People Search and the Structural Dimension in Knowledge Management Systems

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Abstract: This paper's starting point is the challenges that users experience when trying to locate colleagues with the aim of sharing knowledge. Beginning with the requirements to include cognitive, relational, and structural dimensions in knowledge management systems, we outline AI-based approaches and solutions that can contribute, in particular, to the structural dimension by means of people metadata. The aim is to strengthen searching in knowledge management systems and ultimately to be able to improve knowledge sharing.

Keywords: Knowledge management systems, Knowledge sharing, Knowledge search, People search

1. Introduction

Knowledge sharing refers to when knowledge is made available and presented to others in an organization in a way that is absorbable and useful for others (Ipe, 2003). Basically, knowledge sharing is made possible through two overall strategies: 1) a codification strategy whereby knowledge is codified, stored, and disseminated through the use of information technology, and 2) a personalization strategy, whereby sharing takes place through person-to-person interaction (Hansen, Nohria and Tierney, 1999).

The term "knowledge management" was coined in the 1990s (Jennex, 2008). Since then, the field has undergone different phases. Initially, the focus was on repositories for managing knowledge, which was followed by a generation of research focusing on knowledge sharing (Ackerman et al, 2013). Recently, de Carvalho et al (2018) have argued that a third generation of knowledge and expertise sharing is approaching, whereby advanced technologies offer new ways of capturing and sharing knowledge. Despite the change of focus in later generations of research, repositories and platforms still play an important role in supporting knowledge sharing and locating people and expertise in organizations.

However, it has been acknowledged that knowledge management systems need to mirror the knowledge-sharing activities surrounding them. Inspired by the concept of social capital, Ackerman and Halverson (2003) identified three dimensions for improving knowledge management systems to better support knowledge sharing. They include a cognitive dimension in which it is emphasized that a common understanding and a shared language are important prerequisites for knowledge sharing. The relational dimension highlights the importance of understanding and sharing norms, identity, mutual obligations, and trust. The structural dimension addresses employees' need to find and collaborate with others to obtain resources they do not possess themselves (Ackerman and Halverson, 2003). The structural dimension implies that employees can easily locate and identify colleagues, which is otherwise known to be a challenge.

2. Challenges in People Search

Searchers in the workplace generally search for people for three reasons: 1) to contact the person; 2) to find documents or data that the person has produced; or 3) because a person possesses specific expert knowledge (Balog, 2007; Freund, 2015; Hertzum, 2014; Hertzum and Pejtersen, 2000; Schoegje et al, 2023). A recent study identified a specific role of people search as part of the retrieval process, i.e., when a person is searched for as a shortcut to identify another person who knows about a certain topic or as a stepping stone to help in remembering related projects, people, and lab data and to determine how this information may be used in an exploratory search (Svarre, Lykke and Bygholm, 2024). People are critical information sources because they provide contextual and historical insights and contribute explanations and ideas for searching.

Although enterprise search is critical for business performance, research on the topic remains limited (White, 2020; 2023). Only few studies refer to challenges in connection with people search. Lykke et al (2022) describe how people search is challenged by spelling errors, inconsistent person metadata, and missing mentions of persons related to, e.g., a certain project, lab test, or product development. Furthermore, it is highlighted as problematic that persons disappear from the people directory when leaving a company. In search situations, the information seeker may remember a retired project manager, whom they would like to consult to get the names

of specific persons who carried out a particular project. Another problem is when a searcher may remember the person's initials but not their full name, which is what is mostly used as person metadata.

Overall, these examples show the importance of being able to connect and show relationships between people and the projects they have been involved in, the products, organisms, and technology they have worked with, the lab tests they have completed, and the colleagues with whom they have worked.

3. Possible Solutions

Based on the problems identified above, we present recent AI-based solutions aimed at improving people search as a means to strengthen the structural dimension and, in turn, enhance knowledge sharing.

Several papers are based on machine learning, a combination of algorithms and method often used in artificial intelligence (Mukhamediev et al., 2022). Gammack et al (2022) draw on machine learning and semantic search in their suggestion to improve access to design documentation in the form of heterogeneous technical materials. In assessing the outcome of the solution without testing it with end users, they conclude that the solution has much potential while also being challenged by the diverse nature of the materials included in the system. Another study, by Lykke (2022), uses the same combination of semantic search and machine learning for improving people search by their initials in a biotech company, which has been shown to be challenging. However, initials are commonly associated with alternative meanings of the same combination of letters, which disturbs the precision of the solution. This solution was an early attempt, so further refinement with semantic tools could potentially be an improvement.

An ontology is a structured tool used for deducing relations in machine learning and AI (Ghidalia et al, 2024). Ontologies are efficient tools for assisting knowledge sharing in organizations by managing organizational knowledge, e.g., during search. Osman, Mohd Noah and Saad (2022) reviewed 13 papers presenting ontology-based knowledge management tools for knowledge sharing across a range of knowledge domains. Ontologies were used for various purposes across the reviewed studies, e.g., knowledge extraction, knowledge inputs and annotation, and matching processes to support retrieval. Their review concludes that despite using ontologies, it is still a challenge to find and extract fragmented and incomplete knowledge. The authors also point towards the potential of automating the process of building ontologies, as there are many manually created ontologies in the reviewed papers (Osman, Mohd Noah and Saad, 2022).

Lastly, generative AI and large language models (LLMs), such as ChatGPT and CoPilot, can also strengthen people search and the structural dimension. Based on deep learning and trained on vast amounts of text, LLMs are capable of solving a wide range of tasks, including question answering and summarizing text (Birhane et al, 2023; Meyer et al, 2023). Applied to internal systems and data, generative AI can improve and democratize access to organizational knowledge through search, connect employees, and perhaps even strengthen knowledge-sharing cultures (Alavi, Leidner and Mousavi, 2024; Sumbal and Amber, 2025). However, attention should be paid to overreliance in the responses given, as well as ethics and legal issues (Alavi, Leidner and Mousavi, 2024).

4. Concluding Remarks

This paper has investigated recent developments and initiatives that can assist in, or perhaps even handle, the assignment of people metadata in knowledge management systems. Supporting people search and the structural dimension of knowledge management systems can be a challenge in many ways, for example, due to heterogeneous meanings of words, employees whose details are deleted from corporate systems when they change jobs or retire, and inconsistent or missing assignment of person metadata. However, new technologies and approaches may hold the potential to reduce such challenges by offering novel approaches to handling person metadata and access to the knowledge of colleagues. Future research should closely evaluate the effect of these approaches in strengthening the structural dimension of knowledge management systems.

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AI declaration: No AI tools were applied in the development of the current paper.

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