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Registration, access and use of personal knowledge in organizations

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ABSTRACT

Organizations have managed information regarding knowledge of employees using processes such as codification, knowledge mapping, network analysis and personalization. Recently, personal knowledge registration (PKR) has become another way of managing this knowledge. Little is known about how organizations support PKR, and how PKR facilitates the flow of information and knowledge.

This paper examines how different information management professionals access and use PKR. It is a multiple case study, with 43 semi-structured interviews and an analysis of strategic documents. The purpose is to shed light on strategic intentions with PKR, its collaborative tasks and qualities. A conceptual model was built for this purpose. The aim is to better understand how PKR works and to examine how information on education, training and the skills of employees is managed in organizations.

The findings demonstrate that organizational strategies portray elaborate intentions regarding knowledge seeking and sharing, while less emphasis is put on knowledge registration or management. Interviewees expressed lack of appropriate actions to support PKR. Access and use of PKR is limited and the organizations still struggle to manage the PKR of their employees.

1. Introduction

Studies in knowledge management (KM), human resource management (HRM) and records and information management (RIM) are extensive and growing. Recently, personal knowledge registration (PKR) has become another way of registering and managing the knowledge of employees (Haraldsdottir, 2018). PKR has evolved from the disciplines of HRM, KM and RIM. The intention of PKR is to generate an overview of accumulated personal knowledge embedded in the employees (Gunnlaugsdottir, 2008b; Hase & Galt, 2011; Henttonen, Kianto, & Ritala, 2016; Macguire, 2005). The need to register intellectual capital has been addressed among human resource (HR) and training managers for some time (Delaney & Huselid, 1996; Haraldsdottir, 2018). The purpose of registration is to gain a better use of valuable knowledge, build interdisciplinary teams and to find instructors for in-house training, as well as for recruitment and development. The term personal knowledge registration and the abbreviation PKR is a consequence of this discourse.

PKR is a system of concepts, processes and methods that can be implemented in different software systems. PKR creates a community of knowledge, as described by Sigala & Chalkiti (2007) where the acquisition and sharing of knowledge can take place. The term is comparable to the information a person registers in a curriculum vitae (CV), except the information belongs to an organization. PKR is similar to the creation of corporate knowledge directories, company yellow pages and expert networks (Andreeva & Kianto, 2012; Vuori & Okkonen, 2012). PKR is one type of a knowledge directory in a "cleverly constructed database" as described by Davenport & Prusak (1998). PKR covers a set of information that the individual, in co-operation with a manager, selects and considers relevant while employed (Haraldsdottir, 2016). As such, PKR is personnel records, often related to human resource management systems (HRMS), human resource information systems (HRIS), information registered into the learning and development module of talent management systems (TMS) or human capital management systems (HCM) (Kavanagh & Johnson, 2017).

Registering personal knowledge using PKR creates an overview of collected organizational knowledge and assists employees, in particular HR and training managers, to look for, and find, current and valuable knowledge among their staff.

The aim of this study was to understand in what way organizations

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support PKR and how its use impacts the work of its facilitators; managers of HR, training, information technology (IT), records and information, and quality. An interdisciplinary study was conducted as an analytical framework to enhance the understanding of PKR. The implementation of PKR was analysed by studying existing strategies and multi-professional interviews. Organizational intentions with PKR were identified. Furthermore, an analysis was made of how PKR was being accessed, by whom and how this access was perceived by employees. A conceptual model, demonstrating the above mentioned facilitators of PKR, was created for this purpose. In sum, the paper addresses the following research questions:

RQ1 – How is personal knowledge selected, registered and secured in organizations?

RQ2 – In what way is personal knowledge made accessible to employees?

RQ3 – In what way is personal knowledge made usable for in-house organizational training?

The paper is organized into seven sections. Section two reviews the theoretical background and examines relevant studies while section three introduces the conceptual model. Methodology is presented in section four. Section five contains the key findings. Discussions and summary is covered in section six. The paper concludes with a contribution to theory and practice and an outline for future studies.

2. Knowledge directories

KM theories focus on knowledge processes, (Argyris, 1999; Davenport & Prusak, 1998; Liebowitz & Beckman, 1998), best practices and sharing work-related experience with co-workers (Christensen, 2007). Optimal usage of work-related knowledge, experience and skills of employees is highlighted (Hansen, Nohria, & Tierney, 1999; Skyrme & Amidon, 1998, Skyrme, 2011). Emphasis is on finding ways to limit time-consuming information searches, redundant work, repetition of unsuccessful tasks or rediscovery of the wheel when employees leave the organization (Calo, 2008; Carmel, Yoong, & Patel, 2013; Leyer, Schneider, & Claus, 2016). Organizations that can efficiently identify knowledge within their ranks and apply it in their operations are more likely to have an edge over their competitors (Migdadi, 2009). A competitive edge is furthermore grounded in the way organizations manage to attract, select, develop and retain their talented employees (Stahl et al., 2012). Likewise, organizations tend to promote their employees' knowledge as their greatest advantage. Training of employees refers to a systematic approach to learning and development to improve individual, team, and organizational effectiveness (Goldstein & Ford 2002). Leyer et al. (2016) stated that the purpose of a process-based social knowledge system was to provide easy access to available knowledge sources, while the knowledge itself was not contained in the system. The same applies to PKR. It is a knowledge directory that includes information regarding knowledge origin, i.e. which employees possess the required knowledge (Leyer et al., 2016, p. 97).

Organizational knowledge is defined as either tacit among the employees or explicit when shared with others (Jashapara, 2011; Panahi, Watson, & Partridge, 2013; Sigala & Chalkiti, 2007). Knowledge mapping and organizational networking is helpful in externalizing knowledge (Chan & Liebowitz, 2006). Borgatti & Cross (2003, p. 433) claim that the probability of seeking information from another person is correlated with knowing what that person knows, "know-who", valuing the knowledge, having timely access to it and perceiving it not too costly. Nebus (2006) maintains that the person's choice of contact is influenced by existing relationships (what he terms an advice network). While known relationships, or what Granovetter (1973) terms strong ties, may be comfortable and easy to access, they may also induce hindrances and exclude the best possible and unknown contact persons (Ellison, Gibbs, & Weber, 2015). As stated in Borgatti & Cross (2003, p. 442), people may interact with a limited set of co-workers for knowledge seeking, which may be hindering if other people are better sources. According to Nebus (2006), a partial reason may be that traditional knowledge sources, such as portals of best-practices, internal benchmarking or work-related know-how, need adaption from original use before re-use. Not knowing whom to ask is problematic if the knowledge network is only partially explicit. Moreover, trust and ownership and reciprocal relationships within the organization play a key role in facilitating knowledge sharing (Damodaran & Olphert, 2000; Drucker, 1993; Ford, 2003; Klamma et al., 2007; Newman & Newman, 2015).

Training in organizations produces clear benefits for individuals and teams, organizations, and society (Aguinis & Kraiger, 2009). Training strategies cohere with business strategies as they improve organizational value (Guthridge, Komm, & Lawson, 2008). Training strategies may therefore be considered a way to advertise the organization as a knowledge approving and supportive workplace. Organizations that use training to a greater extent report higher perceived organizational performance (Delaney & Huselid, 1996). On-the-job training is strongly related to transfer of training and firm performance (Saks & Burke-Smalley, 2014). In their comparison of high performance work systems, Becker & Gerhart (1996) linked strategic training to value creation in HRM. Training was categorized, measured and registered according to job descriptions. Delaney & Huselid (1996, p. 949) acknowledged the value systems of HRM practices, including the registration of employee training into HRMS, where information on individuals and hours could be evaluated. Registration of employees' participation in training originated in HRM theories where it was positively related to organizational performance, progress and prospects (Becker & Huselid, 2006).

3. A conceptual model for PKR

In order to better understand how PKR works a conceptual model was built. Based on the perception that managing knowledge is a multi-professional task, the model represents six facilitators of PKR in accordance with the main interview groups of the study (see Table 1) (Franks, 2013, Oliver & Foscarini, 2014; Saffady, 2015). These are employees working in HR and training (Becker & Huselid, 2006; Drucker, 1993), records management (Franks, 2013; Gunnlaugsdottir, 2003; Gunnlaugsdottir, 2008b; Saffady, 2015), IT (Damodaram & Olphert, 2000; Leyer et al., 2016), quality management (Brumm, 1996) and general employees (Goldsmith, Joseph, & Debowski, 2012). These facilitators select and register the personal knowledge. In order for PKR to function, access, usability and security of information are critical success factors. PKR relates to significant elements of knowledge sharing which are social practices and the actual systems that support knowledge sharing (Ackerman, Dachtera, Pipek, & Wulf, 2013; Damodaran & Olphert, 2000; Leyer et al., 2016). Access and usability of PKR is dependent on its purpose and platform as well as user involvement in the development phase (Bano & Zowghi, 2015). The ability to allocate and effectively access and utilise knowledge, relies substantially on its facilitators, who actually create, register, share, and use knowledge (Andreeva & Kianto, 2012; Goldsmith et al., 2012; Henttonen et al., 2016).

Fig. 1 represents the conceptual model of PKR. It demonstrates the six facilitators and their tasks and the three quality aspects of PKR; access, usability and security. Each task and quality is further described on the right side of the model and in Sections 3.1–3.5.

3.1. Selection

Selection is made by employees in cooperation with their manager or HR manager. It includes formal and informal education, work-experience, internal and external training, participation in conferences and webinars; language skills, IT and communicational skills; teaching or writing experience (Haraldsdottir, 2016). These qualifications constitute the knowledge (know-what) of employees registered in PKR. Verification of certificates or similar documents is in the hands of the

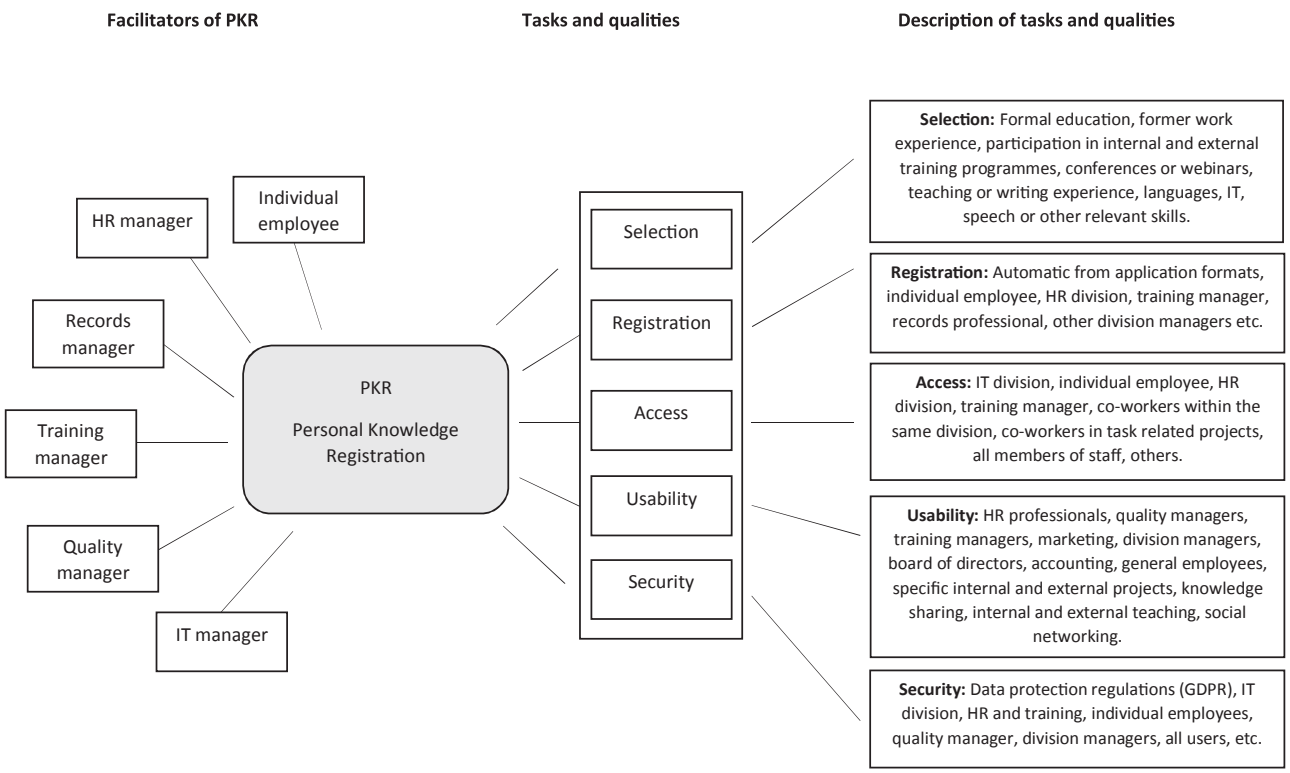

Fig. 1. Conceptual model.

HR manager.

3.2. Registration

Registration is partially automatic in HRMS. New employees may apply for a job on the website of the organization, adding files into a web-based application. The HRMS reads the application automatically and registers the information. Entering information as work experience grows is in the hands of individual employees, the HR or training manager or a supervising manager. The administration of the registration and classification of personal knowledge may be, as with other information systems, in the hands of a records manager (Franks, 2013).

3.3. Access

Access is managed in either the HR or IT division or by a records manager (Saffady, 2015). As the registration and use of information is collaborative, it is preferable that all employees have full access to PKR. Access may be limited to the HR or training manager, as it is their responsibility to find in-house knowledge and administer a needs analysis for further recruitment of employees.

3.4. Usability

Employees with access can use PKR. Usability of an interactive system captures how effective and efficient it is for users to carry out needed tasks and how satisfied they are while using it (ISO, 2017). It is also necessary to consider a PKR's utility, i.e. if it offers the right tasks (functionality) to the user. Johannessen & Hornbæk (2014) noted that utility depends on usability meaning that good utility of a system is only experienced if its usability defects have been mended. Utility and usability appears as critical success factors and two main causes of underutilization of an Electronic Information Management System (Damodaran & Olphart, 2000; Leyer et al., 2016). Lack of utility appears as inadequacies of the technology and lack of usability appears as lack of user-friendliness of the system. User-friendliness of PKR is vitally interrelated with its usability.

3.5. Security

Security is in the hands of the collective group using PKR. PKR is intended for internal use, through a database, the intranet or a corporate social media as described by Ellison et al. (2015). External hazards are monitored by the IT division, while internal hazards may be reduced by standardizing work-processes, ensuring user guidelines, supervising access and audit log of the use of employees (Gunnlaugsdottir, 2008a). Legal demands, such as personal data protection regulations (GDPR) (IT Governance Privacy Team, 2016; Kristjansdottir, 2017), must be obliged.

4. Material and methodology

The aim was to provide an understanding on how organizations support PKR and how that support influenced the work of a predefined group of professionals. The data collection took place in Iceland. The interviews and data gathering were conducted in 2011–2016. Qualitative methodology was used for conducting the study. It is well suited to obtaining data at the scene (Gorman & Clayton, 2005; Silverman, 2013). The research was a multiple case study (Creswell, 2013; Merriam, 2009) containing six organizations, and a total of 43 interviews (see Table 1). The number of employees in each organization ranged from 150 to 1000. The organizations were evenly divided between the public and the private sector and considered in the forefront of their individual sector. These sectors were: A) Financial private, B) Technology communication C) Industrial Consultancy, D) Industrial Energy, E) Financial public and F) Surveillance Institution.

The organizations were selected using purposive sampling based on the objective of the study and according to certain characteristics that were considered likely to give informative findings (Esterberg, 2002; Morse, 1991). These included existing organizational strategies on HR and training, experience of implementing PKR and experience of conducting internal training programmes. It was important that the

organizations were technically capable of implementing a functional database or corporate social media for managing knowledge and had former experience in PKR for knowledge registering purposes, whether they were successful or not. A hypothesis was worked out during the study and from the analysis of the data (Moustakas, 1994). The two following methods were applied.

4.1. Discourse analysis

In order to understand how PKR was used in the organizations, internal documents, such as training strategies, and in their absence, HR strategies, were examined (Gee, 2014). Studying the documents allowed for identifying written intentions and making a comparison of how these were interpreted by interviewees, and how the organizations fulfilled their intentions. The aim was not to uncover contradictions in the documents (Wetherell, 2001). The empirical analysis consisted of systematically reading the documents. Selection of words, repetitions and use of terms regarding intent, support, selection, registration, responsibility, collaboration, security, access, usability and sharing of knowledge, or actual lack of these terms, was examined. Examining the strategies was useful for understanding whether the organization were meeting their own requirements and whether the employees knew, understood and followed the strategies. The strategic documents were a foundation for further analysis of the interviews.

4.2. Semi-structured interviews

Interview guides were written for different groups (Bogdan & Biklen, 2003; Kvale 1996). The purpose was to capture the perspectives of different professionals and examine how and why their different meanings would affect the study (Yin, 2014). The interviewees were selected in a systematic manner and consisted of employees with similar positions in each organization. Grounded theory was used as a method to analyse the interviews (Charmaz, 2006; Glaser & Strauss, 2012). Themes were sought in the data. They were coded and classified and indications found to merge the classification of the themes (Hennink, Hutter, & Bailey, 2011). Interviewees had the following responsibilities: personnel administration and HR strategies; in-house training programmes and training strategies; implementation and administration of ERMS; implementation of international standards and quality strategies and management in various divisions, including IT. Organizations named A, B and C were private and organizations named D, E and F public. Table 1 gives an overview of the interviews.

The risk of revealing the identities of the interviewees was significant as the interviews took place in a small society (Gorman & Clayton, 2005). It was anticipated that sensitive information could be revealed during the interviews as questions were asked about the superiors and colleagues of the interviewees, their experience of support, as well as successes and failures in PKR. It was, therefore, deemed necessary to disguise individuals and their workplaces in all cases.

Table 1
Distribution of interviews.

Distribution of interviews							
	Private			Public			
	A	B	C	D	E	F	Total
Management	2	2	2	2	2	1	11
HR manager	1	1	1*	1	1	1	6
Training manager	1	1	0	1	1	1**	5
Records manager	1	1	0	1	1	1	5
Quality manager	0	0	1	1	0	0	2
Employee working on quality control	0	0	0	0	1	0	1
Employees***	3	0	4	2	3	1	13
							43

* An employee responsible for HR and Training.
** An employee responsible for Training and Quality Management.
*** Chosen employees work in the same department as the interviewed manager.

5. Findings

This section presents the analysis of the organizational strategies and the interviews. A comparison was made between strategic intentions and subsequently the perceptions of the interviewees on how PKR was supported, facilitated, accessed and used.

5.1. HR and training strategies

Table 2 exhibits the six organizational strategies.

The six strategies demonstrated elaborate objectives regarding the education and training of the employees exemplified as *"ambitious education and training plan"* in organization A, *"top-quality education"* in organization B and *"strategic education and training programmes"* in organization D.

Statements such as *"we are a knowledge community"* as in organizations A, *"human resource is the knowledge that resides in the team"* as in organization C and *"the training of employees is an investment for the future"* as in organization E gave reason to believe that these organizations considered strategic value in the knowledge of their employees. Emphasis was on developing the knowledge worker for the benefit of both parties. The strategies portrayed the aim of having qualified employees that were encouraged to *"maintain and develop"* their knowledge *"in order to be successful at work"* as in organization D. The employees were expected to *"show initiative",* seek educational offerings and share their knowledge through *"open and honest communication"* as in organization A and D. Good communication or "*inner service"* was considered *"the drive that generates the best use of collective knowledge"* as in organization F.

Organizational strategies of C and D used the term "*foster"* where they described how new employees were welcomed. New employees were provided with a mentor as in F that got the more experienced staff to *"take on the role of instructors"* for new employees. Employees in organization D were encouraged to share their knowledge with academic communities and assist one another with daily work.

Organizations A, B, C and D used the term "*opportunity"* and A, B, E and F used "*encourage"* repetitively in relation to training. The term "*develop"* was frequently used in the strategies. In order to develop within an organization, the individual employee had to take an "*initiative"* as in organizations A, B and E and be "*responsible"* for their own development as in organizations B, C and E. Organization F, however, used the term "*possibility" in* relation to training and the term "*responsibility"* was used to describe organizational responsibility.

The terms describing the tasks and qualities of the conceptual model were a rare find in the organizational strategies. The terms "*use" or "usability"* and "*access"* were hardly mentioned in the six organizational strategies. Organization E was the only organization that highlighted the need of managers and education representative to *"have access to valid information regarding each and every employee"* while organization C emphasised the necessity for new employees to get *"useful information about their role and responsibilities on the first day" and* organization F highlighted "the *best use of collective knowledge".* The terms *"selection"* and *"security"* were not mentioned in the strategies. However, strategic "*registration"* was described once. Organization E expected employees to *"assist managers, education and training representative, and an educational committee, and register themselves all additional knowledge and skills into a HR database".* Moreover, E's organizational strategy was the only one that described training as a method to increase "*happiness"* of employees and its "*intent for employees to fully use their skills".*

One organizational strategy was only visible to employees on the intranet and not on the organizations website. It was however the only strategy that had a date, an expiring date and a signature, revealing the

Table 2
HR and training strategies.

A Financial – Private Nearly 1000 employees.	B Technology – Private Around 500 employees.	C Industrial Consultancy – Private Over 300 employees.
A is a knowledge community of employees who have various experience and knowledge. We encourage work development and offer an ambitious education and training plan where all employees have the opportunity to increase their knowledge and skills. The objective is to stimulate and maintain employees' professional knowledge. We furthermore encourage employees to maintain their professional knowledge and give them the opportunity to develop and grow at their work. Training and education is on the one side an initiative of the training manager but no less an initiative of the employee or his/her manager. We welcome new employees and provide strategic training and education. When hiring, knowledge, experience, education and interests, are taken into account. We work strategically towards creating an environment where we can all grow at work and improve our skills. Emphasis is on good working environment with opportunities to share knowledge and information as appropriate.	Bs strategy is to offer employees top-quality education in order for them to develop at work. Employees are responsible for maintaining their own knowledge and it is therefore necessary to follow current offerings. It is the strategy of B to give employees the opportunity to develop within the organization. It is a mutual benefit, the employees advance their experience and the organization is more likely to retain a long-term relationship with employees. Work development is a mutual task of employees and B, but the best chances contain outstanding performance and showing initiative at work. Signed by the HR manager.	The resources of C are embedded in the employees, their knowledge and significant experience. It is therefore the goal of C to hire, sustain and elevate qualified employees in every way possible. E puts great emphasis on having qualified and interested employees with significant experience and knowledge. C gives employees the opportunity to develop and attend courses. It is a mutual responsibility between the employee and his/her manager to follow-up on education and training for each and every employee. The reception of new employees must be systematic and in coherence with the organizational procedure. A new employee must be "fostered" with a more experienced employee until he/she has adjusted to daily routines at the office. A new employee receives useful information about his/her role and responsibilities on the first day. Human resource is the knowledge that resides in the team.
D Industrial/energy – Public Over 250 employees.	**E Financial – Public Nearly 200 employees.**	**F Surveillance – Public Almost 240 employees.**
We gain knowledge and we share it. We emphasize on constantly developing our employees' skills and talent and encourage them to continually seek ways to develop at work. In support we offer strategic education and training programmes, which ensures necessary knowledge and capabilities in order to become successful at work. D has a close relationship with academic communities on organizational matters and the employees share their knowledge with those communities as much as possible. New employees get strategic training from the first day. Good quality procedure for new employee reception is built on the collaboration of managers, HR division and fosters who have had special training. We seek to create an atmosphere of good information flow and knowledge allocation. Communication is open and honest and employees assist one another with daily work and thereby contribute to positive working environment.	The training strategy of E emphasises employees' opportunities to achieve training that increases their capabilities and happiness at work. Its purpose is to encourage employees to maintain their knowledge and have the opportunity to grow and develop at work, to assist managers, educational representative and the education committee, and to generally contribute to increasing abilities and skills. The goal of the strategy is to activate and encourage employees to take initiative and responsibility of their own knowledge and abilities in a changing environment and to maintain and inspire employees' knowledge and personal skills at work. It is important that employees themselves register all additional knowledge and skills into the HR database so that managers and educational representative have access to valid information regarding each and every employee. The intent of the training strategy is for employees to be willing and capable of increasing and fully using their skills. Employees are expected to develop constantly towards changing needs, both professionally and technologically, and be willing to train for new and changing projects. The cooperation between management and educational representative includes the analyzation and categorization of training needs but moreover to support and elevate employees to increase their knowledge and skills. The training of employees is an investment for the future of E.	Emphasis is on employees' possibility to acquire education and knowledge regarding their work. Employees are expected to have and maintain their knowledge as appropriate with the aim to proceed with their work in a professional manner as well as advantageously. An attempt is made to get more experienced employees to take on the role of instructors while a new employee is trained for a job and the job environment. Emphasis is put on inner service as it creates the drive that generates the best use of collective knowledge when searching for solutions regarding various projects that the institution is responsible for. Each division manager evaluates the need for education in cooperation with the employee and HR manager. Employees are also encouraged to seek other educational offerings, such as language courses or other courses that may be considered valuable at work and attended outside of regular working hours.

HR manager as the author. The other five organizations had their strategies visible on their websites, yet without a date or an author. Organizations A and D put emphasis on using the plural personal pronoun *"we"* while the strategies of other organizations were objective, referencing the organization or the strategy itself as an authority.

All organizations had training managers or a training representative within their HR divisions. They were all conducting in-house training programmes on a grand scale, offering a variety of short courses for all employees. Terms that have a reference to in-house teaching such as "*teach", "in-house training"* and *"internal programmes"* were however absent from the organizational strategies although the term "*training"* was used in a broad sense.

5.2. Extracts from interviews

The purpose of examining the interviews was to understand the perception of the interviewees and their experience of PKR. Information was collected to answer the three research questions on current status of PKR, its access and usability.

5.2.1. Selection and registration in PKR

The interviews were in general characterised by the terms "would" and "should" as most interviewees agreed on PKR being necessary and showed interest in using interactive databases or social media for entering and accessing information on personal knowledge. None felt they had been entirely successful in its implementation.

Seven out of eleven members of management were using Excel for registering personal knowledge of employees. They claimed it was their way of "staying on top of things" as they needed overview of their employees' education and training to know what knowledge was still missing, which employees had attended last conferences abroad or had specific language skills. Different managers excused current status of PKR access and usability and expressed great interest in it. Some pointed out that someone else should already have taken the initiative to make "the dream of PKR come true".

HR managers agreed that although PKR had started with great interest and some managerial support, it had slowly died or ended-up among other unfinished projects. The HR manager in organization B stated that it was their goal to achieve better control over PKR. He

maintained that this information was of best use if it was available in a central database. The HR manager in organization A agreed and said that they had not yet achieved their goal of covering all PKR. They had started a lean-management group that was strategically registering knowledge networks within each division, although these networks were currently only available to individual groups and not in a central database. In organizations C and D, the HR managers were working on changing the training culture and attempting to work more in line with organizational strategies. The HR manager in organization C stated that their career development "had to be better adjusted to their organizational strategy". The HR manager in organization D put emphasis on the organization being on a certain journey and that it was time for the next level, from being a traditional industry to a more market oriented knowledge organization. Their training programmes were being intertwined with their organizational strategies and much emphasis was put on more strategic choices using performance indicators as well as sharing their expertise externally, at all school levels.

The HR managers in organizations E and F, both public, were less optimistic on PKR matters. They described their fear of having managers exposed as having a more limited formal education than their subordinates or having kitchen employees, drivers or janitors required to enter personal knowledge into PKR. The HR manager in organization F stated that registration of formal education was not their top priority in regards to the more experienced employees. PKR was rather intended for newcomers and future registrations as the organization was expected to go through a generation change. The HR manager in organization E stated that the HR division was "not using the database much, as it was rather intended for the employees, so that they could register their education, courses and conferences." This statement contradicts E's strategy which was the only strategy mentioning "registration" in its text and emphasising the need for managers to "have access to valid information regarding each and every employee".

Two quality managers described an urgent need for PKR for interdisciplinary teamwork. Quality managers in organizations C and D agreed on the importance of PKR as a management tool to gather, read and measure the intellectual property of organizations. They stated that this gathering of information was in accordance with ISO standard certifications. Having an overview of education, experience and skills was considered important. They claimed that optimal registration and use of internal knowledge to fulfil external inspections and internal audits and select the right individuals for interdisciplinary teams was valuable, particularly in dispersed organizations. The quality representative in organization E was the only one opposed to PKR. She put emphasis on security of information and said that in her opinion "people's education and training was private and should not be open for everyone to read". She stated that employees with little formal education might experience a discriminating comparison.

Records managers in all six organizations found themselves only marginally involved in PKR (Haraldsdottir, 2017). Their efforts were primarily focused at ERMS. Interviewees in organizations B, E and D, claimed that they were not aware of a system currently intended for PKR. The records managers in organization A, C and F were on the opinion that there should be PKR, as it was of utmost importance to have an overview of the knowledge of the employees.

5.2.2. Access

Several interviewees from all organizations showed an interest in taking a personal responsibility for PKR. A number of interviewees from different professions expressed that managerial encouragement was needed for PKR to be more successful. While some were unsure whether all employees would be willing to share their personal knowledge, due to perhaps limited education, most interviewees maintained that employees should have an "inner drive" to register everything they found important about themselves in a collaborative system. A manager in organization A estimated that over 70% of her employees would willingly enter information into PKR in order to make it visible to co-workers how they had gained their experience. She stated that those with little formal education were the most willing to register information about their participation in courses or conferences. Most managers approved of PKR as a socio-technical system that should be open for everyone in the organization or as a manager said: "Knowledge is our most valuable asset and it should be possible to implement a system like Facebook or LinkedIn, or some similar social network, as a base for an organization, and people should see the benefit of putting themselves out there and share work-related information with colleagues."

In organizations A, B and C the interviewed training managers stated that there was PKR and employees were supposed to register what they considered important. There was no follow-up on the system and nobody really put an effort into it. The HR manager in organization E compared the registrations in the database to "black holes" and claimed that neither the HR division nor the managers were using it. The HR manager in organization F stated that education and training was never really discussed in connection with the organizational strategy. She also claimed that the collection of information on the personal knowledge of employees had been her personal project. She stated that they had an actual example of having hired an employee with specific knowledge needed among other employees, but since nobody really knew about it, they had used an external instructor for training, unaware of having an even better instructor in their staff. This experience had been, according to her, disturbing and encouraged her to start using PKR.

5.2.3. Usability of personal knowledge for in-house organizational training

According to interviewees, formal education, i.e. most recent university degree, was registered in five organizations out of six. Some interviewees expressed difficulties gathering certificates from the more experienced members of staff. "Asking someone who graduated in 1972 to deliver the certificate, is almost considered insulting" said the training manager in organization E. These five organizations were able to confirm certain degrees among employees. Organizations A and B had a reasonable overview of their employees' participation in internal courses while organizations C, D, E and F had incomplete listings of course participation in internal short courses. The HR manager in organization A said his division had approximately 90% of their employees' formal education registered into their database and most internal courses. In organization B the course registration was manual from internal participation lists, although the registration process was sometimes left forgotten due to other ad-hoc projects. In organizations C, D and E the registration of short courses was dependent on individual contributions to the database, but nobody followed up on who attended each course. In organization F, neither the HR manager nor the individual in charge of employee training had any registration covering employee participation in internal courses. Both expressed hopes to implement PKR but shared their worries that employees might find the registration process too intrusive.

Employees' participation in external courses, conferences or webinars was not systematically registered. Training managers in organizations A and B described these registrations as „that is … I must admit … that is way out of order" or "by mere chance". The HR manager in organization C agreed and stated „we have absolutely no control over this information." In all six organizations, registration of external courses, was dependent on employees' registrations and their delivery of copies of certificates to the HR division. HR or training managers also gathered receipts from the accounting division to confirm external courses. In organizations A, C, D and E employees could write their own information regarding external courses into central databases but there was no follow-up on their registrations. All interviewees agreed on the advantages of PKR and gave various reasons for its necessity, such as it being „cost-effective" and „a matter of quality control". An IT manager had registered employees' personal knowledge into Excel instead of PKR. When asked whether the training manager might find her registrations useful for in-house training, the reply was: „Oh yes, sure, I have

never really thought of it that way." In an interview with the training manager, a few weeks later, the IT manager had not shared the existing registrations.

All training managers expressed urgent need for information about their colleagues' interest in contributing to in-house training. They claimed that most courses on domestic IT, regulations, products and service was taught by internal staff while more complex and specified courses were typically taught by external instructors. A training manager, oblivious of a colleague's vast experience and interest in teaching, exclaimed when his name came up in an interview: „Really, does he work for us, oh please don't tell anyone I didn't know!"

6. Discussions and summary

This section presents a discussion of the key findings of the study. The three research question are summarized in the following sub-sections.

6.1. On selection, registration and security

The analysed strategies seemed to demonstrate great organizational interest in offering appropriate training programmes, as well as encouragement for maintaining and developing of the knowledge of employees. Selection, registration and security of added knowledge was, however, limited to one single use of the term *"register*." These findings contradict to how Becker & Huselid (2006) describe knowledge sharing as a beneficial influence on organizational performance, prospect and progress. The findings suggest that HRMS, knowledge mapping, corporate directories on intranets or interactive databases, had been tried in the participating organizations but without great success. The causes seem to be linked with a lack of managerial support, unclear responsibility of tasks and qualities and a lack of added value to the users. Furthermore, interviewees claimed that they were not involved in the development phase of PKR. Bano & Zowghi (2015) maintained that while there are many positive effects of involving users, in this case employees, in system development there are also challenges. These include motivation and expectations of users, managerial challenges and time constraints. The experience of both managers and employees in all six organizations, confirm these hindrances and may have influenced why employees were not more involved.

Damodaran & Olpert (2000) stated that one reason for limited success of information management systems was lack of user-friendliness, poor design, inadequate training and absence of added value. These barriers mirror the responses of the interviewees. While different employees described similar subjective goals of using PKR, which was having an overview over employees' knowledge, their motives differed. Responses from management described a need for overall systemization of knowledge, HR managers focused on career development and recruitment of employees. Training managers lacked an overview to find instructors for in-house training. They expected that their colleagues might be willing to instruct, if their knowledge was only known. Quality managers stated that PKR should be inherent in all quality procedures to constantly secure the participation of the most qualified employees in every project. General employees also described their perception of being ignored or *"forgotten"* as they were not requested to register their personal knowledge and nobody had asked for their specific skills. The needs of employees correspond to significant elements of knowledge sharing which are social practices and the actual systems that support knowledge sharing (Leyer et al., 2016).

The tasks described in the conceptual model were not fulfilled. Nobody seemed to have a clear role or responsibility for PKR. The selection and registration of information was in the hands of whoever accepted the task. Categorization of registered information was unclear and described as chaotic by the interviewees. This seemed to lead to interviewees preferring to use Excel spreadsheets over existing PKR. For those in management who had access, it was not in their work-habit to look for the expertise of co-workers in PKR. An interactive system, such as PKR, without managerial support, clear goals and common source of information, does not survive (Ackerman et al., 2013).

6.2. On access

The general perception of interviewees suggested that their PKR barriers were rather technical than social. This is contrary to the findings of Damodaran & Olphert (2000), where cultural barriers, knowledge ownership and attitudes towards knowledge sharing were considered much higher inhibitors to the uptake of electronic knowledge management systems (EIM). Access, and thereby the opportunity to use and benefit from the system, seemed to be a pragmatic success factor for the uptake of PKR in all organizations. Most employees could only access their individual profiles and not their colleagues. Their personal registrations had also limited usability as they could not be used for writing a CV. Yet, the fact that they could not search for knowledge among co-workers, was their strongest inhibitor. Social barriers seemed, however, significantly minor as 40 interviewees out of 43 stated that a corporate PKR should be open for everyone. As stated in Leyer et al. (2016) the idea of PKR was *"to indicate which employee is the knowledge owner"* and *"to motivate employees to indicate their areas of expertise"* (2016, p. 97). Interviewees claimed that the information registered was no secret and the benefits of having an overview had the upper hand of privacy.

The three interviewees who questioned the use of PKR were worried about how an open PKR would impact those with little formal education. They also claimed that some employees were not interested in exposing their expertise, as they might be asked to do undesirable tasks. One interviewee, a manager in organization D, confirmed these worries and claimed to be willing to register personal information into PKR, but anticipated to be bothered by co-workers and was simply too busy to assist.

Because of employees' restricted access to PKR and thereby limited usability of registered information, PKR did not create added value for employees nor the participating organizations. The conceptual model, demonstrating six facilitators of PKR, their tasks and the system qualities postulated that PKR had been accomplished with the collaborative effort of different professionals and their shared goal of PKR. The findings suggest otherwise. Each facilitator, demonstrated in the conceptual model, attempted to have an overview of existing knowledge, while collaborative efforts were limited. Interviewed records managers were only marginally involved in the implementation of PKR. The same applied to quality managers and IT managers who had put the development and implementation of PKR aside for other ad-hoc projects. Management did not act as a role model as they preferred to use Excel while claiming that there was a will and a need for a functional PKR. According to them the responsibility of the current status of PKR laid elsewhere.

6.3. On usability

HR and training managers were trying their best to collect and register employees' personal knowledge, focusing on being able to confirm formal degrees to supervising institutions and having an overview of employees' in-house training participation. They urgently lacked information on their participation in external training and conferences, and they missed having a sufficient overview to involve employees in instructing in-house programmes. They had to rely on their personal network and stated that they repeatedly scheduled the same instructors despite thinking that more qualified instructors existed among their staff. Their experience resembles how Borgatti & Cross (2003), Nebus (2006) and Ellison et al. (2015) describe the risk of building a narrow network and not being aware of unknown expertise among co-workers. The interviewed training managers all stated that they wished for a functional PKR but the strategic decision to develop

and then implement a system was not on their table.

PKR is used as a directory, not a repository, as it does not contain the knowledge itself but points to the knowledge holder (Leyer et al., 2016). And since PKR consists of information on the personal knowledge of employees, while employed, registered information remains searchable, trustworthy and applicable. PKR has the possibility to enlarge employees social network as it opens the possibility to seek knowledge from someone outside of an individual's current network. As pointed out in Ellison et al. (2015) knowing one's network can help colleagues find common ground and locate experts in a particular domain within the organization. In their analysis of enterprise social network sites (ESNS) they discovered that a greater network transparency within organizational context increased knowledge sharing (2015, p. 112). Borgatti & Cross (2003) emphasized the significance of knowing who knows what in an organization. They maintained that the decision to seek information from a specific someone was depended on the relationship between the seeker and the knowledge holder. Still, PKR needs constant updates and participating efforts from all stakeholders in order to function (Goldsmith et al., 2012). Thus, loss of knowledge cannot be avoided if necessary information is not registered or when employees leave the organization – unless it has been successfully transferred through on-the-job training as described by Saks & Burke-Smalley (2014). For that to happen, the knowledge owner needs to be known.

The main reason for PKR failure, according to the interviewees, was on the one hand the limited access to the personal knowledge of employees, and on the other hand the uselessness of registered information due to lack of support, user guidelines, supervision and strategic intent. Additionally, user involvement in the development of PKR was none. Finally, employees in IT divisions were too busy with ad-hoc matters and did not prioritize necessary updates on PKR software which did not help with its user-friendliness.

7. Conclusion

The findings represent elaborate objectives regarding the education of employees and training in organizational strategies. These documents gave reason to believe that participating organizations considered knowledge of great value. Repetitive use of the term *"knowledge"* indicated an emphasis on developing the knowledge worker. Registration of knowledge, as in PKR, was however only described in one strategy out of six. Despite apparent lack of PKR use, expressed views and experiences of interviewed professionals and their positive perceptions towards PKR indicated that education and training, and the registration thereof, was considered urgent and economically significant for value creation in organizations.

This study has a few key contributions to theory and practise. First, the findings suggest that inadequate PKR use caused training managers to seek external knowledge for in-house training programmes as they lacked an overview of knowledge and experience within the organization. Secondly, lack of managerial support and user-guidelines for employees negatively influenced the use of PKR. Consequently, a lack of added value of using the system and unfinished software development added to the experience of poor user-friendliness. Another outcome of the study, and the most influential requirement for successful PKR according to interviewees, was employees' limited access to PKR. All participating organizations had tried one form or another for PKR, most often HRMS but with limited success. The findings show that access of PKR was usually restricted the personal profile of the employee despite there being technological and social solutions for further access. Use of PKR was limited and in coherence with its constrained access. These barriers give good reasons for further study in other organizations with the purpose of examining whether and for what reason the conceptual model may have been applied more successfully.

Future research may also include another practical implication of this study. The European Personal Data Regulations (GDPR), due in May 2018, is anticipated to have impact on how organizations are allowed to collect information on employees and their personal knowledge (IT Governance Privacy Team, 2016; Kristjansdottir, 2017). Simultaneously, the Icelandic standard on equal pay management system, and a legislation thereof, is expected to have influence on how PKR is perceived by management and employees (Icelandic Standards, 2012). The standard and its legislation, gives organisations an opportunity to improve their management of equal wage affairs and obtain certification that women and men working for the organization enjoy equal wages for the same jobs or jobs of equal value. A fully functional PKR may verify the education and training factor of employees and play a key role in finding a correct outcome when calculating wages. In the light of apparent unsuccessful PKR use in this study, it is interesting to study further how Icelandic organizations are preparing to meet obligatory and necessary registrations of the personal knowledge of employees. It is furthermore of interest to study how organizations are going to combine the need for PKR in compliance to GDPR. This promises to be a fruitful area for future research.

This study is limited to only six organizations in Iceland. Still, the participating organizations and the 43 interviewees were purposively selected which advances the truthfulness and value of the findings. Despite its limitations, this study bridges an important gap in a rapidly growing interdisciplinary field of information management. It provides a multi-professional, empirical example of how and why efforts in implementing PKR were not as successful as anticipated. It adds new knowledge on the importance for organizations to portray clear strategic intent, define responsibilities and act accordingly with managerial support, when implementing PKR. This study can become the basis for further research in Iceland and lay a foundation for similar research in other countries. Despite all possible technological and social solutions available, and the apparent keen interest of the interviewees in PKR matters, the findings suggest that organizations are still struggling to know what they know.

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