Research on Enterprise Innovation Network Based on Cluster Supply Chain

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Abstract: It introduces the definition and characteristics of cluster supply chain, analyzes framework of enterprises innovation network based on cluster supply chain, discusses main body and motivity of innovation network based on cluster supply chain. It also expatiates advantages of innovation network based on cluster supply chain, and puts forward several issue must pay attention to when constructs innovation network based on cluster supply chain.

Keywords: Innovation network, Cluster supply chain, Supply chain, Industrial cluster

1. Introduction

Faced with uncertainty market and swift developing technology, enterprises pay great attention to strategic industry and core technologies more and more. Because complexity of innovation product and innovation process big enhanced, modern technology innovation stresses it as a network and integration activity. It regards innovation as enterprise’s interior research, development, manufacture, marketing function parallel operation processes, and emphasizes crosswise cooperation among enterprises and the upstream and downstream enterprise and users in innovation process. Along with more and more scholars study enterprise’s exterior innovation behavior, research on enterprise innovation network becomes the hot spot gradually.

Industrial cluster and supply chain as distinctive spatial economy organization configuration in the current world economics, is becoming development key of many provincial economy entity and enterprises’ survival. Industrial cluster and supply chain both are network organization. Cluster supply chain transplants supply chain operation platform to industrial cluster, industrial cluster and supply chain embeds and harmonizes each other, forms supply chain network organization system which has scope economy and economies of scale. Cluster supply chain, as a new network organization coupled by industrial cluster and supply chain, starts to receive researcher’s attention. Enterprises innovation network based on cluster supply chain is advantageous to enterprises integrate resources in enterprise cluster to carry on coordination innovation, and has the extremely vital role to enhances enterprise’s competitive power. It will study enterprises innovation network based on cluster supply chain in this paper.

2 Definition and Characteristics of Cluster Supply Chain

2.1 Definition of Cluster Supply Chain
Cluster supply chain is the coupling organizing form between industrial cluster and supply chain. It considers cluster supply chain as such a organization: “originated but not limited to enterprise, based on but not localized to cluster”. Cluster supply chain is the supply chain which is composed of research institutes, suppliers, manufactures, merchants and retailers in the same or cor-relational industry value chain in the same industrial cluster. These organizations form supply chain network in local region by relationship of suppliers and clients, link by the way of formal convent or informal incompact based on trust and undertaking. In this industrial cluster region, not only there is cooperation in every separate supply chain, but also it exists harmony between enterprises in different supply chains. There are many specialized relational small & medium enterprises which lay outside of these single supply chains, they
cooperate and reinforce the production of these single supply chains. This agile network system buildup a cluster supply chain.\(^3\)

Cluster supply chain has longitudinal enterprise mutual cooperation based on highly developed labor division, horizontal breadthwise relatively complete supply chain structure system. The network is this organization’s visualization structure outline, above this background foundation is the stealth and directed chaining construction.\(^4\) Cluster supply chain is a complex network organization which is composed of many supply chains, it has industrial cluster’s characteristic, simultaneously also has characteristic of supply chain.

2.2 Characteristics of Cluster Supply Chain

Cluster supply chain is a supply chain network which takes industrial cluster as the platform, which is different from traditional supply chain. What it stressed is each link's integrity of supply chain in cluster region.\(^5\) Its main features display in following several aspects:

1. Integrity based on industrial cluster local integration
2. Dynamic rivalrousness based on similar industrial localization
3. Embeddedness based on trust
4. Mass customization based on time competition
5. Universal compatibility based on small and medium-sized enterprise localization

3. Framework, Main Body, Motivity and Advantages of Innovation Network Based on Cluster Supply Chain

3.1 Framework of Innovation Network Based on Cluster Supply Chain

The cluster supply chain network’s numerous structure main bodies may induce into enterprises (including core enterprise, supply enterprise, demand enterprise, competition enterprise and supplementary enterprise, etc.), intermediary organization, government department, scientific research institution, financial institution and so on. Cluster supply chain’s main body is quite many and network relations are also quite complex.\(^6\) Cluster supply chain’s core network is value creation fountainhead of cluster supply chain, which constitutes by numerous enterprise groups, including vertical network and horizontal network. The vertical network which constitutes by numerous supply enterprises, core enterprise and demand enterprise, is supply chain network which our generally study, the relation between enterprises is vertical integrated supply relations; in horizontal network which constituted by core enterprise, competition enterprise, supplementary enterprise, although between enterprises do not have simple and direct supply relations, but their existence causes cluster supply chain maintains normal competitions, cooperation and trade orders, they are essential constituents in entire cluster supply chain network; auxiliary service sector, which is composed of government department, scientific research institution, intermediary organization and financial institution and so on, and hardware infrastructure, humanities and exterior market environment constitute cluster supply chain’s support network. Cluster supply chain’s core network covers cluster supply chain’s core member and main value network, but cluster supply chain’s periphery support network is an essential part similarly. Cluster supply chain network architecture has overlapping, that is to say, supply chain in cluster is not existed independently, each supply chain has possibility to overlap and link with other supply chain. Looking from cluster supply chain’s vertical network architecture, supply chain structure reflects the process from raw material supplier to manufacturer, distributor and customer’s physical distribution, information flow and fund flow. Looking from cluster supply chain’s horizontal network architecture, each level in supply chain have many member enterprises, relationship between them are both mutual competition and mutual cooperation.

3.2 Main Body and Motivity of Innovation Network Based on Cluster Supply Chain
Core enterprises in cluster supply chain lead the innovation of cluster, they are not only main bodies in the product chain, but also are main bodies of innovation. Non-core enterprises face the pressure of innovation. If core enterprises have had competitive advantages through technological innovation, cause product renewal, then, they will definitely request upstream and downstream enterprises to be able to provide raw material or spare part which conforms to its specification, and provide higher technology support. Once necessary enterprises’ technology is unable to satisfy the request which core enterprises’ product to promote, these enterprises are facing the danger eliminated by core enterprises. Enterprises must enhance their competitive power, must carry on technological innovation, to extend to supply chains high-end, like this they can occupy vantage point in supply chain members’ gambles. If enterprises always carry on “tries to overtake each other” type supply chain controlling force contention, each enterprise always “rushes to be first” has chain innovation unceasingly, the entire network will be at good innovation condition.

3.3 Advantages of Innovation Network Based on Cluster Supply Chain
Supply chain innovation and industrial cluster innovation both adopt network innovation pattern, but supply chain innovation has a bigger superiority than industrial cluster innovation, mainly because supply chain network has closer node relations. Through supply chain’s integration, enterprises in industrial cluster integrate themselves into supply chain, and engaged specialization based on comparison superiority in supply chain. Supply chain’s innovation network construction first derives from cooperation innovation between supply chain member enterprises. Theoretically speaking, innovation network based on supply chain is able to create value for all supply chain member enterprises. Through supply chain cooperation innovation, enterprises in supply chain form an integrated network, thus create network effect. 
Cooperation based on supply chain’s benefit causes enterprises’ innovation in supply chain more effective, pays great attention to coordination has competitive power. Enterprises which have heterogeneity and complementary resources form trust and cooperation relationship based on supply chain benefit in supply chain network, then enhance innovation network’s organization degree in cluster supply chain, promote collective study efficiency, and is advantageous to innovation ability promotion finally. Cluster supply chain’s network is propitious to enterprises in cluster supply chain preserve resources, participate risks, obtain information, close complementary resources, reduce product development cost, enhance technical ability, and intensify reliability.

4. Several Issues Which Must Pay Attention to When Constructs Innovation Network Based on Cluster Supply Chain

Innovation network based on cluster supply chain is advantageous to promoting enterprises’ competitive power, is advantageous to industrial cluster’s sustainable development. When we constructs innovation network based on cluster supply chain we must pay attention to following issues:

4.1 From Government Stratification Aspect
Government as “the hand which cannot see”, mainly performs function of macroeconomic regulation and control, market guidance and surveillance to market economy development. In recent years, some success place industry clusters’ practice proved that local authority has pivotal function through industrial policy guidance, providing public product and servicing supply chain to complete construction and coordinating operation to industrial cluster’s development. Government may take measures in formulation perfect laws and regulations, optimizing innovation working conditions, cultivating region good faith culture and promoting cluster system industrial upgrading and so on, which promotes to construct innovation network based on cluster supply chain.

4.2 From Intermediary Organizations Aspect
Information and supervisory service organization is the bridge between each innovation main body in cluster supply chain system, creating information network platform can promote information communication of innovation network. Organization departments including universities, colleges and institutes, development facility, government laboratory and center for public productivity, etc., its major function is providing talented person and technical support continually for cluster supply chain system. It can promote cooperation between industrial cluster and local universities, local scientific research institutions in, and promote development of cluster supply chain system through integrated technological innovation.

4.3 Establish Innovation Network Public Coordinated Mechanism
Cluster supply chain has several leading core enterprises, when each leading core enterprise has its own core competitiveness, it will have possibility of each core enterprise to carry on forming single chain supply chain and cooperating cross supply chains. But in order to cause cooperation of horizontal and vertical integrate in industrial cluster into highly effective way, forming network movement platform based on trust network, information network, physical distribution network and knowledge network, it must establish a kind of public coordinated mechanism in enterprise innovation network which may cause every kinds of problems and information be solved rapidly in cluster supply chain. Meanwhile, it provides convenient for establishing orderly trust mechanism and building a transparent frame pattern in cluster supply chain, reduces leading core enterprises’ transaction risk greatly, expands cooperation dimension and span between enterprises in cluster supply chain, guarantees establishment of cluster supply chain movement platform based on trust network, information network, physical distribution network and knowledge network. This public coordinated mechanism causes to form a kind of good cooperation atmosphere in cluster supply chain, facilitates enterprises in cluster according to principle of cooperation, pledge credit, communicating mutually, seeking common ground while maintaining difference, and improving continually to carry on coordination, create a soft environment to form a formidable cooperation network.

5 Conclusion
Modern technology innovation stresses it as a network and integration activity, emphasizes crosswise cooperation among enterprises and the upstream and downstream enterprise and users in innovation process, research on enterprise innovation network becomes hot spot gradually. Industrial cluster and supply chain as distinctive spatial economy organization configuration in current world economics, Cluster supply chain, as a new network organization coupled by industrial cluster and supply chain, starts to receive researcher’s attention.
Cluster supply chain is a supply chain network which takes industrial cluster as the platform, which is different from traditional supply chain. What it stressed is each link’s integrity of supply chain in cluster region. Cluster supply chain’s main body is quite a lot and network relations are also quite complex. Core enterprises in cluster supply chain lead innovation of cluster, they are not only main bodies in product chain, but also are main bodies of innovation. Enterprises must enhance their competitive power, must carry on technological innovation, to extend to supply chain’s high-end, like this they can occupy vantage point in supply chain members’ gambles. If enterprises always carry on “tries to overtake each other” type supply chain controlling force contention, each enterprise always “rushes to be first” has chain innovation unceasingly, the entire network will be at good innovation condition. Cooperation based on supply chain’s benefit causes enterprises’ innovation in supply chain more effective, pays great attention to coordination has competitive power. When construct innovation network based on cluster supply chain, government and intermediary organizations need take some corresponding measure, it also need build a kind of public coordinated mechanism to make a good soft environment for forming a formidable cooperation network in cluster supply chain.
References


