

Collaborative Tools and Techniques of Knowledge Sharing: A Literature Review

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Abstract

Nowadays, the world is frequently referred to as the “information world”. Companies rely on knowledge to differentiate themselves and get a competitive advantage. As a result, businesses pay close attention to knowledge management and devote a significant amount of time and resources to ensuring that knowledge is appropriately owned and exploited. Individual knowledge transfer is also a factor. The paper examines knowledge transfer and sharing, with the goal of determining the most effective internal communication tool for information transfer. The research findings should aid company management in organizing internal communication in a way that allows them to carry out their knowledge management plan.

Keywords

Collaborative Tools, Knowledge Sharing, Knowledge Management, Communicative Activities

1. Introduction

Nowadays, data and information are everywhere, and the amount of data and information produced grows exponentially every year. As a result, many businesses are attempting to develop intelligent information systems for the analysis and interpretation of massive amounts of data and information. Knowledge and knowledge transfer are essential differentiators in terms of company competitiveness in contemporary times, and all successful firms confess that their primary goal is to focus on people and their knowledge, and they aim to produce, improve, transmit/share, embed, and update knowledge. In other words, they concentrate on knowledge management principles.

Knowledge sharing is very significant because it is a requirement for know-

ledge application. There is a substantial association between information sharing and knowledge application [1]. Knowledge sharing promotes knowledge application, which is defined as the application of knowledge to improve the quality of work.

As a result, understanding how to facilitate and improve the process of knowledge sharing and knowledge transfer is becoming increasingly important in order to equip all workers with the necessary knowledge and prepare them for its use and implementation. Only when the appropriate communication tools are employed, and when they are used in the appropriate place and context, can knowledge transmission be effective.

The main goal of the research is to provide a collection of communication tools that assist knowledge management and to specify how to use them properly. A list of regularly utilized internal communication tools in international IT organizations that are regarded as leaders is presented. Then the tools in terms are evaluated of their ability to transmit knowledge.

2. Definitions and Theoretical Aspects

Knowledge transfer refers to the planned movement of the right skills and information at the right time to keep a workforce productive, competitive, and able to execute business strategy [2]. In Paulin and Suneson's [3] opinion, Knowledge transfer and knowledge sharing are sometimes used synonymously or have overlapping content.

Knowledge transfer between employees can be defined as the situation in which information is transferred from one worker to another and the other worker not only understands but is also ready to apply the information. If information transfer is effective, it lays the groundwork for knowledge application, and leads to better decisions which improve work quality.

Mladkova [4] defines knowledge management as "an intentional effort that culminates in a situation in which the right knowledge is owned by the right people at the right time. 'It is critical that knowledge be shared and distributed inside an organization, so that isolated information or experience may be exploited by the entire company', Probst, Raub, and Romhardt [5] remark. Who needs to know (or be able to do) how much of what, and how can we make knowledge sharing easier?" is the central question. Part of the last question also leads to the paper's major goal: what internal communication tool should be utilized to ensure that knowledge is delivered correctly and efficiently.

Every communication is an exchange of information. You can't stop it from happening, but you can limit or enhance the opportunity for mutual learning. Attempts at secrecy usually end in mistrust, erroneous judgments, and inaccurate information. Sharing knowledge with the purpose of maximizing mutual learning is the ideal technique. This is, of course, easier said than done [6]. Knowledge transfer and knowledge sharing are often distinguished by authors. Knowledge sharing, according to others, is more valuable because it assures that

knowledge is not just transmitted but also understood. The main target is achieving information transfer in the most effective way possible, as well as finding the most efficient tools for this purpose.

Gamble and Blackwell [7] declared that interaction is the most effective way to transfer knowledge. The further one gets away from learning through interaction, the less likely knowledge will be transferred efficiently.

Knowledge concerning awareness is local and sticky and often does not transfer easily. A flexible organizational structure can support knowledge sharing based on a successful infrastructure that supports knowledge and information sharing [8].

Knowledge sharing necessitates the development of two basic and closely related parts, both of which are based on social contact and communication. First, a sufficient level of trust between the individuals must be established, ideally with the strongest forms of personal trust. Second, people must gain a basic comprehension of the values, beliefs, and perspectives that support one another's knowledge base [9].

Sharing and disseminating relevant information is often required in order to apply knowledge across a distributed organization. A high level of knowledge sharing tends to increase the quantity of ideas and knowledge items that are discussed.

High-level managers recognized the benefits of knowledge transfer, according to Patriotta, Castellano, and Wright [10], as a way to avoid duplication of efforts, save time and energy in accessing information and ready-made solutions, learn from others' best practices, and achieve global scale efficiency.

Some studies have identified the most efficient or important channel of knowledge transfer between universities and industry [11], between countries [12] [13], between projects [14], or within strategic alliances [12]. The findings in [11] are usually on a higher level, such as "personal (informal) contacts". Although it is self-evident that good relationships between communicating individuals are required, there is no detailed explanation of how these contacts occur.

There are other options, such as face-to-face meetings, phone calls, and emails, and it's reasonable to assume that a combination of technologies is employed.

3. Literature Review

The authors provided a theoretical model for the impact of trust, tacit and explicit knowledge sharing, and familiarity with information privacy policy on project collaboration effectiveness in [15]. They presented hypotheses and revisions to include some preliminary data analysis. They found that individuals unable to share information within and across teams are withholding information due to a lack of confidence amongst project team members or a lack of understanding with company information privacy regulations. The amount to

which knowledge is shared is influenced by the level of trust. They shed light on additional facets of trust and its role in productive collaboration. The study gave a better understanding of the role of an individual's acquaintance with their organization's privacy policy in efficient collaboration and suggested practical applications. It also looked into the impact of short- and long-term projects on effective collaboration, as well as providing best practices for project managers and practitioners.

The relationship between Groupware utilization and the knowledge management process was investigated by [16]. Knowledge capture, knowledge storage, knowledge transmission, and knowledge reuse were all taken into account. They acquired data for this qualitative study from 272 front-line bank employees in Tunisia and used structural equation modelling to evaluate it (SME). They expected knowledge transfer to be significantly associated with the use of Groupware tools and the four stages of the knowledge management process, but they discovered that knowledge transfer is not significantly associated with Groupware use.

Ghani [17] proposed a framework for describing the numerous tools and strategies available to knowledge management professionals. He gave an outline of a few essential phrases and concepts, as well as a description of the framework. He gave examples of how to use it and discussed a number of possible applications. Information management tools and approaches have been used to disseminate knowledge via communication and collaboration technologies, indicating the transition from process to practice.

Data was collected from 189 managers working in 87 businesses listed on Pakistan's Lahore Stock Exchange using a self-administered questionnaire. Confirmatory factor analysis and structural equation modeling revealed that trust, cooperation, and empowerment (facets of collaborative culture) have a significant and favorable impact on both knowledge donation and knowledge collecting (dimensions of knowledge sharing). Both knowledge-sharing characteristics were shown to be unaffected by cultural difference. Both elements of information sharing, on the other hand, had a considerable positive impact on employee creativity. The findings of this study add to the existing body of knowledge by identifying the function of collaborative culture in boosting organizational creativity via several knowledge sharing characteristics.

Institutions must discover and improve communication tools that are successfully acknowledged and adopted by users in order to further reinforce the positive effects of knowledge exchange through e-communication technologies. Essentially, they must invest in tools that are easier for consumers to use in order to build complete knowledge sharing methods. From the perspective of lecturers, Hassandoust and Kazerouni [18] discussed and investigated the most efficient accessible solutions for online knowledge sharing in institutes of higher learning. The research assisted in identifying the most appropriate systems for this aim and improving them in order to get better academic performance. To

gather data for this study, a survey was undertaken. They created a questionnaire and sent it to over 700 lecturers at a Malaysian institution through email.

The study [19] was interested in the convergence and integration of knowledge management and collaboration. It helped people comprehend the ideas of knowledge management and collaboration better. It also focused on the confluence of knowledge management and collaboration by giving several interpretations of this convergence. After that, it proposed a broad framework for collaborative knowledge management.

In the Web 2.0 age, Razmerita *et al.* [20] presented novel techniques for managing personal knowledge. They questioned if Web 2.0 technology (social software) could truly solve the problems related with knowledge management. They also questioned if Web2.0 might reconcile the competing interests of controlling organizational information with personal goals, allowing for a more effective manner of sharing and managing knowledge at the individual level. The study used illustrative examples to introduce a theoretical argument. They discovered that Web 2.0 was useful for communicating, collaborating, sharing, and organising knowledge in a variety of ways. It also allowed for the creation of a new model that includes tools for official and informal communication, cooperation, and social networking. On the web and in companies, this approach fostered engagement, cooperation, and knowledge exchange.

The growing number of industrial business collaborations, which include cross-functional and cross-company development activities, raises the bar for establishing successful knowledge sharing procedures in larger organizations. In light of such developing organizational collaboration models, Bertoni *et al.* [21] underlined the significance of knowledge as a critical enabler for effective engineering efforts. They offered Knowledge Enabled Engineering as a way to improve the extended organization's ability to build successful collaboration across its elements, despite the fact that organizational structures, technology, and processes are all different. They dissected the strategy and its components, suggesting areas, approaches, and technologies that could be useful in utilizing firms' knowledge-sharing potential.

Al-Anqoudi [22] investigated the approach to collaborative and cooperative learning in the education or training sector using existing technology groupware tools in order to add value to employees and organizations in a variety of ways, such as lowering training costs and shortening the learning curve. Counseling with local and external experts, sharing training outcomes, problem-solving discussions, increased reuse, and decision-making may all be done in the shortest amount of time possible. The study focused on creating future communities of practise that will support the organization's research and development efforts. According to them, collaborative learning strategies enable junior employees to learn from senior employees and aid in the acquisition and sharing of knowledge through professional sharing networks and informal social learning. They also suggested that future strategy creation and improvement may be accomplished by a professional sharing network with minimal barriers.

Savolainen [23] expanded on the idea of information and knowledge exchange as communicative activities. He conducted a conceptual study to learn how scholars handled information and knowledge sharing from the perspectives of transmission and ritual. When viewed from the perspectives of transmission and ritual groups, the data show that information and knowledge sharing are identical communication acts. The former viewpoint emphasized one-way communication from sender to recipients, with sharing activities appearing as information or knowledge transmission, diffusion, or provision. The sharing action has been defined in terms of exchange, exhibiting two-way communication between interacting participants, from a ceremonial standpoint. Knowledge sharing activities have primarily been studied in work-related situations, although information sharing has also been studied in non-work settings. There were more parallels than differences in communicative activities, information sharing, and knowledge sharing. However, due to numerous interpretations of the concepts of information and knowledge, the terminological concerns got more problematic if the focus was switched to what exactly was being shared while providing information or knowledge.

With the type of collaborative tools and technology at their disposal, Aklilu [24] examined the growth in understanding and tacit healthcare knowledge sharing among physicians and clinicians. Tacit healthcare knowledge sharing among clinicians, such as sharing of best practises, tips and tricks, interprofessional collaborative networking, clinical experiences and skills, is known to have a significant impact on the quality of medical diagnosis and decisions, and collaborative tools and technologies help employees of an organization work closely with their colleagues, partner organizations, and other volunteers. The study proposed that collaboration tools and technologies could open up new avenues for tacit healthcare knowledge sharing among experts, and it demonstrated this by presenting findings from a review of relevant literature and a survey of Medical Doctors who had moderate to high interaction with collaborative tools and technologies in the healthcare industry.

4. Knowledge Sharing's Success Factors in Collaboration Platforms

There are several factors that affect the knowledge transfer and sharing in a collaboration platform. **Table 1** below list some of these factors, each of these factors will be discussed in the following section.

Table 1. Knowledge sharing's success factors in collaboration platforms.

No.	Success Factors of Knowledge Sharing
1	Organizational factor
2	Individual factor
3	Content factor
4	Cooperation factor

- **Organizational Factor**

Individual perceptions of culture may differ inside the firm, which may have an impact on individuals' information sharing behavior. The structure of an organization can have an impact on how well information is shared. Knowledge exchange is simplified by a system that facilitates contact between departments and units and further implements a comprehensible bureaucratic approach. Top management support is another crucial factor that encourages people to share their knowledge.

- **Individual Factor**

A company's distinct mission and vision give structure within the organization and impact employee behavior patterns. Knowledge sharing is an unusual phenomenon that necessitates incentives and encouragement. As a result, it is considered that compensating employees has an impact on their willingness to share their knowledge. Collaboration platforms also enable new techniques of communication on the workplace intranet, although this intangible tool initially causes employee distrust. The relevance of the content is a requirement for a successful collaboration platform.

- **Content Factor**

The content's substance cannot be assured if a collaborative platform is unsupervised. Employees must be able to trust the sources they use. Material monitoring improves content quality and encourages users to share their knowledge.

- **Cooperation Factor**

Knowledge is increased by collaboration through knowledge sharing. Clear guidelines and a fundamental comprehension are the underlying assumptions. When it comes to the cooperation element, the communication network is critical. In order to feel motivated to share knowledge, the user must also see a need to strengthen the communication network.

5. Discussion

The collaborative mechanisms built through the management culture, according to studies, were the tactics for information exchange. They provided for free, transparent and two-way information transfer at all levels of the organization, including inputs from external environmental factors, research institutions, and intermediaries. The solutions were based on a variety of cooperation drivers, but cross-functional team culture, management engagement, and the usage of supporting tools were the three most important elements identified for knowledge sharing. Multiple perspectives were enabled throughout the development process because of the varied scale of managers participating in decision-making.

The development teams were made up of people with a variety of technical expertise, allowing each team member to have a wide cross-functionality. Knowledge is freely exchanged two-way, internally through various levels of the organization and externally with their numerous stakeholders, which builds up the body of knowledge and leads to improved innovation performance outcomes, according to all three participants. As a result of this knowledge sharing,

a robust knowledgebase has emerged, comprising valuable and original material that can be employed in future improvements.

The strategies make use of role-based access control mechanisms, allowing multiple employees to work on projects at the same time. This demonstrates how geographical constraints can be overcome to boost early and late-stage development. The industry's flat management structure generates a large quantity of information riches, with much of it shared as tacit knowledge. Personal interaction is a common way for this knowledge to be shared. Phone calls and emails, as well as the usage of rapid development tools, were another method of communicating tacit knowledge.

Both tacit and explicit information were shared, as evidenced by both early stage and late stage product development. During the early stages of the project, when manufacturers were scoping the project and determining what they could and couldn't deliver, explicit knowledge exchange was the standard. Later in the projects, tacit knowledge was incorporated as enhancement suggestions. Finally, the sources of information were carefully studied, with management referring specifically to persons with experience in that field to share knowledge and seek improvement suggestions. Organizational characteristics, technical turmoil, and patent protection are all elements that might influence knowledge generation in a corporation when specific processes or methods of information sharing are used.

The majority of the research findings emphasize the impact of environmental factors on external and internal knowledge transfer during the dispersed collaborative development process. Because the information transfer mode is two-way rather than one-way, it can help to build up more knowledge, resulting in improved overall innovation performance.

6. Conclusion

From the previous discussion, it is clear that collaboration within different workgroups, communities, and virtual environments, can't be achieved without the help of collaborative tools. These are the first to be adopted, adding based on the demands and necessities, advanced collaborative systems and technologies; Also, from the knowledge management point of view, tools bypassed a long time ago the level of a simple conversational instrument, sustaining its life cycle stages; Furthermore, developing of some collaborative tools in the last years implies using technologies and web programming, because of the boom of open-source solutions, in order to reduce their development effort.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Nesheim, T. and Gressgard, L.J. (2014) Knowledge Sharing in a Complex Organiza-

- tion: Antecedents and Safety Effects. *Safety Science*, **62**, 28-36.
<https://doi.org/10.1016/j.ssci.2013.07.018>
- [2] Trautman, S. (2014) 4 Practices to Embed Knowledge Transfer into Your Business Culture.
 - [3] Paulin, D. and Suneson, K. (2012) Knowledge Transfer, Knowledge Sharing and Knowledge Barriers—Three blurry terms in KM. *Electronic Journal of Knowledge Management (EJKM)*, **10**, Article No. 321.
https://www.researchgate.net/publication/286105137_Knowledge_transfer_knowledge_sharing_and_knowledge_barriers-Three_blurry_terms_in_KM
 - [4] Mladkova, L. (2004) Management Znalostí Praxi. Professional Publishing, Praha.
 - [5] Probst, G., Raub, S. and Romhardt, K. (2000) Managing Knowledge. Building Blocks for Success. John Wiley & Sons, New York.
 - [6] Groff, T.R. and Jones, T.P. (2003) Introduction to Knowledge Management. Butterworth-Heinemann, Burlington.
 - [7] Gamble, P. and Blackwell, J. (2001) Knowledge Management. A State-of-the-Art Guide. Kogan Page, London.
 - [8] Coleman, D. (1999) Groupware: Collaboration and Knowledge Sharing. In: Liebowitz, J., Ed., *Knowledge Management Handbook*, CRC Press, Boca Raton, 11-23.
 - [9] Hislop, D. (2005) Knowledge Management in Organizations. A Critical Introduction. Oxford University Press, Oxford.
 - [10] Patriotta, G., Castellano, A. and Wright, M. (2013) Coordinating Knowledge Transfer: Higher Managers as Higher-Level Intermediaries. *Journal of World Business*, **48**, 515-526. <https://doi.org/10.1016/j.jwb.2012.09.007>
 - [11] Bekkers, R. and Bodas Freitas, I.M. (2008) Analyzing Knowledge Transfer Channels between Universities and Industry: To What Degree Do Sectors Also Matter? *Research Policy*, **37**, 1837-1853. <https://doi.org/10.1016/j.respol.2008.07.007>
 - [12] Marcon, M.R. (2012) SMEs and the Internationalization of R&D Activities: Knowledge Transfer Flows between Firms. *European Journal of International Management*, **6**, 133-153. <https://doi.org/10.1504/EJIM.2012.045794>
 - [13] Schleimer, S. and Riege, A. (2009) Knowledge Transfer between Globally Dispersed Units at BMW. *Journal of Knowledge Management*, **13**, 27-41.
<https://doi.org/10.1108/13673270910931143>
 - [14] Frank, A.G. and Ribeiro, J.L.D. (2014) An Integrative Model for Knowledge Transfer between New Product Development Project Teams. *Knowledge Management Research and Practice*, **12**, 215-225. <https://doi.org/10.1057/kmrp.2012.57>
 - [15] Ramim, M.M. and Lichvar, B.T. (2013) Effective Collaboration and Knowledge Sharing in Short vs. Long Term SD Projects. *Online Journal of Applied Knowledge Management (OJAKM)*, **1**, 133-147.
 - [16] Khelil, A. and Affes, H. (2014) The Relation between Groupware Technology and Knowledge Management Processes. *International Conference on Innovation & Engineering Management (IEM-2014) Copyright IPCO-2014*, Sousse, 22-25 March 2014, 189-195.
 - [17] Ghani, S. (2009) Knowledge Management: Tools and Techniques. *DESIDOC Journal of Library & Information Technology*, **29**, 33-38
<https://doi.org/10.14429/djlit.29.276>
 - [18] Hassandoust, F. and Kazerouni, M. (2011) Implications Knowledge Sharing through E-Collaboration and Communication Tools. *Journal of Knowledge Management, Economics and Information Technology*, **1**, 1-6.

- [19] Nesrine, B. and Narjès, B. and Henda, B. (2012) On the Convergence of Collaboration and Knowledge Management. arXiv:1202.6104.
- [20] Razmerita, L., Kirchner, K. and Sudzina, F. (2009) Personal Knowledge Management: The Role of Web 2.0 Tools for Managing Knowledge at Individual and Organizational Levels. *Online Information Review*, **33**, 1021-1039.
<https://doi.org/10.1108/14684520911010981>
- [21] Bertoni, M., Johansson, C. and Larsson, T.C. (2011) Methods and Tools for Knowledge Sharing in Product Development. In: Bordegoni, M. and Rizzi, C., Eds., *Innovation in Product Design*, Springer, London, 37-53.
https://www.academia.edu/919668/Methods_and_tools_for_knowledge_sharing_in_product_development
https://doi.org/10.1007/978-0-85729-775-4_3
- [22] Al-Anqoudi, Y., Al Nasseri, S. and Srinivas, S. (2012) Collaborative Learning and Knowledge Sharing Using Technology Tools in Employee Development. *International Conference on Knowledge Management & Resource Sharing (ICKMARS-2011)*, Muscat, 4-5 December 2012, 10 p.
<https://www.researchgate.net/publication/261931549>
- [23] Savolainen, R. (2017) Information Sharing and Knowledge Sharing as Communicative Activities. *Information Research*, **22**, 7-10.
- [24] Aklilu, T.B. (2014) The Contribution of Collaborative Tools and Technologies in Facilitating Tacit Healthcare Knowledge Sharing amongst Clinicians. Master's Thesis, Department of Informatics and Media, Uppsala University, Uppsala.