

Knowledge Management Practices in Research and Development Strategic Projects Undertaken by Banks

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Abstract: The dynamic development of information technologies that can support the functioning of financial institutions also implies a rapid increase in the number of investments in projects, e.g., related to ICT and AI. In addition to projects concerning current operations in the banking sector, a growing number of research and development projects of strategic importance can be observed. Implementing such projects is an excellent way to improve the banks' competitive position on the market, provide a better response to customers' increasing expectations, improve the quality and increase the security of the financial services offered. The problem addressed in this study is of great significance in the context of seeking new directions to stimulate the development of R&D activities of strategic importance carried out by banks. However, such research has not been run thoroughly enough so far. Therefore, the theoretical, methodological, and practical gaps in this area are clearly visible against the background of the literature review. There is a need to improve knowledge management processes at the level of R&D strategic projects during their planning, implementation, completion, and post-project reviews. Project managers and business practitioners use more or less formalized activities and practices of knowledge management in strategic R&D projects, which are more or less adapted to the specifics of these financial institutions vital for the economy. The paper discusses the practices, procedures, and approaches used in selected big banks in Poland. This preliminary research used reviews of organizational documentation, direct observation, and interviews with people involved in R&D projects. Identification and analysis of these practices can contribute to improving the effectiveness of explicit and tacit knowledge management processes that are of strategic importance in the banking sector.

Keywords: Knowledge management practices, Research and development projects, Strategic bank projects, Knowledge management in projects

1. Introduction

Modern financial institutions and banks are required to effectively manage explicit knowledge in a formalized and documented form, as well as informal, subjective tacit knowledge, which results from personal experiences. The use of appropriate knowledge management practices helps to streamline decision-making processes, improve the quality of customer service and increase operational efficiency. The most important activities supported by these practices include, e.g.: capturing knowledge from various sources, organizing and storing knowledge in an orderly manner, sharing knowledge, ensuring access to knowledge and its transfer, managing the risk of losing critical expert knowledge, supporting knowledge-driven decisions and continuous improving banking organizations in order to ensure an appropriate competitive position in a dynamic banking environment. Knowledge management in banking supports the promotion of learning and innovation, building on the collective intelligence of the organization and gathering knowledge about customers. Apart from that, promotion of learning and innovation development in the banking sector is a subject of considerable interest, as visible thanks to the results of literature research devoted to new trends in knowledge in this sector, new technologies and digital media, as well as problems of adaptation to dynamic changes taking place in the banking sector (Borba *et al.*, 2022).

Constant changes taking place in a turbulent environment are conducive to the increasing use of a project approach in the development of financial software supporting the management of money and financial transactions. Appropriate selection of methodological approaches to project and risk management is one of the critical success factors for large financial software projects (Tae *et al.*, 2020). Among the most important success factors for IT projects in banking are also the right selection of subject matter experts of projects, development environment, project manager skills and good communication (Priambodo *et al.*, 2019). In addition, the literature points to the importance of knowledge as well as human and intellectual capital development, which is necessary for the successful implementation of IT projects and modern management models (Grzeszczyk, 2020). Changes taking place in the environment of financial institutions, therefore, force the use of appropriate approaches and practices to knowledge management in projects. In particular, account should be taken of the high intensity and diversity of knowledge fields, as well as the related need for knowledge and technology intensity (De Borba, 2022). These phenomena affect relations with bank customers, enforce digitization processes and the increasing use of IT supporting the functioning of financial institutions. Such investments take the form of IT projects, the implementation of which significantly modifies the current operations of banks.

In the past, the transfer of technologies developed by scientific and research institutions outside the banking sector was often observed. In recent years, an interesting trend has been noticed - a number of strategic research and development projects is implemented in the banking sector. The implementation of strategic projects is an appropriate way to improve the competitive position of banks, respond more efficiently to the growing expectations of customers, improve the quality and increase the security of the financial services offered. Against the background of the literature review, theoretical, methodological and practical gaps in the improvement of knowledge management processes at the level of R&D strategic projects during their planning, implementation, completion, and post-project reviews are clearly visible. Research related to this has not been carried out sufficiently thoroughly so far, and it is important in the context of searching for new directions to stimulate the development of strategic R&D activities conducted by banks.

Openness to the introduction of innovative solutions and knowledge management play a key role in the planning and implementation of strategic R&D projects undertaken by banks. Proper strategic alignment of information system and innovation can be achieved by implementing innovative solutions supported by organizational learning, knowledge management, developing good cooperation and understanding by the management of the need to introduce innovation initiatives (Yaw Obeng and Mkhize, 2019). Project managers should therefore improve knowledge management activities and practices that foster good communication at various levels of the organization, and the success of strategic IT projects. Thus, it is important to conduct theoretical analyzes and empirical research identifying applied and potentially available practices that may be of interest to project managers and business practitioners in the banking sector. Their identification can contribute to improving the efficiency of knowledge management processes in strategic IT projects and increase the probability of their success. The research results presented in this paper concern the practices, procedures and approaches used in selected large banks in Poland. The following research methods were used during the research: reviews of organizational documentation, direct observation, and interviews with people involved in R&D projects.

2. Knowledge Management in Strategic Banking Projects

Modern advanced economies are usually supported by knowledge management, human capital development and learning processes of financial and non-financial organizations (Clarke and Gholamshahi, 2018). Improving information and knowledge resources through intellectual and mental activity creates the basis for forging key economic resources of modern financial institutions (Ali and Yusof, 2009). Implementation of knowledge-based solutions, development of education and improvement of human capital management have a significant impact on creating favorable conditions for economic growth, as well as improvement of socio-economic well-being analyzed at the micro and macroeconomic levels (Garza-Rodriguez *et al.*, 2020).

Financial institutions are based not only on physical but also on intangible resources, and are knowledge and intellectually intensive (Yao *et al.*, 2019). Expanding knowledge resources, developing human capital and increasing the value of the intellectual capital of the organization provides it with a competitive advantage, and the accumulated resources of data, information, knowledge and experiences create the potential for shaping new values (Dumay, 2016). Projects that involve making temporary efforts and sharing significant amounts of knowledge between individuals and groups participating in these projects can also contribute to the increase in the number of useful knowledge resources, even if they do not have prescribed learning mechanisms, and are usually focused on immediate results (Holzmann, 2013). The importance of long-term and responsible knowledge collection and management is easier to understand when managing strategic projects or programs (sets of projects) that are focused on delivering long-term and strategic benefits.

Management of knowledge in projects is recognized as an increasingly important development factor in many industries. Research is being conducted on analyzing not only knowledge management within projects (temporary organizations), but also between them (Hanisch *et al.*, 2009). Identifying and acquiring knowledge, as well as learning from project experience is a problem increasingly recognized by banks. Previously, the importance of knowledge management was seen mainly in the context of repetitive processes carried out on the basis of traditional organizational structures. The growing importance of issues concerning knowledge management in projects results from the increasing involvement of banks in the implementation of projects. These organizations see more and more clearly turbulent changes in the environment, dynamic technological advances, the growing role of project-based activities and the need to introduce innovations in IT processes and systems supporting knowledge management. Therefore, bank managements clearly notice the growing challenges and competition in the banking sector, the increasing importance of knowledge, intellectual capital and the resulting challenges facing modern financial institutions (Joshi *et al.*, 2010).

Knowledge management is implemented in banks to support the identification, collection, protection, development, maintenance and application of knowledge in the learning processes of individual employees and the entire organization in order to ensure the maximization of knowledge-based sustainable growth of the organization (Mehrotra, 2019). This is done by systematically acquiring, organizing, storing and sharing knowledge, which most often results in streamlining decision-making processes, improving the quality of customer service and increasing operational efficiency. These systematic activities include the effective management of both explicit knowledge (regarding formalized and documented information) and tacit knowledge (related to experts, their subjective experiences, attitudes and observations).

The most important aspects of knowledge management in banking include: knowledge capture, knowledge organization and storage, knowledge sharing and communication in project teams, access to and retrieval of knowledge, knowledge transfer and training, knowledge-based decision-making, risk management and continuous improvement of knowledge resources. Banks strive to acquire valuable and useful knowledge from various sources, and capturing it is of great importance. Potential sources of knowledge include, e.g., contacts with customers, knowledge of field experts employed in banks, results of market research analyzes and expert opinions of consulting companies. Captured knowledge can also come from bank documentation, evaluation reports of projects implemented by banks, summaries of surveys and interviews with employees.

Knowledge capture should be organized and stored in an orderly manner. One way is to use knowledge repositories or databases adapted to storing categorized information that is relatively easy to find and share. Information and knowledge may relate to customers, banking products, regulations, research reports and best practices. In modern banks, systems of communication and knowledge sharing by employees are also being developed in order to facilitate the implementation of scientific knowledge diffusion processes and the introduction of useful innovations. Helpful communication tools include, e.g., employee team meetings, discussion forums, intranet portals, workshops and training programs. Great importance should be paid to improving the culture of knowledge sharing and the collective knowledge of bank employees.

Quick decision-making and efficient customer service are possible if adequate access to knowledge resources and its recovery are ensured. Therefore, mechanisms and tools for searching in often extensive repositories and knowledge bases are useful. The developed tools for accessing knowledge and searching for information include, e.g., systems based on natural language processing and machine learning. Among the important aspects of knowledge management in banks, the transfer of knowledge between key and experienced employees and their young successors should also be mentioned. Therefore, all kinds of courses and trainings are useful, as well as mentoring programs and documenting best practices, e.g. in the form of case studies. Appropriate knowledge transfer can contribute to minimizing the risk of losing critical expert knowledge. The key aspects of knowledge management also include knowledge-based decision-making by providing access to relevant and up-to-date knowledge to assess the risk of financial operations, develop effective strategies and make informed decisions conducive to the sustainable development of the organization. Banks should keep abreast of changes in regulations, industry guidelines and best practices for effective risk management. Implementing effective knowledge management practices help banks disseminate information on these topics and mitigate potential risks.

Continuous development of knowledge management practices enables the improvement of mechanisms for collecting and analyzing knowledge supporting the identification of areas requiring improvement in the implementation of changes. Knowledge of good practices and experience from previous contacts with clients creates a good basis for improving banking processes, products and services. Knowledge management in banking makes it possible to use the collective intelligence of the organization, promote learning and innovation, improve customer experience and create favorable conditions for sustainable growth in a turbulent banking environment, as well as the implementation of strategic knowledge and technological projects.

3. Methodology

The problem addressed in this research is of great significance in the context of seeking new directions to stimulate the development of R&D activities of strategic importance undertaken by banks. The purpose of the conducted study is the initial identification of knowledge management practices in R&D strategic projects in such financial institutions.

The main research was preceded by literature research. The following research methods were used in main study: reviews of organizational documentation, direct observation, and individual interviews with people involved in strategic R&D projects. The scope of considerations was limited to the largest organizations from the

Polish banking sector. This is justified by the fact that, above all, such financial institutions undertake to implement R&D projects on their own. This is a relatively new field of activity in this sector and smaller organizations do not have the appropriate experience and resources required.

The conducted study on knowledge management in R&D projects in organizations from the banking sector was aimed at collecting information on the methods, tools and practices of knowledge management, as well as the reported benefits related to it. The method of individual face-to-face interviews was chosen to collect such data due to the possibility of direct contact with bank employees involved in the processes of planning and implementing strategic R&D projects. The use of this qualitative research method was time-consuming and sometimes difficult to carry out due to the numerous professional duties of the respondents, but it made it possible to conduct in-depth research conducive to a good understanding of the researched problems.

Respondents were asked the following questions related to knowledge management practices in R&D strategic projects undertaken by banks:

- What practices of knowledge management in strategic R&D projects do you know?
- How does the specificity of bank's R&D projects affect knowledge management practices?
- Is there an interest in tacit expert knowledge?
- Are actions taken to record the knowledge of people who may change their place of employment?
- Do you have established procedures or good knowledge management practices (e.g. within the methodological approaches of project management)?
- What is the role of informal information and knowledge exchange?
- Is the state of knowledge constantly monitored or are there periodic evaluations?
- What software tools are used in your work to manage knowledge in R&D projects?
- Is building knowledge bases planned in your department?
- Do you use artificial intelligence methods and data mining to build knowledge bases in your R&D projects?
- Does your department use Electronic Document Management (EDM) solutions?
- Does your department use data warehouse solutions in the knowledge management in R&D projects?

20 potential respondents from several of the largest banks were approached with the proposal to participate in the study. Ultimately, 7 respondents took part in the research. The respondents were people from the management staff of R&D projects related to IT implemented in these banks. Most of the respondents had at least 10 years of experience in the banking sector and more than 5 years in project management. Their education was primarily: finance, management and IT. The study was conducted in March 2023.

The methodology of the research presented in this section has limitations due to the relatively small number of respondents who were available and agreed to participate in the interviews. These studies should therefore be treated as pilot studies carried out before the full-scale research project.

4. Results and Discussion

In general, the respondents were open to knowledge management issues, using appropriate tools and practices, as well as learning about new solutions in this area. Some of them emphasized insufficient knowledge of these issues, in particular of specific tools and technologies supporting knowledge management in projects. The interviewees noted that not everyone involved in the bank's strategic projects was aware of the importance of these issues. Among the main applied knowledge management practices in R&D strategic projects, the following were indicated:

- gathering experience after the completion of projects,
- using tools related to popular methodological approaches, e.g. Agile or Prince2,
- the key role of project managers and the appropriate selection of the scope of competence of individual members of project teams,
- gathering expert knowledge,
- using tools such as Confluence or Jira to manage and share knowledge,
- exchange of knowledge during regular meetings and training workshops,
- creating knowledge bases, documenting experiences from strategic projects, and cooperation between various organizational units of banks.

Respondents were aware of the importance of knowledge management in planning and managing strategic projects implemented by banks. Most of them declared that they used various knowledge management methods and tools in their work. They also pointed out the challenges concerning the application of knowledge management practices related to the constant improvement of the required competences, such as the ability to work in a team or the ability to identify and verify knowledge and good communication. They also pointed out that in knowledge management it is important to care for the quality of processed data, their security and proper use so that they properly support business processes.

Based on the analysis of the answers, three groups of respondents can be distinguished. The first group consists of people who use advanced knowledge management tools and methods in their activities. They are aware of the benefits of using these tools, such as faster and more accurate data analysis and better use of available knowledge. Their answers were more detailed and professional compared to other respondents. They were more focused on the practical application of tools supporting knowledge management and their particular impact on projects related to the implementation of the organization's strategy. They were also more aware of the benefits and opportunities of advanced knowledge management, and more engaged in using these tools in their strategic R&D projects. Respondents from this group also pointed to the use of various knowledge management tools, such as Jira, Confluence, Microsoft Teams or SharePoint. At work, they also took up challenges related to the use of advanced methods of AI and data mining to analyze large data sets and discover new relationships in data. In the knowledge management processes, they also used EDM systems, file sharing systems and a data warehouse. In their opinion, these technologies contributed to facilitating access to information, increasing work efficiency and better use of available knowledge.

The second (largest) group of respondents used less advanced methods of knowledge management. These were people less familiar with the procedures, tools and modern technologies supporting knowledge management. Respondents from this group stated that they had only used basic knowledge management tools so far, such as shared folders, e-mail or teleconferencing. In their work, they did not use AI methods or data mining, and only one of them used EDM or a data warehouse. Despite this, they were aware of the potential benefits of using modern technologies, the practical use of which in their banks was limited. One of the representatives of this group seemed to be aware of the benefits of using advanced methods such as AI and data mining, but had not had the opportunity to use them in his daily work. However, another respondent from this group was not aware of the existence of these methods. One more respondent used knowledge related to experience and training, and another used expert knowledge as part of solving technical problems.

It was also possible to distinguish a third group that answered the questions in a short and somewhat enigmatic way. While this group claimed to have used various tools, its members were unable to provide particular information. They pointed out that the transfer of knowledge is an individual matter and depends on specific people. At the same time, they were aware of factors influencing the quality of knowledge management, such as organizational culture, IT systems or business environment. The responses from this group indicated that knowledge management was, in their opinion, still in its early stages of development. They used tools such as SharePoint, but at the same time indicated that access to knowledge and information was still limited and depended on individual employees who had the necessary knowledge. Respondents from the third group pointed to the lack of formal knowledge exchange systems and the lack of dedicated tools that could facilitate knowledge management practices in projects. In their answers, the respondents also emphasized the importance of organizational culture and a good climate for cooperation and knowledge sharing. This group included answers indicating the lack of implemented solutions for knowledge management and data processing in their strategic R&D projects. In addition, their answers showed incomplete awareness of the benefits of implementing knowledge management tools, such as EDM and data warehouses.

The answers obtained as part of the study indicate the selective use of practices and opportunities resulting from the use of modern technologies in knowledge management in strategic R&D projects. In some cases, this may be due to a lack of awareness or lack of access to the right tools. In other banks, there are restrictions related to the policies of the organization and specifically understood legal regulations. In order to improve the efficiency of knowledge management in projects, it is worth investing in training for employees and the implementation of modern tools and technologies. Efforts should also be made to improve internal communication and develop modern forms of organizational culture based on sharing knowledge and improving cooperation.

The answers of the respondents suggest that in most cases actions were taken to support knowledge management in strategic R&D projects. All respondents used tools supporting team work, although not all of

them used EDM systems or data warehouses. The answers obtained show that the issues of AI and data mining are not yet well known, accepted and used in practice. This is despite the extensive literature on many applications of AI in knowledge management (Pai *et al.*, 2022).

The most frequently mentioned benefits of knowledge management in projects included better coordination and cooperation of teams, better communication, more effective use of knowledge resources, as well as faster decision-making related to project planning and implementation. Respondents also mentioned challenges that were important to them, such as too many documents, the problem with finding and organizing them, and difficulties in keeping knowledge up-to-date.

A group of respondents was identified as less advanced in the use of knowledge management methods, because the answers were 'I don't know' and 'I don't use'. Representatives of other groups were more advanced and aware of the benefits of using different knowledge management methods in strategic R&D projects.

One should also pay attention to some similarities among many respondents' answers. In general, they were aware of the benefits of using tools supporting knowledge management, such as EDM systems or data warehouses, but at the same time some did not use them in their work or used them only in some projects. The approach of the respondents to the exchange of knowledge between employees was also similar. All interlocutors were aware of its importance, but they did not always use dedicated tools to facilitate these exchanges. A common element was also the lack of formalization of processes related to knowledge management and the lack of designated persons or teams responsible for this field. Respondents were aware of the need for knowledge management in strategic R&D projects, but often did not take specific actions in this regard.

Interviews with respondents focused on the initial identification of knowledge management practices in R&D strategic projects undertaken by banks. The possibility of continuing further research on the impact of the use of advanced knowledge management methods and tools on such project outcomes should be considered.

5. Conclusions

Based on the performed study, the following conclusions can be drawn:

- knowledge management tools and methods are quite well known and mostly recognized by respondents, but their use in organizations varies,
- knowledge management tools and methods are considered useful and can bring benefits at work,
- tools and methods of AI and data mining are used only in individual cases,
- EDM systems are used in most organizations and are considered beneficial,
- the use of data warehouses is incidental,
- the main challenges in knowledge management in strategic R&D projects are large data sets and problems with their search and categorization,
- tools and methods of knowledge management in projects can contribute to improving the efficiency of work and the quality of implemented projects,
- appropriate training on knowledge management tools and methods is important so that employees have the necessary skills to use them,
- there is a need for greater use of good practices, tools and methods of knowledge management in strategic R&D projects and organizations. Staff training is necessary to raise awareness in this field and make better use of the relevant tools, practices and methodological approaches.

As a result of the conducted research, the need to broaden the knowledge and experience of bank employees and managers of projects implemented there on the real benefits of applying good and well-thought-out knowledge management practices in strategic R&D projects was identified. It is therefore necessary to develop training programs related to this as appropriately qualified employees can significantly contribute to the implementation of banks' strategic goals and create conditions for their competitiveness. Allocating more funds to employee training may therefore contribute to the growth of banks' long-term strategic potential. In particular, it is important to improve the qualifications of employees in the effective use of new ICT and AI solutions supporting knowledge management in projects. The currently undertaken research is preliminary and needs to be continued among a wider group of respondents from a larger number of banks.

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