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ENHANCING INNOVATION MANAGEMENT COMPETENCES IN BANKING

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Abstract:

The purpose of this paper is identification of routines and practices in banking that enhance and develop innovation management competences. Authors will identify routines and practices from other service industries that could be implemented in banking in the future. Routines and practices will be classified according to previously developed model of innovation management in services, with specific phases and competences. Authors have conducted desk research of publications related to innovation management routines and practices in banking following the innovation management phases and corresponding competences in previously developed model for services. Research findings and systematization of publications confirmed that the general model of innovation management processes could be recognized in real practice of banks. Still, many improvements in innovation management in banks could be expected in the future based on transfer of good practices from other service industries. Paper conclusions and recommendations could be used in banking in order to enhance their competences in managing innovation processes by developing routines and practices needed for the successful innovation management. Paper presents the original attempt to systematize the existing innovation management practice in banking and to develop a relevant model of innovation management in the banking sector.

Keywords*:*

innovation management; innovation in services; banking

1. Innovation management competences

Management literature contains numerous models of the innovation processes as a result of efforts to establish certain connections, relationships and patterns in order to determine the innovation process, reduce its uncertainty and random nature, which would result in more efficient management (Marinković et al, 2017). Since innovation is seen as a complex process, composed of many different activities, the basic questions that are asked today relate to the possibilities of managing this process. The attention of contemporary authors in the field of innovation management is focused on defining the different stages, that is, the phases of the innovation process, as well as the role of participants in the organization during their development.

Considering innovation management, it may seem impossible to manage something so complex and uncertain. The complexity of this aspect of management can be shown in product development, where for successful development it is necessary to continuously fulfill three sometimes conflicting goals (Schilling & Shankar, 2019): 1. maximize product compliance with customer requirements, 2. minimize development cycle and 3. control development costs. The innovation processes themselves are experimental and exploratory in nature and rarely follow strict linear paths. In addition, project teams are usually made up of experts from different fields. Innovation projects are characterized by uncertainty, risk, and a high degree of failure. Therefore, project teams are more actively involved in risk management and jointly achieve a high degree of flexibility and responsiveness by constantly searching and being open to new options. Innovation projects are usually unique business ventures, but some good practices can be recognized (Marinković, et al., 2011). With a greater understanding of the innovation processes, firms can improve their innovation management and leverage more appropriate, context-specific capabilities, such as research and development and new product development capabilities, as well as organizational resources that facilitate modifications of firm processes, structures and business models (Gajendran, et al., 2014). Innovation competences of trust and power play a key role in the relationship between enhancing adaptability of leadership and operational effectiveness (Ferrer, & Santa, 2012).

Frishammar et al., (2019) recognize three new trends: 1) a shift from closed to more open models of innovation, 2) a shift from providing physical products to industrial products and services, and 3) a shift from an analog to a highly digitalized world. They propose a revised innovation audit framework, which acknowledges new trends and supports innovation management in increasingly dynamic and competitive environments.

2. Routines and practices in innovation management in services

Contemporary economic environment and rapid technological changes are driving governments, companies and individuals to seek sustainability through new service models. As consumers demand better and more valuable services, organizations need to improve the innovation process in order to develop in time-to-market new or renewed solutions (D'Alvano & Hidalgo, 2012). Innovation process analysis in service sector (D'Alvano & Hidalgo, 2012) showed that the most used innovation management tools belong to known and easy-to use tools – Brainstorming, Trend studies, Strategic alignment, Survey and documentation processes, Expert meetings, Best practices, Value analysis, Gantt charts, Business plans and Formulation and

scenario analysis. The authors concluded that the leading organizations present simultaneously better development of its innovation process, use of innovation management tools and activities intensity than remaining organizations.

Conducted case study research in innovation management in the service sector (Marinković, et al., 2011) has shown that special attention should be paid to two stages of the innovation process: defining user requirements and their translation into project requirements. These two stages affect the project time, later feedback relations and therefore the costs and the results. Requirements must be precisely and correctly defined, which requires adequate knowledge and competence of participants. In some cases, investment in relationships and networks (rather than in developing competences internally) may offer a more sustainable business model for many firms (Story et al., 2011). Gajendran, et al., (2014) have pointed to the significance of pursuing the development part of R&D, especially when conscious cognitive routines, combined with functional and integrative organizational routines, indicate an opportunity for an incremental innovation.

An innovative service organization can develop certain routines and subprocesses, abilities and competencies, that are related to innovation process management. In ICT-based service innovations, the service organization needs to develop different management skills that are important for managing the entire innovation process. Certain parts of the innovation process can take place in another organization, through the use of outsourcing, and the skills that are most often transferred to another organization relate to the development of software and hardware for a new service. Then, the organization that develops ICT support for the new service is expected to have the competencies to translate user requirements into project requirements, and system development according to established requirements and testing. An organization working on ICT development can be involved in other phases of the innovation process, as their experts could contribute to the development of a more efficient solution, but above all to transfer knowledge and thus further develop the capabilities of service providers to manage the innovation process. Service innovation management skills are developed through the development of routines and subprocesses. Based on Tidd & Bessant (2020) approach to development of competences for innovation management and research (Marinković, 2012), a new competence list for ICT service innovations is developed and presented in Table 1.

Table1. Developing innovation management competences through innovation process in services

ABILITIES OF INNOVATION MANAGEMENT IN SERVICES	ROUTINES AND SUBPROCESSES IN THE ORGANIZATION WHICH CONTRIBUTE TO THE DEVELOPMENT OF MANAGEMENT SKILLS
Problem identification and user requirements	Systematic monitoring: trends in the environment, user behaviour, competition moves, statistical reports on the use of services, customer complaints, results, development of customer relations
Formulation of goals and strategies for a new service	Continuous harmonization of business strategy and innovation strategy in accordance with the competencies of the organization
Generating ideas	Using different methods and techniques of generating ideas with the formation of multidisciplinary teams, development of innovative climate and culture
Selection of ideas worth realizing	Use of methods and techniques of evaluation and selection of ideas, use of multidisciplinary teams, development of innovative climate and culture, development of tolerance, conflict resolution
Analysis of the (technological) environment and possibilities in relation to selected ideas	Continuous monitoring of technologies and development trends in the environment in order to choose the right technology and development models (independently, cooperation, license, etc.)
Defining user requirements	Continuous monitoring of user trends, needs, praises and complaints, in order to develop the ability to translate them into specific user requirements for a special development process
Translating user requirements into project requirements	Education for translating user requirements into project requirements, especially in the case of ICT development
Development of a new service and service delivery process according to project requirements and testing	Continuous work on independent or cooperative development of new solutions based on the application of ICT, development of test models by phases, modules, continuous monitoring of the development and application of ICT in the environment, identifying opportunities for technology transfer
Evaluation of solution	Continuous activities of evaluation of solutions from different aspects, proposing corrective actions and evaluation after corrections
Staff training	Development of staff training programs for the introduction of new services, acceptance of changes, providing support
User training and launching	Development of user training programs for the use of new services and acceptance of changes, development of marketing and PR activities
Post-launch support	Continuous work on the development of customer support in the use of the new service, building relationships of trust and long-term relationships with customers
Development of an innovative organization	Promoting the image of an innovative service organization whose innovations are confidently accepted in the environment, organizational learning

Source: (Marinković, 2012)

2. Contemporary innovation and innovation management in banking

The banking sector in its evolutionary journey is undergoing significant changes up to the level of transformation. The main factors toward transformative banking business model lie in the internal requirements for development and numerous external forces viewed in the phenomena characterized by global economic integration, regionalization of markets, ever-present knowledge-based economic development, high regulatory pressures, sophisticated customers' needs, rapid technological development, political, legal and demographic changes, and a turbulent business environment shaped by volatility, uncertainty and acceleration. These underlying influences made sustainability a hot topic that attracted important consideration from academics and practitioners in the 21st century, implying a fundamental shift in businesses and societies worldwide, including financial services and the banking sector consequently (Tornjanski et al., 2015). To effectively respond to all changes, the adequate level of capabilities and capacities in banking services represent a key challenge and hot strategic topic for consideration, including rethinking and redefining business strategies and business models, along with further alignment at all levels in the ecosystem (Fasnacht, 2009; Huo & Hung, 2013).

One of the key drivers toward sustainability and economic growth is innovation. A narrow aspect of innovations appreciates innovation as a competitive strength of an organization and as a key driver for boosting business performance and profitability. An innovative approach at the organizational level implies principles of openness, flexibility, quality management, ambidexterity and business excellence frameworks, aiming at meeting customer-centricity and exceeding various stakeholders' expectations. A wide perspective of innovations accepts innovation as the core of a competitive economy of any country (Drucker, 1988; Christensen, 1997; Fasnacht, 2009; Huo & Hong, 2013; Talib, et al., 2012; Löfsten, 2014; Tornjanski et al., 2015; Tornjanski et al., 2017; Tornjanski et al., 2017a; Tornjanski et al., 2020). Innovation in the banking sector is recognized as a foundation for changes in the financial system with the purpose to enhance efficiency in the core functions of a financial system. More precisely, effective innovation in banking implies adoption of integrated drivers consisting of excellence, stakeholders' satisfaction, simplicity, differentiation, sociability, innovation speed, separability, innovative technology use, innovative product fit and innovative culture development (Donnelly, 1991; Thwaites & Edgett, 1991; Frame & White, 2014; Tornjanski et al., 2015).

Taking into account that innovation management is vital for a successful outcome of the novelty on one hand and that the innovation process includes numerous activities undertaken to bring innovation into the market on the other, existing literature suggests a holistic, systematic approach and new forms of managing an innovation process. For example, Aslam et al. (2020) have proposed an Absolute Innovation Management framework that integrates organizational strategy, design thinking and innovation ecosystem aiming at creating innovation concept for real-life practice and making organizations ready for the forthcoming IoT and Society 5.0 revolution (Tornjanski et al., 2020). Besides, the development and adoption of effective structures and implementation mechanisms as a basis for creating visible improvements in the value creation for all corresponding stakeholders in the innovation ecosystem should be taken into account in holistic innovation management. In addition, effective linkage with the external environment focused on generating a portfolio of ideas should be considered in the banking sector (Strategic Innovation Group, 2002;

Fasnacht, 2009; Tornjanski et al., 2015; Tornjanski et al., 2015b). When the future perspective of banking is in question, early birds of research results indicate two fashionable and dominant transformative banking models: the agile bank model and the digital bank model (Tornjanski et al., 2015a), later enriched with the models of networked organization, self-management teams and organization, IT transformed organization (Tornjanski & Čudanov, 2021).

The journey towards a new banking model(s) is shaped by various changes in both the hard and soft components of an organization. Artificial Intelligence (hereafter: AI) plays an important role in representing an emerging topic that should be adequately understood and implemented with the purpose to contribute to the overall business performance, work-health-personal life balance of employees and sustainable growth in banking (Tornjanski et al., 2020). From a global perspective, AI is in the initial phase of implementation in the banking sector. The biggest potential of AI in the future banking business is viewed in the areas of (Rao & Verwei, 2017; Tornjanski et al., 2020): Personalized financial planning; Process automation; Anti-money laundering; Fraud detection.

There is no doubt that the traditional banking model is not feasible anymore. Recent research shows that the future banking perspective lies in the innovative model fitting into the vision and concept of the Society 5.0. A sustainable future in the context of Society 5.0 can be defined as: "an innovative approach that encompasses and encourages simultaneous development and growth of both, economies and societies by introducing a concept of deep integration of humans' and smart machines' cognitive and emotional intelligence and open innovation, thus by empowering collective intelligence for the long-term well-being and prosperity of different stakeholder groups in the ecosystem" (Tornjanski & Čudanov, 2021). In other words, future banking is viewed as human-centric financial services, focused on sustainability and well-being for both businesses and people. As being human-centric in the future, banking sector also shoud nurture customer relationships. Barjaktarović Rakočević et al. (2017) have analysed desirable resources for creating longstanding and excellent relationships with bank customers.

Technological innovations have brought a lot of worthy transformations for the financial services industry. To name just a few: low costs, higher velocity of doing transactions, more affordable financial services to all the people. And that is exactly what financial technologies – fintech is – "fintech is the use of technology to provide new and improved financial services" (Thakor, 2019). Nevertheless, besides those advantages fintech brought to the financial services arena, Bofondi and Gobi (2017) argue that fintech also imposes challenges to traditional banking institutions. In their study Carbó-Valverde et al. (2021.) analyze how the relationship between fintech and banks evolve through the time. Siek & Sutano (2019.) tried to answer a very intriguing question regarding what the level of impact fintech has on traditional banks. They concluded that even though fintech start-ups have disrupted banks mainly in the area of payments, generally banks are not disrupted mainly because of the security issues since customers find themselves more secure with banks than fintech start-ups.

The above does not mean that banks can be peaceful with their position. In the light of even higher velocity of changes and strong development of information technologies and fintech companies' forces, banks have to be ready more than ever to re-evaluate and change their business models and find new competitive advantages (Jakšič & Marinč, 2019). Authors Li et al. (2019) have explored what impact fintech innovations in banking have on their risk-taking levels. Very interesting question regards whether fintech development has influence over banks' cost efficiency. This question was researched in study of Lee et al. (2021) and revealed that fintech innovations lead to cost efficiency but also enhance technology used by banks.

Authors Chen et al. (2019) have analysed underlying technologies in fintech innovations and what values applied technologies give to the innovators. Authors Heredia et al. (2022) have

explored and proposed the role of management for leadership for improving firm performance through digital capabilities and found out that digital capabilities are sufficient but not necessary condition for firm performance improving.

3. Methodology

Through a systematic review of the relevant literature, this paper identifies development of innovation management competences in banking and provides a novel classification and systematization. The research was conducted in the period from January to June 2022, through a structured keyword search of the *Web of Scien*ce database, covering the publications in the period between 2000 and 2021. This search resulted in around 100 identified publications. Afterwards, the process of selection was performed. Selection was based on title and abstract, publications were further filtered based on 5 inclusion criteria, following the example of the author's model (Dziallas & Blind, 2019): peer-reviewed articles published in journals; publications in English; publications that comprise main keywords: „*innovation management*", „*banking*" or „*competences*" in the title, abstract or full text; publications between 2000 and 2021. In total, 30 publications met the selection criteria and they represent the basis of this paper for further systematization and classification of their topic. They were classified on the basis of competence they were related to, regarding innovation management competences previously presented in Table 1.

4. Findings

Systematization of publications is based on previously developed innovation management competences relevant for service innovation management. The routines and subprocesses are grouped into three main dimensions: Searching for opportunities, Internal activities and Diffusion and customer support. Relevant publications for each dimension are presented in Table 2. Some publications are covering two or more dimensions.

Table 2. Innovation management competences in innovation processes in banking

ROUTINES AND SUBPROCESSES IN SERVICES WHICH CONTRIBUTE TO INNOVATION MANAGEMENT COMPETENCES	RELEVANT PUBLICATION FROM INNOVATION MANAGEMENT IN BANKING
SEARCHING FOR OPPORTUNITIES	
● Systematic monitoring of: trends in the environment, user behavior, competition moves, statistical reports on the services in use, customer complaints, results, development of customer relations ● Continuous monitoring of technologies, especially ICT and development trends in the environment in order to choose the right technology and development models ● Continuous monitoring of user trends, needs, praises and complaints, in order to develop the ability to translate them into specific user requirements for a special development process	Greuning & Bratanovic, 2009 Tinnilä, 2012 Aboelmaged & Gebba, 2013 Zineldin & Vasicheva, 2015 Campanella et al, 2015 Harris et al, 2016 MacDonald et al, 2016 Qamruzzaman & Jianguo, 2018 Kapidani & Luci, 2019 Del Gaudio et al, 2021 Milosevic et al, 2021
INTERNAL ACTIVITIES	

● Continuous harmonization of business strategy and innovation strategy in accordance with the competencies of the organization ● Using different methods and techniques of generating and evaluating ideas, multidisciplinary teams, development of innovative climate and culture, development of tolerance, conflict resolution (independently, cooperation, license, etc.) ● Education for translating user requirements into project requirements, especially in the case of ICT development ● Continuous work on independent or cooperative development of new solutions based on the application of ICT, development of test models by phases, identifying opportunities for technology transfer ● Continuous activities of solution evaluation respecting different aspects, proposing corrective actions, conducting evaluation after corrections ● Development of staff training programs for introduction of new services, change management, staff support activities	Fasnacht, 2009 Bucherer et al, 2012 Hirshleifer et al, 2012 Bysted, 2013 Uzkurt et al, 2013 Schuchmann & Seufert, 2015 Serinkan & Kızıloğlu, 2015 Tornjanski et al., 2015 Tornjanski et al., 2015b Milošević et al., 2019 Uchupalanan, 2020 Mousavi et al, 2021 Ngo et al, 2022 Bui et al, 2021
DIFFUSION AND CUSTOMER SUPPORT	
● Development of user training programs for adoption of new services, change management, development of marketing and PR activities ● Continuous work on the development of customer support in introducing new services, building relationships of trust and long-term relationships with customers ● Promoting the image of an innovative service organization whose innovations are confidently accepted in the environment, organizational learning	Littler & Melanthiou, 2006 Fasnacht, 2009 Oliveira & von Hippel, 2011 Uzkurt et al, 2013 Schuchmann & Seufert, 2015 Tornjanski et al., 2015 Tornjanski et al., 2015b Fontin & Lin, 2019 Sund et al, 2021 Norveel et al, 2022

Source: Authors

4.1. Searching for opportunities

Del Gaudio et al. (2021) in their study search for the answer how ICT diffusion affects banks' performance. The results show that ICT diffusion has a very positive effect on profitability and stability of the banking industry. Triangular relationship between knowledge management, information technologies and cloud computing empower banks to improve service quality and become more innovative (Zineldin & Vasicheva, 2015). Those authors have concluded that knowledge management and cloud computing support banks to develop more competitive, customer-oriented, efficient and sustainable business models and to innovate their core operations. The empirical research of Campanella et al. (2015) found out that form the technological innovations, ERP software systems and the software for the management of credit risk are "the two innovations that may, more than others, have an effect on the financial structure, competences, abilities, organization, and economic results of the banking system".

It is recognized (MacDonald et al, 2016) that blockchains are more than just a new technology to be applied by banks, but rather compete with banks as organizations, enabling banking

transactions to shift out of centralized hierarchical organizations and back into decentralized markets. Tinnilä (2012) avoided the inevitable bias toward banking, if only ”banking services” oriented studies would have been reviewed. He indicates that it is important to review and analyse different future trend studies for finding the most pertinent trends from banking service viewpoints. Greuning & Bratanovic (2009) show that financial innovation has also led to the increased market orientation and marketability of bank assets. The practices of bank supervisors and the appraisal methods practiced by financial analysts continue to evolve in order to meet the challenges of innovation and new developments.

Qamruzzaman & Jianguo (2018) have analysed relations between financial innovation, banking sector development, and economic growth and suggest that “financial innovation should be encouraged in the financial system through co-operation in the financial development process by infrastructure enhancement, technological advancement, and financial integration among financial institutions”. Milosevic et al. (2021) in their research found out that the impact of innovation speed on bank performance is more influential for the performance success than the impact of innovation quality. Aforesaid implies that performance success for the banking is more driven by innovation agility and readiness, even though innovation quality is still important for banking industry.

Kapidani & Luci (2019) performed research to discover how the type of financial sector - banks and equity markets, affects innovations. The outcomes of the research for the banking sector show that a higher level of crediting by the banking sector positively affects the innovations, measured by the number of patent applications.

Harris et al (2016) proved that practitioners interested in introducing new technologies to the elderly might consider making their innovations more compatible with existing technologies already in use. Aboelmaged & Gebba (2013) study proposes a model that helps to conceptualize mobile banking adoption through integrating constructs of technology acceptance model and theory of planned behaviour in order to predict mobile banking adoption. They found a significant positive impact of attitude toward mobile banking and subjective norms on mobile banking adoption. The effects of behavioural control and usefulness on mobile banking adoption were insignificant.

4.2. Internal activities

A study conducted by Bysted (2013) confirmed that managers’ ability to provide autonomy in the workplace is significant for the innovative working behaviour of employees in the financial sector as well as in other sectors. Also, it showed that employees with a high level of job satisfaction situated in environments characterized by innovation trust will bring more innovative performance. Uzkurt, et al, (2013) examine a relationship between organizational culture and firm performance and the role of organizational innovation in this relationship. Serinkan & Kızıloğlu (2015) investigated if there is a connection between teamwork and innovation management in banking organizations. They found a significant relationship between those two variables, but also suggested creation of an organizational climate that enables innovation management and teamwork, and an effective system of communication within institutions.

Bucherer et al (2012) are focused on business model innovation as a distinct type of innovation. Their cases from banking indicate the importance to treat it not as an isolated activity but to align it with the company’s innovation and long-term corporate strategy.

Schuchmann & Seufert (2015) showed that found increasing acceptance of a permanent test mode respectively “beta versions” in the banks which lead to products/services that are not entirely mature and need to be further developed together with clients in order to gather experience, test

them and not waste any time in the process. They see this as an approach that is considering failure as a learning opportunity.

Research of Uchupalanan (2020) is based on the interaction between service innovations and competition through different stages of innovation processes. Even though IT innovations significantly shaped the way banks are creating and offering their products and services, innovative banks do not consent with technological routes to dictate their service innovation processes. Besides technological innovation, the innovation process is also driven by organizational learning, corporate innovation champions, the roles of industry regulators, and patterns of internal cooperation etc. The aim of the study conducted by Mousavi et al. (2021) was to detect success factors for innovation management in banks. Common factors of successful innovation management processes in banks like communications, costs, human resource management etc. are enhanced with specific factors of successful innovation management in banks: innovation supportive leadership, market and customer orientation, information technology management, intellectual opportunities, as well as innovation opportunities and process management, according to aforementioned authors. Milošević et al. (2019) researched and suggested a mechanism by which top management involvement and knowledge sharing successfully enhance project performance in the banking sector and revealed that interaction of management involvement and knowledge sharing gives significant project performances prediction within the banking sector.

Since authors Ngo et al. (2022) believe that the evaluation of innovation capability under uncertainty is vital to organizations, they have proposed a new integrated method for the evaluation of innovation capability in banks by combining the analytic hierarchy process (AHP) and the evidential reasoning (ER) approach. Very noteworthy research has been performed by Bui et al. (2021) since they tried to describe the connection between bank CEOs risk – taking and the companies (whom they borrow), innovations. Their research has proven that "high risk-taking banks lend more to highly risky firms (with no credit rating, small size and high asymmetric information). Furthermore, they found that these high risk-taking banks also lend more to innovative firms with high R&D intensity, more patents, and more patent citations". Similar research of Hirshleifer et al. from 2012. asked if self-confidence of banks' CEO influence innovations. The results revealed that overconfident CEOs, from innovative industries, achieve greater innovative growth opportunities.

4.3. Diffusion and customer support

Littler & Melanthiou (2006) identified some of the major risks and uncertainties associated with a new service, Internet Banking, during the early stages of its market development. Schuchmann & Seufert (2015) advise development with clients in order to gather experience, test them and not waste any time in the process. Also, they see this as an approach that is considering failure as a learning opportunity. According to Oliviera & von Hippel (2012) the users will tend to be the first to develop many of the functionally novel services they need (via self-service) or novel products (via self-built prototypes). They found similarity of the user role in novel service development to that which has been observed in product development. Uzkurt, et al, (2013) indicate that it is "beneficial for organizations to nurture an innovative organizational culture by instituting mechanisms and structures which foster new ideas and ways of thinking and operating as this is likely to improve firm performance".

Author Sund et al. (2021) have analysed innovation labs, as places responsible for generating ideas and promotion of innovations, in a couple of retail banks in Europe. They realized that

constraints of innovation labs are coming from lack of resources and capabilities and form the impossibilities to satisfy both top managers and core business units' managers.

Norveel et al. (2022) in their study tried to reveal necessary basic digital competence of banking employees and where they stand in order to meet growing demands for implementing innovative technologies solutions. The biggest challenge was to inspire the employees about possible benefits of their digital competencies' improvements. Very interesting research has been presented in the paper of Fontin & Lin (2019), because they wanted to see if there is a difference in terms of financial innovation between high and low-income countries. The results discovered that there is a difference, low-income countries do vary greatly in terms of financial innovation, with competition, financial inclusion and banking access as major determinants of financial innovation.

5. Conclusions

Conducted desk research of available publications has shown that contemporary banking is open to introducing innovation and innovative models in their practice. Innovation management competences are very diverse and they are continuously developing. Numerous publications related to the various stages of the innovation process in banking, can be a good basis for making relevant decisions in the practice of banks.

This paper presents systematization of the existing innovation management research in banking in three dimensions: Searching for opportunities, Internal activities and Diffusion and customer support. Further research for each dimension could be used to develop a relevant model of innovation management in the banking sector, with focus on competences that need to be developed in each phase.

By combining available knowledge and own practical experience, significant competencies can be built in the practice of banks and new knowledge will be passed on to the next generation of projects. These correlations of competences and project results can be explored in more detail in some future research.

Also, many improvements in innovation management in banks could be expected in the future based on the transfer of good practices from other service industries. Paper systematization, conclusions and recommendations could be used in banking in order to enhance their competences in managing innovation processes by developing routines and practices needed for the successful innovation management.

6. References

Aboelmaged, M., & Gebba, T. R. (2013). Mobile banking adoption: an examination of technology acceptance model and theory of planned behavior. *International journal of business research and development*, *2*(1).

Aslam, F., Aimin, W., Li, M., & Ur Rehman, K. (2020). Innovation in the Era of IoT and Industry 5.0: Absolute Innovation Management (AIM) Framework. Information, 11(2), 124, 1-24.

Barjaktarović Rakočević S, Milošević N, Cicvarić Kostić S. (2017). Value of CRM initiatives for banks: Is the skepticism justified? Marketing, Serbian Marketing Association, Belgrade, 48 (2), pp. 107 - 114, doi: 10.5937/Markt1702107B

Bofondi, M., & Gobbi, G. (2017). The big promise of Fintech. *European Economy*, (2), 107-119.

Bucherer, E., Eisert, U., & Gassmann, O. (2012). Towards systematic business model innovation: lessons from product innovation management. *Creativity and innovation management*, *21*(2), 183-198.

Bui, D. G., Chen, Y., Lin, C. Y., & Lin, T. C. (2021). Risk-taking of bank CEOs and corporate innovation. *Journal of International Money and Finance*, *115*, 102387.

Bysted, R. (2013). Innovative employee behaviour: The moderating effects of mental involvement and job satisfaction on contextual variables. *European Journal of Innovation Management, 16(3), 268-284.*

Campanella, F., Della Peruta, M. R., & Del Giudice, M. (2015). The effects of technological innovation on the banking sector. *Journal of the Knowledge Economy*, *8*(1), 356-368.

Carbó-Valverde, S., Cuadros-Solas, P.J., Rodríguez-Fernández, F. (2021). FinTech and Banking: An Evolving Relationship. In: King, T., Stentella Lopes, F.S., Srivastav, A., Williams, J. (eds) Disruptive Technology in Banking and Finance. Palgrave Studies in Financial Services Technology. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-81835-7_6

Chen, A. M., Wu, Q., Yang, B. (2019). How Valuable Is FinTech Innovation?, *The Review of Financial Studies*, Volume 32, Issue 5, May, Pages 2062–2106, https://doi.org/10.1093/rfs/hhy130

Christensen, C. M. (1997). The innovator's dilemma: when new technologies cause great firms to fail. Harvard Business Press.

D'Alvano, L., & Hidalgo, A. (2012). Innovation management techniques and development degree of innovation process in service organizations. *R&D Management*, *42*(1), 60-70.

Del Gaudio, B. L., Porzio, C., Sampagnaro, G., & Verdoliva, V. (2021). How do mobile, internet and ICT diffusion affect the banking industry? An empirical analysis. *European Management Journal*, *39*(3), 327-332.

Donnelly, J.H. (1991). Six Ss for new product success. Bank Marketing 23, 36-37.

Drucker, P.F. (1988). The Coming of the New Organization. Harvard Business Review, 45-53.

Dziallas, M., & Blind, K. (2019). Innovation indicators throughout the innovation process: An extensive literature analysis. *Technovation*, *29*(3), 80-81

Fasnacht, D., 2009. *Open Innovation in the financial services: Growing through openness, flexibility and customer integration*. Verlag Berlin Heidelberg: Springer.

Ferrer, M., & Santa, R. (2012). The interrelatedness of innovation competences, operational effectiveness and organizational processes. *Review of Management Innovation & Creativity*, *5*(14).

Fontin, J. R., & Lin, S. W. (2019). Comparison of banking innovation in low-income countries: A meta-frontier approach. *Journal of Business Research*, *97*, 198-207.

Frame, W. S., & White, L. J. (2014). Technological change, financial innovation, and diffusion in banking (pp. 1-5). Atlanta, GA, USA: Leonard N. Stern School of Business, Department of Economics.

Frishammar, J., Richtnér, A., Brattström, A., Magnusson, M., & Björk, J. (2019). Opportunities and challenges in the new innovation landscape: Implications for innovation auditing and innovation management. *European Management Journal*, *37*(2), 151-164.

Gajendran, T., Brewer, G., Gudergan, S., & Sankaran, S. (2014). Deconstructing dynamic capabilities: the role of cognitive and organizational routines in the innovation process. *Construction Management and Economics*, *32*(3), 246-261.

Greuning, H. V., & Bratanovic, S. B. (2009). Analyzing Banking Risk: A Framework for Assessing Corporate Governance and Risk Management, Third Edition. World Bank.

Harris, M., Cox, K. C., Musgrove, C. F., & Ernstberger, K. W. (2016). Consumer preferences for banking technologies by age groups. *International Journal of Bank Marketing*.

Heredia, J., Castillo-Vergara, M., Geldes, C., Carbajal Gamarra, M. F., Flores, A., Heredia, W. (2022). How do digital capabilities affect firm performance? The mediating role of technological capabilities in the "new normal", *Journal of Innovation & Knowledge,* 7 (2). https://doi.org/10.1016/j.jik.2022.100171

Hirshleifer, D., Low, A., & Teoh, S. H. (2012). Are overconfident CEOs better innovators?. *The journal of finance*, *67*(4), 1457-1498.

Huo, J., & Hong, Z. (2013). The Rise of Service Science. In Service Science in China (39-68). Springer Berlin Heidelberg.

Jakšič, M., & Marinč, M. (2019). Relationship banking and information technology: the role of artificial intelligence and FinTech. *Risk Manag* **21,** 1–18. https://doi.org/10.1057/s41283-018-0039-y

Kapidani, M., & Luci, E. (2019). The Effects on Innovation from Financial Sector Development: Evidence from Developing Countries. *Journal of Competitiveness,* 11(2), 84–94. https://doi.org/10.7441/ joc.2019.02.06

Lee, C.-C., Li, X., Yu, C.-H., & Zhao, J. (2021). *Does fintech innovation improve bank efficiency? Evidence from China's banking industry.* International Review of Economics and Finance, 74, 468–483. https://doi.org/10.1016/j.iref.2021.03.009

Li, C., He, S., Tian, Y., Sun, S., & Ning, L. (2022). Does the bank's FinTech innovation reduce its risk-taking? Evidence from China's banking industry, Journal of Innovation & Knowledge, 7 (3), https://doi.org/10.1016/j.jik.2022.100219.

Littler, D., & Melanthiou, D. (2006). Consumer perceptions of risk and uncertainty and the implications for behavior towards innovative retail services: the case of internet banking. *Journal of retailing and consumer services*, *13*(6), 431-443.

Löfsten, H. (2014). Product innovation processes and the trade-off between product innovation performance and business performance. European Journal of Innovation Management, 17(1), 61-84.

MacDonald, T. J., Allen, D. W., & Potts, J. (2016). Blockchains and the boundaries of self-organized economies: Predictions for the future of banking. In *Banking beyond banks money* (pp. 279-296). Springer, Cham.

Marinković, S. (2012). *Menadžment inovacija u uslugama*, Zadužbina Andrejević, Belgrade.

Marinković, S., Jovanović, M, Petković, J. (2017) *Co-creation as innovation model in ICT based services,* International Conference for Entrepreneurship, Innovation and Regional Development, ICEIRD, City college, University of Sheffield, Thessaloniki, Greece, pp. 285-292.

Marinković, S., Levi Jakšić, M., Manić, B. (2011). Service innovations based on ICT implementation - roles of NSD participants, *TTEM - Technics Technologies Education Management, DRUNPP, 5/6,* 6 (2), 438-446.

Milošević N, Tošković O, Barjaktarović Rakočević S. (2019). Does perceived top management involvement and knowledge sharing affect perceived project performance?

Evidence from the banking sector, JEEMS Journal of East European Management Studies, 24(2) pp. 259 – 279, https://doi.org/10.5771/0949-6181-2019-2-259

Milosevic, N., Dobrota, M., Dmitrovic, V., & Barjaktarovic Rakocevic, S. (2021). Managerial Perception of Human Capital, Innovations, and Performance: Evidence from Banking Industry. *Engineering Economics*, *32*(5), 446-458. DOI: 10.5755/J01.EE.32.5.26032

Mousavi, S. F., Azar A., Khodadad, S. H. (2021). Success factors of innovation management in the banking industry using the grounded theory approach. Journal of Industrial Engineering and Management Studies. 8(2), pp. 138-159. DOI: 10.22116/jiems.2022.138127

Ngo, N. D. K., Le, T. Q., Tansuchat, R., Nguyen-Mau, T., & Huynh, V. N. (2022). Evaluating innovation capability in banking under uncertainty. *IEEE Transactions on Engineering Management*.

Norveel, J., Gonzalez, R., & Presthus, W. (2022). Basic digital competence in Norwegian banking. *Procedia Computer Science*, *196*, 183-190.

Oliveira, P., & von Hippel, E. (2011). Users as service innovators: The case of banking services. *Research policy*, *40*(6), 806-818.

Porter, M.E. & Ketels, C.H.M. (2003). UK Competitiveness: Moving to the Next Stage. DTI Economics Paper No 3, URN 03/899.

Qamruzzaman, M., & Jianguo, W. (2018). Investigation of the asymmetric relationship between financial innovation, banking sector development, and economic growth. *Quantitative finance and economics*, *2*(4), 952-980.

Rao, A., & Verweij, G. (2017). Sizing the prize: What's the real value of AI for your business and how can you capitalise. PwC Publication, PwC.

Schilling, M. A., & Shankar, R. (2019). *Strategic management of technological innovation*. McGraw-Hill Education.

Schuchmann, D., & Seufert, S. (2015). Corporate learning in times of digital transformation: a conceptual framework and service portfolio for the learning function in banking organisations. *International Journal of Corporate Learning (iJAC)*, *8*(1), 31-39.

Serinkan, C., & Kızıloğlu, M. (2015). Innovation management and teamwork: an investigation in Turkish banking sector. Journal of Management Policies and Practices. 3 (1), pp. 94-102. http://dx.doi.org/10.15640/jmpp.v3n1a11.

Siek, M., & Sutanto, A. (2019). Impact Analysis of Fintech on Banking Industry. *2019 International Conference on Information Management and Technology (ICIMTech)*.doi:10.1109/icimtech.2019.8843

Story, V., O'Malley, L., & Hart, S. (2011). Roles, role performance, and radical innovation competences. *Industrial Marketing Management*, *40*(6), 952-966.

Strategic Innovation Group. (2002). A framework for strategic innovation. Retrieved from: http://www.raumer.com/articles%20and%20presentations/Strategic%20Innovation%20White%20Paper.pdf

Sund, K. J., Bogers, M. L. A. M., & Sahramaa, M. (2021). Managing business model exploration in incumbent firms: A case study of innovation labs in European banks. *Journal of Business Research, 128, 11–19*.doi:10.1016/j.jbusres.2021.01.059.

Talib, F., Rahman, Z., and Qureshi, M. N. (2012). Impact of total quality management and service quality in the banking sector. *International Journal of Telecommunications System and Management*, 1(2).

Thakor, A. V. (2019). Fintech and banking: what do we know? *Journal of Financial Intermediation, 100833*.doi:10.1016/j.jfi.2019.100833.

Thwaites, D. & Edgett, S. (1991). Aspect of innovation in turbulent market environment: empirical evidence from UK building societies. The Service Industries Journal 11(3), 346-361.

Tidd, J., & Bessant, J. R. (2020). *Managing innovation: integrating technological, market and organizational change*. John Wiley & Sons.

Tinnilä, M. (2012). Impact of future trends on banking services. *Journal of Internet Banking and Commerce*, *17*(2), 1.

Tornjanski, V. & Čudanov, M. (2021). Towards Society 5.0 Era: Organisational Empowerment of the Sustainable Future. In Proceedings of the 3rd Virtual International Conference: Path to a Knowledge Society - Managing Risks and Innovation (pp. 413-422), Niš, Serbia.

Tornjanski, V., Čudanov, M., & Săvoiu, G. (2015). A holistic approach to innovation management in banking: a review. Econophysics, Sociophysics & Other Multidisciplinary Sciences Journal (ESMSJ), 5(2), 8-15.

Tornjanski, V., Knežević, S., & Delibašić, B. (2017). A CRM performance measurement in banking using integrated BSC and customized ANP-BOCR approach. Management: Journal of Sustainable Business and Management Solutions in Emerging Economies, 22(1), 71-85.

Tornjanski, V., Knežević, S., & Milojević, S. (2020). Synergetic effects of integrated collaboration between humans and smart systems in banking: An overview. In XVII International Symposium SYMORG.

Tornjanski, V., Marinkovic, S., & Jancic, Z. (2017a). Towards sustainability: Effective operations strategies, quality management and operational excellence in banking. Amfiteatru Economic, 19(44), 79-94.

Tornjanski, V., Marinković, S., Levi Jakšić, M., and Bogojević Arsić, V., (2015). The prioritization of open innovation determinants in banking. *Industrija*, 43(3), 81-105.

Tornjanski, V., Marinković, S., Levi Jakšić, M., and Bogojević Arsić, V., (2015b). The prioritization of open innovation determinants in banking. Industrija, 43(3), 81-105.

Tornjanski, V., Marinković, S., Săvoiu, G., & Čudanov, M. (2015a). A need for research focus shift: Banking industry in the age of digital disruption. Econophysics, Sociophysics & Other Multidisciplinary Sciences Journal (ESMSJ), 5(3), 11-15.

Uchupalanan, K. (2020). Competition and it-based innovation in banking services. International Journal of Innovation Management. 4 (4) pp. 455–489.

Uzkurt, C., Kumar, R., Kimzan, H. S., & Eminoğlu, G. (2013). Role of innovation in the relationship between organizational culture and firm performance: A study of the banking sector in Turkey. *European Journal of innovation management*.

Zineldin, M., & Vasicheva, V. (2015). Banking and financial sector in the cloud: knowledge, quality and innovation management. In *Cloud Systems in Supply Chains*. pp. 178-194. Palgrave Macmillan, London.