

# Learning Management System as a Tool of Knowledge Management

**EVA RAKOVSKÁ**

Faculty of Economic Informatics, University of Economics in Bratislava,  
Bratislava, Slovakia

**ALŽBETA KANÁLIKOVÁ**

Faculty of Electrical Engineering, University of Žilina,  
Žilina, Slovakia

**Abstract:** The term Knowledge Management is often misinterpreted in various ways in the practice. Small and mid-sized enterprises often have the problem to understand and to involve the concept of Knowledge Management in daily life. This paper introduces the connection between the Learning Management System tools and the tools of Knowledge Management. It shows how to use them in practice as support for creation of the Knowledge life cycle within an enterprise and how to develop the Knowledge management system by using the Learning Management System. Finally, the paper reminds us that education within an enterprise needs deeper IT knowledge in the 21st century.

**Keywords:** Learning management system; Knowledge management system; Tacit knowledge; Business improvement; Learning net

**JEL Classification:** O32

## 1 Introduction

Although the term Knowledge Management has been well-known more than twenty years, there are still some enterprises, mostly small and mid-sized enterprises, without any information about it. Some of them have no idea how to use Knowledge Management or how to create a Knowledge Management system and establish it in daily practice. Managers of companies and enterprises often misinterpret what the Knowledge Management is and they interpret it as sustainable employee education by using e-learning [10]. Many of them do not like e-learning and the education supported by the computer.

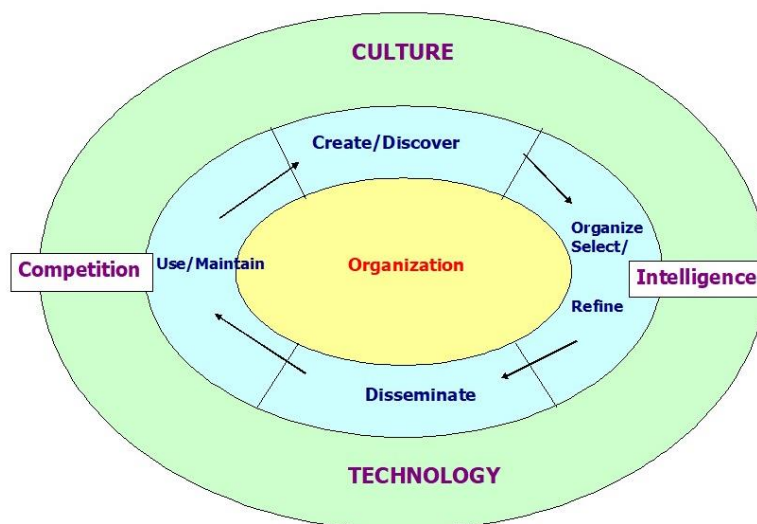
But the era of Smart Cities brings new opportunities to join the small and mid-sized enterprises and companies into smart processes and to be in connection with customers and all employees everywhere they are. So, it is necessary to use appropriate IT tools for managing intangible assets, which is often the core of a successful business. There are many ways how to start introducing the Knowledge System into the business processes. Cloud solutions and IT outsourcing seem to be the best solution, but still, there are many questions (which IT functionality is the best to outsource; which cloud solution is appropriate for my enterprise; the financial aspect - decreasing the costs; does it really support the business processes? etc.). The IT outsourcing and using cloud solutions is often a part of business processes, so the transformation of IT has also impact on the business processes and on people. People do not like a change, especially, a radical change. Therefore, to make the transformation of people's thinking is necessary. It is the main role of the Knowledge Management in practice.

The article focuses on the possibility to involve the information technology supporting the knowledge management processes step by step, in an easy way, by using the Learning

Management System. The LMS Moodle is used as a good example for small enterprises, where the costs are minimal.

## 2 Knowledge management processes

The Knowledge Management definition has changed over the past few years. The boundaries between technocratic and managerial access are wiped out because the information technologies are involved in the business processes as their organic parts. But the knowledge management processes stay the same and if we take into consideration the following description of Knowledge Management from [3]: “Knowledge Management is the systematic management of an organization's knowledge assets for the purpose of creating value and meeting tactical & strategic requirements; it consists of the initiatives, processes, strategies, and systems that sustain and enhance the storage, assessment, sharing, refinement, and creation of knowledge”, we have to see that the processes covering the knowledge life cycle [1] have an impact on corporate or enterprise strategy, functional organization of business processes and induction of changes in people's actions.



**Fig. 1** Knowledge life cycle within an organization [1]

The knowledge within an organization is an intangible asset; it is human property (Who is the knowledge owner?) and it has sense only in the practice (What to do with the knowledge? Is the knowledge a driving force in the business process?). Finally, knowledge is not easy to gain and gather because it comes not only from learning but also from experience, observation and intuition. So, it is necessary to find a way how to store and reuse the knowledge and involve it in practice in a new way by using IT (How to handle the knowledge? How to use appropriate technologies?). [2] The three main questions „Who? What? How?“ are very important in the case when the management are going decide to choose appropriate IT as knowledge management support.

Fig.1 describes the Knowledge Life Cycle within an organization (enterprise). Each phase of the life cycle has some specification and it is necessary to say that most of the phases concern explicit knowledge (to store and organize, to select and refine, to disseminate, to share and to maintain). Only creation, discovery and usage can be bound by tacit knowledge. The process

of knowledge creation often comes from discovering and observation of the tacit knowledge [4] hidden in actions, activities and business processes. There are many various techniques and methods of externalization of the tacit knowledge (surveys, interviews, brain storming, Delphi method, etc.), which are often supported by IT. Another possibility of how to discover and create the new knowledge is to analyse and model the existing knowledge-base containing the knowledge trapped inside organizational routines, processes, products, customers, etc. This kind of knowledge is called embedded knowledge [4].

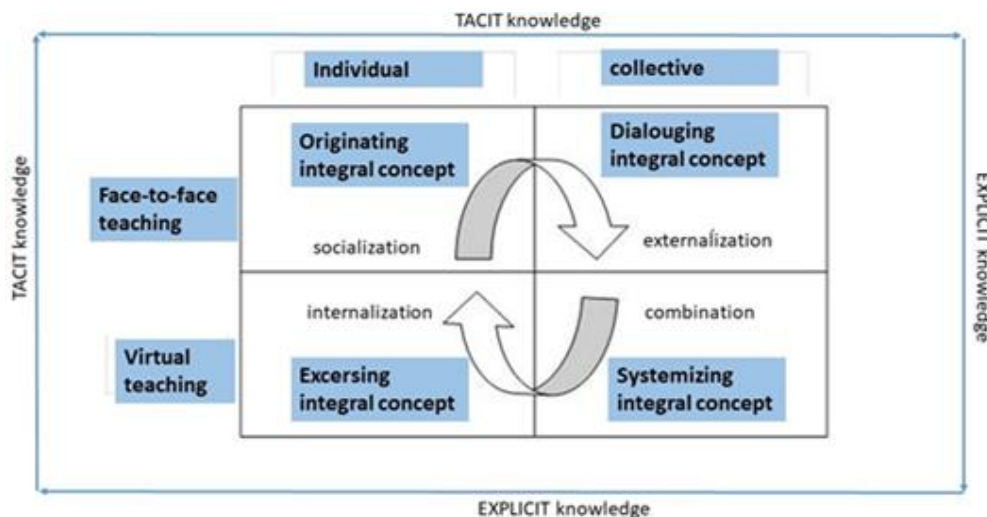
The source of knowledge comes not only from within the organization but also from the external sources, such as customers, suppliers, cooperating partners and competitive environment of the market. Each source brings different knowledge, which can be included in joint projects, operational data, product feedback, market trends, developments, etc. It is not easy to coordinate the knowledge acquisition from various sources and to externalize the tacit knowledge for further purposes. Information technologies can be very useful and they allow management of all knowledge processes in a smart way.

### **3 Tacit knowledge and the Learning Management System**

Although there are many various IT technologies for supporting all phases of the knowledge life cycle, such as groupware systems, the intranet and the extranet, data warehousing, data mining, Decision Support Systems, CMS, DMS, Artificial Intelligence tools, simulation tools, semantic networks, etc., it is sometimes too expensive and complicated to introduce these ITs in the practice of small enterprises. Many times, such ITs are not understandable for employees. The Learning Management System offers an easy way how to create embedded knowledge, how to store tacit and explicit knowledge, how to share and disseminate it, and it allows organizing it. Learning is an organic part of the knowledge life cycle, so LMS has similar functionalities as knowledge technologies [5].

As we mentioned before, the tacit knowledge is knowledge that is personalized and that is difficult to formalize and communicate but deeply rooted within an individual. The main question “How to capture or offer tacit knowledge through the learning management system?” seems like a challenge for IT professionals and for managers. Learning management systems have the primary role to manage the learning activities as courses, users and roles, but modern LMS have included the tools for supporting information and knowledge management.

The well-known SECI model [9] describes the four processes ongoing within an organization in daily routine (socialization, externalization, communication, internalization). Implementation of the SECI model in the eLearning is mentioned in [9].



**Fig. 2** Implementation of SECI model in the e-learning course [2]

Fig.2 describes how to implement the SECI model in learning, and the bottom part of the scheme concerns virtual teaching, where we traditionally use explicit knowledge as a source of teaching. So, when we speak about knowledge combination (explicit to explicit knowledge) in the context of e-learning, we speak about knowledge systemizing (for collective learning). In a similar way, we speak about knowledge exercising by internalization of explicit knowledge.

There is a big challenge how to deal with tacit knowledge in the context of using LMS as a tool for Knowledge Management. The two main points of this challenge are below:

1. The first challenge is how to convert the tacit knowledge into explicit knowledge. Explicit knowledge is information that can be electronically captured and stored so it can be managed and shared with others. Tacit knowledge should be converted into explicit knowledge and offered to learners in such a form that they could combine shared explicit knowledge with their own experience and proceedings. This kind of conversion creates a spiral effect that illustrates social learning [5]. One of the means of capturing tacit knowledge is a video. For example: someone captures a video of an assembly line worker installing a part of a newly built car. Tacit knowledge has been recorded and uploaded on LMS. Then, a subject matter expert (a line manager or a trainer, for example) can validate the video content, comment on it, categorize the content and align it with specific competencies. This is the way of storing and sharing the tacit knowledge within an enterprise. Another way is to use various scenarios, where the student can influence the content. A similar case is using of games.
2. The second challenge is how to publish explicit knowledge that encourages participants to create their own tacit knowledge. For example, we will publish theoretical knowledge and encouragement to complete an assignment - write an essay. Or, we will create an interactive test using the Scorm format that leads to gradual learning of skills. Also, a video is a powerful tool for handling tacit knowledge when we combine it with Artificial Intelligence. In this way, we can also learn how to exercise some procedures, which implement the tacit knowledge. Modern Learning Management Systems have plenty of features (SCORM, notification, gamification, videoconferencing, assessment engine, surveys engine, files repository, rich communication tools, eCommerce, single-sign on, etc.); they are often available on clouds and the users have mobile access to them.

#### 4 LMS functionality that supports knowledge management

Traditionally, the LMS system records mainly explicit knowledge. Each LMS contains more functions - support system solutions, security, management and formal course development, services of knowledge (functions of the LMS system that are dedicated to knowledge and knowledge content), services of knowledge sharing, knowledge creation and knowledge mapping.

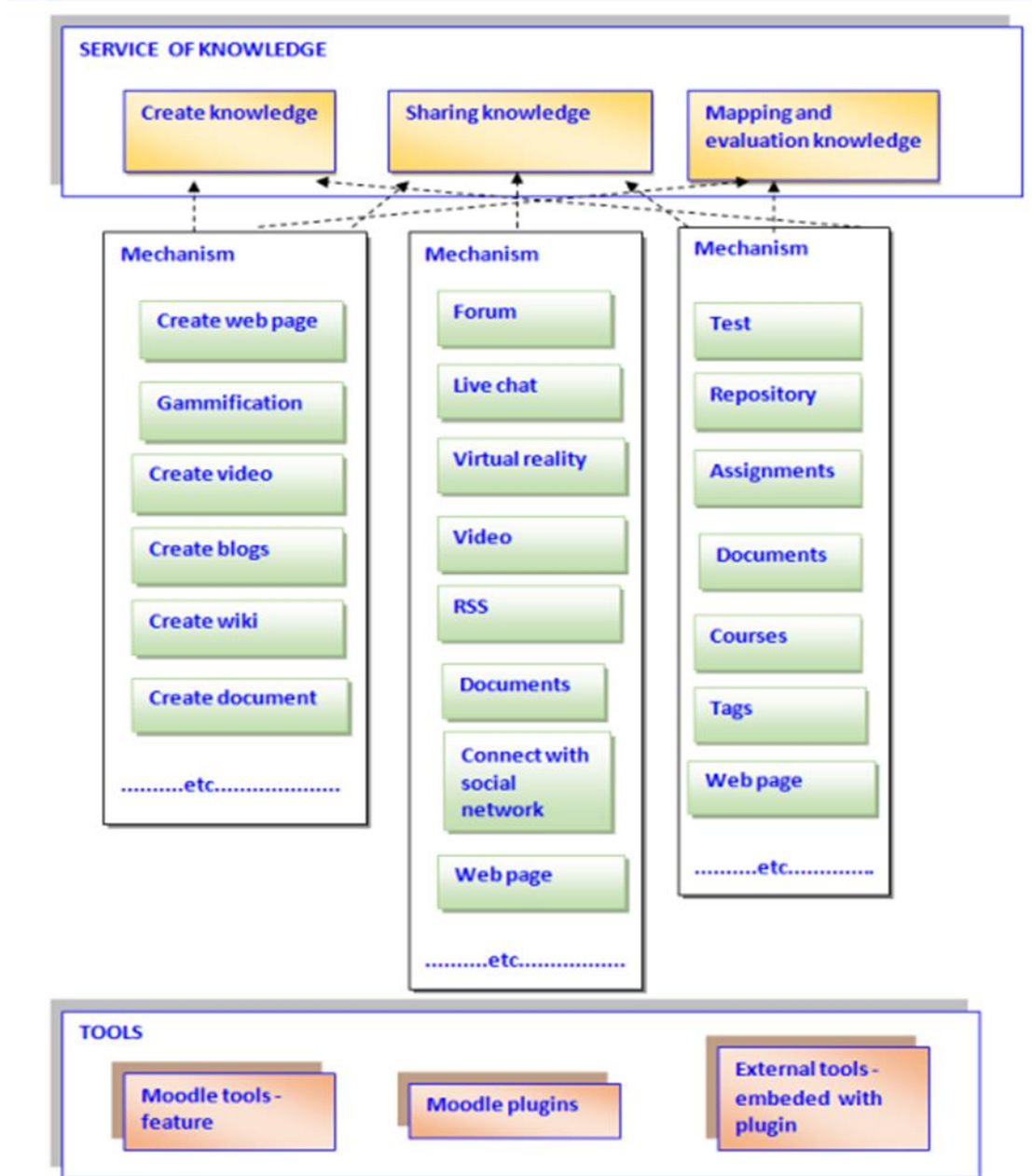


Fig. 3 Knowledge services and their support by LMS tools (mechanisms)

There are a lot of mechanisms that provide knowledge services and create new ones all the time. These mechanisms allow the conversion of explicit knowledge into tacit knowledge. The mechanisms are implemented through LMS tools or via plug-ins or external tools that are embedded or linked to the LMS. Fig.3 shows special knowledge functions of LMS - the

knowledge services are provided by mechanisms and are created with tools of the LMS system or external tools. Fig. 3 shows the mechanisms that are being used today and support the creation of tacit knowledge. In fact, other mechanisms can be added. Many mechanisms allow or offer two or three knowledge services. For example, we create a web page or a video, and we can share knowledge, so this is the service of sharing of knowledge. The same web site can map the knowledge and possibly evaluate the knowledge.

Here are a few examples of supporting of the knowledge life cycle by LMS. LMS systems are regularly upgraded and so the number of features that are focused on knowledge is going to increase regularly [5,6]:

- LMS Moodle has had a connection to Google tools since 2017, especially to Google glass - it is a tool that is associated with virtual reality [6];
- LMS Moodle has a connection to Office 365, too [6];
- The service of gamification has LMS Docebo directly in the system and LMS Moodle through plug-ins. Gamification is game-based learning; you can leverage your competitive nature while increasing learning engagement and, therefore, knowledge retention [5];
- LMS Docebo has the ability to create a website quickly with widgets [5];
- Almost every LMS system allows inserting a video and some LMS systems have a direct connection to mobile devices;
- LMS connectivity with the social network;
- Connectivity of LMS with Artificial Intelligence methods is represented in the example: LMS Moodle LOGs and Intelligent Agent Rules Moodle have the ability of tracking the learner's activities - learned activities, subjects, courses, frequently asked questions, connection with yellow pages which have data repositories in which personal information is collected, as well as areas of knowledge and interest of each person. In an educational environment, specifically, in Moodle, the users can find and contact other users based on knowledge - "know who knows". It means cooperating and sharing with people that use the same specialized knowledge [7];
- Another example in [8] is on how to use Artificial Intelligence, e.g. agent implementation by IBM Watson chatbot.

There are plenty of websites which offer a Learning Management System and do marketing for "the best solution" for your company, enterprise or school. The information technologies have gone "a long distance" in the last five years and there is a variety of combinations of the tools supporting all the phases of the knowledge life cycle in practice.

## 5 Conclusions

The terms Learning Organization and Knowledge Organization are often presented as "miraculous concepts" and they have brought a lot of theoretical articles, instructions and best practices on how to proceed when introducing the Knowledge Management in practice. We know plenty of methods and it is not easy to choose the best one. Sometimes the best solution is the simplest one, especially when we speak about small enterprises. The success of

introducing new IT in the company depends on the organizational culture, the company's mood and the good relations between employees and managers.

It is easy to start with the open source Learning Management System and try to teach people how to improve their daily action by using „the right knowledge in the right way and in the right place“ and then upgrade the LMS tool and invest the money in further improvement. There are plenty of LMSs available (Litmos, Moodle, Learnis, Talent LMS, Adobe LMS, Lessonly, Bugle, etc.), so it is necessary to make the first successful step in the environment of the knowledge space.

## References

1. AWAD, E. M., GHAZIRI, H. M., 2004. Knowledge Management. Pearson Education Inc., Prentice-Hall: 2004, ISBN 0-13-034820-1.
2. RAKOVSKÁ, E., KANÁLIKOVÁ, A., 2018. Development and implementation of e-learning course by using knowledge engineering and software engineering methods, In: DisCo 2018: Překonávání bariér a výzev v otevřeném vzdělávání, Praha, Czech Republic, 25.-26.june 2018 [in print].
3. FROST, A., 2010. Knowledge management tools, last update 2018, [online] Available at: <<https://www.knowledge-management-tools.net/>> [Accessed 10 May 2018].
4. HAJRIC, E., Knowledge management, last update 2018, [online] Available at: <<https://www.knowledge-management-tools.net/>> [Accessed 15 October 2018].
5. DOCEBO, [online] Available at: <<https://www.docebo.com/blog/learning-30-uncover-hidden-knowledge-in-your-organization/>> [Accessed 15 October 2018].
6. MOODLE, [online] Available at: <<https://moodle.com>> [Accessed 15 October 2018].
7. SPROCK, S.A., VICARI, R.M., Knowledge Management in Moodle Based On Internet of Things. 2015 [online] Available at: <[https://www.researchgate.net/publication/282443117\\_Knowledge\\_Management\\_in\\_Moodle\\_Based\\_On\\_Internet\\_of\\_Things](https://www.researchgate.net/publication/282443117_Knowledge_Management_in_Moodle_Based_On_Internet_of_Things)> [Accessed 12 October 2018].
8. DYACHENKO, Y., Artificial Intelligence Technologies for Personnel Learning Management Systems [online] Available at: <[https://www.academia.edu/28443649/Artificial\\_Intelligence\\_Technologies\\_for\\_Personnel\\_Learning\\_Management\\_Systems](https://www.academia.edu/28443649/Artificial_Intelligence_Technologies_for_Personnel_Learning_Management_Systems)> [Accessed 12 October 2018].
9. VIRKUS, S., 2011. Framework for Information and Knowledge Management, Tallin University, [online] Available at: <[http://www.tlu.ee/~sirvir/IKM/Theoretical\\_models\\_of\\_Information\\_and\\_Knowledge\\_Management/the\\_nonaka\\_and\\_takeuchi\\_knowledge\\_spiral\\_model.html](http://www.tlu.ee/~sirvir/IKM/Theoretical_models_of_Information_and_Knowledge_Management/the_nonaka_and_takeuchi_knowledge_spiral_model.html)>, [Accessed 12 October 2018].
10. Khademi, M., Kabir, M., Haghshenas, H., 2011. E-learning as a Powerful Tool for Knowledge Management, [online] Available at: <<http://www.ipcsit.com/vol12/8-ICDLE2011E0019.pdf>>, [Accessed 12 October 2018].

**Contact data:**

**RNDr. Eva Rakovská, PhD.**

Faculty of Economic Informatics

University of Economics in Bratislava,

Dolnozemska cesta 1, 85333 Bratislava, Slovak Republic

[eva.rakovska@euba.sk](mailto:eva.rakovska@euba.sk)

**Ing. Alžbeta Kanáliková, PhD.**

Faculty of Electrical Engineering,

University of Žilina, Univerzitná 1, 01026 Žilina, Slovak Republic

[alzbeta.kanalikova@fel.uniza.sk](mailto:alzbeta.kanalikova@fel.uniza.sk)