

The Knowledge Management of Low-Cost Industrial Clusters

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Abstract

Theorizing the knowledge management engage with the industrial cluster.— The investigation of innovation and transformation of low-cost industrial clusters become into innovative industrial clusters, as well as the determinants that affect the innovation ability of industrial clusters.

Keywords

Management, low cost, metrology, environment.

1. Introduction

Background and question

American scholar Humphrey J. and Schmitz (1995) divided clusters into two categories: innovation-based clusters and low-cost clusters. Innovative clusters (high-road, innovation. based) are characterized by innovation, high quality, functional flexibility, and a good working environment. Under good laws and regulations, enterprises develop their cooperative relationships consciously. Low-cost clusters (low-cost based), the basis of their participation in the competition is the low-cost advantage under the premise of guaranteeing a certain quality.

Based on the research on the path of improving the innovation ability of low-cost industrial clusters, this paper proposes the path and countermeasures for the evolution of existing low-cost industrial clusters to innovative industrial clusters. Based on the current theoretical hotspots of knowledge management and industrial cluster research, this research conducts in-depth analysis on the existing industrial cluster innovation theory system, and logically explains the transformation of low-cost industrial clusters into innovative industrial clusters. The determinants affecting the innovation ability of industrial clusters have both theoretical value and positive, practical significance.

1.1. Significance of Research

At present, the development of industrial clusters has two different models: one is the low-end way of low-cost clusters; The second is to go innovative high-end cluster. Most of the industrial clusters in developing countries belong to low-cost clusters, such as light textile clusters and small commodity clusters, etc. The products of these clusters are not of high grade, and they lack specific brand value and are difficult to create high market value. Therefore, it is necessary to promote the transformation of low-cost clusters into innovative ones. Consequently, it is necessary to strengthen the research on the knowledge management of low-cost industrial clusters. It is starting from technological innovation, and flexible production management should be adopted to enhance the capacity of independent innovation so as to fundamentally realize the transformation of industrial clusters from low-cost type to innovative type.

1.2. Research Methodology

The content of the low-cost industrial cluster innovation research of knowledge management is very complicated; this thesis uses economic theory and innovation theory to analyze, evaluate and comprehensively study the knowledge management of low-cost industrial clusters, focusing on theoretical and empirical analysis. Combining qualitative analysis and microanalysis, static and dynamic analysis, correlation analysis and research on various phenomena and relationships. At the same time, it pays attention to the combination of field investigation, questionnaire survey and literature reference, and investigates the innovation ability of some industrial cluster enterprises. Based on the comprehensive data, the application of the hierarchical evaluation method is used to build the overall knowledge management ability of low-cost enterprise clusters — the innovation evaluation system of the cluster.

2. The Basic Theory of Knowledge Management in Low-Cost Industrial Clusters

2.1. Knowledge Management Overview

As Dorothy Leonard Barton (2000) stated, the competitive advantage that can give an organization is to know how to use the knowledge it has and to acquire or create new knowledge quickly. It can be seen that knowledge management integrates multidisciplinary theories such as management, economics, informatics, and behavior, and is a comprehensive cross-disciplinary research topic. The widespread attention and recognition of academia and business are key. With the accelerating international development process and the deepening of knowledge management research, knowledge management has been continuously valued and affirmed by various countries.

2.1.1. Concept of Knowledge Management

2.1.1.1 Definition and classification of knowledge

The definition of knowledge in the dictionary is: knowledge is the understanding of the attributes and connections of things, expressed as the psychological forms of perception, representation, concept, and a law of things.

Knowledge can be divided into many different types according to different classification criteria. The most fundamental classification of knowledge is to divide knowledge into Explicit Knowledge and Tacit Knowledge, which fundamentally reflect the difference between subjectivity and objectivity. Polanyik believes that subjective knowledge is tacit knowledge, knowledge can be embodied by itself; and explicit knowledge represents objective knowledge, which must first be understood and applied by people. Therefore, all knowledge is either explicit or rooted in tacit knowledge. Moreover, for their proportion in the knowledge system, Wema Aleo compares explicit knowledge to the islands that are exposed to the sea, while tacit knowledge is hidden under the sea.

2.1.1.2 Knowledge Management Definition

As a newly developed research field, knowledge management has not yet formed a widely recognized definition. In summary, the theoretical world has the following typical main points: Thomas J. Beckman (1999) defines the concept of knowledge management as A continuous process of managing knowledge to meet current and future needs, identify and explore existing and upcoming intellectual assets, and develop new opportunities. Maryam A (2001) and others believe that knowledge management refers to the process of creating, acquiring and using knowledge in order to enhance organizational performance. Yogesh Malhotra believes that knowledge management is a purposeful management process that combines information management capabilities with employee innovation to meet organizational needs for increased stress, survivability and competitiveness. Rosemann and Chart argue that knowledge

management is the solution to the problems that organizations generate in the process of knowledge provisioning. Ives sees knowledge management as an effort to manage knowledge work at the right time, in the right place, in the right body, and to improve employee and organizational performance.

2.1.1.3 Organization of knowledge management content and research results

Warton (1998) believes that organizational knowledge management should include the following four aspects: First, the creation of opportunities creates new ideas for people to interact;

The second is to provide various means of response to facilitate people to respond to emergencies;

The third is to continuously develop an organizational knowledge base in a highly differentiated environment; the fourth is to take various measures to improve employee work skills.

Marshall (1996) believes that organizational knowledge management should include the following six aspects:

The first is to create group knowledge by organizing various internal activities;

The second is to transfer knowledge through various informal training or social events;

The third is to obtain the required knowledge from within or outside the organization in a timely and convenient manner in the case of demand;

The fourth is the processor system that can be used for the organization after the knowledge is accepted;

The fifth is to realize the implicitization of knowledge through external forms such as various reports, charts or speeches, thereby increasing the acceptance of employees;

Sixth, through the means of incentives and leadership, knowledge is widely used and shared in the organization.

2.2. Industrial Cluster and Knowledge Management Research Status

In the middle and late 18th century, with the development of the social division of labor and specialization, the phenomenon of enterprise clusters characterized by industrial agglomeration and geographical concentration began to emerge. Since then, with the advantages of clustering, the trend of enterprise clustering has gradually developed and been recognized. In the 21st century of economic globalization, enterprise clusters have become a significant force to promote global economic development and grow an important industry: economic phenomena and organizational forms.

2.2.1. Industry Cluster Related Concepts

2.2.1.1 Definition of industrial cluster

Because of the different research backgrounds and purposes, scholars of the definition of industrial clusters have different understandings. Adam Smith believes that clustering is a group formed by a group of small and medium-sized enterprises with a division of labor to complete the production of a particular product. This is a view based on the perspective of division of labor. Krugman believes that industrial clusters are many small and medium-sized enterprises that gain performance advantages through cooperative cooperation with each other, and these small and medium-sized enterprises are geographically relatively concentrated.

It can be seen that industrial clusters have two distinctive characteristics: one is the similarity of economic behavior, and the other is the interdependence of production methods. It is precisely because of this similar economic behavior that the clusters participate in the spatial proximity of enterprises.

2.2.1.2 Enterprise Cluster Classification

Looking at the different starting points of the cluster, the classification method of the cluster is also diverse. Summary The typical classification methods at home and abroad can be summarized as follows:

First, the clusters are divided according to the nature of the association: value chain clusters, labor clusters, and innovation clusters;

Second, clusters are divided according to geographical clustering: regional clusters and non-regional clusters;

The third is to divide the cluster by time: emerging clusters, existing clusters, recessive clusters, and potential clusters;

The fourth is to divide the cluster according to the cluster innovation mechanism: innovative clusters and low-cost clusters.

2.2.2. Progress in the Research of Knowledge Management in Industrial Clusters

2.2.2.1 Characteristics of knowledge management in a cluster environment

First of all, in the industrial cluster, there is an interdependent and cooperative relationship among enterprises, which creates a large knowledge environment beyond the enterprise itself for the knowledge management of the enterprise. It can be said that the knowledge management mentioned in this paper is discussed in the specific environment of the cluster.

Secondly, the status quo of industrial clusters can be found.

Thirdly, it is precisely because of the similarity or relevance of the production of each enterprise that the industrial cluster can be realized.

Knowledge management in a cluster environment has unique steps compared to knowledge management in a general environment due to the characteristics mentioned above. The study found that knowledge management under cluster conditions is mainly achieved through the following three steps (see Figure 2.1).

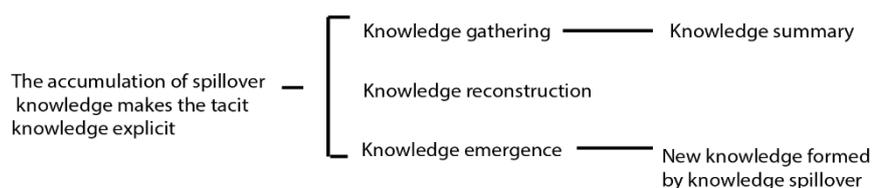


Figure 1. Step of Knowledge Management in Cluster Environment

As can be seen from Figure 1, the first step in knowledge management in a cluster environment is knowledge aggregation. For enterprises in the cluster, because of the similarity of production, enterprises can complement each other's expertise. This possibility connects the knowledge between enterprises into a relatively open knowledge network. Companies with different needs can obtain the relevant knowledge from this knowledge network and absorb it for digestion and utilization to gain innovative knowledge.

The second step is knowledge refactoring. The knowledge interaction formed by the first step of knowledge aggregation will, in turn, lead to knowledge reconstruction. The reconstruction here is not simple recombination after decomposing in the traditional sense, but a process of knowledge reinvention that incorporates innovative behavior among enterprises.

The third step is the emergence of knowledge. In the cluster, the interaction of knowledge networks can increase the impact of each other and form new knowledge that the original organization does not have. This process is similar to the emergence of complex systems research, so it is called the emergence of knowledge.

The above three steps summarize the specific work of knowledge management in the industrial cluster environment, but we must realize that the three aspects described here are the central part, and in the actual knowledge management, it will operate according to the specific situation, but it will change anyhow. The core is unchanged.

3. Knowledge Acquisition and Spillover Mechanism of Low-Cost Industry Clusters

As mentioned above, the importance of knowledge management is self-evident in the era of knowledge economy. As the primary link in knowledge management, the basic status of knowledge acquisition is unquestionable. Only the process of knowledge acquisition works well, and then subsequent knowledge, absorption, digestion, sharing and learning, and even the innovation of knowledge can be discussed. The knowledge acquisition inside and outside the cluster enterprise will lead to the knowledge spillover effect of the industrial cluster, and the active and effective knowledge spillover for the development of low-cost industrial clusters. Very important, this constitutes another critical aspect of this chapter's research.

3.1. Overview of Knowledge Acquisition in Low-Cost Industrial Clusters

In today's era of rapid development of the knowledge economy and information technology, companies have fully realized that knowledge is the most valuable asset and resource. Therefore, knowledge acquisition, as an indispensable part of knowledge management, will become an essential part of industrial cluster enterprises, especially the enterprises in low-cost industrial clusters to establish and realize knowledge management and improve their core competitiveness.

3.1.1. Research on Cluster Knowledge Acquisition

The knowledge economy is a knowledge-based economy, and economic development depends to a large extent on the discovery, accumulation, and innovation of knowledge. The knowledge economy is an economy based on the production, distribution, and use of knowledge. Today, with the advent of the knowledge economy, companies have begun to realize that their most valuable assets and resources are knowledge, that is, knowledge as a resource is the key to production, and is the driving force for economic growth. "Knowledge is power" will be fully utilized in this era. Understand. In the era of knowledge economy, knowledge management has become an essential basis for enterprises to make strategic decisions in the face of new situations.

3.1.2. Concept of Cluster Knowledge Acquisition

As a purely technical concept, Knowledge Acquisition has a long history in the fields of computer artificial intelligence and information systems. In this field, knowledge acquisition refers to the process of knowledge transfer from external knowledge sources to internal computers, that is, how to extract some problem-solving knowledge from experts' minds and other knowledge sources, and express them according to proper knowledge. The method transfers them to the computer. This conceptual image vividly demonstrates the process and purpose of knowledge acquisition. Therefore, drawing on the definition of the concept, porting its concept to the process of enterprise knowledge management, and so on to define the concept of cluster knowledge acquisition. The author believes that cluster knowledge acquisition is to convert unorganized documents, data (explicit knowledge) and expert skills (tacit knowledge)

existing in the human brain into reusable and can be reused between cluster enterprises and cluster enterprises. Retrieve the knowledge of the form.

3.2. Cluster Enterprises' Knowledge Acquisition Methods

3.2.1. Internal Knowledge Acquisition in Cluster Enterprises

As mentioned above, internal knowledge is the essential content of cluster knowledge. Therefore, it is imperative to study knowledge acquisition within cluster enterprises. Here I divide it into knowledge acquisition within cluster enterprises and knowledge acquisition between cluster enterprises. The knowledge acquisition of cluster enterprises is based on the premise that cluster knowledge exists and shared. The following two scenarios are respectively carried out.

3.2.1.1 Explicit knowledge and acquisition method

1 Distributed Searching

Relational databases, dedicated document libraries, and Internet search sites all provide companies with a variety of expertise or general knowledge, which shows that the company's knowledge sources are multifaceted. Therefore, the enterprise's knowledge management system must first collect extensive information and then extract the knowledge needed by the specific enterprise from the general information to achieve the acquisition of explicit knowledge.

2 intelligent agent (Agent)

Agent refers to those entities in the field of artificial intelligence that have the ability to perceive, solve problems, and communicate with the outside world. Intelligent Agents have improved their agent and initiative, and have critical applications in personalization, data mining, search, knowledge maintenance, and update.

3 data mining (DM)

As a critical step in knowledge mining (KDD), data mining is also a problematic point of knowledge mining. Data mining technology not only needs to realize simple retrieval, query and call data to specific databases but also comprehensive statistical analysis and reasoning of these data into macro, meso, and micro levels to guide the practical problem-solving. Moreover, from which it is expected to discover some correlation between events, and even use existing data to predict future activities.

3.2.1.2 Tacit knowledge and its acquisition method

1 psychological method

The conversation method is the most common and most commonly used psychological method of knowledge acquisition, especially in the case of insufficient written materials, to obtain the connotation of related concepts and terms through language conversation. Experts can divide the concepts and issues in the field of study into some topics or topics, find relevant experts on each topic, and conduct centralized conversations with relevant experts to obtain the relevant tacit knowledge required.

2 technical methods

The technical methods of tacit knowledge acquisition are presented in two forms, one is a semi-automatic knowledge acquisition method, and the other is automatic knowledge acquisition method. Nowadays, semi-automatic knowledge acquisition methods are generally used, and some knowledge with specific knowledge editing ability appears. Engineering language and knowledge acquisition tools. According to the needs, knowledge acquisition can be divided into three processes: conceptualization, formalization and knowledge base refinement.

3 management methods

The incentive mechanism in enterprise management is to mobilize the enthusiasm of talents and give full play to the knowledge acquisition ability of all employees, thus forming a good cycle.

3.2.2. Knowledge Acquisition Between Cluster Enterprises

Undoubtedly, within the industrial cluster, in addition to acquiring explicit knowledge and tacit knowledge as much as possible from the enterprise, the enterprise will acquire the required knowledge from other enterprises, and this acquisition is based on cluster enterprises. Based on the knowledge sharing, knowledge sharing closely links the enterprises within the industrial cluster and enhances the competitiveness of enterprises and even the entire cluster.

3.2.3. Cluster Enterprise External Knowledge Acquisition

In addition to the knowledge acquisition within the cluster enterprise and the knowledge acquisition of the cluster enterprise, knowledge acquisition outside the cluster is also a meaningful way. From the perspective of acquiring the knowledge path outside the industrial cluster, the cluster enterprises mainly adopt the two forms of "pipeline" and "technical goalkeeper."

Pipes are like the role of pipes in real life, connecting one port to two ports and having connectivity between the two ports. That is to say, in the case of prior determination of the target, the strategic partnership or network relationship is adapted to form an information connection channel between the local enterprise and the external knowledge source of the cluster. Owen, Smith and Powell (1999) conducted a related study of the Boston biotechnology community and found that knowledge spillovers occur primarily in intra-regional corporate networks, although space distance is not the only factor in knowledge transfer. The "network pipeline" outside the cluster brings about a broad and smooth flow of knowledge, rather than the undirected, spontaneous "regional broadcast" that we traditionally mean. In short, the cluster enterprise acquires not only new knowledge from the internal knowledge network of the cluster but also acquires new knowledge through the outside of the cluster. It is an all-dimensional knowledge acquisition process.

4. Inter-Enterprise Learning Process in Low-Cost Industrial Clusters

(1) Knowledge spillover

According to the previous analysis, because of the gap between the technical level and the knowledge structure (the resulting "potential energy difference") that cluster enterprises ask for knowledge spillovers, and their active learning desires also affect knowledge spillovers.

(2) Knowledge digestion and absorption

In this session, the enterprises in the cluster carry out the integration of various resources to solve various practical problems faced by the community, including their different knowledge and capabilities, and coordinate the digestion and absorption of relevant knowledge. It can be seen that the complementarity of resources in the cluster and the need to solve common problems are the main driving factors for enterprises to carry out knowledge digestion and absorption.

(3) Knowledge overflow

The premise of the knowledge re-spill process is the completion of the process of digestion and absorption of knowledge. Only through the flow of the last round of knowledge increases the knowledge stock of the cluster knowledge base and generates some new knowledge that can be used for spillover.

5. Countermeasures for Knowledge Management of Low-cost Industrial Clusters

Based on the knowledge management theory, as pointed out in the previous article, the focus of knowledge acquisition is the acquisition between cluster enterprises. It can be seen that it is very important to strengthen the communication between enterprises, which leads to the concept and multi-level analysis of knowledge cluster spillovers in industrial clusters. The positive and negative effects of spillovers and the effective way to avoid the negative effects of knowledge spillovers are to establish a knowledge spillover guarantee mechanism, which means changing employees' knowledge of knowledge, especially tacit knowledge, strengthening the property rights protection of explicit knowledge and information disclosure. Institutions, and pay more attention to the creation of knowledge rather than acquisition; the acquisition and overflow of knowledge are based on the sharing of knowledge, which can not only improve the income of enterprises within the industrial cluster, but also achieve a win-win situation.

6. Conclusion

Through in-depth research on knowledge management of low-cost industrial clusters, the following main conclusions are obtained:

(1) Based on the definition of low-cost industrial clusters, the unique characteristics of low-cost industrial clusters are proposed: low-cost industrial clusters are a kind of regional production organization composed of highly specialized SMEs; Industrial clusters are mainly based on small and medium-sized enterprises, with a clear division of labor. Industrial technology innovation is mainly based on continuous innovation; low-cost industrial clusters are based on low cost as the main competitive advantage.

(2) When describing the knowledge acquisition and knowledge spillover effects of low-cost industrial clusters, the author built a set.

The knowledge sharing model between groups of enterprises and the knowledge acquisition and its influencing factors are analyzed in detail. Then the ability of cluster knowledge acquisition based on absorptive capacity is proposed. Based on this, the knowledge acquisition ability model is constructed. Finally, the impact of absorptive capacity is discussed in detail: factors and their intrinsic connection to knowledge acquisition capabilities.

(3) Low-cost industrial clusters Enterprise learning is a dynamic process of knowledge flowing between different enterprises in a cluster, including three stages: knowledge spillover, knowledge digestion and absorption, and knowledge spillover. The essence of learning among enterprises in a cluster is continuous circulation. The cyclical movement process of cluster knowledge of "knowledge spillover - knowledge digestion and absorption - knowledge spillover."

6.1. Lack of Research

Knowledge management is difficult in the research and implementation process because of the complexity of knowledge. Combining the characteristics of low-cost industrial clusters, the research on cluster knowledge management is still in its infancy, and the complete theoretical system is still under construction. There are still some shortcomings in this paper. Moreover, limitations:

(1) This paper focuses on the research on knowledge management of low-cost industrial clusters. It does not profoundly analyze the formation background of low-cost industrial clusters, the cultural factors within the clusters, the cluster structure and the corresponding

technological developments, and does not adequately discuss the appeal factors to China. The role of knowledge management in low-cost industrial clusters.

(2) This paper mainly studies the knowledge management of low-cost industrial clusters from the aspects of cluster knowledge acquisition and spillover, but it only makes a preliminary discussion on how to upgrade and upgrade low-cost industrial clusters. It does not propose that low-cost industrial clusters develop into innovations. The specific way and path of the industrial cluster.

6.2. Research Outlook

For the vast knowledge management research, this article is like the tip of the iceberg. It is necessary to dig deep into the formation and development mechanism of low-cost industrial clusters, and further study the knowledge management of clusters such as the following:

(1) A detailed study on the background of low-cost industrial clusters, the cultural factors within the cluster, the cluster structure, and the corresponding technological developments, and then explore the relevance of appeal factors to the knowledge management of low-cost industrial clusters.

(2) A detailed study on the control, coordination, and evaluation of the specific implementation process of knowledge management in low-cost industrial clusters.

(3) In-depth research on the optimization and selection of evaluation methods for the innovation ability and effect of low-cost industrial clusters, and optimize and adjust the corresponding evaluation index system in combination with the different development levels of the cluster.

(4) How to innovate and upgrade low-cost industrial clusters, and combine the specific characteristics of different industrial clusters to explore specific paths for the development of innovative industrial clusters.

The research on knowledge management of low-cost industrial clusters is a long and complicated process. This research report has only done exploratory preliminary research. Other needs for further improvement are subject to discussion by scholars and experts.

Acknowledgments

This research was completed following the careful guidance of Dr. Ramanathan. From the topic selection, structure arrangement and writing of the research, the professor's patient help, and meticulous attention were obtained. Dr. Ramanathan's integrity, rigorous academic attitude, profound knowledge, pragmatic spirit, peaceful and accessible character have a profound impact on me and will benefit for my life. Here, I would like to express my deepest gratitude and my highest respect to the guide!

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