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Dissertation Thesis Abstract

THE PROPOSAL OF AN EFFECTIVE KNOWLEDGE MANAGEMENT MODEL BASED ON LEADERSHIP IN INDUSTRIAL ENTERPRISES

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SÚHRN

KHAZIEVA, Natalia, Mgr.: *Návrh efektívneho modelu manažmentu znalostí založeného na vodcovstve v priemyselných podnikoch* [Dizertačná práca] – Slovenská Technická Univerzita v Bratislave, Materiálovotechnologická fakulta so sídlom v Trnave; Ústav priemyselného inžinierstva a manažmentu. – Školiteľka: doc. Ing. Henrieta Hrablik Chovanová, PhD., Ing. Paed. IGIP – Trnava: MTF STU, 2024. 143 s.

Dizertačná práca je zameraná na problematiku znalostného manažmentu a vodcovstva (vedenia) v priemyselných podnikoch. Hlavným cieľom predkladanej dizertačnej práce je navrhnúť efektívny model riadenia znalostí založený na vodcovstve v priemyselných podnikoch. Predmetom dizertačnej práce je úloha vodcovstva v procese znalostného manažmentu. Objektom výskumu je priemyselný podnik. Dizertačná práca pozostáva zo siedmich hlavných kapitol. Prvá kapitola je venovaná analýze teoretických východísk vedenia a jeho odlišností od manažmentu (riadenia), znalostí a znalostného manažmentu. V druhej kapitole sú popísané hlavné ciele výskumu a výskumné hypotézy. Metódy a metodika výskumu sú uvedené v tretej kapitole. Štvrtá kapitola obsahuje analýzu súčasného stavu skúmanej oblasti a na základe získaných výsledkov je v kapitole päť vypracovaný návrh efektívneho modelu znalostného manažmentu založeného na vodcovstve v priemyselných podnikoch. V kapitole 6 je návrh zhodnotený a overený praxou a napokon siedma kapitola obsahuje prínosy návrhu pre teóriu, prax a vzdelávanie.

Kľúčové slová: znalostný manažment, vedenie, proces učenia, inovatívne vzdelávacie metódy, analytické metódy, vyučovací proces.

Dizertačná práca bola napísaná ako súčasť projektu VEGA 1/0518/22 „Zavádzanie integrovaných manažérskych systémov s hodnotovo orientovanými požiadavkami pre vytváranie modulárnych kolaboratívnych pracovísk“ a KEGA 025STU-4/2023 „Budovanie modulárneho laboratória pre rozvoj zručností auditovania manažérskych systémov“.

ABSTRACT

KHAZIEVA, Natalia, Mgr.: *The proposal of an effective knowledge management model based on leadership in industrial enterprises.* [Dissertation Thesis] – Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology in Trnava; Institute of Industrial Engineering and Management. – Supervisor: doc. Ing. Henrieta Hrablik Chovanová, PhD., Ing. Paed. IGIP – Trnava: MTF STU, 2024. 143 p.

The dissertation is focused on the issue of knowledge management and leadership in industrial enterprises. The main goal of the presented Dissertation Thesis is to propose an effective knowledge management model based on leadership in industrial enterprises. The subject of the dissertation thesis is the role of leadership in the knowledge management process. The object of the research is an industrial enterprise. The Dissertation thesis consists of the introduction, seven chapters and conclusion. The first chapter is dedicated to the analysis of the theoretical background of leadership and its difference from management, knowledge and knowledge management. In chapter two, the main objectives of the research and the research hypotheses are discussed. The methods and the methodology of research are presented in chapter 3. The results are presented and analyzed in chapter 4. Following the received results, in chapter 5, the proposal of an effective model of knowledge management based on leadership in industrial enterprises is developed. In chapter 6, the proposal is reviewed and verified by practice and finally in chapter 7, the author outlines the significance of the proposal for both existing theory, practice and education.

Keywords: Knowledge management, leadership, learning process, innovative educational methods, analytical methods, teaching process.

The dissertation thesis was written as part of the project VEGA 1/0518/22 „Implementation of integrated management systems with value-oriented requirements for the construction of modular collaborative workplaces“and KEGA 025STU-4/2023 "Building the Modular Laboratory for the Development of Management Systems Auditing Skills".

CONTENT

INTRODUCTION

Knowledge Management (KM) is one of the emerging topics of academic and professional discourse in many fields of knowledge, including cognitive sciences, sociology, management science, information science (IS), knowledge engineering, artificial intelligence and economics. During the last 30 years, scholars elaborated models of knowledge management (Nonaka and Takeuchi, 1995; Nissen, 2006; Bratianu et al, 2011), trying to describe its process and parts and conceptualize the entire approach. Each model has its own limitations and critics but continues the development of the theoretical framework.

However, by studying the knowledge management process and any initiatives related to it, it was identified that many of them fail. Poor management and lack of commitment and support were the main issues while implementing KM initiatives and running the KM process. KM initiatives are changes and new directions that are initiated and pushed by people (workers, employees, managers or executives) who are seen as leaders. Theory of leadership has developed significantly over the last 100 years, studying leadership as innate qualities, transformational and transactional behavior, interaction with followers, orientation on tasks or employees and others. Leaders can differ not only in qualitative characteristics but also in type of nomination: assigned and emerged, which may also lead to varied results. Thus, the presented work aims to study the role of leadership (and which type is better) in the knowledge management process in the industrial enterprises and propose an effective model to run this process.

The main goal of the presented Dissertation Thesis is to propose an effective knowledge management model based on leadership in industrial enterprises.

The Dissertation Thesis consists of introduction, seven chapters and conclusion. The first chapter is dedicated to analysis of the theoretical background of leadership and its difference from management, knowledge and knowledge management. In chapter two, the main objectives of the research and the research hypotheses are discussed. The methods and methodology of research are presented in chapter 4. The results are presented and analyzed in chapter 5. Following the received results, in chapter 6 the proposal of an effective model of knowledge management based on leadership in industrial enterprises is developed. In chapter 7, the proposal is reviewed and verified by practice and finally, the author outlines the significance of the proposal for both existing theory, practice and education.

1 THEORETICAL FOUNDATIONS OF KNOWLEDGE MANAGEMENT BASED ON LEADERSHIP IN INDUSTRIAL ENTERPRISES

The aim of this chapter is to consider the key terms and definitions that are essential for further exploration of the studied topic. A systematic literature review is the main approach to study literature concerned with the chosen topic.

1.1 Leadership

There isn't a strong operational definition of leadership, and it depends on the field in which it is studied. Despite the fact that almost everyone knows this term and has their own explanation for it, "there is no consensus for example, that leadership be singular or plural, that it be a trait or a set of behaviors, or that it be best viewed as a subject or as an object" (Raelin 2016, p. 131). This means that this field of knowledge continues to be studied and has unknown facets. Simultaneously, during the last 25 years, the amount of new leadership theories has increased, and focus has moved from understanding general leadership processes to a phenomenon that evolves over time, depending on the hierarchical level to which the leaders belong (Kaiser, Hogan, & Craig 2008).

1.1.1 The main concepts of Leadership

The concept of leadership cannot be studied without followers because these parts mutually need each other. They are closely linked and are two sides of one process but initiatives to create communication, to develop relationships and to define the frameworks usually come from leaders. Leaders help to deliver a company's purpose to employees and motivate them to achieve it by improving the performance of a team or organization. The performance of a team or organization is based on a combination of specific tasks, relations, change, and external behaviors that are relevant for their situation (Yukl 2012).

1.1.2 Management and leadership

Leadership is a process that is similar to management in many ways. As a whole, researchers often consider the definition of management through its functions: planning, organizing, commands, coordination and control. A leader can be assigned or emerged and may have the same functions as a manager.

The key function of management is to organize order and stability of an organization, while the primary function of leadership is to provide changes and progression.

1.1.3 Leadership Models

Traits Approach

The trait approach was widely discussed in the 1950s and 1960s. The primary focus was addressed to the search for the universal traits owned by leaders. The identification of characteristics that distinguish leaders from non-leaders (or followers) and effective from ineffective leaders, is the center of the classic trait approach.

Skills Approach

This approach assumes that skills and abilities can be learned and developed rather than personality characteristics (traits), which are usually considered as innate. While personality plays an important role in leadership, knowledge and abilities are required for effective leadership.

Behavioral Approach

The Behavioral Approach is broader and includes the actions of leaders that influence followers in various circumstances. The general focus is based on what leaders do and how they act (Northouse 2013, p. 71). Research suggests that leadership consists of two main types of behavior: task behavior and relationship behavior. Task behavior stimulates goal achievement; relationship behavior supports followers feeling comfortable with each other, with themselves and circumstances or surroundings. The key purpose of leaders is to combine these two behaviors to affect followers to reach a goal.

Situational Approach

The situational approach is one of the more widely recognizable approaches. It focuses on the idea that leaders may perform different behaviors in different situations. This approach was developed by Hersey and Blanchard (1969a) and has been revised several times.

The situational approach points out that leadership includes both directive and supportive behavior and each has to be realized properly in a particular situation. To define what is suitable in a particular situation, a leader must evaluate followers and decide how competent and committed they are to accomplish a goal. Because goals may be different and followers' skills and motivation vary over time, leaders should act according to the situation and adapt their directive or supportive style to meet the varying needs of followers. Thus, the situational approach includes leadership styles and the development level of followers.

Path-Goal Theory

This theory centers on the leader's style but places emphasis on the results achieved by followers. The leader is considered as a source of inspiration, who influences subordinates to complete their tasks. The path-goal theory tries to explain the effect of the leader's behavior on the follower's motivation, satisfaction, and performance. This theory is based on the expectancy theory of Victor Vroom, which explains that people always act or behave according to the reward expected. The task of a leader is to recognize entirely the working goals of every follower and the rewards associated with the goals, and provide this level and type of reward when the follower meets the requirements of his/her work.

Leader-Member Exchange Theory

The classic exchange theory of leadership is based on studies in social psychology and points to a leader providing more benefits than costs for their followers. Thus, it's necessary to have a positive exchange between leaders and followers to reach group goals. On the one hand, leaders influence followers. On the other hand, a growing number of studies (Green 1975; Mumford et al. 2000; Yukl 1998; Green & Schriesheim 1980) show that followers may similarly affect leaders.

Before Leader-Member Exchange Theory (LMX), researchers considered that leaders behave in one way for all of their followers. The LMX approach changes this assumption and suggests that there is a difference between how leaders treat each follower. LMX says that leaders and followers establish dyadic (two-person) relationships and behave according to their roles. The value of the relationship is based on the degree of mutual trust, loyalty, support, respect, and obligation.

Transformational Leadership

Transformational leadership has its roots in the work of MacGregor Burns (1978) who identified two types of political leadership: transactional and transformational. The traditional transactional approach includes an exchange relationship between leaders and followers, but the transformational approach is about the communication of the leaders' values, beliefs, and needs to their followers. According to Burns, transforming leadership is a process in which "leaders and followers help each other to advance to a higher level of morale and motivation". Burns argued that transforming and transactional leadership were mutually exclusive styles. Transactional leaders usually do not endeavor to make cultural changes within an organization, working with the existing culture, while transformational leaders do try to change the organizational culture.

Authentic Leadership

Authentic leadership implies a leadership style when people act in a real, genuine and sincere way, based on their own beliefs as individuals. Authentic leadership emerged from the positive organizational behavior movement to provide a deeper investigation into the beneficial aspects of organizational life (Anderson et al. 2017). According to Avolio and Gardner's (2005) model, authentic leaders inspire followers to examine their own beliefs and values. While understanding their own values, authentic leaders put the needs of their followers above their own and work closer with followers to bring into line their interests in a bid to construct a greater common good. When followers hold beliefs that match those of their leaders, they will identify with their leaders and strive to be like them.

Servant Leadership

Another type of leadership that changes the traditional perception of leadership is servant leadership. This means a leader influences and serves simultaneously. This idea is based on the writings of Greenleaf (1970, 1972, 1977) and supposes that servant leaders put followers first, inspire them, and help them develop their personal competences. This attention to the concerns of the followers, along with empathy, leads to the greater good of the organization and society as a whole.

1.2 Knowledge Management

Knowledge and knowledge management are the essential basis of any organization operating in the modern world. The field of knowledge performance has been broadly discussed over the past 30 years from different standpoints: creation, acquisition, transfer and sharing, storage, usage, and loss. Scholars develop models to depict its functions and explain how it works, helping to understand the creation and exploration of competitive advantages based on knowledge.

1.2.1 Theoretical concept of Knowledge

According to the Resource-Based View (RBV), knowledge is one of the strategic resources that can lead to a sustainable competitive advantage. Various researchers propose definitions based on their research goals. Thus, Davenport et al. (1998) consider knowledge as "information combined with experience, context, interpretation, and reflection that is ready to apply to decision and actions."

Knowledge can be classified in various categories:

- individual or group,
- internal or external,
- hard or soft,
- practical or theoretical,
- tacit and explicit.

1.2.2 Theoretical concept of Knowledge Management

Different scholars define the term Knowledge Management in various ways. According to Gold et al. (2001), Knowledge Management is the capability to manage knowledge such as collecting internal or external knowledge of organizations, transforming them to new ideas or strategy and applying and protecting them. Lytras et al. (2002) defined knowledge management as a systematic, explicit application of knowledge that will help the organizations to maximize the organizations' knowledge-related effectiveness and returns from the knowledge assets. It also creates new opportunities, encourages innovation and performance as well as increases customer value. Thus, knowledge management is an activity of capturing, storing, sharing and using knowledge (Leidner et al 2006; Chang & Lin 2015). Moreover, it can also be described as a systematic process for gathering, organizing and communicating both tacit and explicit knowledge of employees (Schultze & Leidner 2002; Alavi et al 2005; Massey & Montoya-Weiss 2006).

1.2.3 Knowledge Management process and models

The most well-known work about knowledge management and knowledge dynamics is the one of Nonaka and Takeuchi (1995). The authors described the meaning of knowledge using several terms: explicit knowledge, tacit knowledge, and social context (Ba). Later, this model was developed by the idea of knowledge being a process (Nonaka, Toyama & Hirata 2008). This means that knowledge continuously transforms through four basic processes: socialization (tacit to tacit), externalization (tacit to explicit), combination (explicit to explicit), and internalization (explicit to tacit) – SECI model.

In 2006, Nissen expanded Nonaka and Takeuchi's model. The scholar added time as an independent fourth dimension (see Figure 6). He suggested two new ideas: life cycle and knowledge flow.

Later, C. Bratianu et al. (2011) proposed the Organizational Knowledge Dynamics (OKD) model. The OKD model shows that knowledge creation adds new knowledge to the already existing; knowledge sharing changes the distribution of knowledge within an organization but does not add new knowledge; knowledge acquisition introduces new

knowledge in an organization; and knowledge loss which decreases the organizational knowledge. Knowledge could be lost inside and outside the organization. Knowledge loss within the internal environment happens through unlearning and forgetting.

1.2.4 Main problems and obstacles of Knowledge Management process

Knowledge management initiatives do not regularly achieve the expected results, and are not effectively used by the workers who continue to produce and share knowledge in the way they did before. Employees often face poor management; and companies struggle with outdated knowledge and a lack of necessary skills. This means that KM fails, starting from the personal level to macro level.

It's necessary to mention that if the company more or less deals with (problems, barriers, views, factors, difficulties) and finds ways to overcome them, its KM initiative has success and becomes part of the routine process.

1.3 Conclusion of the Literature Analysis

The existing models of knowledge management are also discussed. They describe how knowledge occurs and is changed. At the same time, the process itself is considered as independent, without anyone's control or influence. However, despite the importance of knowledge as a strategic resource of competitive advantage, many knowledge management initiatives fail and the reasons, widely discussed in literature, are lack of support from managers/ leaders and lack of monetary motivation.

2 OBJECTIVES OF THE DISSERTATION THESIS

In the following chapter, the authors will outline the goal and related hypothesis of research and then outline the research methodology to achieve the presented goal.

2.1 Research Goal and Objectives

The main scientific goal of the Dissertation Thesis is to propose a knowledge management model based on leadership in industrial enterprises". The main scientific goal of this Dissertation Thesis will be supported by the following objectives:

1. to identify the main theoretical concepts of leadership and knowledge management.
2. to analyze the current difficulties and problems of the knowledge management process within enterprises via a literature review and case studies, surveys and interviews with practitioners.
3. to quantify and evaluate the received data in relation to the established scientific hypothesis of the thesis.
4. to propose an effective model of knowledge management based on leadership in industrial enterprises.
5. to evaluate and verify the proposal in selected industrial businesses.
6. to describe the benefits of the dissertation for science, practice and business, as well as for pedagogy.

2.2 Research Hypothesis

In addition to the above mentioned research objectives, the authors set a series of research hypotheses to statically test the importance of leadership in managing knowledge in industrial enterprises.

Hypothesis 1.0: The type of knowledge management methodologies and type of leadership within the industrial enterprises are not related.

Hypothesis 1.A: The type of knowledge management methodologies and type of leadership within the industrial enterprises are related.

Hypothesis 2.0: The existing practices of knowledge management and type of leadership within the industrial enterprises are not related.

Hypothesis 2.A: The existing practices of knowledge management and type of leadership within the industrial enterprises are related.

Hypothesis 3.0: The actions of workers aimed at sharing knowledge and information and type of leadership within the industrial enterprises are not related.

Hypothesis 3.A: The actions of workers aimed at sharing knowledge and information and type of leadership within the industrial enterprises are related.

Hypothesis 4.0: The roles of leaders and type of leadership within the industrial enterprises are not related.

Hypothesis 4.A: The roles of leaders and type of leadership within the industrial enterprises are related.

Hypothesis 5.0: The size of enterprises (in terms of number of employees) and type of leadership within the industrial enterprises are not related.

Hypothesis 5.A: The size of enterprises (in terms of number of employees) and type of leadership within the industrial enterprises are related.

3 METHODS AND METHODOLOGY OF THE DISSERTATION THESIS

The methodology explains the research design, the process of research, limitations and ethical considerations.

3.1 Methods used in the dissertation

The following scientific methods and approaches were used to meet the main objective and sub-objectives of the dissertation thesis: analysis, synthesis, induction and deduction, systems approach, graphical methods, statistical methods, sentence logic.

3.2 Research Methodology

At the commencement of effective scientific research, it is necessary to define a general approach to the research. In this regard, Saunders et al. (2007) established a model of research "best practice" that describes the process as an onion, involving several layers that need to be peeled to disclose the main focus of the study.

3.3 Research Strategy and Data Collection Methods

Considering the current study, the strategy level of research consists of one approach - a case study. The research includes two stages:

a) the authors conducted a preliminary analysis to develop an online administrative questionnaire,

b) the authors ran an online administrative questionnaire.

3.4 Online Questionnaire and Questionnaire Design

As a central method of research, an online self-administered questionnaire was accepted. The questionnaire consists of 16 questions where only one question is open and others are closed. The format of these closed questions includes a combination of single choice, multiple choice and dichotomic (yes/no) answers. This approach of questionnaire design allows obtaining comparable data and seeing "general" lines and deviations.

The authors used their own contacts, open resources for obtaining email addresses (official web-sites, site for job seeking and so on), and the Office of Statistics. Having the email addresses, the authors sent a link to a questionnaire and respectfully asked for it to be completed. After the data collection, the results were analysed and interpreted using the online service Posit Cloud (https://posit.co/). The data was analysed using percentage and graphical analysis and statistical methods as a chi-square test. The test is used according to the specifics of the obtained data.

3.5 Ethical Issues and Limitations

At the beginning of the questionnaire the participants were informed that any information obtained in study will remain strictly confidential and only be used for research purposes. The researchers also informed that no personal information will be disclosed or reported. It was also mentioned that participation in research is voluntary and does not require any further action. The obtained answers will only be used for research purposes and will not be sent to third parties.

As with any research, this study has some limitations. One limitation was the restricted time duration and financial resources available. Consequently, the findings were collected using a cross-sectional approach over a certain period of time rather than a longitudinal approach.

4 ANALYSIS OF THE CURRENT STATE OF IMPLEMENTATION (APPLICATION) KNOWLEDGE MANAGEMENT MODEL BASED ON LEADERSHIP IN INDUSTRIAL ENTERPRISES

We investigated the role of leadership in the knowledge management process through a questionnaire survey.

4.1 Questionnaire survey characteristics

Totally, 353 emails were sent using contact lists asking to complete the questionnaire. By the end of March of 2024 year, the authors obtained 119 filled responses that is 33,7% of return rate. Due to the fact that the object of the research is industrial enterprises, we need to clean data and use data only from companies that represent industrial enterprises (54 organizations, see Figure 11) – 45 % of respondents work in industrial enterprises.

4.2 Data Analysis

The first group of questions consists of basic identification questions for the companies that participated in the survey. The authors continue to analyze the 54 industrial enterprises and describe the obtained data of these enterprises. The next group of questions consists of research questions from the field of knowledge management. The last group of questions is about leadership.

4.3 Research hypothesis testing

The authors established several hypotheses and tested them on cleared data (54 respondents). Due to the fact that authors collected nominal data and for some questions the

respondents may choose several answers, the authors collected more than 54 observations for some variables. In other words, the authors have enough observations to conduct a chi-square test and interpret the results.

Based on the test analysis, we reject the null hypothesis, Hypothesis 1.0, that the variables are unrelated and provides support for the alternative hypothesis, Hypothesis 1.A, that the variables are related. In other words, the knowledge management methodologies relate to type of leadership.

We reject the null hypothesis, Hypothesis 2.0, that the variables are unrelated and provides support for the alternative hypothesis, Hypothesis 2.A, that the variables are related. In other words, the knowledge management practices relate to type of leadership.

We reject the null hypothesis, Hypothesis 3.0, that the variables are unrelated, and provides support for the alternative hypothesis, Hypothesis 3.A, that the variables are related. In other words, the existing actions of workers to share knowledge and information relate to type of leadership.

We reject the null hypothesis, Hypothesis 4.0, that the variables are unrelated and provides support for the alternative hypothesis, Hypothesis 4.A, that the variables are related. In other words, roles of leaders inside the industrial enterprises relate to type of leadership.

We reject the null hypothesis, Hypothesis 5.0, that the variables are unrelated and provides support for the alternative hypothesis, Hypothesis 5.A, that the variables are related. In other words, the size of an organization (number of employees) relates to type of leadership.

4.4 Summary of conclusions from the analysis carried out on the current state of implementation (application) of the knowledge management model based on leadership in industrial enterprises

We examined the issue of creating the model of knowledge management based on leadership in industrial enterprises through the analysis of the current state. The direct research was carried out using a questionnaire with a subsequent evaluation of the results.

The obtained data from the conducted questionnaire shows us that knowledge management inside industrial enterprises does not gravitate towards certain practices or methodologies excluding all others. The distribution and usage of various practices and methodologies are widely spread. Herewith, the respondents emphasized the positive correlation between KM and innovations of an organization and its competitiveness.

5 THE PROPOSAL OF AN EFFECTIVE KNOWLEDGE MANAGEMENT MODEL BASED ON LEADERSHIP IN INDUSTRIAL ENTERPRISES

In the following part we discuss the limitations of existing models of knowledge management and knowledge strategies model and propose a model of effective knowledge management based on leadership in industrial enterprises and give some explanations.

5.1 Knowledge management models and knowledge strategies model and its criticism

Previously described in the theoretical foundation section, knowledge management models show how knowledge changes and transforms from tacit to explicit and from explicit to tacit (Nonaka and Takeuchi; 1995), then M. Nissen (2006) added time as an independent fourth dimension, later C. Bratianu et al. (2011) proposed the Organizational Knowledge Dynamics (OKD) model to show that knowledge creation adds new knowledge to the already existing; knowledge sharing changes the distribution of knowledge within an organization but does not add new knowledge; knowledge acquisition that introduces new knowledge in an organization; and knowledge loss which decreases the organizational knowledge. However, despite the existing criticism of each model, we may add that the discussed models do not

include somebody who carries out the knowledge management process or can influence the implementation process. Thus, we suggest that any model of knowledge management should include a leader to run it. In this case a leader is preferable, since he/she can perform both the functions of a manager and the functions of a leader.

Additionally, the models of knowledge management mentioned in the literature review, consider an organization with a "flat" organizational structure, meaning that there are few or no hierarchical levels within the organization and all employees perform the same tasks depending on their functionality (Craig, 2018; McCafrey, 2022). Thus, we suggest that any models of knowledge management should include a hierarchical organizational structure.

Based on Michael Porter's idea of generic strategies introduced in the book "Competitive Advantage: Creating and Sustaining Superior Performance (1985), Constantin Bratianu (2022) proposed a model of generic knowledge strategies. That is why knowledge strategies (knowledge exploitation, knowledge acquisition, knowledge sharing and knowledge exploration) indicated by C. Bratianu (2022), may be seen as parts of knowledge management within an organization. Besides this, we may add other parts. Following this idea, each of these parts may be managed and led differently.

5.2 Proposal of a knowledge management model based on leadership

Knowledge management is at the centre of the scheme and consists of several parts:

- Exploitation (loss, storage and application),
- Sharing (improvement),
- Acquisition (maintenance and protection),
- Exploration (creation).

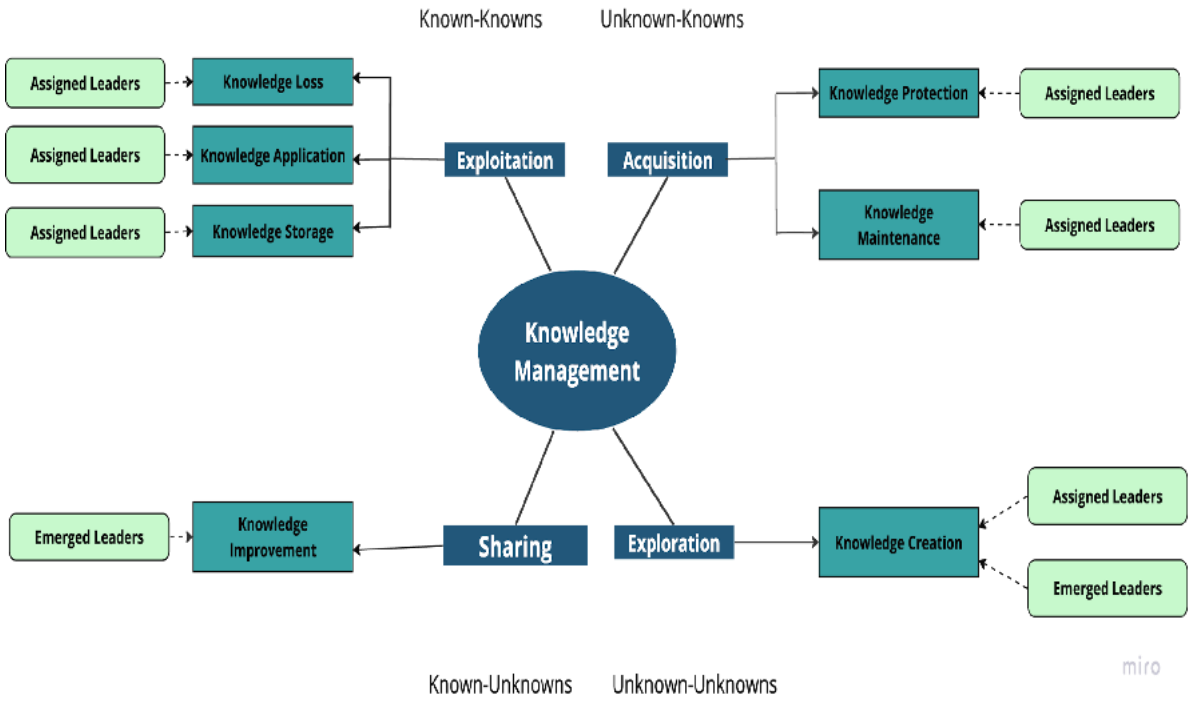

Figure 1 Knowledge management scheme based on leadership in industrial enterprises
Source: Own elaboration.

Knowledge management may be carried out through application, storage, loss, improvement, maintenance, protection and creation (see Figure 1). The thin solid arrows demonstrate this. These performed elements can be realized at the same time, partially,

parallel or subsequently regarding one or more knowledge. It is important to mention that applied elements or actions to the same knowledge may differ among employees. The arrows with dotted lines indicate the impact of leaders (assigned or emerged) through elements or actions of knowledge management.

Following up the findings of the analytical part of our research, the investigation of parts and elements or actions of knowledge management, and also comments about organizational structure where knowledge management is considered, we may propose a knowledge management model based on leadership in the industrial enterprises. For a graphic visual demonstration of model, the authors use the special software "TouchGraph Navigator 2" (this licenced software is used at Institute of Industrial Engineering and Management, the Faculty of Materials Science and Technology in Trnava, the Slovak University of Technology in Bratislava (STU)), which has a logic of mind mapping.

The main entity of our research is knowledge management but it does not exist independently within the industrial enterprises. Its borders may be explained by comparing it with related disciplines such as information management, data management, business intelligence, custom relationship management, learning, organizational development and training, organizational learning, human resource management, innovation management, risk management and quality management. The main distinctive features of KM and the mentioned disciplines are indicated in International Standardization of Knowledge Management (ISO 30401 Knowledge Management Systems – Requirements in 2018).

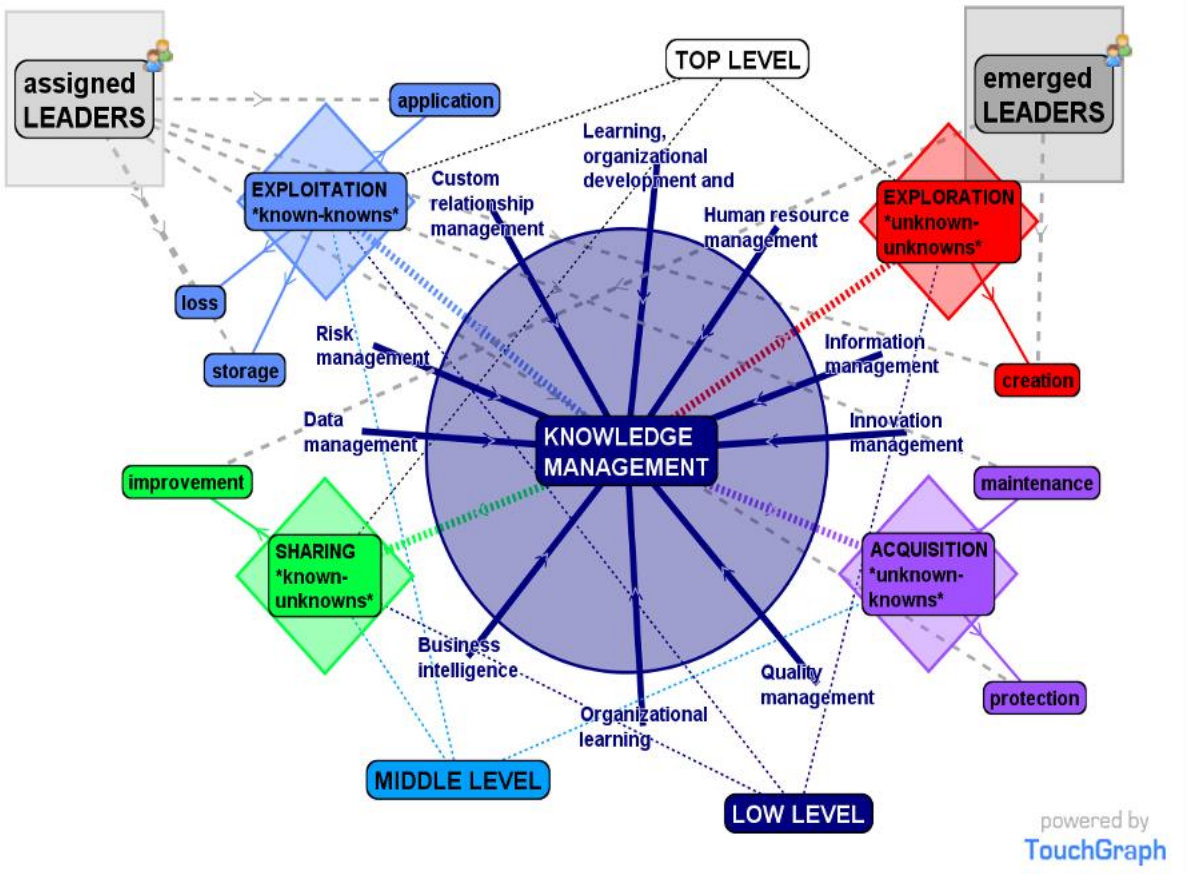

Figure 2 Knowledge management model based on leadership in industrial enterprises
Source: Own elaboration.

Following the idea of the "known-unknown" matrix in conjunction with knowledge management, we add key parts of knowledge management to the model. The different parts of knowledge management correspond to each quadrant of the "known-unknown" matrix. Thus, knowledge is exploited, acquired, shared and explored within the industrial enterprise. These parts are presented enlarged, and within these parts other actions in relation to knowledge may be performed. These actions should comply with the goals of industrial enterprises and depend on the object of knowledge. The older an enterprise is, the more likely it is to have several organizational levels (at least top level, middle level and low level). As another type of resource, knowledge management should have somebody who may lead or manage it.

The knowledge management model presented in Figure 2 takes into account four parts of knowledge management (exploitation, sharing, acquisitions and exploration), seven elements or actions of knowledge management (application, storage, loss, improvement, maintenance, protection and creation), level of organizational structures (top, middle and lower) and types of leaders (emerged and assigned), and their connection to each other. This is a dynamic model and connection lines between levels of organizational structure and parts of knowledge management and between leaders and elements or actions of knowledge management may be redrawn according to the specifics of industries, companies, goals of the companies and the development and implementation of the concept of knowledge management over time.

6 THE EVALUATION AND PRACTICAL APPLICABILITY OF THE PROPOSAL

We consider the verification of the proposed model knowledge management based on leadership in industrial enterprises based on:

- Accessible relevant scientific and professional sources (List bibliographical references);
- Presentation of the materials of current work on several conferences;
- Confirmation from practice regarding the possibility of application of the suggested proposal in industrial enterprises.

6.1 Verification of proposals from existing academic literature

The suggested proposal correlates with the theory of knowledge management and its elements. Being a strategic resource of the organization, knowledge is also needed to be managed. Discussed parts of knowledge management in the proposed methodology correspond to the views of scholars about elements of knowledge management (Kayworth & Leidner 2003; Zaim 2006; Fong & Choi 2009; Turner et al 2012).

Moreover, the model clarifies and complements the model of C. Bratianu (2022) in terms of replacement of strategies by knowledge management parts. Because the strategy is viewed as a long-term direction of the organization and may include several parts and actions aiming to pursue it, knowledge exploitation, storage, loss, sharing, acquisition, creation and exploration are the actions necessary to reach the overall strategy of the organization.

Discussing the type of leaders, the authors stopped at the types such as emerged and assigned because knowledge management is a long process during which the different characteristics of leaders may be seen. It is quite difficult to determine the types of leaders during a whole knowledge management process because leaders may behave differently while performing certain tasks or realizing parts of knowledge management.

6.2 Verification of proposals from conferences

The authors presented some parts of their work at conferences that were dedicated to the various aspects of knowledge management in different fields and published papers in the proceeding of this conferences.

6.3 Verification of theoretical proposals in the field of knowledge management from practice

To further verify the application proposed model and nine steps of implementation, the authors presented the results to industrial companies. The authors asked to estimate the relevance of the proposed methodology for business, the possibility of implication, and the expected results of its implication.

The opinion received from the company COS s.r.o., address: Prílohy 576/50 Zavar 919 26, Slovakia, is in Appendix E.

7 BENEFITS OF THIS DISSERTATION THESIS FROM THE POINT OF VIEW OF THEORY, PRACTICE, AND EDUCATION

The theoretical and practical advantages are summarized in the following chapter as well as the advantages for education.

7.1 Theoretical benefits of the proposal

The outlined proposal supplements the existing models related to knowledge and knowledge management. One of the important contributions to the theory relies on the clarification of parts of knowledge management.

Additionally, it is important to mention that parts of knowledge management may be realized in the industrial enterprises independently from each other, partially, parallel and/or subsequently in relation to the same or different objects of knowledge at different levels of industrial enterprises. The theoretical models should recognize that knowledge management cannot be implemented in the same way at each level of organizational structure because the same knowledge may be managed differently.

Moreover, the authors emphasize the key role of leaders in managing knowledge. The leaders are very multifaceted personalities who may develop skills and adapt their behavior to situations and change the focus of leading (people or tasks). The more important part here is how leaders appear in the organizations (emerged or assigned) and how long they support knowledge management.

7.2 Practical benefits of the proposal

The proposal also presents benefits for practice to stimulate the knowledge management process and its development. Understanding what parts are included in knowledge management, managers can provide both systemic and targeted management in relation to certain knowledge and at different levels of the organizational structure of industrial enterprises. By appointing appropriate leaders for different parts of knowledge management, organizations can ensure a more effective and efficient knowledge management.

The authors may indicate the main benefits of the Dissertation Thesis:

- Development of a model for knowledge management based on leadership in industrial enterprises.
- Critical analysis of the current state of knowledge management and leadership among industrial enterprises;

• Dissemination of results of scientific work at professional and scientific-practical international conferences.

7.3 Educational benefits of the proposal

Knowledge management models can also be taught in educational institutions because knowledge continues to be a valuable resource of enterprises. Understanding what and how the knowledge management process influences organizations to avoid failures.

The main contributions of the Dissertation Thesis for educational process in the field of knowledge management and leadership are:

• The results of the presented work may be used as a basis for processing or supplementing teaching texts related to strategic-, operational-, human resource-management and leadership;

• Written papers in co-authorship and presentations at conferences based on the materials of the presented work may be used as an inspiration for future research among students of undergraduate and postgraduate levels.

CONCLUSION

The proposed model suggests parts of knowledge management to run it and deals with two types of leaders - assigned and emerged. The styles of leadership that are discussed in scientific and professional literature have the limitations in implication in practice, because leaders are not objects – they may develop some qualities, adapt their behavior to reach established goals, change focus etc. The employees or followers indicated that it is more important for them how long and how often they receive support from leaders, which does not necessarily correlate much to the leadership styles. The approach to nominate leaders (assign or emerge) may influence the knowledge process significantly.

The main scientific goal of the presented Dissertation Thesis was to propose an effective knowledge management model based on leadership in industrial enterprises. In conclusion, we can summarize that the main scientific goal and the objectives of the Dissertation Thesis have been met.

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