

## IMPLEMENTATION OF DIGITAL INNOVATION IN BANKING SECTOR

Aleksandar Vekić<sup>45</sup>

Jelena Borocki<sup>46</sup>

Angela Fajsi<sup>47</sup>

DOI: <https://doi.org/10.31410/EMAN.2018.134>

---

**Abstract:** *The new era in banking can rightly be called digital. Development of internet technologies and modern solutions for banks operating are providing a high level of changes in business models. Digital banking is rapidly growing area where users quickly and easily adopt new changes, because they understand their importance in facilitating everyday life. Emphasis is placed on the improvement of the payment system and development of all its segments. The introduction of innovations in the banking sector also leads to an improvement in the quality of services, development of employees, leads to better recognition in a very competitive market, strengthening the stability of banking business with increased revenue and higher growth rate. This applies in particular to the ubiquitous use of modern technology, IT solutions and software, in the functioning of financial services, giving them an entirely new dimension and creating a new concept called FinTech. The expectations are that these changes will accelerate even further, the longer - term impact on the bank's operating income will be even greater and the performance of services more efficiently. This will allow the banking sector to survive and adapt in very challenging time, and lead to sustainable development. Therefore, it is necessary to pay special attention to the impact of innovations on the digital world in banking.*

**Key words:** *digital innovation, banks, FinTech, payment system, development*

---

### 1. INTRODUCTION

In recent years, the banking sector has been exposed to great changes, especially in the area of digitization and modern technologies. The banking sector is the part of the economy which consists of banks and other financial institutions which provide lending and investments. Using of new possibilities becomes one of the major themes in the business strategies of the banks. Every part of the banking business is covered by these changes, so not paying enough attention to this phenomenon, always leads to systematic problems, often too negative results or cessation of business. Innovation in digitization and technology has become increasingly important to the evolution of bank retail delivery system and the development of new electronic retail products [1]. This kind of innovation requests a high level of investment, so banks need to plan innovation activities and provide enough funds for their realization. One of the important question is: Where is the investment limit and what is the relationship between invested vs. achieved? In the modern banking business is increasingly tilted to the development of mobile banking, and services that promote its easy execution. Implementation of digital innovations goes through bank terminals, automated teller machines, internet banking, mobile banking and products such as digital wallet, blockchain technology system (introduction of digital currency in the payment process), etc. Using of modern automated computer programs allows for users to get a financial advice courtesy, so no human interaction required. A high

---

<sup>45</sup> Assistant - Master, Faculty of Technical Sciences, Trg Dositeja Obradovica 6, Novi Sad, Serbia

<sup>46</sup> Associate professor, Faculty of Technical Sciences, Trg Dositeja Obradovica 6, Novi Sad, Serbia

<sup>47</sup> Assistant - Master, Faculty of Technical Sciences, Trg Dositeja Obradovica 6, Novi Sad, Serbia

level of innovation, transforming banking sector and changing the face of the existing banking system. The reasons for these rapid changes should be sought after development of a new technology, arises of new competitors, growth of users' expectations, etc. One of the main question is how this system will be transformed? It is necessary to create models that would enable the introduction of digital innovations in a fast, efficient and easy way. Through development of different models for this purpose, future research will be directed at finding the optimal model according to the given parameters such as: time of introduction, the level of needed changes, potential obstacles, harmonization level of applicable laws, the relation between cost and revenue, etc. Timely response to new changes, leads to the improvement of the business model, avoidance of negative consequences that can arise due to neglect of future trends.

## **2. NEW TRENDS IN THE BANKING SECTOR**

Banks try to discover the latest technology advances and use them, so very important is to use cloud - based infrastructure for each segment, even for providing consumer or commercial credits. Implementation of new innovation is driven by other factors, such as new regulatory requirements, delivery architectures, IT and mobile technologies, qualifications and knowledge of employees, market rules, customer requirements, competitors, etc. An important task for banks is to establish innovate operating environment, simplifies design and development of new banking products and services. As technology provides consumers with new, smarter options, there's been a seismic shift in the banking industry [2]. Banks are in a state of transition – both physically and digitally [3]. The majority of traditional banks is not using available technologies in a sufficient manner in order to modernize and transform their operations [4]. During that time, technologically advanced competitors have recognized that modern business has to be digitized, starting to position themselves as financial institutions of the future [4]. Companies who base their business on online and/or mobile presence exclusively have attracted clients who lost their confidence in traditional financial institutions during the crisis and/or clients who demand different banking services - personalized, interactive, with better understanding for the client's daily needs [4].

World analysts recommend for banks to follow all new aspects and implement some of those features in their business. Banks that honestly and realistically their digital maturity, and create a digital strategy based on such an assessment, will concentrate on developing capabilities that facilitate digital services, rather than automated services [4].

Gartner has developed a set of impact statements and associated recommendations to help bank CIOs and direct reports identify the challenges and opportunities that leveraging new digital technologies and providers – in the banking niches and beyond-present [5].

Impacts	Some of the possible solutions
The urgent need to improve customer experience is driving Bank CIOs to acquire or partner for design and customer experience development	<ul style="list-style-type: none"> <li>- Acquire customer engagement expertise from providers outside financial services</li> <li>- Evaluate those digital banking providers that have architecture to support traditional and mobile browsers as well as a native and hybrid mobile technology</li> </ul>
Rapidly changing technology and customer environments are forcing bank CIOs to be more agile and constantly create new digital banking capabilities	Bimodal IT framework to segment IT's management of demand for operational efficiency and digital innovation through the bank
The increasing commoditization of existing products, as well as disruption from banks and nonbanks, are leading bank CEOs and CIOs to create new sources of innovation and revenue.	CIOs should expand their understanding of emerging financial technology startups, as well as bank activities to identify potential partners and technologies that can support digital innovation.

**Table 1.** Impacts and some of the possible solutions for digital banking innovations [5]

According to McKinsey survey, its defined six design trends which creating value in winning and retaining customers [6]:

**Personalization** - process involves using advanced analytics to tailor an experience to a specific individual. Banks can personalize a site experience based on browsing history and other sources to show content that's relevant to the customer. One bank tailors its pages to feature products that a visitor is qualifies for based on analysis of that person's browsing and social history.

**Instant gratification** - Conditioned by real-time ride hailing, one-click shopping, and same-day delivery services, digital customers are coming to expect instant gratification constantly. Some banks are experimenting with a visual interactive voice response technology for resolving a problem immediately, obtain digital signature or upload a new document needed to process a loan or claim.

**Simplification** - process of simplifying the customer experience, while factoring in regulatory necessities and security.

*Aleksandar Vekić was born on August 27th, 1985, in Knin, Republic of Croatia. In 2009, he graduated the field of marketing at the Faculty of Economics in Subotica.*



*He obtained the master's degree at the Faculty of Technical Sciences Novi Sad in 2013, field of Investment Management. He is currently a Ph.D. student of the final year of doctoral studies at the Faculty of Technical Sciences in Novi Sad, where he is also employed as an Assistant at the Department of Industrial Engineering and Management. His current professional orientation is in the field of entrepreneurship and innovation. He has authored several scientific papers and participated in a scientific research project of the Ministry of Education, Science and Technological Development. He was part of the winning team for the Best Technological Innovation of Serbia in 2015, with the innovation Banking kiosk - ATM +. In 2016, with a group of doctoral students, he represented Serbia at the international competition ECOTHROPHELIA EUROPE in Paris.*

**Automation** - process which speed-up and simplify back - end processes, and has an important role as a design feature.

**Ubiquity** - involved services which provide benefits for customers such as watch program on one device, and to resume watching on the other. New tools help banks to understand customers' preferences when it comes to device and channel.

**Gamification** - implies the process of designing game-like features to help customers to make better financial choices through “nudges”, a behavioral science concept that uses small suggestions and rewards to affect change.

“New generation of banks are not just banks, which are involved in the implementing a new strategy for the sake of survival. But, banks who are involved in the process of creating a paradigm shift to overcome the ever-changing market requirements and customer preferences by the way they organize the internal and external activities, and initiatives by considering traditional human values and using modern technology. That may result in creating larger revenues by properly investing and managing the funds to create optimum profit and goodwill for the long run of the business can be considered and proved as sustainable” [7].

Development of a new generation of banks includes research and using benefits of modern platforms and services such as: Internet, Society for Worldwide Inter-Bank Financial Telecommunications (SWIFT), Automated teller machines (ATMs), Cash dispenser, Electronic Clearing Service, Bank net, Chip card, Phone banking, Tele - banking, Internet Banking, Mobile Banking, Anywhere banking, Voice Mail, Kiosk, etc [7].

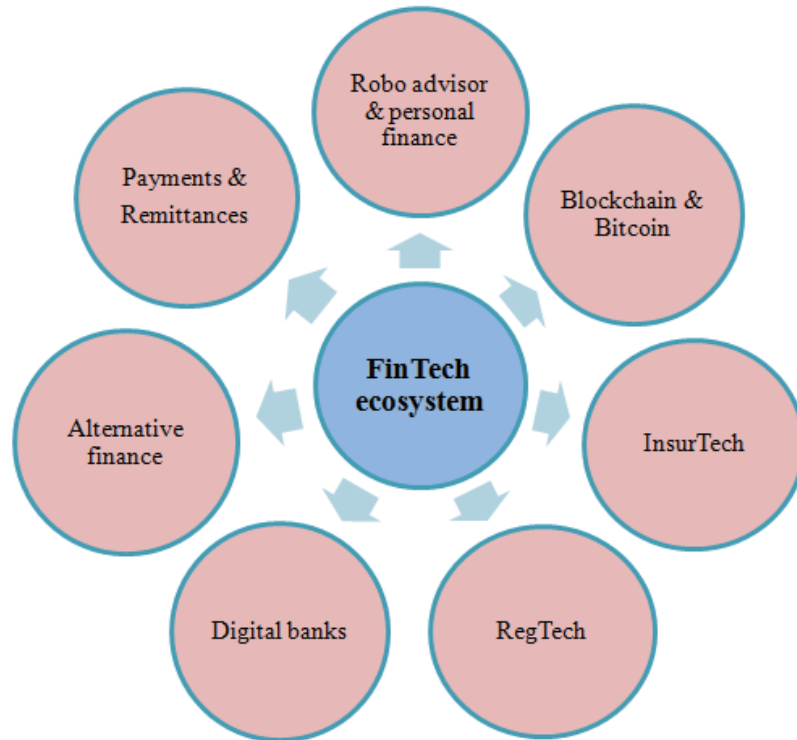
### 3. DIGITAL INNOVATION IN FUCTION OF FINANCIAL BUSINESS DEVELOPMENT

Digital revolution in the banking sector is far from over, and banks will need to continue to be innovative in order to attract new customers and improve their market position. The digitalisation of economies and societies is progressing with the increasing adoption and use of information and communication technologies (ICTs) and the continuous migration of social and economic activities to the Internet (through digital services such as social networks, e-commerce, e-health and e-government) [8]. Digital innovation is the use of digital technology during the process of innovating. “Digital innovation has radically changed the nature and structure of new products and services, spawned novel value creation and value appropriation pathways, enabled innovation collectives that involve dynamic sets of actors with diverse goals and capabilities, produced a new breed of innovation processes, and, more broadly, transformed entire industries in its wake” [9]. According to these authors: digital innovation as the creation of (and consequent change in) market offerings, business processes, or models that result from the use of digital technology [9]. In the banking segment digital innovations are widespread, and include a high participation of modern technologies.

The new concept is called FinTech (Finance and Technology) describes a business that aims at providing financial services by making use of software and modern technology [10]. The FinTech is a new value proposition applied to financial services [11]:

- New offering of financial products and services,
- New process,
- New business model and,
- The intensive use of technology (cloud, mobile data, metadata, etc).

The users of the FinTech are [12]: 1) B2B for banks and 2) their business clients; and 3) B2C for small businesses and 4) consumers. Trends toward mobile banking, increased information, data and more accurate analytics and decentralization of access will create opportunities for all four groups to interact in heretofore unprecedented ways [12].



**Figure 1.** A highlight of FinTech ecosystem [13]

**Robo advisor** - incorporate automated, algorithm - based portfolio management advice into financial advice solutions. Digital advice may be delivered in a fully automated format or may supplement traditional advisory models [14].

**Blockchain and bitcoin**- A blockchain is essentially a distributed database of records or public ledger of all transactions or digital events that have been executed and shared among participating parties. Bitcoin is the most popular example that is intrinsically tied to blockchain technology [15]. Bitcoin is a so-called virtual currency (unit of virtual currency represents a value) that has been devised for anonymous payments made entirely independently of governments and banks [16]. Bitcoin is a transparent, peer to peer, electronic transaction system that based on complex cryptographic algorithms, as opposed to traditional payment systems based on trust [17].

**Insurtech**- can be defined as the result of the extensive use of technology in the insurance sector, materialized in new innovative products and services, and it is causing a revolution in that sector [18].

**RegTech**- the marriage of technology and regulation to address regulatory challenges has existed for some time with varying degrees of success. Increasing levels of regulation and a greater focus on data and reporting has however brought the RegTech offering into greater focus, thereby creating more value for the firms that invest in these solutions. Some of the key characteristics of RegTech are: agility, speed, integration, analytics [19].

**Digital banking-** implies a digitization process (or moving online) of all the traditional banking activities and programs that historically were only available to customers when physically inside of a bank branch [20]. This concern issues such as generating the supply, distribution and sales of financial products and services via digital channels, exploiting cutting-edge technology to know the customers better and anticipate their needs swiftly and suitably, and an omnichannel solution, or the possibility of customers communicating with their bank via all channels, both analogue and digital, as well as the automation of services [21]. It is generally expected that digital banking will give priority to the needs of end customers ahead of product creation, since they are the focal point for which the range of products and services on offer is defined and there is something of a consensus that the concept of digital banking above all applies to retail banking [21].

**Alternative finance-** Alternative finance is the term coined to represent forms of finance that stretch beyond the three traditional asset types (stocks, bonds and cash) [22]. According to Cambridge Centre for Alternative Finance, it's defined as instruments, channels, or systems of finance that emerge outside of the regulated banking system [23]. It makes use of technological innovations, such as alternative currencies, disintermediated business models and lending mechanisms to change the way finance has been carried out traditionally. Some of the forms of alternative finance are: crowdfunding, online marketplace lending, pension led funding, etc.

**Payment and remittances-** “A payment is the transfer of one form of good, service or financial asset in exchange for another form of good, service or financial asset in proportions that have been previously agreed upon by all parties involved. Payment can be made in the form of funds, assets or services” [24].

**Jelena Borocki** is Associate Professor at University of Novi Sad, Republic of Serbia, Faculty of Technical Science, Department of Industrial Engineering and Engineering Management. Her principal



subjects/occupational skills are: entrepreneurship, innovation management, strategic development and strategic position and action evaluation in SMEs. She is specialized consultant for innovation and organizational development in SME sector.

Besides her academic background, she's got more than 15 years of experience as a consultant for entrepreneurial and innovative activities in SMEs, working as a certified consultant in Adizes Southeast Europe-Novisad and as a consultant in Agency for small and medium enterprises “Alma Mons” in Novi Sad.

She is trained to use IMP<sup>3</sup>ove methodology for innovative companies. She has been involved as a researcher in the three projects funded by the National Ministry of Science and Technology Development (one of them is “The Best Technology Innovation Competition”), and also as an innovation consultant – short term expert in a few EU funded development projects focusing SME development innovation and competitiveness:

**Promoting Entrepreneurship in the High-Tech Area;**

**COMPLEXIM** - Complex Cross-Border Knowledge Transfer Activities for Innovation Management;

**DANUBE PIE** - Specific action “To promote Eco-design among SME manufacturers; Call for proposals ENT/CIP/12/D/N04S00, № 333009, “Danube PIE”. Full name: Product Innovation through Eco-design in the Danube region. Duration: 1/4/2013 - 31/12/2014.

**MAIN** - Mastering innovation in Serbia through development and implementation of interdisciplinary post-graduate curricula in innovation management (Project Number: 544278-TEMPUS-1-2013-1-RS-TEMPUS-JPCR, 2014-2016)

Action “Establishing services enhancing the innovation management capacity of SME's in the Enterprise Europe Network”, Horizon 2020 - Research and Innovation Framework Programme, Project No. 643359 — EEN INNO (1/07/2014 - 31/12/2014) EEN H2020 SGA/GA as the KAM expert

“A remittance is the funds an expatriate sends to their country of origin via wire, mail, or online transfer” [25]. Popular services for this purpose are: PayPal, Western Union, MoneyGram, Wari, etc. These peer to peer transfers of funds across borders are economically significant for many countries that receive them [25].

FinTech as a modern financial sector is characterized as a battle between old technologies and systems with the new. High growth of FinTech industry, is followed by the digital revolution and speedy implementation of new solutions. Global investment in FinTech companies had tripled in 2014, compared to 2013, and reached the amount of \$12,21 billion. According to the last report of KPMG, in the Q1'17, global investment in FinTech companies hit \$3,2 billion across 260 deals [26].

#### 4. CONCLUSION

The progress that is seen in the field of digital banking is unstoppable. Banks need to allow a sufficient level of development through implementation of innovation. For this purpose, detailed development programs have to be created and that requires a high level of investment. If banks want to be digital winners, three behaviors are important: act open, collaborate, invest and desire to reimagine [27]. Digitalisation leads to significant reduction in costs and increased efficiency in operations. In modern business conditions, that is one of the major requests. Also, user experience should be raised at a new dimension and modernizing, so this process enables them to permanently connect to a bank or other financial service provider. The way of execution of financial and payment services, today necessarily includes personalization and automation of the services. The banking sector is a very complex system with high influence on the economy and society as a whole, so careful managing with the changing process are an important factor in that successful transformation. By a detailed insight into the current literature, it is possible to notice the high level of development of FinTech industry in particular, which is the carrier of the digitisation process in the banking sector. Creating of FinTech ecosystem and development of all participants, improve the basis for further development, especially in the emerging countries. In future research, as this segment will further develop, it will be possible to analyze the connection between all important parts of the system, as well as assessing their contribution to the system as a whole. The forecasts are that the funds invested in this area will be increased, so the progress will be more pronounced. We can say with certainty that new tools and mechanisms which will change the face of banking business, will also appear, and change human life in a completely new direction.

#### ACKNOWLEDGEMENT

The authors acknowledge the financial support of the Ministry of Education and Science of the Republic of Serbia, within the Project No. 47028

*Angela Fajsi was born on August 10th, 1987. in Vrbas, Republic of Serbia. In 2010 Angela obtained master degree in the field of Engineering management at the Faculty of Technical*



*Sciences, University of Novi Sad. She is a Ph.D. student of the final year of doctoral studies at the same faculty, where she is also employed as an Assistant at the Department of Industrial Engineering and Management. Her main interests are in value networks, clusters and project management. She has authored several scientific papers and participated in a several projects financed by European Bank for Reconstruction and Development (EBRD) and domestic funds (Vojvodina Provincial Secretariat for economy and tourism, City of Novi Sad Council). She has received several awards for best students and in 2012, she was a part of winning team on the competition PRilika for best problem solving idea.*

## REFERENCES

- [1] Furst, K. Lang, W.W, Nolle E.D (1998). Technology innovation in banking and payments: Industry trends and implications for banks. Quarterly Journal. Vol. 17. No.3.
- [2] Moore, P. (2015). The future of banking. Management, 16.
- [3] Wyson - Constantine, H. (2016). Laying a Foundation for Innovation. ABA Banking Journal.
- [4] Krstic, N. Tesic, D. (2016). Digital disruption of the banking industry- threat or opportunity. Bankarstvo, Vol. 45, Issue. 2
- [5] Gartner (2016). Digital innovation in banks: IT infrastructure modernization accelerates progress. Available at: [https://www.gartner.com/imagesrv/media-products/pdf/red\\_hat/redhat-1-31ERJ3D.pdf?7016000000ldoJAAQ](https://www.gartner.com/imagesrv/media-products/pdf/red_hat/redhat-1-31ERJ3D.pdf?7016000000ldoJAAQ)
- [6] McKinsey Company (2016). Six digital trends that are changing banking. Available at: <http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/digital-blog/six-digital-design-trends-that-are-changing-banking>
- [7] Kumar, A. S. Venkatrama, D. R. (2015). A study on banking services of new generation of banking. International Journal of Science and Research. Vol. 4, Issue 10.
- [8] OECD (2016). "Stimulating Digital Innovation for Growth and Inclusiveness: The Role of Policies for the Successful Diffusion of ICT." OECD Digital Economy Papers. No. 256. OECD Publishing, Paris.
- [9] Nambisan, S. Lyytinen, K. Majchrzak, A. Song, M. (2017). Digital innovation management: Reinventing innovation management research in a digital world. MIS Quarterly. Vol. No. 1, 41, pp. 223-238.
- [10] FINTECH WEEKLY (2017). FinTech definition. Available at: <https://fintechweekly.com/fintech-definition>
- [11] Pailhon, J.M. (2017). FinTech: Digital innovation in the Finance industry. Available at: <https://www.slideshare.net/jmpailhon/fintech-digital-innovation-in-the-financial-industry>
- [12] Investopedia (2017). FinTech. Available at: <http://www.investopedia.com/terms/f/fintech.asp>
- [13] Business Insider (2016). The fintech ecosystem explained. Available at: <http://www.businessinsider.com/fintech-ecosystem-financial-technology-research-and-business-opportunities-2016-7>
- [14] BlackRock (2016). Digital investment advice, Robo advisor come of age. Available at: <https://www.blackrock.com/corporate/en-at/literature/whitepaper/viewpoint-digital-investment-advice-september-2016.pdf>
- [15] Sutardja Center for Entrepreneurship & Technology Technical Report (2015). BlockChain Technoogy beyond bitcoin, Berkeley University of California. Available at: <http://scet.berkeley.edu/wp-content/uploads/BlockchainPaper.pdf>
- [16] Segendorf, B. (2014). What is bitcoin? Sveriges Riksbank Economic Review.
- [17] Skakavac, A. (2017). Bitcoin – Controversies and dilemmas. Conference EMAN 2017 Conference Proceedings – Economics & Management: Globalization Challenges, PP. 240-254. Ljubljana, Slovenia.
- [18] BBVA Research (2016). InsurTech and the disruptive insurance ecosystem, Digital economy outlook. Available at: [https://www.bbva.com/wp-content/uploads/2016/10/DEO\\_Oct16\\_Cap4.pdf](https://www.bbva.com/wp-content/uploads/2016/10/DEO_Oct16_Cap4.pdf)
- [19] Delloite (2015). RegTech Is The New FinTech, How Agile Regulatory Technology Is Helping Firms Better Understand and Manage Their Risks. Available at: <https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/financial-services/performancemagazine/articles/lu-how-agile-regulatory-technology-is-helping-firms-better-understand-and-manage-their-risks-24052016.pdf>



- [20] AVOKA (2016). What is digital banking? Available at: <http://www.avoka.com/blog/what-is-digital-banking/>
- [21] Cuesta, C. Ruesta, M. Tuesta, D. Urbiola, P. (2016). The digital transformation of the banking industry. Digital economy watch. BBVA Research.
- [22] Syndicate Room (2018). Definition of alternative finance. Available at: <https://www.syndicatoroom.com/learn/glossary/a/alternative-finance>
- [23] Cambridge Centre for Alternative Finance (2017). Alternative finance. Available at: <https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/>
- [24] Investopedia (2017). Payment. Available at: <http://www.investopedia.com/?ad=dirN&qo=investopediaSiteSearch&qsrc=0&o=40186>
- [25] Investopedia (2018). What is remittance? Available at: <https://www.investopedia.com/terms/r/remittance.asp>
- [26] KPMG (2017). The pulse of FinTech Q1 2017- Global analysis of investment in fintech. Available at: <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2017/04/pulse-of-fintech-q1.pdf>
- [27] Skan, J. Dickerson, J. Masood, S. (2015). The future of Fintech and banking: digitally disrupted or reimagined? ACCENTURE. Available at: [https://www.accenture.com/\\_acnmedia/Accenture/ConversionAssets/DotCom/Documents/Global/PDF/Dualpub\\_11/Accenture-Future-Fintech-Banking.pdf#zoom=50](https://www.accenture.com/_acnmedia/Accenture/ConversionAssets/DotCom/Documents/Global/PDF/Dualpub_11/Accenture-Future-Fintech-Banking.pdf#zoom=50)