IT-Architecture for Corporate Knowledge Management Systems

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Abstract—For the efficient implementation of the corporate knowledge management systems, common elements of their IT architecture, functional role as well as other specific features of their use are to be understood. The objective of the research is to identify common elements of IT architecture in the knowledge management systems in the corporate segment. To identify the common elements of the IT architecture in the knowledge management systems we have used the method of taxonomic classification of knowledge areas with a complex structure based on the example of a comparative analysis of various software products for corporate training, as well as case studies of this issue using the example of enterprises and organizations in China. We have used data from surveys of employees and companies as regards the development prospects of the corporate knowledge management systems. The sample scope is 1000 managers of the companies from Europe, the Middle East, Japan and China. For the taxonomic analysis 42 corporate knowledge management systems have been selected, which are used in training and represented in the world market. The integration of new technologies into business processes has caused the demand for new knowledge management systems. Due to analysis results of 42 corporate knowledge management systems for learning, which are represented in the market, we can state that the majority of them have been developed on the grounds of the use of cloud technologies. In the total structure its share makes up almost 83 %, whereas 17 % refers to the rest of the corporate knowledge management systems for learning, as well as their combination. The use of obtained research results in practice is supposed if strategic approaches of the implementation of the corporate knowledge management systems at enterprises of China and other countries are justified.

Keywords—Data storage; enterprise; learning management system; taxonomy.
1 Introduction

Creation and maintenance of strategic competitive advantages of an enterprise in the modern digital world requires continuous improvement and development of its human capital through regular staff training and enhancement of competencies, as well as effective information processing. Today organizations are facing new needs when recruiting new employees. Achievements in the field of technology, data availability, new social issues and new types of jobs require new skills that current employees or people ready for employment are lacking [1]. Recently with the rapid development of digital technologies the volume of information in the corporate segment has sharply increased, which induces the need in the systematization of the knowledge management process and the use of IT tools in the process.

Information technologies are one of the important factors for improving business processes in an organization. The development of the information technologies affects any activity in the company. The information technologies are subject to stimulate the transformation of any data into the information useful to the company. Knowledge in the company is the fixed capital or assets necessary for the companies to compete. With the knowledge the company can improve and contribute to the quality performance of human resources in the company [2]. However, the use of IT corporate knowledge management systems is an effective means not only for learning and advanced training of personnel, but also for the accumulation of relevant knowledge and information, as well as its use in work, which ultimately facilitates the growth of enterprise competitiveness. In addition, recently various industries have shown great interest in the new knowledge management paradigm, which is in great demand in different areas [3].

As the world entered the era of the knowledge economy, the demand and application of knowledge are becoming more diverse, personalized, complex, and so on [4]. One of the most essential objectives set out against enterprises is now streamlining of business processes [5]. This enables their effective development as well as the launch of innovations that allow the application of important decisions, working methods and new services. Widely-spread information technologies have impact on the knowledge-based economy. The current information is often used in many sectors for receiving competitive advantages [6]. In a corporate sector the most significant resource for company development is now knowledge, and not the land, labor or capital as it has been before. Within current global markets, which have been rapidly changing, failure or success is no longer associated with traditional expenses on labor, material, or capital. The knowledge acquired by the company and how the company is applying the knowledge have never been so crucial for success [7]. Each organization should become a knowledge-oriented organization, and provide training and ensure a career enhancement for employees, as well as introduce knowledge management (KM) systems to improve work efficiency. This will encourage the motivation in the organization and ability to learn, and stimulate the staff to exchange and share the knowledge, as well as to knowledge management [8].

The knowledge is the most important part of our daily activity for effective performance. It is deemed to be the most outstanding asset for each organization [9].
Knowledge management is a system for acquisition, collection, exchange, storage, and creation of the knowledge. This is a process of the transformation of personal knowledge between people through dialog, discussion, opinions’ exchange, and stories’ sharing. Organizations receive and create the improved or structured information via the learning process in order to develop new knowledge [9]. The knowledge is often defined as “justified personal commitment”. There are a lot of taxonomies, in which various types of the knowledge are specified. The most fundamental difference is between “tacit” and “explicit” knowledge [10].

Thus, the knowledge management (KM) is a process of collection, elaboration, exchange, and proper use of the knowledge by the organization. The knowledge management as the research field has existed more than 30 years. The knowledge management exceeded the scope of the academic theory long time ago and has become an important part of the organization’s activity [11]. The knowledge management (KM) has generated a significant interest in management circles due to its ability to provide organizations with strategic outcomes regarding profitability, competitiveness, and capacity increase [12].

The academic staff related to research field has become more interested in the knowledge transfer as a means of maintaining the competitive advantages of organizations. The opportunity to transfer the knowledge between individuals, within the organization and between organizations has become an important condition for the survival and development of the organization [13]. In opinion of IT specialists the knowledge management means the use of the knowledge through a computer, which includes many such trends as intellectual data analysis, systems of answers to questions and, respectively, web-interface [3]. The knowledge management may be applied almost to all state departments and organizations. Though, the knowledge management is thought to demonstrate more obvious results in relatively large companies and companies with high technologies or knowledge [14].

Earlier the researchers classified the knowledge management system (KMS) as two groups based on the context of general understanding [15].

1. A process / task-based approach: focuses on the use of knowledge by participants in a process, task or project in order to increase the efficiency of this process, task or project. This approach allows identifying the needs of the process in information and knowledge, where they are and who needs them. KMS is designed to collect tacit knowledge and make the knowledge available, when necessary, to those who need it.

2. The infrastructure / common system-based approach focuses on creating a basic collection and dissemination knowledge system for use throughout the organization. This relates to the technical details necessary to provide good memory functions referred to the identification, search and application of the knowledge. The approach is focused on network capacity, database structure and organization, classification of information and knowledge [15].

Traditional KM methods are built mainly on the content and formalization of the knowledge [16]. Applying Business Intelligence (BI) and Enterprise Architecture (EA) tools enables to fill the gap in understanding all aspects of the knowledge [17].
On the one hand, BI allows transforming simple information into valuable knowledge, using data mining methods and techniques. On the other hand, EA supports the digitization of the knowledge obtained from people and processes by creating architectures in various fields. These architectures facilitate the transfer and dissemination of the knowledge to various levels of staff in the organization. Certain benefits of using this system supposed to reduce costs on advanced training of employees due to the staff turnover, the improvement of decision-making processes and creating the knowledge repository [17].

A dynamic knowledge management model (Fig. 1) is proposed for corporate development [18]. In the model there are six interdependent actions for KM implementation: knowledge gathering, knowledge storage, knowledge sharing, knowledge study, knowledge use and knowledge research. There are also three main factors for KM implementation strategy: people, technology, and policy. People are, by all means, the most important factor that performs all six activities in KM process. The technology directly affects the accumulation, storage and study of the knowledge. The policy is mainly related to the exchange, use and research of the knowledge [18].

![Fig. 1. Dynamic model of knowledge management](http://www.i-jet.org)

Knowledge management (KM) is a system of management principles and methods that are necessary for a modern organization. The significant prevailing of China in building a knowledge-based economy and society means that knowledge management is becoming increasingly important. So, the knowledge management is a new concept
for most managers in Chinese corporations, although it has been implemented in many firms in Western countries over the past two decades. For the formation of the corporate knowledge management system a set of information systems is applied, which allow to organize with maximum efficiency all training phases from the preparation of e-learning courses, conducting training and testing, organization of cooperation with the staff to the management and monitoring of the learning process as a whole [19].

Corporate information system (CIS) is a system of governing all resources within the entire enterprise and, which has relevant instruments that allow automating knowledge management functions, including portal means, means of collective communication, etc. [20]. In the world of digital technologies for efficient realization of corporate knowledge management systems at the enterprise is necessary to understand typical elements of their IT architecture, functional roles, which is an objective of our research. The novelty of the research is a systematic approach to studying this issue, using a taxonomic analysis of the classification of knowledge management for corporate training based on a comparison of the capacities and features of its IT architecture, as well as defining typical elements.

2 Materials and Methods

This research was conducted from April to October 2019 and covered the study of the features of IT architecture in knowledge management systems in companies in the corporate sector of China, as well as other regions of the world for comparison.

2.1 Research design

The research format selected and used during its performance was determined by the specifics of the issue under study, in particular, the presence of different cultural features in countries of the world where corporate knowledge management systems are used, with different attitudes to the effectiveness of their implementation. The presence of different approaches to the study of this issue among researchers, related to the diversity of types of IT architecture in corporate knowledge management systems, was also taken into account. A deeper study of this issue on the example of China was caused by the fact that the market of corporate knowledge management systems shows a tendency of significant growth on a global scale.

The data of the survey for 2017 were analyzed in terms of key aspects of the development of corporate knowledge management system in Europe, the Middle East, Japan and China. At the same time there were used the data of the survey of Corporate Learning Pulse 2017, which almost 1000 managers (939 actual participants) from Europe, the Middle East, Japan and China took part in [21]. For comparative analysis there were selected 42 corporate knowledge management systems that have been used for training and are represented in the world market [22]. The taxonomy method was applied to selected 42 corporate knowledge management systems for training, which are represented on the market. Capacity and features of the IT architecture of
knowledge management systems were used as systematization criteria, and the separation was carried out under the main typical element.

2.2 Research limitations

The main focus was primarily on studying the development trends of corporate knowledge management systems for training in world practice in the researches. In addition, the development of corporate knowledge management system was particularly of great attention at Chinese enterprises, in connection with the increased interest to the issue of their use in this country. The analysis data of 42 software products represented in the market for the corporate knowledge management system were used.

2.3 Statistical analysis

The survey data were processed using standard statistical analysis procedures to determine average and relative values. Relative indicators were used to assess the share of the questions studied against the total number of answers. The results obtained are within a reliable error of up to 5%.

3 Results

Researches related to contemporary corporate knowledge database showed that they have been widely expanded in different countries of the world and subject to the organization of the use and storage of the company knowledge, which is applied for the preparation to training courses and tests, internal assessment of employees, elaboration and taking strategic decisions as for the development of the company.

According to analysis data of Global Knowledge Management Market Report, 2019-2025 – Overview, Focus on Select Players, Trends & Drivers, Market Perspective it is forecasted that the world market of the knowledge management will grow by USD 798.9 billion, that is stipulated by relative growth by 20.4% [23]. Knowledge management process, one of the segments, which has been analyzed and examined in the research, will be expanded more than by 23.7%. The increased dynamics supporting this growth makes it critically important for business to keep up with the changing tendency in the market. The Knowledge Management Process, which will reach USD 510.8 billion by 2025, will demonstrate good performance, adding a significant boost to global growth. Among developed countries, the United States will maintain growth rates at the level of 18.7%. In Europe, which remains an important area of the global economy, Germany will contribute more than USD 34.6 billion to the market in the region and increase its influence over the next 5–6 years. The total projected demand in the region will exceed USD 29.2 billion. In Japan, by the end of the analyzed period, the knowledge management market ratio will reach USD 24.4 billion. Being the second largest economy in the world, China will show growth potential by 24.5% over the next two years and contribute USD 182 billion.
In the world market of corporate knowledge management database today the following companies take leading roles: Oracle Corporation; Bloomfire, Inc.; Chadha Software Technologies; ComAround, Inc.; EduBrite Systems, Inc.; Ernst & Young Global Limited; IBM Corporation; Igloo Software; KMS Lighthouse; Knosys Ltd.; OpenText Corporation; ProProfs.com; The American Productivity & Quality Center (APQC); Transversal Ltd. It is important to use effectively corporate knowledge management systems for staff training of the company and enhancement of its strategic competitive position in the market.

The research “Corporate Learning Pulse 2017” carried out by the Financial Times / IE Business School Corporate Learning Alliance (FT / IE Corporate Learning Alliance) reveals 4 key aspects of corporate learning in Europe, the Middle East, Japan and China [21]. Training and leadership development are appreciated, although not a priority. The issues of development of abilities and management, in particular, the recruitment, training and learning of managers / development of leadership qualities are of high priority for senior managers. Until now, training and leadership development programs have not met the expectations of senior specialists, but these specialists are optimistic that future programs will be worth it.

Organizations have tried to measure the impact of managers’ training and the development of leadership qualities, but they are not always reaching the success [21]. Besides, main priorities of the training are: strategy and planning; attraction of clients; implementation of strategies; leadership qualities; successful innovations. However, 58% of senior specialists think that leadership training and leadership development programs are key factors to retaining the best employees. These specialists believe that these programs can also bring tangible and intangible benefits to their organization, while a similar percentage - 53% thinks that investing in employees through these programs leads to changes and innovations in their organization. About 84% of Top managers considers that leadership training and leadership development programs have enhanced their business knowledge, competencies and self-confidence; 83% regards that these programs are vital for achieving business goals, and 81% assumes that the education / development of leadership skills for managers is more important than ever. On the other hand, only 47% of respondents are highly satisfied with their current corporate training programs. As for employees, the presidents / doctors of sciences (75%) are more satisfied with these programs (60%). Top managers who often participate in programs are the least satisfied (39%), which gives a total of 47%. Satisfaction with current programs is the highest in China (72%), Spain (64%) and Germany (57%).

The main reason of dissatisfaction is the inability to measure the results of programs and, therefore, the value of these programs. Other main reasons for dissatisfaction are the inflexibility, impracticality and irrelevance of programs. Besides, only 47% of respondents says that Top management of their organization believes that past investments have added value to the organization. The most positive respondents are from China (69%), Spain (60%) and Germany (60%). Meanwhile, 53% of respondents states that Top management thinks that future investments will add extra value to their organization. Such opinion of the Top management about future investments is strongly expressed by respondents from China (84%), Spain (60%) and Germany.
Senior specialists expect that the programs will have a positive impact on organizational changes (48% thinks so), understanding of the strategy and vision of their company (48%) and more attraction of employees (42%). Concerning business results expected by them, 58% affirms that the programs have to influence positively the profit, income and margin, extend the involvement and satisfaction of clients (55%) and attract talented specialists (51%). So, for recent years in corporate segment there is the necessity of the systematization of knowledge management process and involvement of IT tools as an efficient means to solve many issues connected to its realization and extension at the enterprise.

Knowledge management and the architecture of the enterprise pursue one and the same goal that is to develop the competitiveness of the organization [23]. The architecture of the enterprise also requires a big volume of the knowledge (Fig. 2), which has been saved by organizations, such as business models, business strategies, terms of the organization (strong and weak points, issues and opportunities) [23].

![Fig. 2. Architecture of the enterprise based on the knowledge management system](http://www.i-jet.org)

Source. Elaborated by the authors based on Wibowo [23]

KM is an approach applied for improving organizational training processes and organizational results with knowledge usage that the company owns [23]. In the generally accepted understanding, knowledge management is a strict procedure established by the corporation to work with information and knowledge resources and specialists in certain fields of activity to facilitate an access to their reuse applying modern information technologies [24].

In fact, the knowledge management is a systematic process of creating and transforming individual and group, scientific and practical experience in such a way that the knowledge can be transferred to the processes, services and products offered by the organization so that their total value and, consequently, the total productivity of the organization increase. The key to the knowledge management is, therefore, sharing the right knowledge to the right people within a group of people and the organization at the right time for the effective implementation of business processes. At its core, the essence of knowledge management is to help people working better together, using extended knowledge resources, and efficiently manage them. The result of the successfully operating knowledge management system, as noted earlier, should be a...
knowledgeable, self-learning and developing organization. Among the most common typical elements of IT solutions for corporate knowledge management database are the following: ontology server; data storage; data sources; interface; knowledge search system.

Studying 42 corporate knowledge management systems selected for training that are represented in the market using the taxonomic method, we found out that most of them are based on the use of cloud technologies (Table 1). In the overall structure, this makes up almost 83%, and 17% refers to the rest of the corporate knowledge management systems for training, as well as their combination (using both cloud technologies and others). The use of cloud technologies is a typical element for most of similar systems at the present stage of their development.

Table 1. Taxonomy of the review of knowledge management systems for corporate training

<table>
<thead>
<tr>
<th>Corporate training management systems at the enterprise</th>
<th>Opportunities / peculiarities of IT architecture of knowledge management systems</th>
<th>Main typical element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mindflash</td>
<td>Creation of courses in various formats, sharing them with students using desktop or mobile devices, their analysis in real time mode</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Litmos</td>
<td>Combination of virtual, mobile and social functions</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Docebo</td>
<td>Elaboration of courses in formats xAPI, SCORM и AICC</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Academy LMS</td>
<td>Social platform for learning</td>
<td>cloud storage</td>
</tr>
<tr>
<td>LearnUpon</td>
<td>Elaboration of courses in formats xAPI, SCORM</td>
<td>cloud storage</td>
</tr>
<tr>
<td>WizIQ</td>
<td>Mobile training, interactive whiteboards, surveys</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Saba</td>
<td>Social training, web- and video-conferences</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Braudio</td>
<td>Interactive learning materials</td>
<td>cloud storage</td>
</tr>
<tr>
<td>D2L Brightspace</td>
<td>Mobile learning, virtual classes</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Latitude Learning</td>
<td>Instructor-led training, e-learning courses</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Absorb LMS</td>
<td>Target students’ groups with personalized content for them</td>
<td>cloud storage</td>
</tr>
<tr>
<td>iSpring</td>
<td>Online courses, trainings, workshops and webinars</td>
<td>cloud storage</td>
</tr>
<tr>
<td>KMI LMS</td>
<td>Elaboration of courses in formats SCORM, xAPI, Video, Document, Webinar, Classroom и Blended</td>
<td>cloud storage</td>
</tr>
<tr>
<td>TalentLMS</td>
<td>eLearning platform is compatible with SCORM and Tin Can (xAPI), support the sale of courses, video-conferences, gamification, extended users’ profiles and notifications</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Cornerstone Learning</td>
<td>Use of functions of social training for employees’ incentives and motivation of partners to the knowledge exchange</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Fuse</td>
<td>The platform has built-in analytics, real-time video support and user-generated content</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Bridge Learn</td>
<td>Generalized ready-made courses, video courses, mobile training, built-in analytics and social functions that help students to share their knowledge.</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Blackboard Learn</td>
<td>Gamification functions, active cooperation as well as the integration of DropBox and OneDrive are used</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Meridian</td>
<td>Training programs for desktop and mobile devices, integrated analytics</td>
<td>cloud storage</td>
</tr>
<tr>
<td>Oracle Taleo Learn Cloud</td>
<td>A single platform for online learning, classroom learning, virtual learning and on-the-job learning are applied</td>
<td>cloud storage</td>
</tr>
<tr>
<td>LearntCore</td>
<td>Courses, tests and surveys are applied</td>
<td>cloud storage</td>
</tr>
</tbody>
</table>
ElcomLMS | Ensure personalized training means | Cloud storage
--- | --- | ---
Grovo | Creating courses from scratch or in the Grovo library containing lessons limited in time | Cloud storage
Redware | Blended learning environment, certificates | Cloud storage
Paradiso LMS | Can be used on 75 languages, there is gamification | Cloud storage
Edume | Mobile platform is specialized at staff training and conducting of sale trainings as well as at knowledge programs about the product | Cloud storage
Totara | Can create curriculum, carry out the assessment and manage students’ groups by segments | Cloud storage
Valamis | Gamification and certifying functions are applied | Cloud storage
Administrare | Supports instructor-led learning and blended learning, has multilingual support | Cloud storage
Dokeos | Platform for current courses, video portal, gamification functions | Cloud storage
Wizdom | Multilingual support, personalization of the user interface and an analytical system for tracking students’ performance | Cloud storage
Agylia | Supports and assists in ensuring electronic training and micro-learning courses, videos, PDFs, office documents | Cloud storage
Matrix LMS | Mobile applications, gamification functions | Cloud storage
Kallidus Learn | Consists of “Netflix style” course cards, command panels, mobile training | Cloud storage
SilkRoad Learning | Management of physical and virtual classes, creation of training libraries and providing employees with access to their own personal training portal | Cloud storage

**Local corporate learning management systems**

Source: Drawn up based on information analysis [22]

The learning management system helps to create and organize e-learning, expand knowledge about products and industries, comply with regulatory requirements and offer both internal and external corporate training with certification.

If we consider the perspectives for further development of IT architecture for corporate knowledge management systems, some of its elements will be reduced over time, and some of them will transform and become more effective. For example, we can assume that due to the further development of digital technologies and virtual reality, such an element of the IT architecture of corporate knowledge management systems as the interface will change significantly. A knowledge search system and data storage will become more effective.
4 Discussion

Considering the reason of the need arisen in the corporate sector to systematize the knowledge management process and use IT tools, we should point out that many researchers have a common understanding of the importance of implementing corporate knowledge management systems to enhance the efficiency of information processing.

The knowledge management (KM) is one of the important topics of academic and professional discourse in many areas of knowledge, including cognitive science, sociology, management, information science (IS), engineering, artificial intelligence and economics [25].

The relevance and importance of the knowledge management issue is perceived by most specialists involved in corporate governance and IT technologies for management purposes [24]. Conceptual unity extends to the essence of the knowledge management process, the most important elements (stages) of which are the creation, storage, search, transfer (dissemination) and use of knowledge. However, there are two significantly different approaches to building knowledge management systems (KMS). The first one can be named a classic one when the KMS is developed on the basis of the combination of existing, already proven technologies to support various sub processes of working with knowledge. We are talking about standard and widely used IT technologies, such as E-mail, message boards, discussion forums, general document catalogs, portals, metadata, as well as specific technologies gravitating to artificial intelligence tools, such as automatic classification, automatic annotation of documents, pattern and speech recognition, etc. The second approach can be properly defined as a semantic one. The latter is based on the use of an interconnected set of methods and technologies for working with meaning, data semantics, information and knowledge. Among them are ontologies of subject areas, technologies for their elaboration and maintenance, semantic metadata, semantic search, logical inference systems, semantic profiling of expert knowledge, semantic portals and networks, etc. So, this all said above are accompanied by appropriate technological support in terms of description languages, models, software tools and systems [24].

Contemporary trends in the development of society are characterized by rapid advancement, as well as an active change in technologies in absolutely every area of human life [19]. Information technologies are actively penetrating into all spheres of human activity. Corporate training for company personnel was no exception. In the current conditions of market relations, enterprises inevitably come across the main difficulty - their competitiveness, which is strongly associated with the qualifications and level of training of personnel. Many company executives are fully aware of the fact that to be successful tomorrow they need to invest today in the development of the company and its staff. Many companies equate the performance of each employee of departments, services and the entire company as a whole on the quality of training and staff qualifications. In this regard, corporate advanced training and learning systems are being created that are based on remote computer-aided learning technologies [19]. In digitalized and globally distributed production systems, maintenance and service providers tackle with management challenges - the growing volume of infor-
mation and data related to products and technical maintenance, including relevant knowledge, lessons learned, and advanced practice [26].

We can consider the information as an economic value that is closely related to the volume of the knowledge, which may be given to its users [27]. The information infrastructure of the enterprise is undergoing constant changes [20]. This process can occur both purposefully, in the framework of a specific IT strategy, and spontaneously, under the influence of the current needs of the business. The result is a heterogeneous applied IT landscape containing applications and software components from different manufacturers that are implemented on different platforms and often duplicate separate functions [20].

Liu et al. [28] regard that in a foreign context common interests are often grounded on mutual financial interest, while the Chinese pay also attention to emotions or feelings. In other words, good relations are grounded on the emotions or feelings of individual members (for example, trust). These emotions can be associated with attitude to the organization, colleagues. After establishing good relations between colleagues the exchange of information or knowledge takes place, which serves as the basis for the practice of KM in Chinese business.

Another approach can be found in the study of the issues as for knowledge management in projects on improvement of the processes referred to consulting, using the practical cases of Chinese small and medium enterprises Hu et al. [29] From the point of view of the consultants, they especially worried that managers were too dependent on them to diagnose issues and find solutions. They deceived their customers, were too demanding and could not see the common sense in thoughts and ideas of managers and employees who have made a significant contribution to the process of diagnosing issues. In addition, the low availability of documented contextual information in both cases made it even more difficult for consultants to understand the organizational context. In both cases, the consultants emphasized the need to cooperate with medium managers and experienced heads of production units, quality units and other relevant units in order to fully understand the issues in practice and develop proposals to improve the process.

The results of the taxonomy of researches’ review of literary sources dedicated to the issues of studying knowledge management systems for corporate training in the world and China are shown in Table 2.
Table 2. The taxonomy of researches’ review of literary sources dedicated to the issues of studying knowledge management systems for corporate training in the world and China

<table>
<thead>
<tr>
<th>Research</th>
<th>Main brief conclusions</th>
<th>Method</th>
<th>Theory</th>
<th>Cultural factors</th>
<th>Research scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zhang [30]</td>
<td>Nowadays in the rapidly developing society of information technologies the KM system is becoming an important key competency for developing a business in the market.</td>
<td>Quality analysis Survey</td>
<td>Social exchange</td>
<td>Avoiding conflicts Respect of hierarchical status</td>
<td>Chinese IT company – Taobao</td>
</tr>
<tr>
<td>Chang et al. [31]</td>
<td>Remuneration is significantly related to intention of knowledge sharing for Chinese employees, but not for American employees. Reciprocity and efficiency of the knowledge influence the intention of knowledge exchange in both countries.</td>
<td>Survey</td>
<td>Social exchange Theory of Geert Hofstede</td>
<td>Individualism – Collectivism Avoiding uncertainty</td>
<td>394 employees in the USA and China</td>
</tr>
<tr>
<td>Little [2017]</td>
<td>Training and development of leadership qualities are valuable, although are not of high priority. Matters related to the development of abilities and management, in particular, hiring, training and learning of managers, development of leadership qualities are of high priority.</td>
<td>Survey</td>
<td>Leadership Theory of Geert Hofstede</td>
<td>Orientation on Europe Individualism – Collectivism</td>
<td>1000 managers from Europe, the Middle East, Japan and China</td>
</tr>
<tr>
<td>Martinsons et al. [32]</td>
<td>KM in China is still not fully studied and deserved additional researches. Further in researches of both large and small enterprises should use different methods and theoretical investigations. They also have to properly follow institutional factors in order to study thoroughly and extend our understanding of knowledge management and knowledge exchange.</td>
<td>Quantity analysis Literature review</td>
<td>Social exchange Social capital Theory of Geert Hofstede</td>
<td>Collectivism Avoiding uncertainty</td>
<td>257 articles upon matters of knowledge management in China and other countries of the world, as well as about 200 ones after 2008.</td>
</tr>
<tr>
<td>Wong et al. [33]</td>
<td>More profound understanding of knowledge management practice in China can ensure western organizations to be employers that are more demanded and form a stable organizational structure.</td>
<td>Survey Interview</td>
<td>Social exchange Social capital Theory of Geert Hofstede</td>
<td>Collectivism</td>
<td>46 senior managers in hotels in China</td>
</tr>
<tr>
<td>Yan et al. [34]</td>
<td>In all examined hospitals 63.8% have not implemented KM yet, among them 46% have not planned even. At the same time 49.8% of examined hospitals had no learning program to the basics of KM</td>
<td>Survey</td>
<td>Social exchange</td>
<td>Collectivism</td>
<td>50 hospitals in 15 regions of China</td>
</tr>
</tbody>
</table>
system ever and Internet is a main source of obtaining knowledge by personnel of the hospital.

Chinese organizations can easily find out any potential issues connected to KM practice and, in its turn, they may change their strategy under knowledge management at the working place.

Before managers of small and medium entrepreneurship will start working with consultants, they urgently need to analyze what they are lacking and be ready to participate in the interactive process with consultants in studying and managing knowledge about new methods of business improvement.

A competitive strategy usually contains some main competencies, which may be used for creation of more beneficial values than at competitors. The knowledge, which is accumulated based on the internal organization, are usually unique as they can be used for developing a competitive strategy [23].

5 Conclusion

For last decades the globalization has significantly changed a business practice used by world companies. The integration of new technologies into business processes has caused a demand for new knowledge management systems. Such change of the paradigm greatly influenced all aspects of the activity and stipulates the need in the implementation of corporate knowledge management systems at enterprises. The key trend in the development of corporate knowledge management systems is the use of cloud technologies that are a typical element for them for recent years. Based on analysis results of 42 corporate knowledge management systems for learning, which are represented in the market, we can state that most of them are built using cloud technologies. In total structure it makes up almost 83%, and 17% refers to the rest of corporate knowledge management systems for learning, as well as their combination (application of both cloud technologies and others).

Source: Private generalized researches and review of literature sources [21, 28-34]

http://www.i-jet.org
The use of obtained research outcomes in practice is supposed in case of justifying strategic approaches of the implementation of corporate knowledge management systems at Chinese enterprises and other countries of the world. Researches can be integrated into international practice for studying perspectives of the development of corporate knowledge management systems. The further work relates to the continuation of researches upon the survey based on the example of public sector of economy. Considering the perspectives of the further IT architecture development for corporate knowledge management systems, we can forecast that some part of its elements is reducing in a time, and certain components are transformed and become more efficient. For instance, we can assume that due to the further development of digital technologies and virtual reality such element of IT architecture of corporate knowledge management systems as an interface can be crucially changed. Knowledge search system, data storage will become more efficient.

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7 References

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