

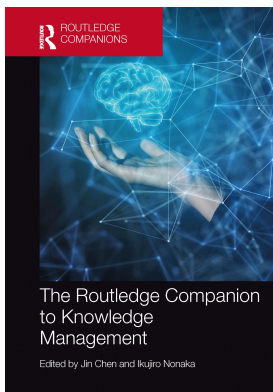
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1

OUTLOOK ON KNOWLEDGE MANAGEMENT

The Origin and Basic Framework of Knowledge Management

Jin Chen

History of Knowledge Management

Athens derived its name from the goddess of wisdom—Athena. In the 5th century BC, Athens became an important center for political, economic, and cultural exchanges in the Eastern Mediterranean, eclipsing Sparta and other Greek city-states. Due to its emphasis on the use of dispersed knowledge, people often refer to Athens in the 5th century BC as “the miracle of Greece”. Pericles, the Archon of Athens in ancient Greece, said proudly in his speech: “Athens is the school of all of Greece”. The Use of Knowledge in Society by Friedrich A. Hayek (1945) clearly describes that knowledge about change has never existed in a concentrated form. Whenever there is a change, some individual minds always feel the change, but merely partially.

Moreover, no one can possess this knowledge about change. However, Ancient Athens broke through the dilemma described by Hayek and succeeded in effectively using dispersed knowledge to form knowledge aggregation, knowledge alignment, and knowledge codification. Therefore, knowledge management has played a critical role in the city-state construction of ancient Athens. Table 1.1 shows ancient Athens and its use of dispersed knowledge.

Table 1.1 Ancient Athens and Use of Dispersed Knowledge

<i>Process</i>	<i>Problem</i>	<i>Solution</i>
Aggregation of knowledge	How to apply scattered and valuable knowledge to the needed problem	Promoting information communication through strong and weak ties in social network
Alignment of knowledge	How do people with knowledge align their actions to achieve common goals?	Encouraging the public to master common sense and participate in public activities regularly
Codification of knowledge	How to reduce the opportunity cost of acquiring and sharing knowledge	Reducing inequality in knowledge sharing through the establishment of formal and informal systems

Management Master's View on Knowledge

Robert M. Grant (1996), the famous strategic management master, once said that knowledge serves as the foundation of all critical advances since the origin of human civilization. Nowadays, the amount of knowledge stock relates directly to productivity and economic growth. The real challenge is not to discuss the knowledge economy and the concept of knowledge workers in general but to explore the essence of knowledge in depth and the use of knowledge which is quite different at other times.

The Origin of Knowledge Management

Peter F. Drucker (1999) believes that “the most valuable asset of an organization in the 21st century is the knowledge workers within the organization and their productivity”. Therefore, the organization must encourage enterprise knowledge sharing through knowledge management and improve its adaptability and innovation capabilities through collective wisdom. Knowledge flow within and across organizational boundaries enables enterprises to respond to external demands quickly and predict the market environment changes using the knowledge resources obtained. In the age of the knowledge economy, the cultivation of corporate competitiveness is inseparable from knowledge management.

The development of knowledge management is closely related to the concept of “intellectual capital”. In 1969, in the letter to a Polish economist, John Kenneth Galbraith pointed out that intellectual capital is not only pure knowledge in the form of knowledge but also includes intellectual activities; that is, intellectual capital is not only fixed capital but also a process of effective use of knowledge and a means to achieve goals. The best model of intellectual capital is the Skandia model, which was created in 1991 by Leif Edvinsson (1996), Intellectual Capital Manager of Skandia, drawing on the ideas of an “intangible balance sheet” and “balanced scorecard” in combination with Skandia's practice.

The Practical Background of Knowledge Management

Since the 1980s, due to intensified competition, downsizing has become a common strategy for companies to increase profits. However, the downsizing strategy has led to the loss of necessary knowledge, and companies have begun to adopt a “knowledge management” strategy, trying to store and maintain employee knowledge that is in line with the company's future interests. Scholars created theoretical frameworks of knowledge management that preceded related standards. APQC (American Productivity and Quality Center) defines knowledge management as a conscious strategy adopted by an organization to ensure members can promptly acquire the knowledge they need. Effective knowledge management can help people share information and then put it into practice in different ways to improve organizational performance ultimately. According to China's National Standard for Knowledge Management (GB/T 23703.2-2010), knowledge management is an activity of planning and managing knowledge itself, the process of knowledge creation, and the application of knowledge.

Two Typical Models of Knowledge Management

The first one is the Thomas H. Davenport (1996, 1998) model, in which knowledge is a dynamic mixture of factors, including structured experience, values, relative information, and expert opinions. It provides the framework for measuring and absorbing new information.

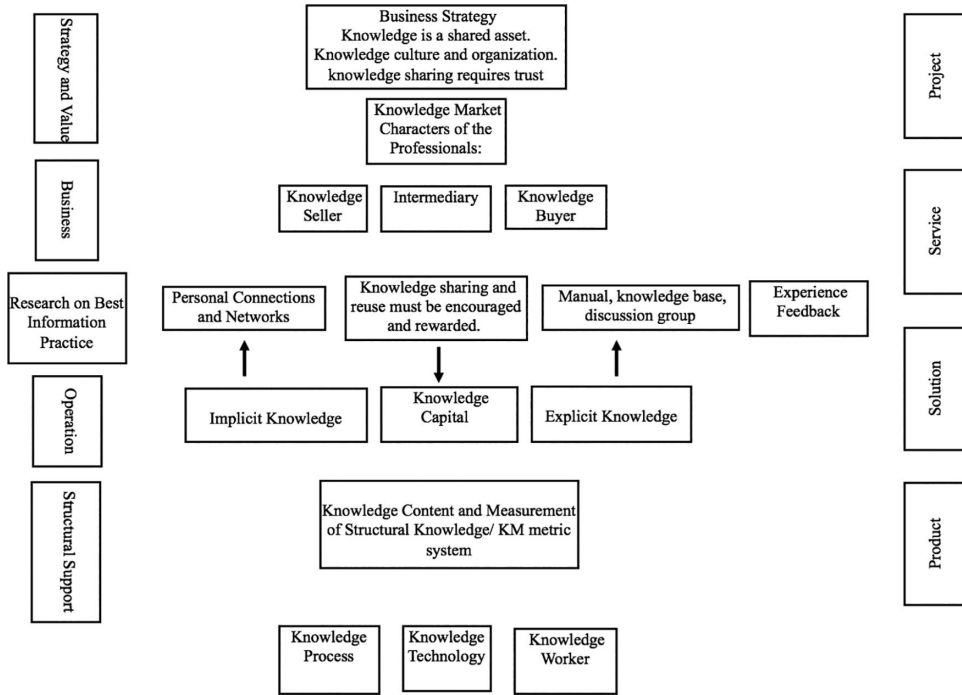


Figure 1.1 Siemens' Knowledge Management Model

Such an explicit model is well illustrated by the knowledge management model at Siemens (Figure 1.1).

The other one is the Ikujiro Nonaka (1994) model. In the mid- to late 1990s, Japanese professor Ikujiro Nonaka further developed a management system for intellectuals and practitioners. Through innovative case studies of Japanese companies, such as Sony, Panasonic, Honda, Canon, NEC, and Fuji Copiers, he attributed their success to the knowledge creation capabilities of the organization, which can fully mobilize the individual knowledge hidden deep in their minds in an “organized way” (Figure 1.2).

Based on the knowledge dichotomy by Polanyi (2009), Ikujiro Nonaka (1994) subdivided knowledge into “explicit knowledge” and “tacit knowledge”, starting from the relationship between these two concepts. He believes that the creation of new knowledge depends on the accumulation of tacit knowledge, which means that organizations have to explore implicit beliefs, intuitions, and inspirations in employees’ minds to produce new knowledge. In Ikujiro Nonaka’s perspective, knowledge is embedded in subjective experience, abstract concepts, standard operating procedures, systematic documents, or specific techniques. His knowledge management concepts are mostly new theories and new insights obtained from philosophy and sociology, which have great significance for reference.

Ikujiro Nonaka drew on the wisdom of Eastern and Western philosophies to construct the knowledge creation theory based on the successful practical experience of Japanese companies. With the socialization, externalization, combination, and internalization (SECI) model as the core, he organically combined subjective and objective, tacit and explicit knowledge, direct experience, and logical analysis to form a series of classics in knowledge management.

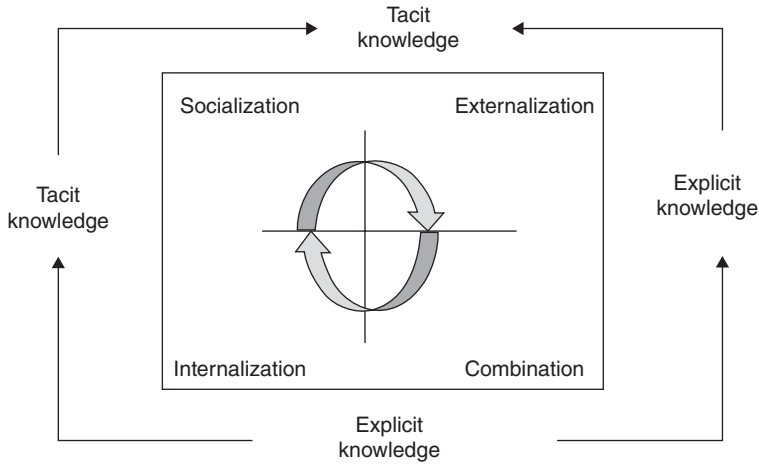


Figure 1.2 Ikujiro Nonaka's SECI Model

Based on the concept proposed originally by Kitaro Nishida (1992), the Japanese philosopher Ikujiro Nonaka (1998, 2000) defined “Ba” as a shared context in motion, which is for the continuous creation of practical meanings toward a certain objective. In “Ba”, knowledge is shared, created, and practiced. “Ba” also provides knowledge with energy, quality, and place to complete the transformation of individual knowledge into shared knowledge, and it rises along the knowledge creation spiral. “Ba” is the site of creative interaction. The space, time, and scene in “Ba” may be real or virtual; it may only exist on the cognitive level or a mixture of the above. “Ba” will appear and disappear along the real timeline. “Ba” is not limited to a single organization but can be created across organizational boundaries. “Ba” can be created as a joint meeting with suppliers, as an alliance with competitors, or as an interactive event with customers, universities, local communities, or government. Organization members transcend the boundary by participating in “Ba”, and when “Ba” connects with other “fields”, they further transcend the boundaries.

In the Ikujiro Nonaka model, tacit and explicit knowledge interact to constitute a series of knowledge creation processes. Knowledge creation enriches tacit knowledge while making it explicit, then combines with explicit knowledge and forms a new tacit knowledge again based on practice. This dynamic spiral movement process consists of four parts: socialization, externalization, combination, and internalization. Professor Ikujiro Nonaka took the initials of the four English words and named this process the SECI Model (Ikujiro Nonaka, 1994). This model is applied to individuals, groups, and organizations and needs to adapt to the social context.

Then, the Hitotsubashi Paradigm, introduced by Professor Nonaka (2015), is a widely accepted knowledge management model in the academic and practical worlds. This model has potential valuable extensions: adding technology factors, emphasizing value realization, focusing on breakthrough innovation, and invoking general wisdom. Therefore, we have to continue to pursue improvement.

The Latest Developments in Knowledge Management

First, the Carnegie Mellon paradigm is worthy of reference. Chinese firms' knowledge management system derives primarily from information management infrastructures. The

second is to apply further and improve the Hitotsubashi Paradigm, emphasizing the knowledge creation spiral and practical wisdom. Finally, we hope knowledge management forms a Chinese Paradigm, emphasizing meaning pursuit and technological innovation and integrating innovation and knowledge management. The above three aspects underlie what the traditional Carnegie Mellon Paradigm and Hitotsubashi Paradigm lack and need further exploration.

Therefore, the development of knowledge management should emphasize the breadth of social interaction and the depths of information technology drive and philosophical guidance.

Extending the Breadth of Social Interaction

It has been 25 years since the introduction of knowledge creation theory. The world has undergone profound and drastic changes in these two-and-a-half decades. For those who need to apply the knowledge creation theory, how significant are the challenges and difficulties they face? Along with the drastic changes in the world, the knowledge scene has also undergone profound changes. The organization is unable to complete the continuous horizontal movement from “socialization” to “externalization”, “combination”, and “internalization”. Otherwise, it cannot complete the vertical transition from a SECI transformation to the next SECI transformation.

Based on this, Ikujiro Nonaka (2011) proposed the importance of practical wisdom or pronesis as six abilities to deepen the knowledge creation spiral. First is the ability to understand what is beneficial to the society in advance and make judgments and decisions for organization. Second is, regardless of the situation or problem faced, the ability to quickly grasp the essence of the problem and use intuition to understand the nature and meaning of people, things, and matters. Third is the ability to continue to create formal and informal shared contexts, “Ba”, to construct new meanings through interactions between people. Fourth is the ability to use analogies and stories to understand various situations, master different experiences, and intuitively understand the essence of things. Fifth is the ability to, when necessary, take all possible means, including Machiavellian methods, to unite people with different goals and inspire them to act. Sixth is the ability to spread the practical idea of “learning by doing” to others, especially front-line employees.

In this process, we should pay attention to the further use of the knowledge creation spiral and the further improvement of globalization. Globalization makes it easier for companies to go beyond their boundaries, and its direct result is the globalization of all knowledge. Open innovation also makes it easier for companies to cross their boundaries so that the creation of knowledge benefits both the organization itself and the ecosystem at the same time.

The current social interaction has taken on the following characteristics:

Technologies such as big data, cloud computing, and artificial intelligence (AI) have brought endless treasures of data and information. Knowledge, information, and data have become increasingly difficult to distinguish. At the same time, the problem of information overload has begun to emerge. The combination of the Internet, social media, and mobile technology has brought about a “Hyper-linked” world, in which everybody participates in others’ lives.

Knowledge sharing has become more pervasive. The Internet of Things has brought a new generation of products, and each new product is also a new service. Knowledge becomes free, unbounded, and personalized. Over-reliance on explicit knowledge makes companies unable to handle change. The scientific, deductive, and theory-advanced approach assumes

that the world exists independently of context. It searches for a universal answer. However, social phenomena, including those of commerce and enterprise, exist precisely depending on context. If humans' personal goals, values, and interests and the interpersonal dependence between people are ignored, all analyses would be futile. However, many managers have not recognized this.

Based on the practical phenomena and characteristics mentioned above, Japanese managers emphasized that the concept of "wisdom" should be established and made into a new focus in knowledge management in terms of theory. For example, it seems that we have passed through the ocean of knowledge management and dived into a deeper ocean of wisdom, which is full of vitality and mystery. We must draw on the concept of Aristotle's practical wisdom, namely "practical wisdom" (Phronesis). He emphasized the critical role of Phronesis in management and organizational activities. In terms of practice, knowledge creation should be a lifestyle for everyone. It is an arduous task to achieve without strict self-discipline, unremitting efforts, empathy, and love. It is also inseparable from "Ba", the concept brought forward by the Japanese philosopher Kitaro Nishida (1992).

Depth of Information Technology-Driven

It is necessary to deepen further the information knowledge generated through interaction, that is, to drive innovation based on information technology. For example, Wiki allows different users to create content and modify and update content, conducive to knowledge innovation. Great companies, such as IBM, Cisco, and Oracle, have spared no effort to launch enterprise-level WEB2.0 products and services, covering the companies' collaborative management, customer relationship management, and portal systems.

Case: Pfizer: Enterprise Web2.0 Initiative

In response to the constantly updated and changing competitive environment with new products outside, Pfizer's strategy was to establish innovation and continuous product improvement culture. The application of Wikis in Pfizer began in 2006 when a team leader at the Research Technology Center (RTC) installed Mediawiki. His goal was to launch a scientific encyclopedia to facilitate external users' collaborative knowledge creation efforts with Pfizer's internal R&D team. History has proved that Pfizer's wiki (Pfizerpedia) is extremely popular, recording 12,000 hits among 13,000 employees worldwide in the first year. Pfizerpedia has become an integral part of Pfizer's IT field, and it has strengthened collaboration and information sharing among employees worldwide. Pfizerpedia makes connections between researchers closer, which helps to stimulate innovation, accelerate the pharmaceutical development process, and maximize Pfizer's R&D return.

Pfizer has used the information platform, including the Wiki innovation platform, to form a collaborative work network with knowledge management, including knowledge creation, knowledge sharing, and knowledge storage, thereby supporting the innovation and strategic management of the enterprise.

The next step involves the application of AI. China's AI industry is developing rapidly, with the emergence of many AI service companies. AI companies can conduct intelligent searches, intelligent creation, intelligent push, and intelligent decision-making. AI and knowledge management are the next areas of focus for knowledge management service organizations (Figure 1.3).

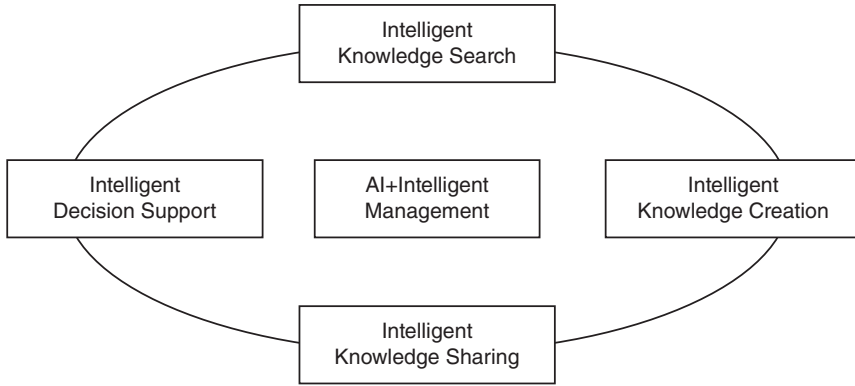


Figure 1.3 Artificial Intelligence and Knowledge Management

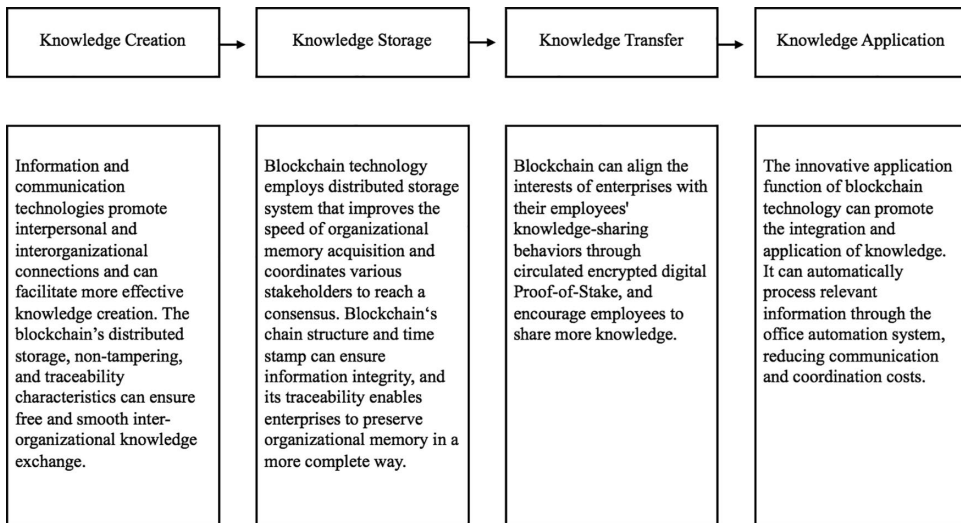


Figure 1.4 Blockchain and Knowledge Management

Moreover, a promising area is the utilization of blockchain; blockchain is a distributed shared ledger and database that can serve as a helpful tool for knowledge management with its characteristics of decentralization, openness, and transparency (Figure 1.4).

Case: Dual-screen Innovation of COMAC

Commercial Aircraft Corporation of China, Ltd. (COMAC) focuses on the construction of core capabilities. It takes the promotion of knowledge accumulated learning and knowledge management as the start to carry out the “Second Screen” construction activity (including the three steps of “establishing an electronic library, creating a scene-based knowledge application platform, and promoting intelligent knowledge services”). The company pays attention to capacity building while training its model team and values management innovation while strengthening technology innovation.

The “second screen” refers to employees add a new computer screen to their daily work computer as an information reference, data support, and knowledge reference medium for routine work to improve efficiency and speed up learning.

The essence of “Dual-screen Innovation” is a mechanism innovation that enterprises pay attention to knowledge management and optimize their learning capabilities. At the micro-level, every employee can benefit from the “second screen”, allowing employees to have a sense of participation in the construction of the knowledge system and then enjoy the sense of gaining innovation and performance improvement. On the macro level, it optimizes the learning atmosphere and organizational learning mechanism of the enterprise, improves the core capability of the enterprise as an innovation subject, and lays a good foundation for COMAC to create a learning-oriented organization.

The “Dual-screen Innovation” of knowledge established an electronic library to realize the “systematization” of knowledge. With a problem-solving mind, it accomplishes the situational application of knowledge in the production of service products. For example, the design of tooling at Shanghai Aircraft Manufacturing Center has been shortened from 22 working days on average to 14, and the efficiency has increased by 36%. At the same time, the improvement of the knowledge management system has made problem-oriented scene-based knowledge identification and integration work a routine at work. Finally, it comprehensively enhances the enterprise’s core competence and achieves the intelligent knowledge service.

The “Dual-screen Innovation” strategy is implemented consistently from top to bottom, stimulating all departments and employees to participate, and can be implemented continuously for a long time. The participation of all employees will produce unexpected ideas and thoughts. As an example, COMAC contributes more than 37,000 knowledge points each year, and the average contribution is 12 knowledge points per person. This kind of participation of all employees with the support of senior leaders guarantees the vigorous promotion and effective implementation of “Dual-screen Innovation”. Meanwhile, “Dual-screen Innovation” guides the integration of internal and external knowledge of the enterprise.

Height of Philosophy Steering

Western philosophy has an extended, deep, and rich epistemology. Generally, Western epistemology focuses on abstract theories and assumptions and regards them as an iron-clad norm. It has driven the development of science, and the background of this tendency is the long tradition of advocating accurate conceptual knowledge and systematic science in the West, which traces back to the Descartes era.

Kitaro Nishida (1992), the 20th-century philosopher, mainly represents Japanese epistemology, which is derived from the fact of pure experience, advocating to express the individual’s direct experience. This tendency corresponds to the Japanese corporate managers’ emphasis on the “real-time” experience. In the perspectives of Japanese managers, reality exists in a state of constant and eternal change, and it is composed of tangible and concrete materials, which is opposed to the mainstream view of reality in the West. That is, in the West, managers believe that reality is an eternal and intangible abstract entity. Japanese managers discover the truth through physical and spiritual interactions between themselves and nature and between themselves and others. This thought originates from the long intellectual

tradition of Japan, which emphasizes “the unity of nature and man”, “the unity of mind and body”, and “the unity of self and others”.

Practical wisdom beyond the “economic goals” of organizational development and quantitative management will cultivate beliefs with high ethical values and form organizations with a sense of mission. The joys of “buying, selling, and producing” put forward by Soichiro Honda and Kazuo Inamori’s motto of “Revere God and Love People” are classic examples of leadership with practical wisdom, which is very inspiring for us.

The concept of “wisdom” can be traced back to ancient Greek philosophy, but philosophers pay more attention to theoretical research rather than theoretical practice. The founder of phenomenology, the study of subjective experience, Husserl (1999) further realized the importance of human subjectivity and empathy at the end of the 19th century. Therefore, from Husserl and Heidegger to Merleau-Ponty in France, they all emphasized that knowledge is always based on subjective vision and subjective experience. Subjective experience can come from the interaction between man and nature, which is physical interaction. Husserl’s research was about creating meaning and value, which lays the foundation for phenomenology. In order to link knowledge with the application of knowledge, Husserl mainly devoted himself to the research of subjective human experience. Husserl proposed that to reveal how human knowledge functions, the human experience must be described and analyzed thoroughly. Husserl believed that to make wise judgments about our actions, we need subjective experience instead of objective experience. In the latter part of his academic career, he thoroughly analyzed the concept of intersubjectivity, how multiple individuals share their subjectivities. Husserl pointed out that the state of intersubjectivity comes from people’s empathy, that is, to discover and understand the intentional behavior of others by “putting oneself in others’ place”. He called this mechanism of empathy “pairing”. Once the two individuals are “paired”, the narrow egoism that initially separated the two would disappear and be replaced by the sense of a shared subjectivity. In order to create the state of intersubjectivity to form the sense of “us” rather than “me”, the organization must help each member breakthrough narrow egoism and take care of each other sincerely.

China’s view of knowledge ranges from Pre-Qin Confucianism and Yangming’s theory of “unity of knowledge and doing” in the Middle Ages to Mao Zedong’s materialistic view of knowledge and practice in modern times. This chapter holds that the logical starting point of China’s view of knowledge lies in people’s virtue ethics, and has always been discussed around the basic relationship between “knowledge” and “doing” in the process of evolution, resulting in basic problems such as where knowledge comes from, how to obtain knowledge, the basic process of knowledge innovation, and the value and efficacy of knowledge. China’s view of knowledge directly points to people and human society (inward knowledge system) in terms of the object of knowledge, the ways and means of acquiring knowledge, and the value of knowledge. And it can promote human beings to deal with the relationship between good people and adjust the conflict of interest between good people. However, it ignores the full use of human relations in nature. Therefore, it has seriously affected the development of material society and productivity.

When we fully understand the critical enlightenment of philosophy to knowledge management, then knowledge management should develop in three directions next: the first is to emphasize group interaction further; the second is to value the knowledge management model driven by information; the third is to develop philosophical concepts, especially the practical wisdom proposed by Husserl’s philosophy as the leading phenomenology and Mao-zedong’s materialistic view.

The Rise of Knowledge Management and Management Changes

In the era of increasingly fierce global economic competition, it is critical to design the philosophy, operating system, and management model of organizational development from a “knowledge management” perspective. In the past century, management has experienced two critical development stages: the first is the stage of scientific management which regards employees as “economic man” represented by Frederick Winslow Taylor et al.; the second is the stage of the knowledge economy and knowledge management that regards employees as “intellectual man” represented by Drucker - (2017, 2020).

Taylor was the first to regard management as a science. He pointed out that establishing various clear rules, regulations, and standards to make everything scientific and institutional is the key to improve management efficiency. Henri Fayol (1999, 2016) from France and Max Weber (2013) from Germany supplemented and improved Taylor’s management theory. They focused on the rationalization of organizational structure and management principles and the rationalization of the function division of managers, which laid the foundation for classical organization theory. Based on scientific management literature, a mature management model of quality and project management was formed, emphasizing a data-based management system.

As early as the early 1960s, Peter F. Drucker (1993) put forward knowledge workers and knowledge management concepts. In a knowledge society, the most basic economic resource is knowledge. Knowledge workers will play an increasingly important role, and every knowledge worker is a manager. Knowledge workers have higher quality and good self-management abilities. In the industrialized world, experts define working methods and procedures, and once they are defined, they cannot be changed. No matter how creative the employees are, the opportunities to show their talents decreased. In the 1980s, Drucker proposed that “The typical enterprise in the future is based on knowledge and consists of various experts who make decisions and manage themselves based on a large amount of information from colleagues, customers, and superiors”.

From the “intellectual man” perspective, corporate management’s philosophy, style, and the system should undergo more significant changes. First of all, the model of “support and care” must be vigorously advocated. Nowadays, managers should consider caring for and motivating employees and creating favorable environments and conditions. They should develop and use the potential and creativity of employees to realize their dignity and value and then help and guide employees to achieve self-management. This management model also contains another vital concept: whether it succeeds or not, courage is instilled in the face of challenges. In short, this should be the focus of business management in the new era.

Ikujiro Nonaka’s theory of knowledge creation emphasizes that “people are the most important asset, and knowledge is the strategic asset of an enterprise”, and modern organizational management theories should be “human-centered”. *The Wise Company: How Companies Create Continuous Innovation* by Ikujiro Nonaka and Hirotaka Takeuchi expounded and proved that wisdom is essential to cope with the rapidly changing world. Moreover, wisdom is a kind of high-level tacit knowledge.

There are three aspects in Dr Debra’s law of knowledge dynamics: the first is to replace information with knowledge since knowledge is the most valuable asset; the second is to replace change with innovation, which means the source of innovative knowledge must be transferred to where it is most needed, and the third is to replace competition with cooperation.

Therefore, knowledge management ideas should be deepened in three aspects: the first is to emphasize emotional interaction, that is, to further develop the knowledge creation spiral model; the second is to emphasize a digital drive, and use advanced digital technology, including network technology, to drive the effectiveness and benefits of knowledge management; and the third is to sublimate the pursuit of philosophy from objective pursuit to subjective pursuit, the pursuit of meaning, the pursuit of value, and the pursuit of happiness.

Emotional interaction broadens knowledge; data-driven increases the depth of knowledge management, and the pursuit of meaning raises the height of knowledge management. Entrepreneurs and managers are expected to optimize knowledge management from the height, breadth, and depth of knowledge and be the guides in a knowledge-needed new era. They need to resist the temptation of short-termism and maintain the company's sustainable development and dynamic capabilities. We should create a future beyond the reach of our competitors, a future that brings comparatively excellent value to customers. In that future, people can live harmoniously in society with moral aspirations and pursue public interests as a way of life.

Finally, let us come back to the Budapest tradition of knowledge management. Michael Polanyi (2009) creatively proposed "tacit knowledge", which can be used as a reference for human development. We emphasize knowledge based on Michael Polanyi's thoughts. However, in the new era, only through the extension of information, emotionalization, and philosophy can one achieve the transformation proposed by his brother Karl Polanyi (2001). The transformation is with particular reference to a society's transformation into a healthy and sustainable organization based on knowledge. Such a society values public interests and morals, strengthens trust and dependence between people, and uses advanced information technology in depth.

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