Proceedings of the 52nd Hawaii International Conference on System Sciences | 2019

Knowledge Risk Management – How to Manage Future Knowledge Loss

Dr. Frithjof Mueller
School of Management and Law, ZHAW
frithjof.mueller@zhaw.ch

Dr. Andrea Mueller
School of Management and Law, ZHAW
andrea.mueller@zhaw.ch

Abstract

Today's organizations have to cope with constant change due to reorganization initiatives, mergers, and acquisitions or the launch of a new product. In addition due to demographic changes and the actual development of the labor market securing knowledge becomes more important for organizations. Consequently, the people within the organizations are getting more important as the management of knowledge as a resource is crucial. The loss of knowledge is relevant to competition and can even be a threat to the existence of the company. Within this paper, the basics of knowledge risk management and empirical data describing the strategic competitive factor of knowledge will be outlined. Furthermore, measures and instruments that can be used to prevent or avoid the risk of knowledge loss are described by showing survey data.

1. Introduction

Today, companies are increasingly exposed to changes that are taking place more and more quickly and usually at the same time. Organizational divisions are relocated, sold, or new business units are established. Especially in such turbulent company phases, the importance of human capital and the knowledge associated with it as production and a competitive factor of a company is becoming increasingly important. "Major changes will only succeed if they are supported by the employees" [1]. Especially in times of organizational changes and restructuring, the management of knowledge as a resource is crucial. The focus is on dealing with the possible loss of knowledge - it is important to protect the existing personal knowledge, especially where this affects the competitiveness of a company. Furthermore, demographic changes pose another risk to the human capital and the respective business-relevant know-how of companies. When employees get older and retire, companies can face significant losses of critical knowledge and skills. As a result, when a lot of people retire in a company, there may be no one left who knows operating certain equipment or manage important customer relationships. Retirement thus not only represents the loss of a worker with the competences needed to perform a specific task. It furthermore may also represent the loss of important know-how whose value to the organization extends far beyond the worker's individual position. [2]. Thus the question arises how the loss of knowledge and competencies can be managed in the future to keep organizations competitive. Accordingly, in the next section knowledge management and knowledge risk management will be outlined.

2. Knowledge management and knowledge risk management

2.1. Basics of knowledge management

Knowledge is an essential component of corporate competencies. It becomes clear that the performance of a company depends not only on pure knowledge (competence/skill), but also on being allowed (enabler) and willing (commitment).

Knowledge management is a term that describes a variety of types of initiatives that share concrete informational resources, accesses available evidence, and manages how individuals work together to share their expertise effectively to support organizational goals and achieve high performance. Its actual definition is contextual to the organization that seeks to implement it, the individuals who may be leading and participating in the implementation, and the tools those individuals employ to get the job done. According to Probst et al. [3], the building blocks of knowledge management can be described as follows: Knowledge identification, knowledge acquisition, knowledge development, knowledge sharing, knowledge use and knowledge preservation. Following Meyer-Ferreira [4], these elements can be classified into the following three core processes: Knowledge generation process,

URI: https://hdl.handle.net/10125/60003
ISBN: 978-0-9981331-2-6

knowledge use process and knowledge risk management process.

The knowledge generation process is about acquiring or developing competitive knowledge for the organization. By recruiting experts or by acquiring companies, knowledge can be acquired that cannot be developed on its own. There is considerable potential for knowledge acquisition in relationships with customers, suppliers and cooperation partners [3]. As an alternative to knowledge acquisition, especially where knowledge is not available outside of the company or where knowledge acquisition is significantly more expensive, knowledge can be developed internally within the framework of competence management. These two knowledge generation processes have one thing in common: human capital is new to the company and therefore particularly valuable [4].

The knowledge utilization process can be divided into four sub-processes: Identify knowledge, codify/document knowledge, share knowledge and use knowledge. Within the framework of knowledge identification, it is necessary to create transparency about already existing, relevant knowledge (knowledge areas, knowledge carriers, knowledge-intensive processes). Only known knowledge stocks can be used [4].

There are two strategies: the codification strategy and the personalization strategy. The codification strategy identifies the knowledge assets themselves and then codifies them, i.e. stores, maintains, updates and makes them accessible in databases accessible throughout the company. This strategy is mainly suitable for non-personal knowledge, i.e. information that has a relatively long validity. The personalization strategy does not identify and codify knowledge stocks but knowledge carriers, whereby two further codification options can be distinguished: Codification of holders of expert knowledge with their fields of knowledge in so-called expert inventories and codification of all knowledge and competence holders with their relevant knowledge stocks in so-called competence portfolios (the quality of knowledge or competences is categorized). With both codification options, the individually available knowledge is recorded, maintained, updated and made accessible to the organization in databases, storage media etc. [4].

When it comes to sharing and using knowledge, sharing knowledge depends on the willingness of knowledge carriers to make their knowledge available. Usually, this happens when they can see a benefit and sharing of knowledge is rewarded. The exchange of knowledge does not necessarily have to be based on monetary incentives. There are other ways to promote the exchange of knowledge such as increased development and career opportunities, increased social prestige, increased expert knowledge, recognition and appreciation for the work done by managers or customers, and of course the opportunity to realize oneself as much as possible at work. However, the creation of these benefits presupposes that an organization facilitates the promotion of the exchange of knowledge and creates cultural and institutional conditions for this. A company with motivational-inhibiting management structures does not sufficiently support an efficient and effective exchange of knowledge. Sharing knowledge also requires trust and openness - a corresponding corporate culture is a basis for this. As important as the accessibility of knowledge in an organization may be, the real value of knowledge sharing is that it offers protection against loss of knowledge. Therefore motivating incentive systems also have a certain risk management character in the context of knowledge use [4].

2.2. Knowledge risk management

In risk management, it is assumed that a risk can arise if money has been invested in any form. Knowledge is invested by generating or developing knowledge. In addition, investments are made in a suitable IT infrastructure or in measures to promote culture as part of the optimal distribution and use of knowledge. As soon as a "knowledge capital" exists, the basic prerequisite for a risk is given [5].

Knowledge management as competence management must, therefore, deal with possible knowledge risks: personnel and structural knowledge risks. Figure 1 shows the different types of knowledge risks within a company.

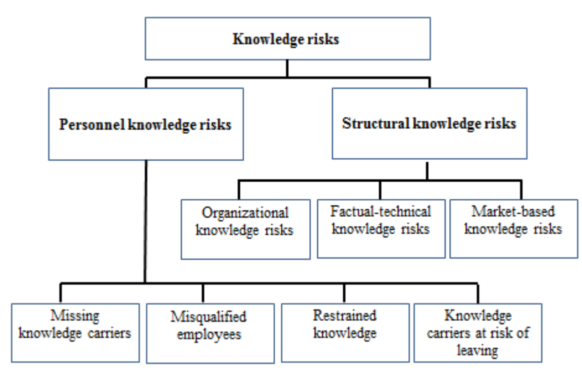

Figure 1. Types of knowledge risks [4].

Even though all knowledge risks are important, personnel knowledge risks are of particular importance in the context of human capital management. The risk of knowledge loss must be controlled first and foremost.
In the following section, we first turn to the risk cycle within knowledge risk management. The focus is on the loss risk/exit risk and how the risk events can be identified and managed in the best possible way.

2.3. The risk cycle

Risk awareness within knowledge management has increased in recent years. And the awareness of personnel risks is also being addressed more systematically today. The focus is on the comprehensive identification, measurement, and management of personnel risks. These risks are to be spread or compensated by the inefficient handling of knowledge. In particular, it is important to prevent the unwanted outflow of knowledge in the best possible way and to protect relevant knowledge. Figure 2 shows the management of knowledge loss risk at a glance: In a first step strategic knowledge in the company has to be identified and the respective risks associated with this strategic know-how have to be evaluated. During the evaluation process, the probability of knowledge loss (e.g. potential turnover of employees) and the size of the potential damage (e.g. a number of employees leaving the company) have to be evaluated. In a next step, the loss and damage risks have to be managed with either person-related or system-related measures as shown below.

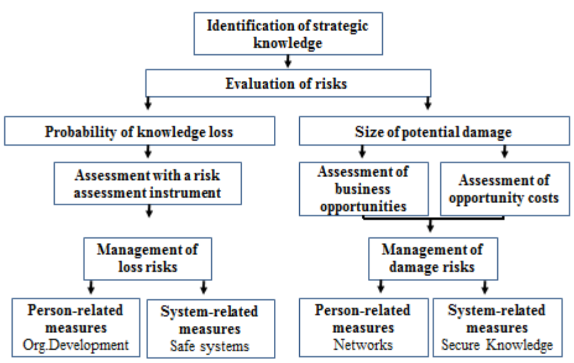

Figure 2. Management of knowledge loss risks [4].

The management of knowledge loss risk is made up of the classic three elements of risk management [5]:
1. risk identification/risk assessment, 2. measurement and monitoring and 3. risk management/control (knowledge protection).
According to Kobi [1], these individual substeps are presented in a risk cycle as shown in Figure 3. In a first step, within risk identification, risks have to be categorized which are relevant for success. Within risk measurement, the relevant risk ha to quantified and managed with respective measures and actions in the next step. Finally, risk surveillance controls the success of the risk cycle in the end by setting up an action-oriented cockpit for surveillance.

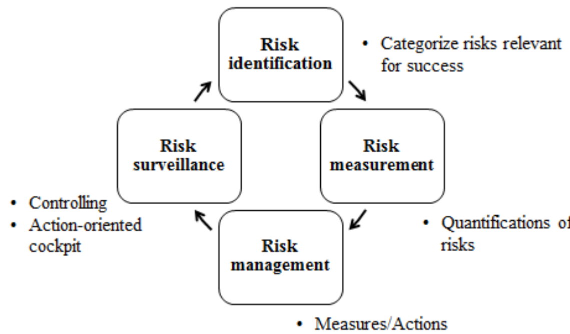

Figure 3. Risk cycle [1].

Following the outline of the theoretical perspective of knowledge risk management, the next section will focus on the current empirical evidence of knowledge risk management.

3. Knowledge as a strategic competitive factor

Knowledge is increasingly becoming a strategic competitive factor that must be managed in order to ensure competitive corporate performance in relation to the sales market. It is a decisive factor in the value creation process and must be able to be used as a strategic resource. Therefore a company has to be able to translate human capital into performance. In the end, this always takes place via the business processes. Accordingly, the management has to know which processes and which of the service providers involved are able to deliver the success-relevant services, especially if the company is in strong competition or has to defend a competitive advantage [4].

The outflow of knowledge can have serious consequences for a company. Employees leaving the company can destabilize entire teams and unsettle employees. The effects of a single termination can already have serious consequences. The damage can be even more serious when entire teams leave. This is particularly the case if entire structures are disintegrated in the event of restructuring or dissolving project teams.

A study by the Fraunhofer Institute for Industrial Engineering and Organization (IAO) [6] and the IT industry association Bitkom shows reasons for future loss of knowledge and skills. Figure 4 shows where companies will find the biggest causes for the loss of know-how and specialist knowledge. When looking at the results, it is noticeable that well over half of the companies (64 percent) expect knowledge and skills to be lost in the future because employees are more likely to leave the company for career reasons. Small and medium-sized enterprises are particularly affected, as they often are not able to pay the salaries of large companies. Furthermore, 42 percent of those surveyed say that the age-related departure of employees will be an important reason for the loss of knowledge in the future. Causes that can be located primarily in the personal environment of employees, such as the perception of parental and parental leave (35%) or the care of relatives (18%), are assessed more cautiously. Only 16 percent of those surveyed expect an increase in knowledge loss in the future because employees become ill. The same applies to the cause of "internal changes", which are a reason for the future loss of knowledge for 11 percent.

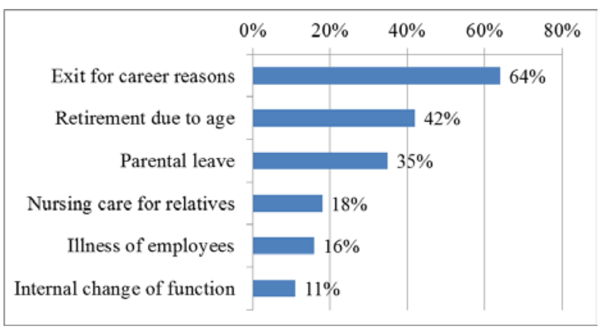

Figure 4. Reasons for the future loss of knowledge and skills [6].

If employees take their personal knowledge with them, this can have cost-intensive consequences, especially when employees "take along" clients and their portfolios. In the worst case, this can cost their existence. The pure loss of turnover can cost the company dearly by the loss of sales associated with the loss of knowledge and competence. Figure 5 shows how companies estimate the loss of sales associated with loss of knowledge and competencies. On average, this amounts to 8.5 percent, whereby the variance of the answers is considerable. For example, some companies report that they have lost more than 30 percent of their sales because they are unable to complete all orders due to a shortage of skilled workers.

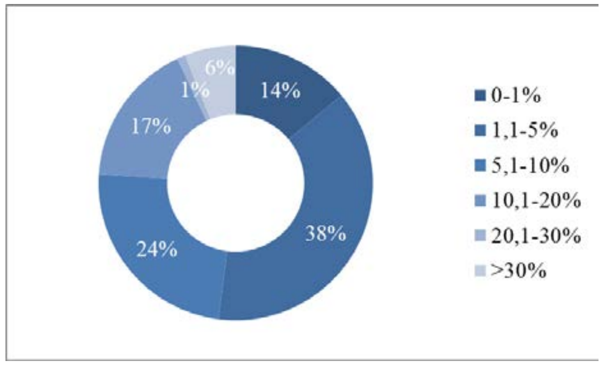

Figure 5. The estimated loss of sales associated with loss of knowledge and competencies (Mean: 8.54%; Maximum: 40%) [6].

In addition to the loss of sales, Figure 6 shows further consequences of knowledge loss. The results of the study of Fraunhofer IAO [6] show how companies assess the effects of the loss of knowledge and know-how today and in the future.

Already today, 45 percent of those surveyed say that a lack of knowledge or skilled workers leads to an overload of existing personnel. For the future, this approval level will rise to 52 percent. It is noteworthy that today almost 26 percent state that orders could be placed by not be accepted because the company does not have sufficient expertise; for the future, this figure will even rise to 36 percent. These figures give cause for concern. On the one hand, they carry the risk of an Overload of existing personnel. This poses a risk to companies into a kind of vicious circle: Too few skilled workers leads to an overload of existing specialists, which in turn leads to dissatisfaction or sickness-related absences, which intensifies the skilled worker-problem again.

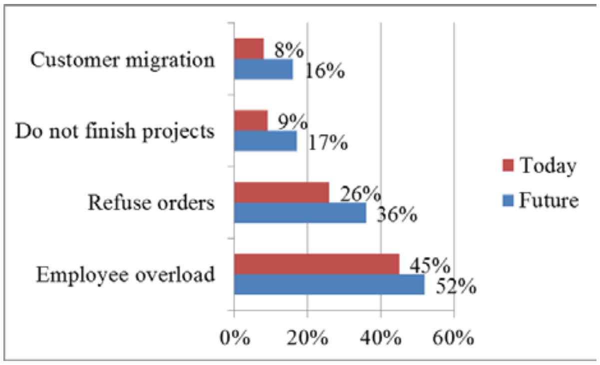

Figure 6. Effects of loss of knowledge and competence [6].

These facts show that an employee's departure and the associated loss of knowledge have a direct influence on productivity as there is a direct relationship between knowledge outflow and business success. Thus, the real value of human capital becomes apparent. The company not only loses its investments (and has to make them again), it also loses the real added value of its employees until they are replaced on an equivalent basis (replacement costs and training costs). In addition, there are lost business opportunities: on the one hand, performance can be reduced during the period of notice, and on the other hand, earnings losses can also have an effect beyond the training period (e.g. lost earnings due to loss of image due to non-compliance with obligations, etc.) [4].
Ultimately, the employee's decision to remain with the company and make their performance available to the company depends on their job satisfaction and commitment. In order to ensure these services in relation to the sales market, a holistic view and management of human capital as a strategic competitive factor is central. Furthermore, organizations have already implemented measures and instruments that support the successful transfer of knowledge.

4. Measures and instruments to secure know-how

In the future, the shortage of skilled workers will increase due to the consequences of demographic change.
For this reason, many companies are counteracting an insecure personnel situation. In terms of their self-image, "young" workforces age and age-related departures can no longer be avoided. It will be particularly difficult for those companies that do not yet have demographically appropriate personnel development strategies [7].

In order to secure the relevant know-how of employees who are leaving the company methods can be used that are continuously applied in the working process. These methods can be used selectively when employees leave the company or, if necessary, even after the departure of employees, so to speak retroactively [8].
However, the limits of securing experience must also be taken into account. Knowledge is always personal and the mediation of experience is therefore particularly suited to methods that enable direct communication between individuals. Thus, the expertise that employees have in a technocratic sense can be transferred. Documentations, if they have been made at all can be transferred to the successor. Without the same experience (which, for example, can be divided into identical storage systems or a common nomenclature) the documentation, however, is often difficult to understand. In addition, the transfer of experiences to the successors is not just the result of the preservation of the company's know-how, but it is also a sign of personal appreciation: The expert status of an employee is thus emphasized and acknowledged within an organization [8, 9].

There already exist a couple of employee-related instruments for knowledge and competence maintenance which are shown in the overview in Figure 7 below.
As shown in Figure 7 the most popular continuous instrument for the preservation of knowledge and competencies for companies is to strengthen the informal exchange of knowledge. This can be achieved by promoting an open knowledge culture, e.g. a common break arrangement (coffee corners, lunch) but also through the recognition and appreciation of effective knowledge transfer through material and immaterial incentives. Many companies have already dealt with this topic and measures in this thematic area compared with all other employee-related instruments (63 percent of the companies surveyed as shown in Figure 7) [6]. This means that measures and instruments to strengthen the informal exchange of information are the most common instruments used to maintain knowledge and skills in a company.
And for the future, too, the companies see this as a further step in the right direction and expect that further investments will be made at this point and these measures will be applied in 84 percent of the companies [6]. Accordingly, companies continue to strengthen the informal exchange of information as this is the most important instrument for the preservation of knowledge and competencies for the future.

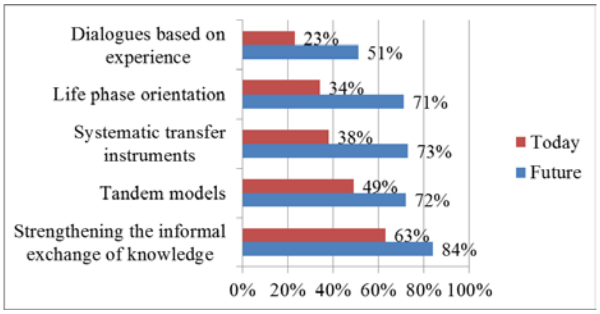

Figure 7. Importance of employee-related instruments today and in the future [6].

In contrast to continuous measures for the preservation of knowledge and competencies, there are also specific measures that uniquely contribute to the transfer of knowledge: A selective instrument for securing experience with the departure of employees are tandem models, in which knowledge providers or retiring employees and knowledge recipients or successors work together for a limited period of time in order to transfer competencies and secure critical experience knowledge [8]. Tandem Models are already used by half of the companies surveyed and are the second most important instrument currently used in the companies surveyed. Especially successful companies, i.e. companies, which are once again increasing their profits after the pre-crisis year 2008 use eleven percent more tandem models than less successful ones [6].
In the future, it is expected that the use will increase and tandem models will be an important standard instrument when employees are leaving the company.
Continuous instruments for securing experience anchored in the work process are also systematic transfer instruments for experiential knowledge, such as expert debriefing or storytelling. With the help of these instruments relevant empirical knowledge from completed projects or core tasks critical for success in the working process are continuously passed from experts on to employees in regular workshops [8].

Nearly all companies surveyed in this study, know continuous, systematic transfer instruments. However, their importance has so far only been high in 38 percent of companies. However, the companies see a strong increase in importance to 73 percent. Thus, these instruments seem to have great potential in the future to preserve knowledge and skills [6].
A future challenge is to create clearly structured and tailored instruments to the company's needs and to support employees in training and regularly using these instruments.
Another continuous tool for the optimal usage of experience and competencies in companies is life-phase oriented competence and career planning of employees. The optimal consideration of the needs of employees can, for example, be taken into account in career models which adapt to an individual employment biography. Specialist careers with expert status during a family phase or with a focus on coaching and consulting during a senior phase response to the individual needs of employees (e.g. flexibility in time), the long-term commitment of employees to the company and are making full use of the company's expert knowledge [6].
A demographically stable personnel policy will also deal with these. Accordingly, such planning instruments have so far been applied by only 34 percent of the companies surveyed. However, 70 percent of companies expect these strategies to be used in their company for the future [6]. This implies a challenge for research and development. These strategic questions of a demographically stable personnel policy focus on manageable instruments and qualifications for companies. Another selective measure for the departure of experts intergenerational dialogues of experience. They enable companies to the safeguarding of experience knowledge, especially in the case of short-term retirement of experienced knowledge carriers. A constant communication with employees who are leaving the company enables participation in their wealth of experience. The company thus receives an overview of the spectrum of knowledge that distinguishes these people. This ensures continuity in the fields of activities of the successors, receiving information on important customers, cooperation, and contact persons. Thus important networks can be preserved [8].
Inter-generational dialogues of experience can also be moderated by independent persons to support the participants and thus have the opportunity to efficiently develop these important knowledge resources. Among the companies surveyed, only 23 percent of them currently use such dialogues of experience when employees leave the company [6].
For the future, companies expect that dialogues of experience will increase sharply, and will be used in every second company. As dialogues of experience so far are not so widely known, it is necessary to realize good training of employees and consulting units in the companies, such as human resources development or human resources departments that provide the support in using and moderating dialogues of experience [8].
Furthermore, knowledge loss and competence can be dealt with on a strategic level by implementing strategies to deal with knowledge. Strategies in dealing with knowledge are an opportunity to make specialist knowledge available in the company or to tackle knowledge-based challenges. One approach can be to nurture and maintain the available knowledge and to

further develop it, which is referred to as a "sustainability strategy". Another approach can be to bring knowledge and competence into the company through recruitment, which is referred to as a "recruitment strategy". Another way of tackling knowledge and competence challenges may be to outsource part of the services, which can extend into the organization's knowledge-intensive core processes. In this case, the lack of knowledge on the market is bought in, which in this study is called the "make-or-buy" strategy. And finally, an "up-or-out" strategy, which is characterized by companies actively supporting employees to accept alternative job offers when the possibility of advancement in their own company hierarchy is limited. Experience has shown that this model is practiced by consulting firms, which often create a network that can be used for later acquisition activities.

5. Conclusion

Organizational risk management is a complex and important task for managers; particularly as the consequences of poor risk management is becomingly increasingly visible through financial loss. Stakeholders, such as institutional investors, are no longer willing to accept ignorance as an excuse. Managers must be aware of the risks associated with their organization's activities and have in place ways to manage unwanted events. Accordingly, the consequences of knowledge loss can have costly consequences for companies. While risk management has long been established in other sectors and areas, human resources risk management has only recently been gaining ground. This reflects the increasing awareness that employees and their knowledge are not only the most expensive resource in companies but also the most important.

Accordingly, it will be important for companies to adequately assess the potential of knowledge loss (e.g. by an organization risk matrix, where it is assessed what happens if knowledge is lost [10]) and apply appropriate measures and instruments to prevent potential knowledge loss for the company. As this paper shows there are already a couple of existing measures and instruments to cope with this problem and according to the surveyed companies, these will be expanded in the future. Foremost informal exchange of knowledge is gaining more and more important in the future. Yet, as the world of work is getting more flexible and independent, continuous and systematic instruments to secure know-how will get more important as well. Furthermore, companies have to deal with the topic of knowledge loss on a strategic level as well. One way is to follow a "sustainability strategy" by nurturing and maintaining the knowledge in the company. Following such a strategy will be even more important in the future, as talents and people with certain skills and knowledge will be a business-relevant resource (e.g. data science, consulting, etc.).

Knowledge management is the skilled organization and the conscious handling of the resource knowledge for the realization of competitive advantages.

Sources of danger and challenges for knowledge retention arise, for example, as a result of demographic change or an increasingly volatile labor market and low employee retention. High turnover and the aging of the workforce can endanger intellectual capital if implicit knowledge is not passed on, if there is no motivation to pass it on, if the process of knowledge transfer is not organized at an early stage.

Due to the demographic developments and the more volatile job market, the importance of knowledge risk management will get more important in the future. An aging workforce will have implications for most developed economies, but managers need to examine the particular effect it will have on their own companies by looking at the age distribution of their employee base and develop adequate actions to cope with the risks associated with the knowledge loss due to the retirement of their employees. One way will be the identification of the greatest challenges as workers retire or leave and to forecast what the workforce needs will be in each job family at different points in the future. This forecast will require two kinds of information: internal workforce supply and workforce demand based on strategic assumptions about growth targets, emerging business models, productivity increases, and new technologies [2].

Yet, the success of knowledge management and especially knowledge risk management in companies is not natural as organizational culture is widely held to be the major barrier to the creation and leverage of knowledge assets. Accordingly, a major question for companies working on this topic will be to find out what are the characteristics of the culture that will help to implement the respective actions for knowledge risk management [11].

The findings of Storm and Stone [12] on the effect of saving enhanced memory (SEM) support the usefulness of outsourcing relevant memory content to external media for subsequent, efficient work. Storage seems to allow the release of cognitive resources for the processing of new content and thus supports cultural change towards a learning organization.

Knowledge risk management appears to be a promising area for empirical research. It sits at the intersection of two exciting fields – risk management and knowledge

– and has practical utility for managers and practitioners.

If personnel risks can be viewed holistically and effectively managed, the opportunities inherent in human capital can also be exploited in a more targeted and sustainable manner. Risk management is also opportunity management - controlled risks are opportunities.

References

[1] Kobi, Jean-Marcel (2012). Personalrisikomanagement: Strategien zur Steigerung des People Value, 3. Auflage, Wiesbaden: Springer Gabler.

[2] Strack, R., Baier, J. & Fahlander, A. (2008). Managing Demographic Risk. Harvard Business Review, February 2008.

[3] Probst, Gilbert/Raub, Steffen/Romhardt, Kai (2012): Wissen managen: Wie Unternehmen ihre wertvollste Ressource optimal nutzen, 7. Auflage, Wiesbaden: Springer Gabler

[4] Meyer-Ferreira, Peter (2015). Human Capital strategisch einsetzen: Neue Wege zum Unternehmenserfolg, Köln: Luchterhand.

[5] Zbinden, Daniela, & Meyer-Ferreira, Peter (2001). Wissensrisiko-Management: Ein Vorgehen zur Identifizierung und Bewertung von Wissensrisiken als Problemlösungsinstrument im Wissensmanagement, Discussion Paper 2001-04, Fachhochschule Solothurn Nordwestschweiz

[6] Fraunhofer IAO (2012). Fachkräftemangel und Know-how Sicherung in der IT-Wirtschaft : Lösungsansätze und personalwirtschaftliche Instrumente / Fraunhofer-Institut für Arbeitswirtschaft und Organisation IAO in Stuttgart.

[7] Schnalzer, K., Schletz, A., Buck, H. (2011). Sicherung strategischen Wissens erfahrener IT-Kräfte. Abschlussbericht.

[8] Deissinger, T. & Breuing, K. (2014). Recruitment of Skilled Employees and Workforce Development in Germany: Practices, Challenges and Strategies for the Future. In Short, T. & Harris, R. (2017). Workforce Development. Springer.

[9] Fraunhofer-Gesellschaft (2007). Sicherung von Erfahrungswissen von ausscheidenden Mitarbeiterinnen und Mitarbeitern. Internes Dokument. München.

[10] Massingham, P. (2010). Knowledge risk management: a framework, Journal of Knowledge Management, Vol. 14 Issue: 3, pp.464-485.

[11] DeLong, D. W., Fahey, L. (2000). Diagnosing cultural barriers to knowledge management. Academy of Management Executive, Vol. 14 (4), pp. 113-127.

[12] Storm, B. C., & Stone, S. M. (2015). Saving-Enhanced Memory: The Benefits of Saving on the Learning and Remembering of New Information. Psychological Science, Vol. 26 (2), pp. 182 – 188.