Business Model Dynamic Design and Analysis Based on System Method

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Abstract

Business model and business model analysis is discussed by academia and business in recent years, and it is an important for business success in the future. This paper begins with a comprehensive definition of the business model based on the literature, which illustrates the business model is a complex system, and uses the System Thinking (ST) theory to analyze how to design a business model then proposes some advices on how to make it more effective and efficient in practice.

Key words: Business Model,Dynamic Analysis,System Method

1. Introduction

Over the past few years, business model has been concerned by more and more scholars and entrepreneurs, especially in the post-financial crisis Era, Creating a new business model is regarded as a effective and efficient way to succeed in the future. Management guru Peter Drucker's said: 'the competition between enterprises in the 21st century is no longer the product and product competition, but competition between business models.' Simply speaking business model refers to the 'logic of the firm' -how it operates and creates value for its stakeholders. But in practice it has proved difficult for enterprises to systematically design and configure their business model[1].

- Scholars explain business model in their own perspectives, there is no integrative concept can reflects both the static and dynamic aspects of the business model.
- The business model design is difficult because a lot of internal or external the enterprise factors interact together . So the design process is elusive and unpredictable even as a art .there is no better way than trial-and-Error Learning for business model design.
- Considering the dynamic characteristic of business model, we need a quantitative evaluation method to assess the impact of the innovative change in a new business model, by this way we can redesign it before it is implemented in practice.

System thinking and system dynamics provide effective theory and method for solving dynamic problem in a complex system .In this paper we will explore the business model design with system thinking theory and constitute a dynamic analysis framework by applying system dynamics. This paper includes the following parts:

- Reviews the extant literature and presents a business model concept

from dynamic system perspective.

- Applying system thinking theory to analysis how business model works and give some advices on how to design a business model;
- Illustrates the dynamic analysis framework for business model and via a case study using SD model proves the approach is effective in practice.

2. Business model concept review

The original expression business model comes from the writings of Peter Drucker in last century. There are a lot of literatures using this concept in recent years, but different scholars give the business model concept with their own understanding (Table 1)[2-6].

Reviewing the literatures, it appears that the current concept can be devided into three categories:

- Focus on components. The definition focus on the component of business model, including individuals (customers, partners, competitors, suppliers and other stakeholders) ,transactions structure ,channel relationship in the system.
- Focus on value chain..The definition focus on the customer value creation process, including customer value proposition, value creation, value net and value capture. In fact, it answers the questions: what is the customer value and how can we deliver the customer value appropriately.
- Integrate components and value chain. This kind of definition is frequently used in present, it depicts the content, structure, and governance of transactions designed so as to create value through the exploitation business opportunity . The content of a transaction refers to the goods or the structure refers to the parties that participate, their links,and the way they choose to operate, and governance refers to the way flows of information, resources and goods are controlled by the relevant parties, the legal form of organization, and the incentives to the participants.

In the main, the common thread across all of these approximations to the notion of business model is the logic of the firm, the way it operates and how it creates value for its stakeholders.

3. Business Model: A System and Dy namic Perspecetive

No matter from the component aspect or from value chain aspect, All of the definition about business model point out that business model is a series of assumptions about how to run the enterprise. Business model should answer the following questions:‘ Who is the customer and what does the costumer value?’ and ‘What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?’ The implicit idea is that a business model is about how an organization earns money by addressing these two fundamental issues: how it identifies and creates value for customers, and how it captures some of this value as its profit in the process[7].

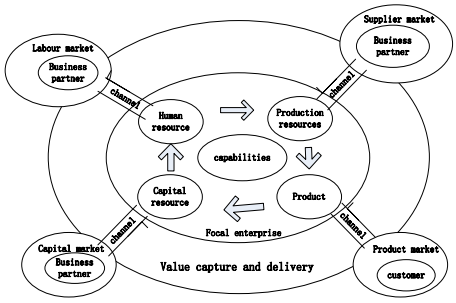

Figure 1. BM in system view

We define a business model as a logic

We define a business model as a logic of how a enterprise capture and delivery value within its value network. It includes customer value proposition (goods and services), profit formula(revenue model, cost structure and margin mode),key processes and key resources[8].

According to above analysis, the business model is a complex system, and we can give a holistic view from a system and dynamic view.

Structure perspective (Figure 1): All elements constitute the system frame including the agents (focal enterprise, the suppliers, the customers and other stakeholders),and the resources (material, capital, labor), capabilities (design ,produce, marketing and so on).these elements are connected for transactions by channels, how many elements or how complex the structure is will depend on the focal enterprise's capabilities.

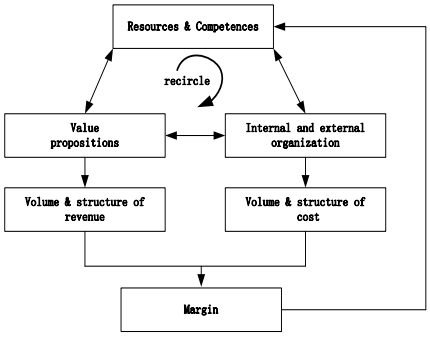

Figure 2. BM in Evolution View(RCOV)

- Behavior perspective: agents are not independent in the system, in order to survive they interact each other by exchange energy flow (information, products and capital),which benefit their own interest. As the complex connection between agents, there are feedbacks in the interactions inevitably, so the system behavior is complex.
- Dynamic perspective: business model system's original dynamic come from the realization of the customer's value. The value circle consists of four parts: value proposition, value creation, value net and value capture (value delivery). During this value circle the enterprise need to explore what is the customer's need, integrate the internal and external resources/capabilities to realize it. By this two transactions, the customer's demand is satisfied and the focal enterprise and the stakeholders get their resource's value, If each participant in the system satisfies with present situation, the value chain will be repeated unless the balance is broken down.
- System evolution perspective: Here we use Penrose's RCOV framework to illustrate how the system evolve from low level to high level over time. The three basic business model components in the RCOV framework(Figure 2) - resources and capabilities (RC); the organization (O) of the business within a value network or within the firm boundaries determine the structure and the volume of costs; and the value propositions (V) through the supply of products and services - determine the structure and the volume of revenues of a business, margin is decided by the revenue and cost then impact the resources & capabilities' changes. Interactions between components develop a new value proposition, to create new combinations of resources or to make changes in the organizational system. So the business model of a given organization is only a snapshot, at a given time, so any innovations of the three core components will cause the business model evolution.

4. System Analysis on Business Model Design

Business model is a complex and dynamic system ,it is difficult using traditional method to design it. System Thinking(ST)

is a way of perceiving the world in a holistic mode rather than cutting it into many pieces and it provides a proper means to uncover the complexity behind system behavior[9]. Next part we will build up the systemic circulation diagram and explore how to design the business model by system thinking theory.

4.1 Problem definition

We take business model as our studying system, it involves not only the product market but also the factor market. The system components can be chose by relevance Principle and our objective is to reveal the relationship between the system structure and system behavior and find a better way to improve it.

4.2 System circulation diagram analysis

There are two parts in our definition of business model, one is the value capture and the other is value delivery. So here we start drawing the two system circulation diagrams separately then integrate two subsystems together for using system thinking to analysis further.

- ***Value delivery subsystem***

In the value delivery subsystem(Figure 3), the enterprises sell the products and services to customers and get their money back. In order to keep competitive position in the marketplace they implement differentiated strategy to make product more attractive. When the customers' need are satisfied the enterprise can get premium price and higher margin, meanwhile the customers' satisfaction will result more new customer's coming. The more margin get the more enterprise's value. The customer's value dependents on the customers' satisfaction and the premium price they pay for the product. There are two reinforce loop in this circulation diagram, their virtuous cycle can increase the customer's value and enterprise's value.

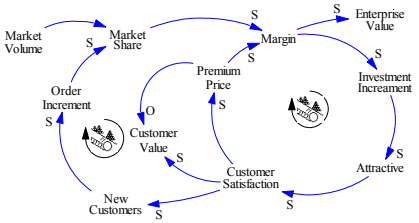

Figure 3 Value delivery subsystem circulation diagram

- ***value capture subsystem***

In the value capture subsystem (Figure 4), the enterprises exploit internal and external resources to produce the products the customers need. On the one hand they optimize the value net to improve the efficiency by expand the scale of production, on the other hand they invest on R&D for new product ,This scale effect will induce a lower cost per unit product, higher quality and short lead time that attract more customers in the marketplace. The enterprise's value come from the revenue structure and cost structure, the more margin the higher enterprise's value. There are four loops in the value capture subsystem, three virtuous cycle reinforce loops can increase the enterprise's value and the balance loop is used to adjust R&D investment, the delay mark between the R&D investment and Innovation capability means the innovative capability's improvement will take a long time.

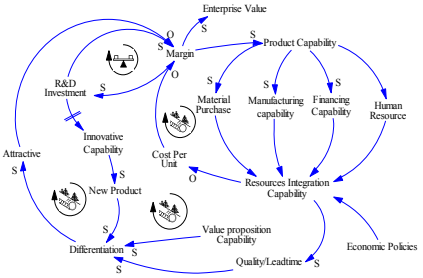

Figure 4 Value capture subsystem circulation diag

- ***Integrative model***

The following circulation diagram(Figure 5) integrates value capture and delivery subsystem. It includes the business model's main content, structure and government. The enterprise's logic can be read from the causal relationship and we can see the big picture. There are six loops in this system circulation diagram.

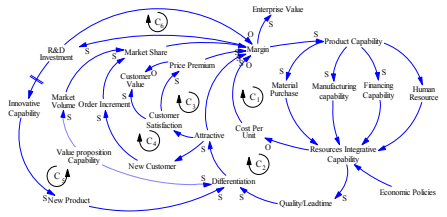

Figure 5 Integrative system circulation diagram

C_1: Margin-Product Capability-Resources Integrative Capability-Cost per unit-Margin;

C_2: Margin-Product Capability-Resources Integrative Capability-Quality/lead time-Differentiation-Attractive-Margin;

C_3: Margin-Product Capability-Resources Integrative Capability-Quality/lead time-Differentiation-Attractive-Customer Satisfaction-Price Premium-Margin;

C_4: Margin-Product Capability-Resources Integrative Capability-Quality/lead time-Differentiation-Attractive-New Customer-Order Increment-Market Share-Margin;

C_5: Margin-R&D Investment-Innovative Capability-New Product-Differentiation-Attractive-Margin;

C_6: Margin-R&D Investment-Margin;

According to the number of "O" type connection in each circle, $C_1 \sim C_5$ is reinforce loop and C_6 is adjust loop. The six loops interact with each other in the system with the information, capital and products flow through the net channels, then the stakeholders in the value net are realized.

We notice that there are two types of hanger, one type point to the loop represent input factor, the other point out from the loop represent output. In Figure 4,we only consider a simple situation, the input are value proposition and economic policies, output are customer's value and enterprise's value.

5. Systemic thinking on business model design

In practice, we can use system thinking theory to change business model to make it more effective and efficient.

- ***Strengthen engine of growth***

Reinforce loop look like two blades sword, When it is initiated with a positive incitement, there will be a virtuous cycle in the loop, and the system will have a exponential increment, vice versa.In fact,the reinforce loop is a engine of growth ,if a product has higher quality than others,it is more different and attractive than the competitor, it certainly will get more profit in the marketplace,and the margin can be invested for much higher quality product which is a reinforce process,that will make the better to the best. Reinforce loop C1～C5 seems have lot of chances in the circles.For instance,to improve investment on R&D, shorten the lead time and so on.

Unleash the constraint

- ***Unleash the constraint***

Hangers in the loop represent some exogenous factors out of the system, which constraint the infinite growth of the reinforce loop.Sometimes it is a better way to unleash the constraints by impacting the hangers.In our system,the market volume is a hanger and it is not completely controlled by the system.The enterprise's

market share will be limited when the market volume is constant. But if the potential demand of customer is exploited then the market volume will be expand and the previous constraint will be solved.

- ***Connect the reinforce loop and adjust loop appropriately***

The two types of loop have different function in the system. Connect them appropriately will make the system develop steadily and sustainable.In our system, C1～C5 loop connect together result in a big increment for margin than the aggregation of each loop,and also the large product scale bring a advantage in factor market.So the enterprise can benefit from the integration of net effect,scale effect and complement effect. Loop C6 adjust the R&D investment in a proper percentage in margin,not too much and not too little.

- ***Keep the system sustainable***

All the system structure reflect our business model, and in order to keep business model going well, we must keep the circle in large-flow and fast-speed. So we must pay attention to the bottle-neck in the system. Another principle is win-win rule for all the stakeholders in the system, if participants are all get what they should get, the business model will not change. But the environment is complex, the customer's requirement is changing over time, science and technology is developing, the competitor's strategy is competitive, and there are too much unsteady factors in and out system. The enterprise should foster a dynamic capability(value proposition capability, integrative resource capability and innovative capability)which keep the evolution of their business model .

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