure (Williamson, 1991). Overall, most agree that a strategic alliance has the following characteristics: complementary resources, shared risks and interests, long-term dynamic contracts and exclusivity (Yoshino and Rangan, 1995; Spekman

et al, 1998; Borys and Jemison, 1989). Unlike a strategic alliance, the symbionts defined here comprises short- and long-term cooperation, resource-balancing and, above all, business models that include value creation and transfer structures and relationships, rather than a governance structure or exclusiveness.

3 Three Typical E-business Models in China

There are three typical e-business models in China: direct manufacturer sales (TCL), intermediary e-business (Dangdang) and third-party platform e-business (Alibaba).

3.1 Direct Manufacturer Sales

Some electric home appliance manufacturers, such as TCL, concurrently run online and offline stores.

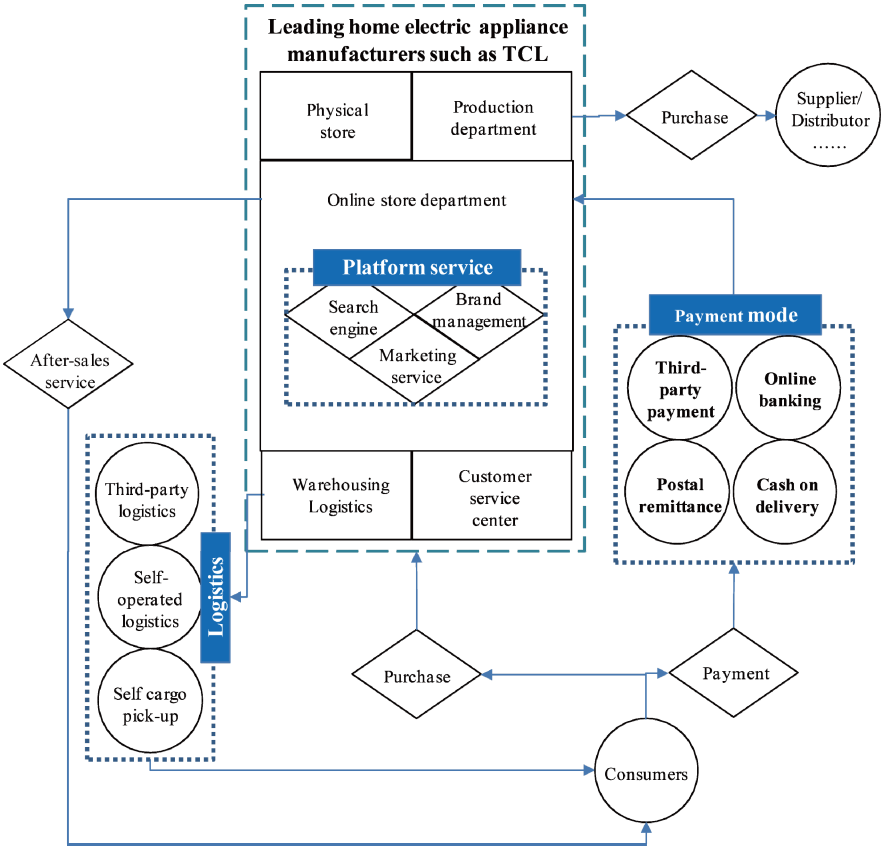

Fig. 1 Director manufacturer sales

These types of manufacturers provide search engines and brand management and marketing services for consumers through e-business channels, enabling consumers to select and pay for products using various payment modes, for example, third-party payment platforms, online banking, postal remittance and cash on delivery. They also provide various logistics modes such as third-party logistics, self-operated logistics, and self cargo pick-up, as well as various after-sales services.

These companies' e-business activities mainly involve managing offline stores, manufacturing, search engines, brand management, marketing, warehousing and logistics, and customer service centers on an e-business platform.

3.2 *Intermediary E-business*

Intermediary e-businesses such as Dangdang purchase products from suppliers and distributors, and provide e-business services including search engines, brand management and marketing services to enable consumers to select and pay for

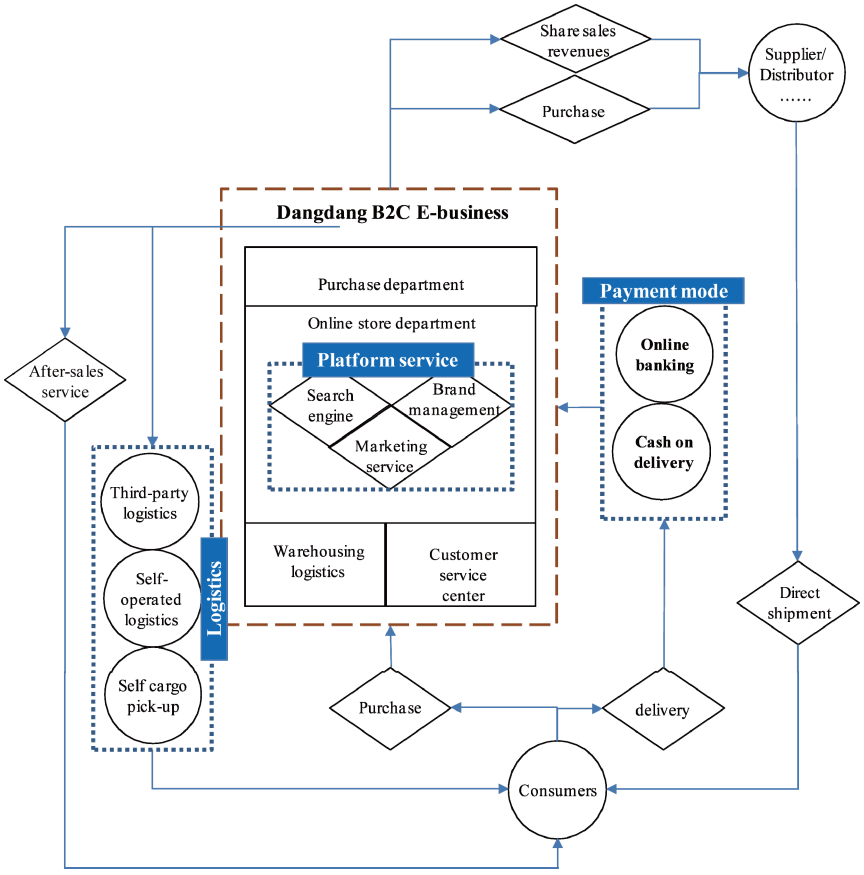

Fig. 2 Intermediary e-business system

products through online banking or cash on delivery. The products are delivered to consumers by third-party logistics, self-operated logistics or self cargo pick-up.

Dangdang has established a channel for suppliers to directly conduct transaction with consumers, much like the third-party e-business mode.

The e-business activities of intermediary e-business include purchasing and online store management (search engines, brand management and marketing), warehousing and customer service centers.

3.3 *Third-Party Platform E-business*

Third-party platforms such as Alibaba provide only the e-business channels, marketing and payment tools. Online stores can use these paid or free tools to display their products (usually purchased from suppliers or distributors). Consumers can pay for their products through Alipay, online banking or cash on delivery. Online stores usually use third-party logistics for customers and provide after-sales services.

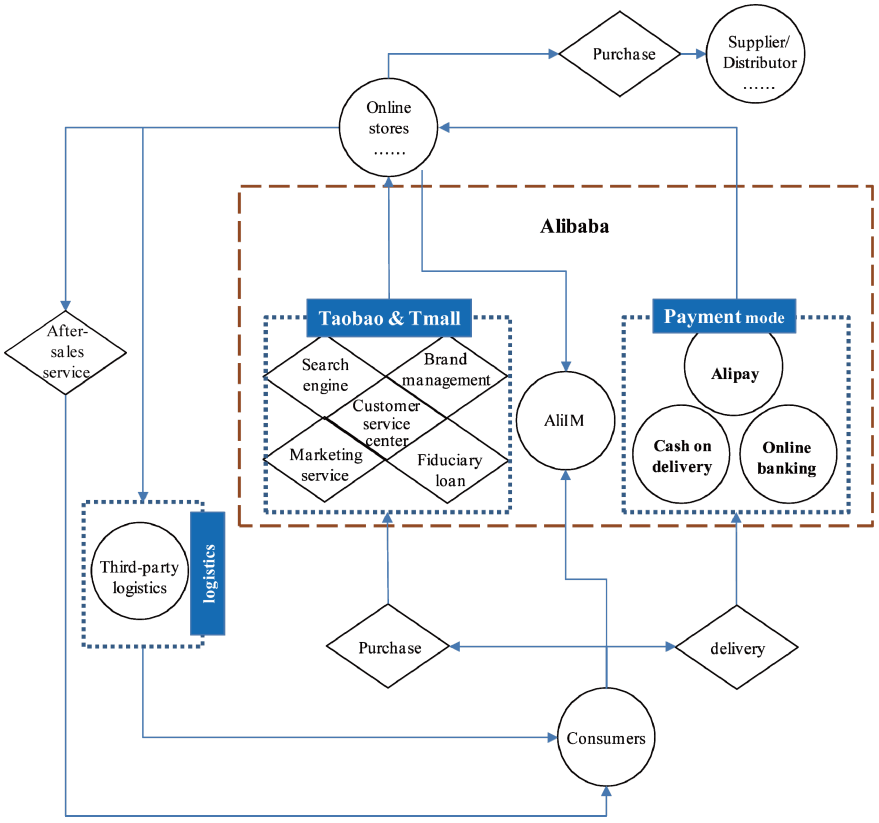

Fig. 3 Third-party platform e-business system

The business activities of third-party platforms involve online promotional channels (Taobao & Tmall, which includes e-business services such as search engines, brand management, marketing, customer services and credit); AliIM; and payment modes (including Alipay, cash on delivery and online banking).

The system figures for the above three e-business models reveal many common areas in terms of stakeholders, business, and management activities because all three belong to one symbiont.

4 Symbiont: Concept and Relationship with Business Models and the Ecosystem

The symbiont comprises the business models of the focal enterprise and part of the business models of its stakeholders.

For example, in the third-party e-business scenario mentioned above, the focal enterprise Alibaba (Taobao and Tmall) transacts with online stores and consumers, and the main activity system comprises network display channels, AliIM, and payment modes based on business model analysis.

Concept 1
Business models are the transaction structures that involve focal enterprises and their stakeholders

To expand the symbiont analysis area, stakeholders' business models must be analyzed. For example, online stores purchase products from suppliers and distributors and deliver them to consumers through third-party logistics companies. In addition to the focal enterprise and its stakeholders, a transaction structure also involves stakeholders' stakeholders, such as customers' customers, suppliers' suppliers and competitors. The symbionts also include internal stakeholders that have independent outputs, interest demands and rights distribution, such as logistics companies and information and payment platforms. The border of this definition is flexible. The overall transaction structure comprises the business model of the focal enterprise and part of the business models of the stakeholders.

Concept 2
The symbiont comprises the business models of the focal enterprise and part of the business models of its stakeholders

If we study the three e-business models using symbiont analysis, we discover that the three models belong to the same symbiont.

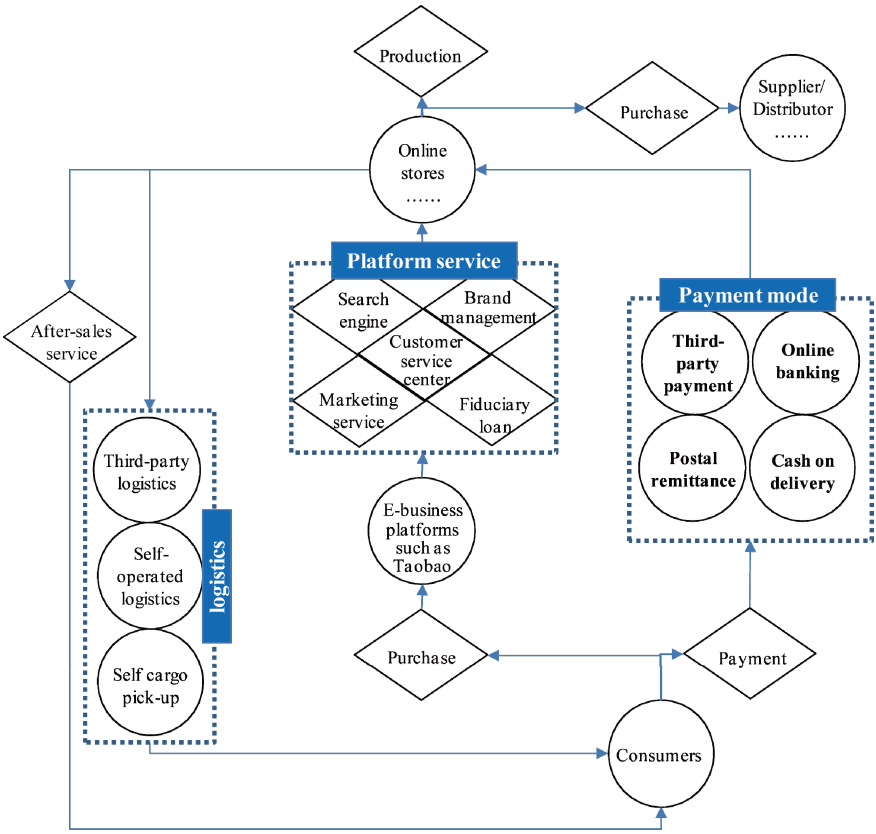

Fig. 4 E-business symbiont system

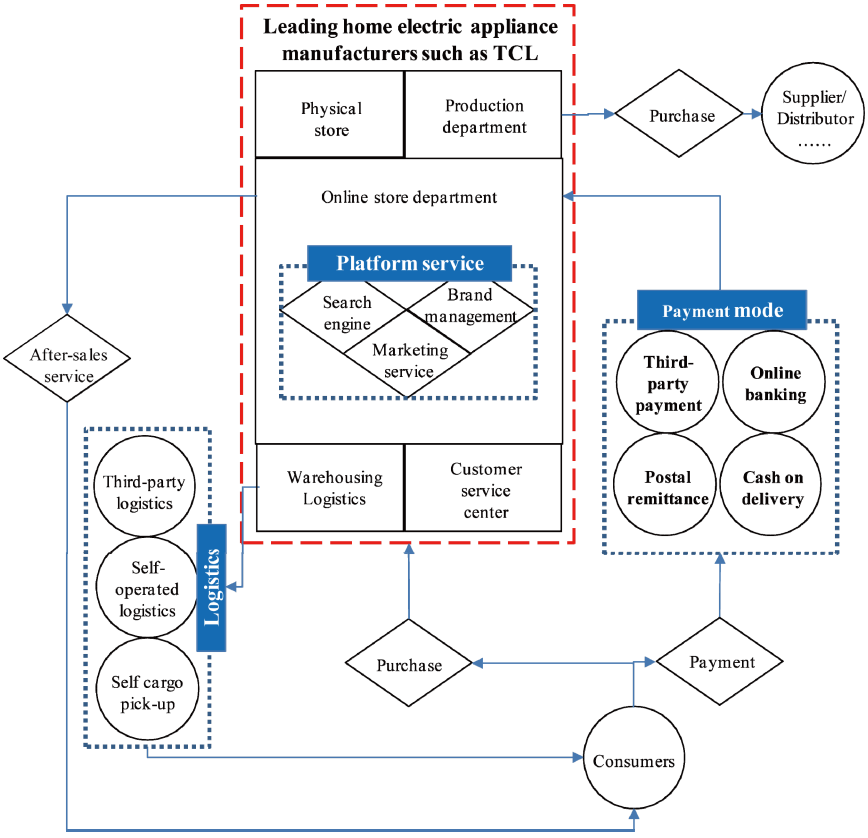

Fig. 5 E-business symbiont – direct manufacturer e-business system (the area enclosed by the red box is the focal enterprise)

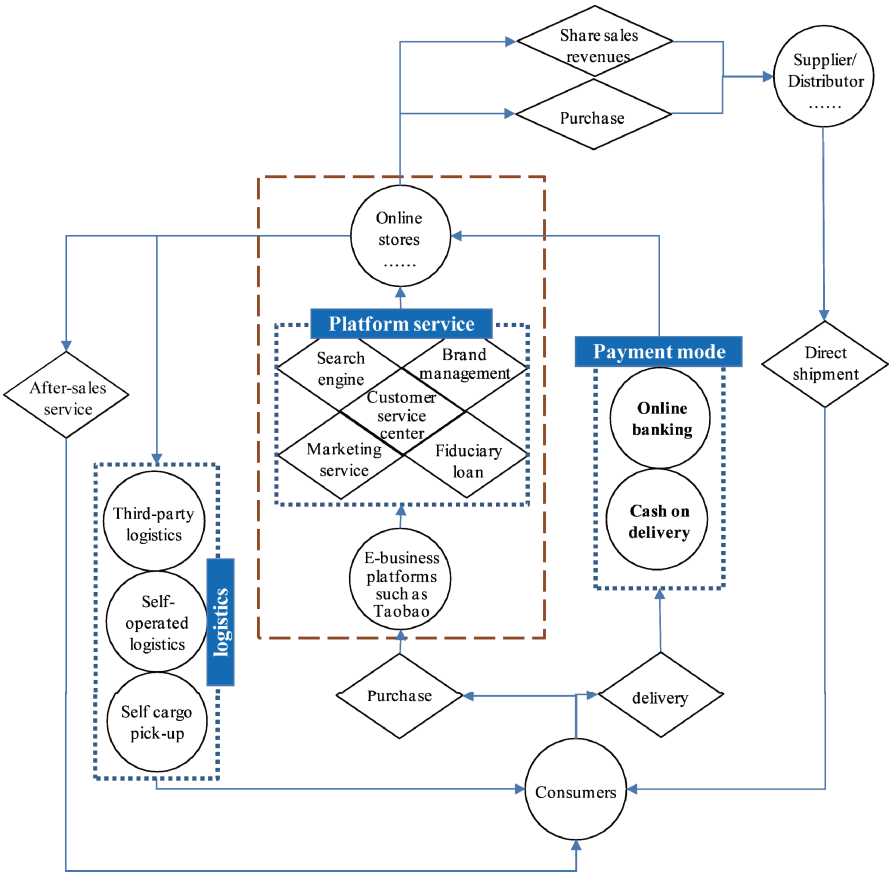

Fig. 6 E-business symbiont – intermediary e-business system (the area enclosed by the red box is the focal enterprise)

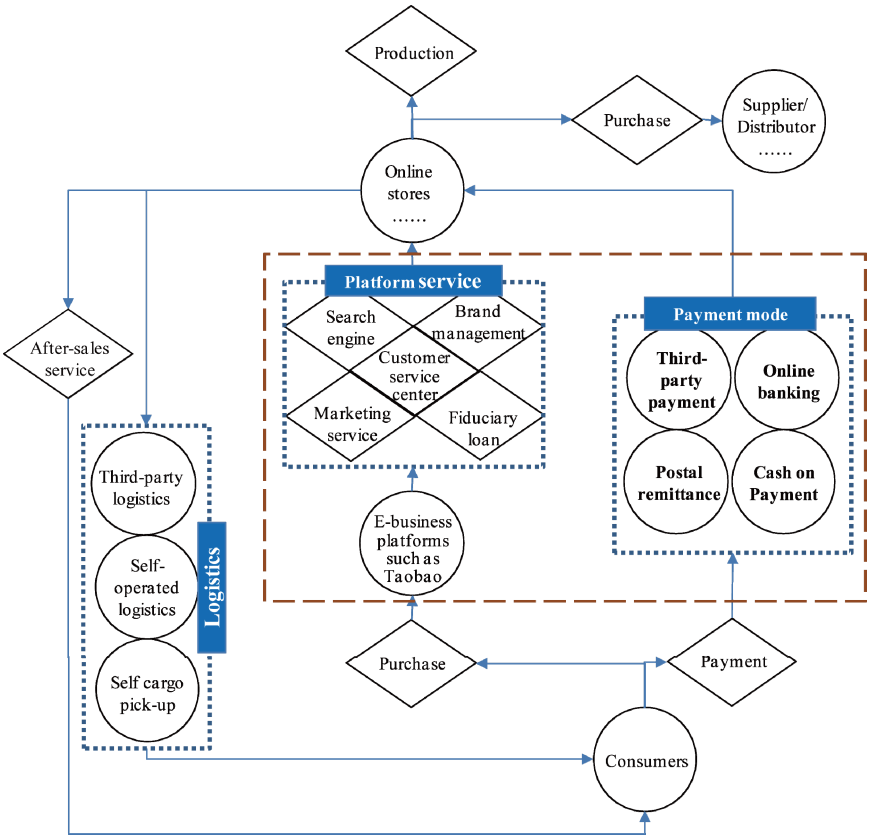

Fig. 7 E-business symbiont – third-party platform e-business system (the area enclosed by the red box is the focal enterprise)

When a symbiont involves the business models of specific stakeholders, only the business models that relate to the focal enterprise are analyzed; i.e. those that involve direct, indirect or potential transactions with the focal enterprise. Therefore, a symbiont only involves part of the stakeholders' business models.

Concept 3

The business ecosystem comprises the focal enterprise's symbiont, and the symbionts of its competitors (including similar products and substitutes), partners, and upstream and downstream stakeholders.

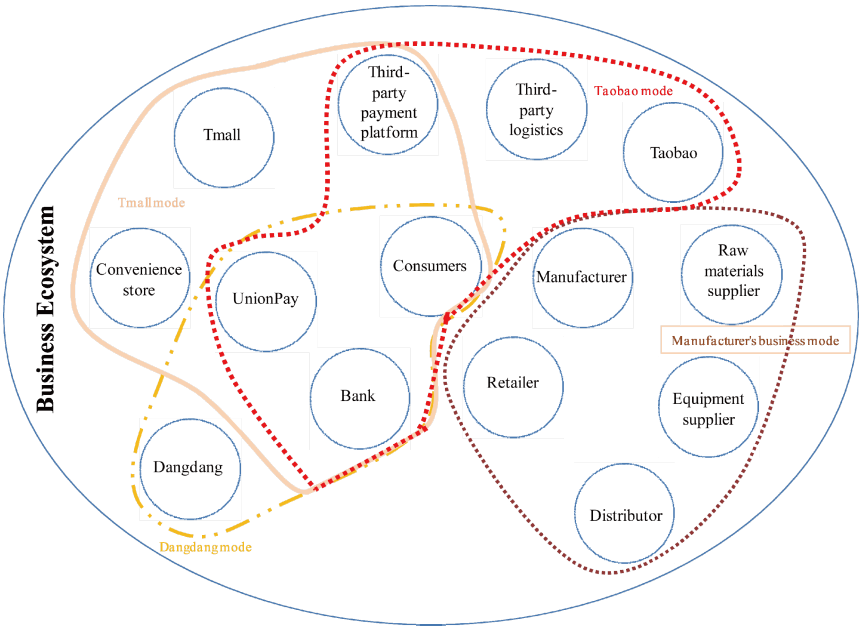

Fig. 8 Scope of stakeholders[1]: business models, symbiont and business ecosystem

The business ecosystem is another term that is often discussed with the focal enterprise's business model and symbiont. In essence, the business ecosystem comprises the symbiont, which in turn comprises the focal enterprise's business model.

The business model comprises the focal enterprise, stakeholders and their activity systems.

In addition to the focal enterprise's business model, the symbiont includes part of the business models of the stakeholder that have direct, indirect and potential transactions with the focal enterprise. For example, the business model of a third-party platform involves online stores and consumers, while the symbiont of the third-party platform includes third-party logistic companies, suppliers and distributors, and the business models of online stores. The business models of online stores also include the models of the banks and tax agencies that are linked to the third-party platform. Therefore, the symbiont fuses the third-party's business models and part of the business models of the online stores.

In addition to the focal enterprise's symbiont, the business ecosystem comprises symbionts of competitors that produce similar products, substitutes of their products, and upstream and downstream stakeholders. As shown in the above

[1] The activity system has a similar definition. To simplify the figure, the activity system is omitted.

figure, the business ecosystem comprises the symbionts of the three typical business models.

If the stakeholders in some symbionts are involved in one industry, their symbionts and those of their competitors form an industry ecosystem. The cross-industry symbionts formed based on such industry ecosystems form a business ecosystem.

5 Business Model Innovation from the Symbiont Perspective

1 Expanding from stakeholders to their stakeholders or further;

From the symbiont prospective, we can innovate a third-party platform e-business model to cover our customers' customers, suppliers' suppliers, and customers' partners, and then compare this model with the direct manufacturer and intermediary e-business models. This type of comprehensive macro perspective helps us with business model innovation and restructuring (see the following figure).

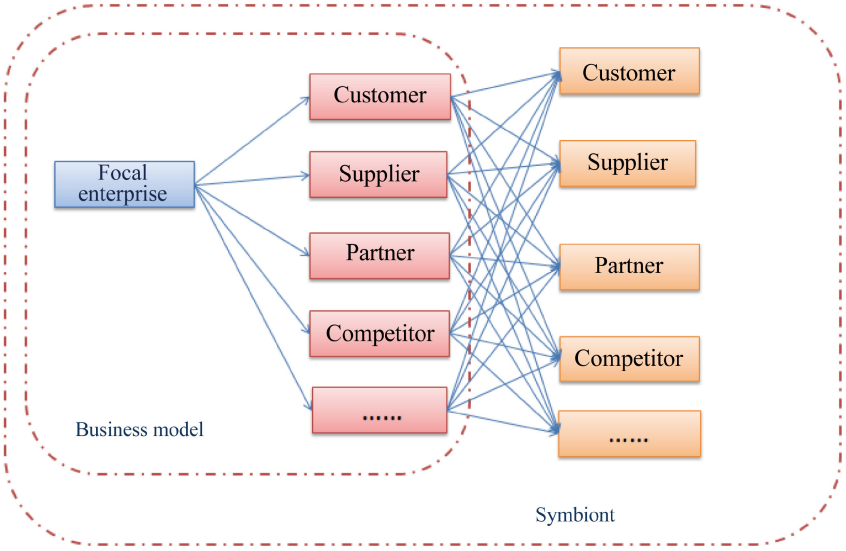

Fig. 9 Expansion of stakeholders (from a business model to the symbiont)

2 Expanding the existing value space to the entire business ecosystem

As shown the following figure, a symbiont creates transaction value for the stakeholders involved in the symbiont, and these stakeholders pay the

corresponding transaction costs[2]. The margin between value and costs is called the value space. In addition to transaction costs, the focal enterprise and stakeholders pay monetary costs[3] such as raw material costs. The appreciated value is equal to the value space minus the monetary cost, or the surplus of the focal enterprise (enterprise value of the focal enterprise) plus the surplus of the stakeholders.

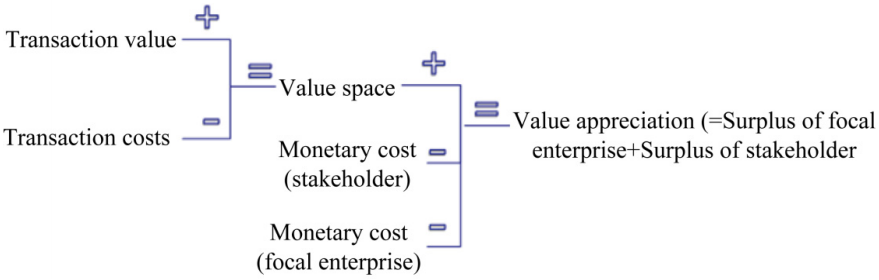

Fig. 10 Value space and appreciated value

From the perspective of an entire symbiont, the final sales value of e-business equals the total revenue from the platform and the logistics and payment services: i.e. the appreciated value shown in the following figure (e-business sales value = unit price x average sales volume of each online store x total number of online stores) minus the transaction and monetary costs incurred during production, transportation and sales. It also represents the maximum enterprise value that can be obtained.

3 Changing the business model from pursuing business scale and profits to integrating transaction value, costs and risks

To maximize value for an enterprise, e-businesses can increase transaction value by raising unit price, the average sales volume of each online store or the number of online stores; reducing transaction costs such as coordination, management and borrowing costs, and tax; or lowering monetary costs such as production and logistic costs. If a new business model raises the transaction value, both transaction and monetary cost rise in parallel. A new business model is effective only when the rise in transaction value exceeds the rise in transaction and monetary costs.

[2] Here we define transaction costs as costs caused during transactions.
[3] Here we define monetary cost as cost generated by the transaction object.

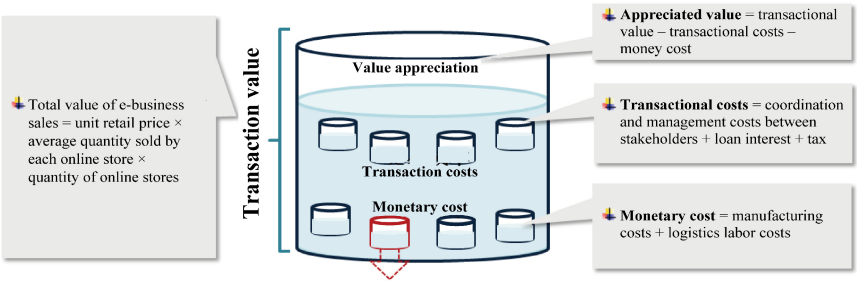

Fig. 11 Appreciated value of e-business eco-system

4 Expanding from existing stakeholders to new stakeholders

The symbiont concept provides a wider perspective for entrepreneurs to find resource weaknesses and design-in new stakeholders to compensate.

For example, Taobao has introduced online stores in third-party platform mode. Given the huge number of scattered stores, Taobao introduces agents to reduce business and transaction difficulties. The introduction of new stakeholders such as business agents substantially elevates Taobao's competitiveness.

Here we assume that the three e-business models utilize the same technologies, management methods and infrastructure. However, if any of these factors differ, both the symbiont and value change, even if the stakeholders and activity system are the same.

6 Division and Reorganization of Symbiont and Business Model Designing

Symbiont expands the prospective from the focal enterprise and its stakeholders to the entire business ecosystem, which spans the whole activity and industry value chains. The entire business ecosystem can be divided and reorganized in three aspects.

Any business and business activities involve investment, processing and output. Investment involves resources, processing reflects stakeholders' capabilities, ownership of output defines the stakeholders' roles (functions, powers and resource capabilities).

These elements, investment, activities[4] and output[5], can be divided.

[4] It is to divide an activity into several small activities, such as the three activities shown in the figure.

[5] It is to further divide the small activities into smaller ones.

Here, we must distinguish resources from capabilities. Resources include raw materials and spare parts to be invested, which are transaction objects before processing. Capabilities are stakeholders' properties that may affect the output throughout the business process. Such properties of stakeholders can be assessed. Specifically, we can assess such properties in two aspects: strengthen, which is reflected by the impacts of the stakeholder on the output, and stability, which is reflected by the variance in the output with the same stakeholders, time and environment.

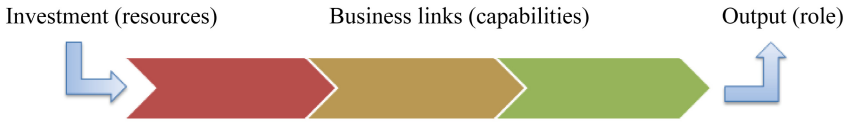

Fig. 12 Three divisions

Divided resources, capabilities, businesses, management activities, and outputs (roles) can be reorganized to form new stakeholders that create a new business model.

The symbiont is an activity system that comprises stakeholders who operate different business models, reflecting their different relationships with the business system. Business systems and stakeholders provide different perspectives through which to analyze symbionts and business models.

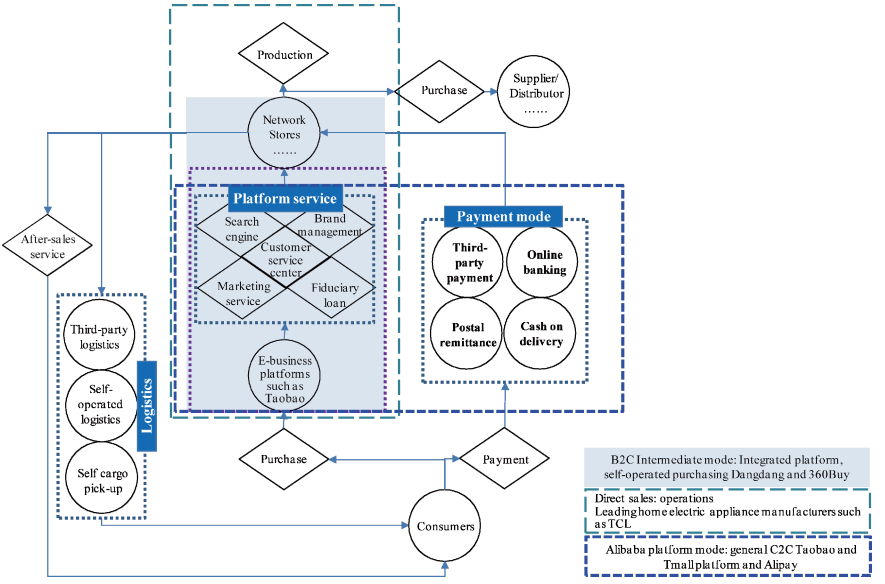

Fig. 13 Three business models for e-business (in the same symbiont)

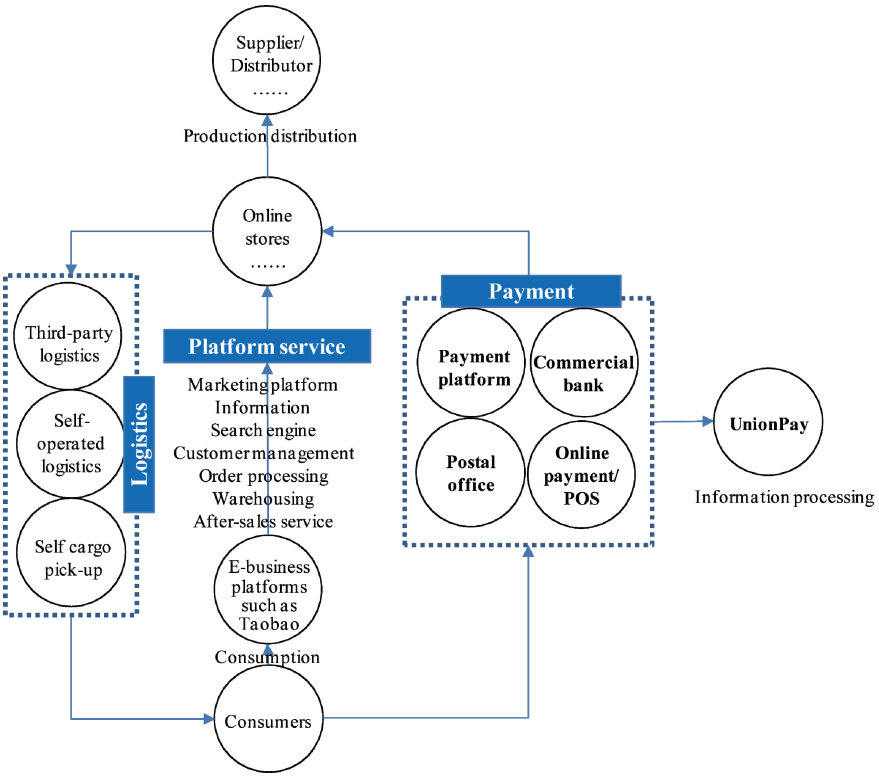

Fig. 14 Stakeholders and activities in the e-business symbiont

The relationships between stakeholders and activities are displayed in the following chart. The first row shows the divided activities and the rows below contain the corresponding stakeholders.

Division and reorganization of roles and resources are similar with the division of activities.

Division and reorganization can be assessed by three elements: transaction value, costs and risks. The division and reorganization of a business activity, role and resource capability will create specific transaction value, costs and risks. To elevate the business model's efficiency, the division and reorganization must realize at least one of the following targets: elevating the transaction value; lowering transaction costs; reducing transaction risks; or realizing a net increase in the transaction value.

The symbiont perspective is used to design business models in the following three scenarios

Analyzing the stakeholders and activities involved in a symbiont provides entrepreneurs with a full view of the business ecosystem. After deciding which activity to operate, an entrepreneur can design a business model to reflect its relationship with the activity.

Entrepreneurs can design strong business models that promote value appreciation in the symbiont in the following ways:

Elevating transaction value: increasing stakeholders (for example, iPhone's iTunes and App stores), expanding the business scale of similar stakeholders (chains and bilateral platforms), and increasing the demand of similar stakeholders (group purchases and complete solutions).

Table 1 Relationships between activities and stakeholders

Business links	Online stores	E-business platform	Independent e-business	Supplier/distributor	Third-party payment	Online banking	UnionPay	Physical store	Logistic company
Production				■					
Search engine	■	■	■					■	
Marketing service	■	■	■					■	■
Purchase				■				■	
Payment					■	■	■		
Logistics	■	■	■						■
After-sales service	■							■	
Communication between buyer and vendor	■		■					■	
Warehousing	■	■	■	■				■	■
Customer management	■	■	■			■	■	■	
Financial guarantee					■				
Credit and repayment							■		
Intermediary payment agent					■	■	■		

Lowering transaction costs: standardizing modules, integrating the backstage, merging similar transactions, and controlling governance structure and resource capabilities;

Reducing transaction costs: dividing and transferring risks through real object options and profit mode design;

More effective symbionts can be designed by analyzing, dividing and reorganizing the existing symbiont's transaction costs and risks.

7 Three Symbiont Theories

The three e-business models have the same stakeholders and activities. What can we learn by comparing the changes to symbiont efficiency under different business models? To answer this question, we have proposed the following three theories:

1 The efficiency of a non-dissipative symbiont is unaffected by different models

A non-dissipative symbiont must meet the following two conditions:

(1) Each transaction process incurs transaction costs that are transferred to one or multiple activities and stakeholders within the symbiont;

(2) Each transaction object includes multiple properties[6], each of which is fully priced and traded internally.

This transaction process meets the first condition because the value created by a non-dissipative symbiont is only transferred within the business system and between the stakeholders in that symbiont.

Different business models reflect the changes in relationships between business activities and stakeholders. The efficiency of a symbiont is assessed by transaction value, costs and risks.

In the ideal non-dissipative scenario in which the symbiont defines the extension of stakeholders (resources and capabilities) and business activities, business models only vary in terms of the relationships between business activities and stakeholders. A symbiont has no internal value dissipation such as transaction costs and unmatched capabilities and rights. Given the definition of the symbiont's border and the lack of external value exchange, the efficiency of the symbiont remains unaffected.

2 The efficiency of a dissipative symbiont is affected by different business models[7]

Dissipation in a symbiont occurs for two reasons:

Transaction costs can be divided in two ways: (1) They are transferred to one or more business activities and stakeholders in the symbiont; (2) They are transferred externally or dissipated, creating a non-zero result.

Some transaction object properties are either not fully priced or externalized during the transaction process, which impairs value.

If the symbiont's border is defined through dissipation when enterprises adopt different business models, the transaction costs and risks caused by transaction division and reorganization between stakeholders and the value dissipation in the symbiont will be different, which in turn alters the symbiont's efficiency. For example, assume that a third party provides services on a third-party e-business platform for an online store that holds fully priced operating capabilities and obtains all the profits from independent operations. This mode lowers value impairment and is more efficient than the intermediary e-business mode because the latter has to

[6] Such as quality, function, outer appearance, materials and experience.

[7] Note: If different business models possess the same dissipation features, the symbionts will have the same efficiency level; however, we assume that dissipation is different here because this scenario is unlikely in reality.

balance operational and e-business services. Therefore, the global scale of this type of third-party e-business platform is greater than other e-business models.

This culminates in our third theory:

3 An enterprise in a dissipative symbiont adopts the most efficient initial business model, resulting in efficiency gains that are clearly higher than the original or any alternative business model

The theory shows that changing the business model incurs costs, and that this must be considered by enterprises when selecting and designing effective business models.

Given the equal dissipation involved in establishing different business models, a symbiont's efficiency depends on the transactions within the business model and the dissipation caused by changing it. Changing a business model causes business activities and stakeholders to divide and reorganize, and triggers value dissipation, which can be neglected. Initially choosing the most efficient[8] business model creates higher efficiency than modifying or restructuring an original business model because doing so avoids value dissipation from division and reorganization.

Even if the existing business model is inefficient, it should not be changed if the costs of division or reorganization are excessive or if the resulting increase in value dissipation exceeds the subsequent transaction value. Moreover, if the total value dissipation of the symbiont exceeds its transaction value, the transaction structure between the focal enterprise and stakeholders will collapse unless external value is introduced into the symbiont.

Business models can be divided and reorganized. Specifically, division divides resources, activities (business and management activities) and outputs, while reorganization redefines the relationships between activities and stakeholders.

Modifying a business model must meet at least one of the following three targets: increasing transaction value, lowering transaction costs and risks, or elevating efficiency (determined by the transaction value, costs and risks).

8 Conclusion and Outlook

Research on business models expands the perspective of enterprises and their stakeholders. Although the business ecosystem provides a macro research perspective, it lacks a middle ground and a unified reference system for comparing and innovating business models. The theory of symbiont fills this gap.

Symbiont theory offers the following three benefits: (1) It defines the source of the focal enterprise's value and the value transfer path through macro structures such as the business ecosystem; (2) It analyzes the focal enterprise from a micro perspective (internal and external stakeholders) to enable optimization; (3) The middle-ground perspective of the symbiont establishes a unified reference system

[8] The scenario of establishing a business model through equal dissipation maximizes transaction value.

for enterprises that have adopted different business models within the same ecosystem, which in turn enables different business models to be compared.

Research on the symbiont will develop by establishing the following:

1 A mathematical symbiont model coupled with a theoretical deduction mechanism
2 Logic for business model comparison and a fiscal reference system that is underpinned by the symbiont concept
3 A symbiont perspective and a design path for business models
4 A method for boosting the efficiency of symbionts and the value of focal enterprises based on transaction value, costs and risks

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