

Research on SDN Enterprise's Collaboration Innovation Mechanism

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Abstract

SDN enterprise's collaboration innovation is the amalgamation of enterprise's collaboration innovation theory and SDN management idea. The paper illustrates the important meaning of SDN enterprise's collaboration innovation, and through compare with different kinds of enterprise alliance between SDN and supply chain, the paper gives the four characteristics of SDN enterprise's collaboration innovation, and then builds the concept model of SDN enterprise's collaboration innovation.

Keywords: SDN, Collaboration, Innovation, Concept model

1. Introduction

At the end of the 1980s, the amalgamation of collaboration and innovation theories became to be the new research focus, and at the end of the 1990s, the new research on enterprise's collaboration innovation at the microcosmic level began spring up, and extended to the enterprise's collaboration innovation at the macroscopic level. On the other side, besides the economic knowledge age's coming, new ideas and theories in management emerged consistently. Based on the deep research in supply chain theory, SDN (Supply and Demand Network with multi- functional and opening characteristics for enterprise) idea was developed and supported by the Chinese National Science Foundation. SDN is a multi- functional, opening and dynamic net structure, it is composed by the "supply-demand flows" among enterprises, and the main goal is to acquire global resources, global manufacture, and global sales. SDN enterprise's collaboration innovation has become a new research field.

2. Meaning of SDN enterprise's collaboration innovation

SDN collaboration innovation is the inevitable choice and key process for SDN, and has the strategic meaning for every SDN nodes and the whole SDN.

2.1 SDN collaboration innovation is a non-traditional enterprise model, and it can realize the collaboration and win in the global range. Research on SDN collaboration innovation will provide a brand new view and channel for the enterprise innovation research, and can promote the Chinese traditional enterprises' breakthroughs in thought.

2.2 SDN collaboration innovation expands in the net space of the SDN nodes inside and among the SDN nodes, which needs sufficient interaction through information flows and knowledge flows dissemination. Therefore, the research on SDN collaboration innovation will expend the space of enterprise innovation and promotes the sharing of information and knowledge among SDN enterprises.

2.3 The collaboration innovation among traditional enterprises may lead to the disruption of logistics and knowledge flows due to the opportunism behavior. While SDN is a network structure of multi-edge supply-demand relationship, which can promote the time continuity of the SDN enterprise collaboration innovation.

2.4 SDN enterprise collaboration innovation can overcome single enterprise's limitations in enterprise innovation on resources and capabilities. Thus, it is good for the SDN enterprises' resource sharing, complement each other's advantages, risk sharing, and is good for enhance the innovation capabilities of SDN enterprises and the whole SDN rapidly.

3. Differences between SDN enterprise collaboration innovation and traditional enterprises' alliance collaboration innovation

Research on enterprise innovation follows the path from single enterprise innovation to enterprises' collaboration innovation, and then to SDN enterprise collaboration innovation. Today, the usual forms of enterprises collaboration including supply chain, enterprise clusters, strategic alliance and visual enterprise, and supply chain is still the main focus of academic research. Supply chain theory comes from the study of optimizing the process to meet the customized needs rapidly, supply chain composed around the core enterprise, and forms the catenulate structure which links the up-stream and down-stream enterprises according to the processes, through collaboration management of the nodes enterprises, it can enhance the products' competitiveness and realize the win-win collaboration inside the chain. Enterprise cluster comes from the enterprises' needs of enhancing the ability of resisting risks by clustering, usually, enterprise cluster refers to the middle sized and small sized enterprises clustering in location and doing the similar industries, through displaying their respective comparative advantages, realize scale economic benefit, and thus face the intense market competition by whole power. Visual enterprise forms when the alliance master enterprise finds the market opportunity, according to its core ability, the alliance master enterprise will face the flying opportunities by integration and collaboration. Strategic alliance is a kind of stable cooperation relationship established among multinational enterprise and based on equality and mutual benefit, it has clear-cut strategic goal, and forms for the long term benefits.

Since different organization forms established according to different strategic goals, and closely related with the organization's external development environment and internal condition, and also because the nodes of the organization structure have different position and relationship, thus the nodes have different collaboration innovation forms.

Based on the SDN collaboration win-win management conception, SDN has no fixed organization boundary, thus breakthrough the fixed thinking of cooperation inside the organization and compete outside the organization, therefore promote the innovation ability of SDN as well as the enterprises in side the SDN. Therefore, SDN collaboration innovation is based on the overall opening and sharing of information, and SDN enterprises will realize collaboration innovation in different kinds of supply-demand flows in different levels actively.

4. Connotation of SDN enterprise collaboration innovation

In the decades after SDN ideas has been raised, researchers have discussed SDN in multi-aspect and multi-angle, they surmised the characteristics of SDN as networking, multi-factions, opening and dynamic stability. The connotation of SDN collaboration innovation also last and impersonate these characteristics.

4.1 Coupling of collaboration innovation

Coupling usually means the compactness of the network nodes' links, in SDN collaboration innovation; it can also be used to measure the degree of SDN nodes' collaboration innovation. SDN networking refers to the multilateral supply-demand networks among SDN nodes, network nodes are the basic units of SDN enterprise collaboration innovation, all the scientific and technological improvements and R&D are around the nodes of the SDN networks. Though SDN nodes have different factions and usages in the supply-demand relationship, they collaborate and fit each other driven by the innovation goals, and integrate their resources, have complementary advantages, provide products and services that meet the customers need with reasonable costs. SDN collaboration innovation changes from the SDN nodes' separate behavior into collaboration behavior that bounded by the supply-demand network relationship, it reflects the coupling of SDN enterprise collaboration innovation, and enhance the SDN whole innovation benefits through enhance the coupling of SDN enterprise collaboration innovation.

4.2 Diversity of collaboration innovation

SDN's multi-functions mainly embodied in the diversity of supply-demand flows' form and the multi-level of supply-demand flows' interactivity. Based in the connotation of supply-demand flows, the basic elements of SDN enterprise collaboration innovation include not only products flow, but also people flow, financial flow, material flow, technology flow and also flows in management such as system flow, culture flow, and information flow, these different kinds of supply-demand flows' interactivities bring the interactivities among different levels' culture. Thus, SDN enterprise collaboration innovation has diversity in the content; firstly, the diversity of functions, not only including the collaboration innovation of products-related technology and market, but also includes collaboration innovation of supply-demand related people, funds, management, knowledge. Secondly, the diversity of interactivity space, the interactivity of supply-demand flows is conducted inside the SDN enterprises, among the SDN enterprises, and in the whole SDN space. Thirdly, the diversity of culture level, it's

the depth of the interactivity of the difference supply-demand flows' in different space, including the collaboration innovation in enterprises' surface level culture, enterprises' middle level culture and enterprises' high level culture.

4.3 Interactivity of collaboration innovation

Communication is the main methods for enterprises to collaborate, and resource sharing is the basic ensure of enterprise collaboration. The cooperation of traditional enterprises' is "compete outside the alliance, cooperate inside the alliance", the goal of collaboration innovation is to enhance the compatibility of the alliance enterprise with outside enterprises, so the tactic choose of enterprise in the cooperation game is only those necessary and limited resource sharing with cooperate enterprises, this kind of half-opening and passively collaborative tactic will impact the speed and result of collaboration innovation. SDN idea changes the cooperation-competition into cooperation-win, the opening of SDN provides the change from SDN enterprises to multi-level, wide range supply-demand flows interactive among SDN enterprises' inside departments and elements in global range, and it's also the reflection of different levels' collaboration among inside and outside enterprises. The supply-demand flow interaction of SDN is a kind of comprehensiveness, opening, initiative behavior, and the criss-cross interactive network provides whole dimension continent resource sharing platform, thus became the base on SDN enterprise collaboration innovation, and push the process of SDN enterprise collaboration innovation.

4.4 Constancy; of collaboration innovation

SDN enterprise collaboration innovation is complementing each other, influence each other and limit each other with SDN structure stability. SDN dynamic stability not only means the multi supply-demand relationship ensure the add or dismiss of SDN nodes will not impact the SDN whole stability, but also means the supply-demand relationship is in the microcosmic changing. SDN enterprise collaboration innovation is established on the base of multilateral supply-demand network structure, the maintain of supply-demand relationship requests the collaboration innovation of related nodes, while the SDN nodes' collaboration innovation can also leads to the emerging of new supply-demand relationship, and dismissing of old supply-demand relationship. SDN enterprise collaboration innovation leads to microcosmic changing of supply-demand relationship, and at the macro level, collaboration innovation happens consistently and keep relative stability, reduces the disruption of supply-demand flow, keep time consistently of collaboration innovation in SDN.

5. Concept model of SDN enterprise collaboration innovation

SDN is a nodes assemble based on the multi supply-demand relationship, and has complex network structure, the SDN nodes has diversity forms, it can be enterprise, research institution, financial organization or even a person, these nodes has equal relationship and driven by supply-demand relationship to become the member of SDN. Since SDN is still in it's primary develop stage, SDN member nodes have not get rid of traditional management mode completely, therefore, due to the inter-activity and impacts of supply-demand relationship, SDN nodes still have many traditional enterprise alliance forms such as supply chain, and sometimes SDN members have multi-roles, they can be the node member of SDN, and also can be the member of supply chain, strategic alliance, or cluster.

Collaboration is uniformity behavior produced by sub-systems' communication and coordination in a complex system, and forms the whole system's combined action, the effects are more than the simply the sum of the single elements' effects.

Because the SDN's network structure character, the supply-demand flows multi-functions and sufficient interactivity, SDN enterprise collaboration innovation has more complexity and specialty. SDN enterprise collaboration innovation refers to use SDN nodes' (enterprise, enterprise alliance, economic person, etc) asymmetry in their core business, knowledge structure and innovation technology, draw support from different network collaboration work environment, innovation design tools and knowledge merge ways, to make innovation has complementary advantages, provide innovation products and services, and arouse and improve SDN whole innovation ability through SDN inside nodes and different flows among SDN nodes, to finally realize global cooperation and win-win goal. The concept model of SDN collaboration innovation shows as Figure 1.

Insert Figure 1 Here

6. Conclusion

Enterprise collaboration innovation has become the research focus of academic, research on SDN enterprise collaboration innovation can be extended from the concept describe to the organization structure, system mechanism, and network platform, to provide supports to the practice of SDN enterprise collaboration innovation.

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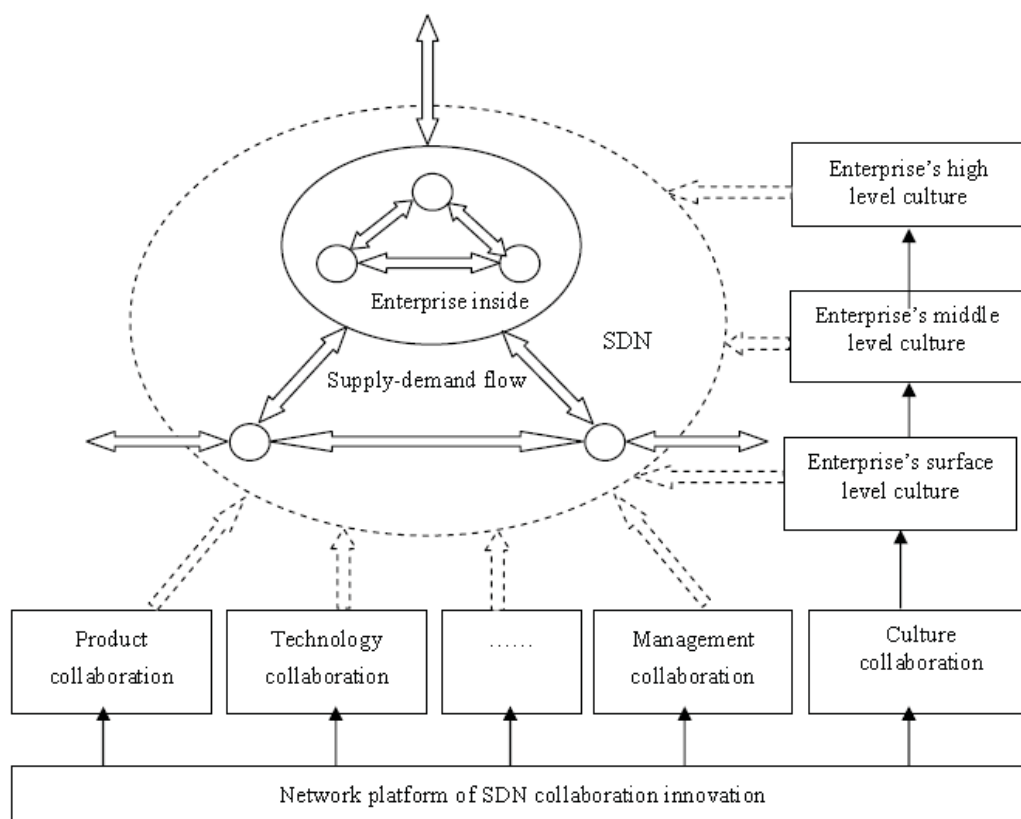


Figure 1. Concept model of SDN collaboration innovation