

Competence Management in a Knowledge-intensive Company Under the Ajar Innovation Strategy

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Abstract—The paper deals with the role of competence management in the development strategy of modern knowledge-intensive companies. The ajar innovation strategy, which assumes that different agents manage different stages of the life cycle of the same technology, encourages companies to manage changes in the formation of competencies and their implementation. In turn, between the formation and implementation of competencies, there are some institutional filters maintaining certain management decisions and blocking the implementation of others.

Keywords—*competence management; ajar innovations; knowledge management; institutional filters; knowledge-intensive companies.*

I. INTRODUCTION

Most people are convinced that tomorrow will be in principle similar to today, with the exception of some small details. Strategic change management begins where there comes an awareness of the distinction, the discrepancy between tomorrow and today's world and the need to manage this discrepancy arises.

The role of the human factor in change management is multifaceted. People are knowledgeable, competent and decision makers. We discuss those aspects in more detail, based on the needs for managing competencies dictated by the realities of the information economy, the formation of which occurs before our eyes. Since the breath of the information universe is most clearly manifested in the activities of knowledge-intensive companies, we focus on the algorithms and behavioral routines practiced by companies of that kind.

The basic principles of the formation and implementation of a competitive strategy for a knowledge-intensive industrial company are as follows:

- timely and adequate response to changes in the market on the basis of independent pricing and nomenclature policy;
- optimization of the size of enterprises incorporated in the company in order to increase manageability and gain synergistic advantages;

- interconnection and continuity of actions and decisions at the strategic, tactical and operational levels of management decision making;
- forming a team of professionals ensuring the implementation of the company's development strategy and production plans;
- balance between the production and infrastructure processes carried out by the company.

Competitive strategies aimed at innovative development of the company, differ in their key aspects and mechanisms for achieving the goals. None of the existing concepts of developing competitive strategies can be neglected, as each of them reflects a certain slice of reality associated with the strategic management of changes in knowledge-intensive companies.

Management of individual organizations that are part of a large knowledge-intensive company is carried out taking into account innovative development strategies those business units adhere to. Depending on: 1) the level of manufacturability of production processes at these enterprises, 2) the vector of changes in markets and market niches in which they operate, and 3) tasks facing them, one of the three strategies of innovative development is chosen – an innovator's strategy, simulator's strategy or conservative's strategy [1]. Inside a diversified knowledge-intensive company, it is necessary to form and maintain a reasonable combination of these three strategies, and the relationship between them may change during the development of a company and its separate divisions.

The main contribution to the adaptation of world management experience by modern knowledge-intensive manufacturing companies is made by three components – knowledge management, competence management, and decision-making management. Those three components are linked by a single logic, predetermined by the company's change management strategy.

Under the paradigm of ajar innovation, different stages of the life cycle of the same technology can be accompanied by different agents, and the innovation “opens” for access, copying and use at several specific stages, while others are closed and implemented by the development company itself.

The advantages and disadvantages of the paradigm of ajar innovation, as well as its comparison with the traditionally discussed paradigms of closed and open innovation, are described in detail in a number of previous publications ([2-4] and others).

Accordingly, an innovative firm should not have the full range of innovative competencies, but only some of them allowing it to implement well its innovative strategy chosen to support certain stages of the innovation life cycle.

Competence is a cognate word of compete. The question of competitive advantages of the company's human potential is transferred to the sphere of competence management – this is what allows modern companies to compete in the markets of information, knowledge and technology [5].

II. KNOWLEDGE MANAGEMENT AS A TOOL FOR DEVELOPING COMPANY'S HUMAN RESOURCES

In the last 20-25 years, there have been changes in the economy and business that have stimulated interest in knowledge management [6]. These include the following:

- Knowledge becomes the main resource of economic development and growth.
- Knowledge-based industries are becoming leading industries.
- Knowledge occupies an increasing proportion in the value structure of products and services.
- Knowledge management transforms it into the practice of organizations. Search for the best experience and its use is becoming a key strategy for organization development.
- Knowledge management systematizes data presentation forms, standardizes algorithms for performing routine operations, which saves a lot of time for information search and processing.
- Knowledge management builds and develops knowledge about customers by creating appropriate databases, customer profiles, and sales support systems.
- Today, when knowledge is the real power, this power is gradually shifting to consumers, giving them the opportunity to influence significantly the market behavior of sellers and producers.
- Knowledge management forms and uses the intellectual capital of the organization (human, organizational, consumer), increases the return on the use of intangible assets, and allows you to distribute the results of R & D on similar projects.
- Knowledge management creates conditions for new knowledge and innovations, contributes to the formation of an innovative climate, supports certain innovative projects.

Successful knowledge management requires:

- Good technological infrastructure that enables efficient transfer and dissemination of knowledge through communication.
- High organizational culture that promotes the transfer of knowledge from one employee and department to another.
- Continuous and qualified personnel training.

Knowledge management enables for each organization:

- Faster response to customer requirements with more efficient innovative solutions and prevent customers from looking for these solutions from competitors.
- Realize innovations into products faster in order to provide them to consumers.
- Use intellectual assets of partners through joint technical, functional, industry expertise.
- Accelerate learning and skills transfer for staff.
- Save resources by reusing the solutions you find.

The “invisible” wealth of enterprises consists of intellectual assets that can bring real income to companies. These are patents and copyrights, knowledge and professional skills of employees, trademarks, customer base, a network of reliable suppliers and partners, innovation culture, corporate memory and databases, quality of work processes, etc. Therefore, the proper organization of a corporate knowledge management system is extremely important.

Summarizing the knowledge management experience, its comprehensive analysis, identifying opportunities to use new organizational models and methods, taking into account specific situations and characteristics of economic agents, it becomes one of the key tasks of managing a knowledge-intensive company [7, 8].

The ability of an organization to perceive, disseminate and act on knowledge determines its ability to learn. In recent decades, the concept and practice of lifelong education as a set of measures enabling a person to learn throughout life has become widespread in the world. “Smart” organizations differ from others in that they not only enable employees to improve their skills without interrupting their core activities, but also create the conditions for this by organizing relevant processes as close as possible to workplaces of their employees and encouraging them to continue intellectual and creative growth.

Knowledge management in a modern company consists of several interrelated stages and successively implemented procedures (Fig. 1):

- knowledge generation (if this procedure is properly organized, then managers, at least, receive a reasonable answer to the question of where the knowledge on which the work of the company is based comes from),
- formalization of knowledge (this stage includes the codification of knowledge, the choice of the appropriate form of its representation, and as the company develops,

an approach to those decisions may undergo significant changes),

- preservation and accumulation of knowledge,
- transformation of knowledge (selection of a convenient form of its presentation, dictated by a character of its further use in the organization and the functions that the knowledge management system is intended to perform),
- knowledge control (organization of access to knowledge and procedures for its application),
- diffusion of knowledge,
- knowledge update (this stage involves the organization of knowledge culling and arrangement).

Attention is drawn to the fact that at no stage of knowledge management can the mechanisms for the use of that knowledge be missed, but among these stages the “medial” procedures for knowledge management – formalization, transformation and diffusion – are most closely linked to those mechanisms.

The nature of knowledge management procedures inside an organization and the quality of that management determine its ability to learn. The efforts undertaken by many knowledge-intensive corporations to create a unified internal information and communication environment are an important step towards the creation of a modern knowledge management system, but this is only one of the first steps. It is necessary to ensure that the knowledge management system addresses the following tasks:

- standardization of business processes that need to be aligned with common standards adopted by the corporation;
- formation of a bank of possible organizational, institutional and managerial decisions that can be accessed in case of emergencies;
- extension of high technological standards that exist in the knowledge-intensive corporation to the activities of suppliers (in particular, small and medium-sized businesses), that have direct long-term business relations with some parts of the corporation.

Thus, a properly constructed knowledge management system becomes one of the elements of cooperation with small and medium-sized enterprises that perform certain production or infrastructure functions that the company outsources. Some of these small enterprises can be established on the initiative of the company itself by separating non-core assets. It is reasonable to resort to such “spin-offs” in cases when the transfer of functions to the outside does not threaten the sustainability of business processes occurring in the company and its branches.

One of the forms of interaction of a large knowledge-intensive company with small and medium-sized businesses is contracting for the supply of certain types of standardized intermediate products for industrial use, as well as certain types of services (security, logistics, exhibition activities, etc.).

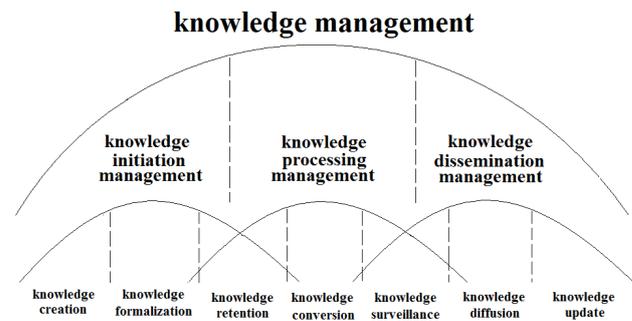


Fig. 1. Methodology of knowledge management.

The possibility of external supply of certain components, parts, assemblies necessary for creation of modern high-tech products at the company's enterprises should be determined not by the low cost of a supply contract, but by the compatibility of technological processes, including technological standards, adopted by the company and its contractors.

Thus, the development strategy of a knowledge-intensive company should include the possibility of transferring certain technologies to its suppliers in order to achieve an appropriate level of compatibility of technological processes. Therefore, a well-formed knowledge management system becomes the first step towards the implementation of the principles impelled by the ajar innovation strategy.

III. INSTITUTIONAL FILTERS IN COMPETENCE MANAGEMENT

Competences management in a modern company can be represented as a unity of three groups of routines (algorithms), each of which has its own meaning and purpose, namely, it is the competence detection management, managing their escalation (formation) and managing their perpetuation, transformation and transfer (Fig. 2).

According to the diagram in Fig. 2, competence management can be conditionally represented as a unity of seven consecutive operations, each of which is aimed at solving particular tasks:

– identification of needs for competencies; at this stage, the company's management often makes a preliminary decision on which stages of the life cycle of the technology being developed the company will maintain by itself, and which will be outsourced – that decision is the basis of the demand for competencies that the company should have inside [9];

- codification of the required competencies: at this stage, job descriptions are drawn up or specified, which assign certain functional responsibilities to employees who are in the relevant positions of various departments – respectively, these employees must have the necessary competencies;
- staff recruitment; the task is not to select employees who already have the required set of competencies, but to select people who are ready and able to train and transform their competencies in such a way as to bring maximum benefit in terms of ensuring the processes implemented in the company [10];

- employee training; this is a key aspect of competency management: as soon as a firm says goodbye to the paradigm of closed innovations, it immediately faces the fact that not all the necessary competences are concentrated in it; therefore, the task is to organize mutual movement: on the one hand, to establish cooperation and interaction with other companies, on the other hand, to train its employees [11];
- learning by doing; regardless of how well trained employees are – well enough or not so well – in any case, there are competencies that can be formed only in practical activities; training in practice is an important step in the formation and preservation of competences in the company;
- codification of acquired competencies; the organization of transfer of practical experience from one employee to another also applies to this stage: there are numerous tools for the accumulation of information and rendering subdivided access to it for employees of different levels and specializations [12, 13]; it includes not only information systems that allow to maintain knowledge management in a company at the primary level, but also all the routines to ensure the exchange of experience between employees – different types of quality circles, various forms of tutoring or mentoring, secondment, shadowing and other organizational solutions;
- finally, motivation of employees to improve their skills; this is the key element necessary to ensure that the efforts of the company's management to build and maintain competencies do not occur once, but receive a certain systematically organized continuation and enhancement [14, 15].

As a result of the formation of distributed competence systems, companies not only participate in network interactions with other agents, but also rebuild their internal structure on network principles [16, 17]. Giving individual units and even individuals the authority to support certain stages of the technology life cycle leads to the formation of a “cellular” structure of companies in which each employee (or a small group of them) is the center of profit and responsibility, subordinate to others and having a certain, although not always strictly defined, range of functional responsibilities.

An important feature of core domains of competence is their inevitable obsolescence [18, 19].

Anyone can find the fact there is a certain group of filters between formation and realization of competencies. It should be noted that the awareness of the presence of similar filters between the demand for technological solutions and their supply was the impetus for the development of the concept of national innovation systems. Today we are on the threshold of formation of national competence management systems.

The presence of filters (conductors for some types of impacts and barriers for others) means that the information on the demand for and supply of competencies is distorted and sifted during the transitions between their formation and their

realization, i.e. some part of it cannot be adequately transmitted and perceived.

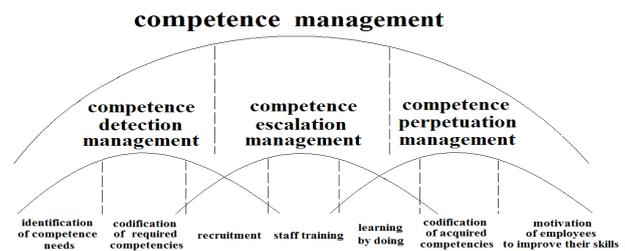


Fig. 2. Methodology of competence management.

The presence of the so-called government order for the training of specialists creates the appearance of a close connection between the education system and the needs of the business environment. However, the benchmarks for planned training of specialists are often based on inadequate (outdated, erroneous, incomplete) information about the future needs of the public sector of the economy in qualified personnel for the relevant range of specialties.

Increasing attention in the system of higher education is paid not to the actual formation of competencies (although it is still crucial), but to the formation of the motivation and value system, the presence of which will allow to realize those competencies [20, 21].

In turn, companies that manage a certain range of business processes face a dilemma – to outsource some of those processes or implement all of them on their own. This problem is particularly acute in knowledge-intensive sectors of the economy, where the leading trend is the deepening of the division of labor between research and development, between R & D and innovation, between the creation of innovations and their application [22, 23]. Depending on the logic of decision-making in this area, firms are ready or not ready to demand a certain set of competencies of their personnel.

IV. CONCLUSIONS

In a number of works devoted to implementation and diffusion of innovations, one can find a naive view that the main obstacle to the expansion of already developed technical solutions is the lack of information about them. As if a simple familiarization of the company's management with high technologies is enough to make it want to use them.

In fact, the main difficulty to the spread of an already formed innovation is not the lack of good ideas, technologies or capital, but the inability to manage cooperation on a large scale, the inability to coordinate the interests of various groups of agents that should become integral elements of long-term interaction processes.

By focusing not on competition and the destruction of other agents occupying the same market niches, but on cooperation, and sometimes direct long-term relationships with them, it is possible to achieve joint success, ensuring the long-term and sustainable growth of the markets in which the company operates.

This strategy can be implemented in various ways, but it is based on certain principles that cannot be neglected.

- Successful knowledge-intensive companies ensure the permanent obsolescence of their previous products by introducing new designs to the market. The devotion to self-competition allows to maintain a constant circle of interaction of both competitors and contractors (as well as final users) with whom long-term economic relations are maintained. Good examples of that kind are represented by software companies that distribute new (more functional) versions of their software products to frequent users for free or for a nominal fee. Thus, there is a field for long-term interaction with a wide range of consumers, whose commitment to the producing company is encouraged and rewarded.
- Companies that have occupied similar market niches for decades are constantly creating external benefits for other agents (both suppliers and consumers) operating in those markets, helping them to solve emerging problems by providing temporarily free resources (for example, production capacity) and technical solutions.
- Successful high-tech firms prefer to establish direct long-term business relationships with other agents, including when they outsource some of their functions or subcontract support operations. The main criterion for establishing partnerships is not cheap goods and services supplied by other agents, but technological compatibility of production and infrastructure processes. This approach greatly facilitates the management of the value chain and ensures the delivery of quality products to end-users, which strengthens the market position of firms professing this strategy.

Thus, innovative enterprises should concentrate employees who are ready and able to manage the initial stages of life cycles of technological innovations, and simulators and conservatives should be guided by the presence of employees whose competencies permit them to manage the later stages of the life cycle of those innovations.

Permanent change management allows knowledge-intensive companies to stay ahead of events, anticipate transformations of the economic environment and to some extent even manage them, to segment local markets, to initiate life cycles of innovation, create demand for high-tech products, providing advanced formation of the necessary competencies and improving the company's knowledge management tools.

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