Oct 31st, 9:00 AM - 10:30 AM

An Investigation of the Effects of Digital Technologies on Business Processes: The Case Study of Banking Sector

Ylber Limani
University for Business and Technology, ylber.limani@ubt-uni.net

Teuta Gazideda
University for Business and Technology - UBT

An Investigation of the Effects of Digital Technologies on Business Processes: The Case Study of Banking Sector

Ylber Limani[1], Teuta Gazideda[1]
[1] UBT College, Prishtina,
ylber.limani@ubt-uni.net, teuta.gazideda@raiffeisen-kosovo.com

Abstract. The purpose of this paper is to analyse and discuss the importance of Digital Technology in Banking business processes. There is a valuable evidence in the literature and within the banking business practices showing the processes of digitalization in the banking system is getting more frequent. In this regard, this research observes the implementation of digital technology in banking business processes and their role on the development of the distribution network through financial institutions. The digital technology implementation within the banking industry is assumed to have faced difficulties when comes to prove the overall bank productivity and cost reduction. The qualitative research is conducted with the aim of selecting and analysing primary data, and the survey research is conducted aiming at quantitative data analyses throughout a structured questionnaire. The main assumption articulated in this research is that the implementation of digital technology significantly increases the productivity of bank operations. The subsequent assumption is about the return on investment on digital technology in banking sector.

Keywords: Digital technology, digitalization, business process, digital transformation, return on investment.

1. Introduction

This paper presents a comprehensive discussion of the possibilities for providing banking services based on digital technology.
In the banking system digitalization is the implementation of digital technology in banking operations. Nowadays it is not really new thing, nonetheless, it is become a necessity for banks in meeting the needs and requirements of customers.
We explained the banking system based on digital technology as an interaction of digital components and their transition from the traditional procedure and activities to the online platforms and activities.
Digital banking operations are technology-based operations which transforms the way banks offering their services and the way customers experience being valued.
The main goal of banking operations remains operations efficiency. However, the adoption of technological innovations is accompanied with many risks, among others with the risk to fail. The operations risk in banking sector may have various potential hazardous sources.
Changing circumstances related to technology implications and the ever-changing demands in this sector may be considered a potential source of risk. This research discussed the digital technology implications on the productivity of banking operations.
Though, digital technology in the banking sector has its own positive contributions and is positioned and accepted as a factor of economic development in general, there are also challenges businesses face during and after digital technology adoption.
The focus of this research is the examination of the adoption of digital technology in banking operations.
In this field of research, the present impact of digital technology in banking operations is become a very discussed topic among many authors. Consistently, this research developed a discussion related to the aspects of existing situation in banking sector in a developing country and justified the application of digital technology in banking operations.
The problem identified in this research is approached qualitatively and quantitatively and is addressed by research questions related to the impact of digital technology on the bank productivity. The assumptions are formulated based on research questions.

The expected results from the research are the confirmation that digital technology has influenced the growth and improvement of performance in commercial banks. Technology has improved operations efficiency, reduced transaction time, transaction costs and return on investment.

2. Literature research

Retail Banks have historically strong branch network. They added ATMs in the 1970s, call centres in 1980, the internet in the 1990s and are now adding mobile in the 2000s. (Skinner 2014).
The corporate client has been transformed by this process using more and more technology-based services, and processes that allow them to manage business on a globalized, 24X7X365 basis. (Skinner 2007)
Customers demand seamless and transparent services on a globalized 24X7 X 365 basis (Skinner 2007)

The growth in e-commerce continues and has even been praised as one of the few high points in the otherwise flat economic landscape in the new millennium. This time every country is more ready to accept Internet as a new battleground for business. Governments could influence rate and nature of adoption of technology and applications (Hakman A.Van 2006).

The goal of the whole business is to "find and retain customers" and the only way this goal can be achieved is to create a competitive advantage by convincing buyers (potential customers) that what you have to offer it comes closer to meeting their particular needs at that moment and time. (Kotler, Armstrong 2011)

The secret sauce of these new innovative approaches, however, is really still down to the individuals driving that change on a day-to -day basis. This is not just about implementing the right technology or whether you integrate the social media or mobile into customer – facing strategy. This is about what drove these innovators to try something different, and where they see the industry going next. (King 2014)

Innovation can be the engine that drives progress and is a competitive advantage, ad hoc innovation is random. This coincidence does not provide a guarantee for the future and is considered gambling without knowing the chances / possibilities in advance. (Gardner 2009)

We believe in fact that a new specular wave of destruction in the global financial industry is taking shape and will keep gaining force and momentum, driven by technological innovation and digitalization, and this will drive in turn a number of incumbents to extinction. We believe then that, even in a safer way, a number of “old banks” will need to let to fail – not for political purposes, or because of the clash of “larger than life” egos. But just for allowing the best reallocation of resources and the creation of a newer better equilibrium will emerge (Scardovi 2016).

The role of technology in the banking industry can allow global economies to build a financial system before building financial infrastructure (Claessens 2001).

DeYoung refers to online banking as an "innovation process" that functions primarily as an auxiliary to physical divisions or branches to provide better banking services. (DeYoung 2007)

Open banking is based on applications, and analytics and offer access to everyone in an open marketplace. This is all about moving us from vertically integrated control structures to a marketplace of plug-and -play processes that are delivered through platforms. Banks therefore are moving from proprietary structures that they control to open platforms where everyone can play in their marketplace. Banks have the opportunity to be better positioned to open marked the digital platform that allows open marketplaces to operate (Skinner 2018).

Information technology is defined as the collection, storage, operation, and transmission of information. It usually covers the connection of automated technology to a business's data needs to produce information. Since the beginning of 21 Century the authors Laudon and Laudon (2001) claim that Information Technology involves the physical hardware and software that connects computers and hardware components and the transfer of data from one physical location to another (Laudon and Laudon 2001).

Later authors described how gradually and steadily communication systems are becoming wireless systems and consequently computers are becoming mobile devices (Rajaraman 2018).

Digitization is explained from many authors from the early stages of the development. Anderson et al (2004) describes the digitalization as a process of converting information into a digital (i.e., computer-readable) format, in which the information is organized into bits. (Anderson et al, 2004)

Lemke (2003) defined digitization as "the ability to use digital technology, communication tools and / or networks to access, manage, integrate, evaluate and create information to function in a knowledge society (Lemke 2003)

Bulow (2011) defined digitalization as a complex enterprise that involves not only image capture, transcription, indexing and distribution, but also technical issues about online presentation, digital file management and digital storage (Bulow 2011).

The growth of the internet has influenced the development of new user expectations. It has encouraged a new generation of users not only expect all information to be available online, but also to expect that information to be fully accessible. (Bulow 2011)

Digital banking is part of the broader context for the move to online banking, where banking services are delivered over the internet. The shift from traditional to digital banking has been gradual and remains ongoing, and is constituted by differing degrees of banking service digitization. Digital banking involves high levels of process automation and web-based services and may include APIs enabling cross-institutional service composition to deliver banking products and provide transactions. It provides the ability for users to access financial data through desktop, mobile and ATM services. (Sharma, Gaurav 2017).

Wewege (2017) rises discussions about the security of retail banks and challenges these banks are facing after the financial crises of 2007-2008. The innovations in financial sectors have influenced the customer behaviour by creation of an favourable and accepted environment. However, the new thinking of millennials has been considered as disruptive change for financial services (Wewege 2017).

Internet banks distribute products and services such as insurance, securities, as well as banking products and services, despite of the fact that not all the products they distribute are produced by their business units (Delgado dhe Nieto 2004).

Rieker (2018) provides with the evidence of the emerging of safe alternatives due to the reduction of fraud level in the financial world. This is partly too be attributed to the digital technology capabilities to process operations automatically with higher control quality (Rieker 2018).

Banking operations are complex operations either from a hierarchical point of view or from the point of view of separate units. On the other hand, in different countries the complexity increases even more when it is known that the growth of the banking business is much higher than that of the economies of the countries. This implies that the role of digital technology is inevitable in complexity and risk management (Loader, 2007; Koskinen, Manninen 2019)

Investing in digital technology and new operating models requires considerable effort by banks, while at the same time exposing them to the risks associated with change. (Koskinen, Manninen 2019)

In the same way there is ongoing reinvention of the concept of banking, including the traditional branch network, it is likely the entire approach to branding will need to be reviewed, with marketers considering the toping by viewing it through an AI lens. (Boobier 2020).

Banking operations in Kosovo
From the literature review we learned that banking operations models need to be highly flexible and fast in order to be able to operate in very fast changing technological environment.
One way to achieve this is through design and practice to foster innovation and creativity. Models of banking operation based on digital technology are mostly the following: ATM Banking; Mobile Banking; Digital Wallet; POS; E-banking.

In order to increase the use of bank cards and the efficiency of payment services, as well as in order to adapt to EU standards, during 2019, the regulation on electronic payment instruments was amended. These changes are expected to affect the growth of bank card use by citizens (CBK 2020). Along with the growth in the number of payment terminals and instruments, statistical data show that 2019 was also characterized by an increase in the use of electronic payment instruments.

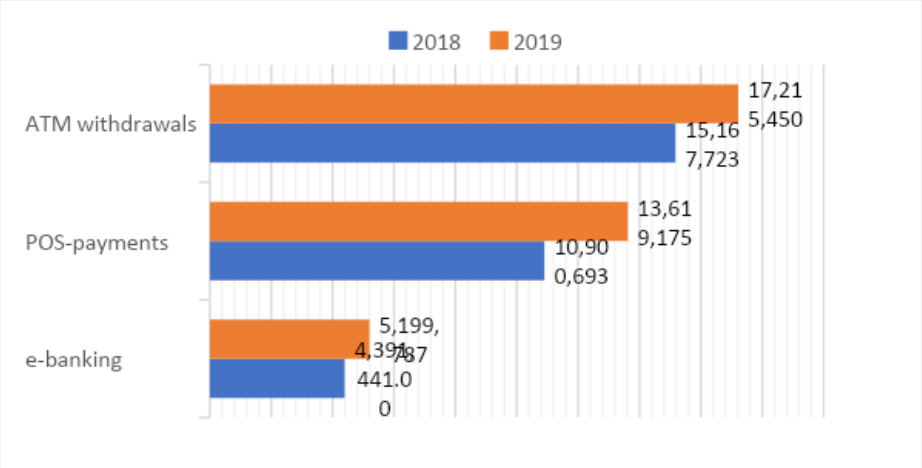

Fig.1 Annual transactions volume of electronic payments instruments in €

Based on statistical data, the development of digital infrastructure has resulted in a faster pace and the rapid growth trend in the use of electronic payment technologies remains encouraging (CBK 2020).
Competition and efficiency in the financial services markets are very important to any economy. Rapid developments in technology, modernization of the payments system, client services and increase of the efficiency of the banking system have already provided clients with numerous payment methods. The payment methods that clients choose are constantly changing (CBAK, 2020).

Digital wallet service

During September 2019, one of the commercial banks in Kosovo introduced a new payment product - digital wallet. This product means a mobile phone application, which is based on bank cards, and customers can conduct contactless payments at POS terminals at home and abroad. The payments via the digital wallet, from the time of launch of this product (September 2019) until the end of 2019 were evident. (CBAK 2020).

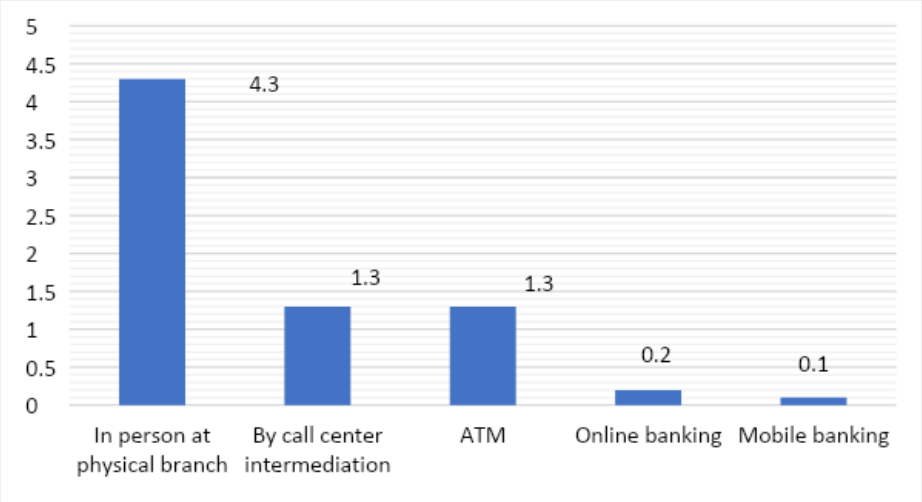

Fig 2: Impact of bank costs of transaction migration to mobile channel-the estimated cost of transaction in relation to the method utilized (ESFE, 2016)

With the digitalization of processes, the customer can choose the traditional service on the bank or other channels of online service, mobile banking or services in self-service machines. Providing banking services without intermediation or direct contact with bank employees allows the client to access services through information technology. Digital technology in the banking sector has its own contributions and is a factor of economic development. Banks need to commit promoting digitalization and staying competitive as the implementation of Digital Technology affects competitive advantage for Banks. Digitalization creates value in Banking Operations by enabling direct processing, automation and digitalization process. Banking services are provided in a limited and controlled environment to be more secure.
Digitalization is a tool for fostering innovation in all operational products and business models (EFSE, 2016; CBAK 2020).

3. Problem definition

This research discusses the effects of Digital Technology on banking operations and potential challenges thereof.
The effects on Banking Operations and Return on Investment are especially analysed with aim of synthesizing some of most important benefits banking sector is gaining due to the huge development and deployment of digital technology.
The literature research provided us with the wonderful insights of many authors, respectively with huge evidence showing the state-of-the-art in the studied context. We show interest to discuss the question whether the lmplementation of digital technology in the banking sector is ensuring return on investment and business growth of enterprises engaged in this process.

Financial Institutions, respectively banking sector is in the process of digital transformation into modern digital Banks. Banking operations require more sophisticated analysis and matured actions in order to succeed providing customers technology-based services. Literature research provided with plenty of evidence showing operations management methods in banking sector institutions are playing a great role in the whole process of business digital transformation.
The main assumption of this research is that digital technology has influenced the growth and improvement of performance in commercial banks.
The research focuses on the banking sector, banking operations and aims to prove the advantages of using digital technology and its methods in order to increase productivity and efficiency and return on investment in the banking system in Kosovo.
The leading building promises towards argument structuring in the hypothesis formulation are the following: a) technology has improved operations efficiency, reduced transaction time, transaction costs and return on investment.; b) digital technology enables Financial Institutions to remain competitive in the market. Consequently, the main conclusion, respectively the argument base supports the hypothetical declaration related to the benefits of digital technology implementation in banking sector.

The formulated hypotheses with the aim to explore the potential relationship between arguments in this paper, are distributed into one main simple hypothesis and two supportive hypotheses as follows:
Basic hypothesis: *the utilization of digital technology significantly increases the productivity of bank operations*.
Supporting hypotheses:
The utilization of digital technology increases the efficiency of bank operations (cost reduction)
The utilization of digital technology increases the effectiveness of bank operations (achievement of targeted results).

Since the study of digital technology types implemented in the banking sector is not in the scope of this research, hence, the effects of technology implementation on the productivity of bank operations are the main subject for discussion.

4. Research methodology

Research design, population selection, sample design, data collection procedures and data analysis are subject of analytical-qualitative and empirical-quantitative approach. Our research design aims to combine study relevance with the purpose of the research by implementing standard procedures concerned with regulation of conditions for the collection and analysis of data in a way that those data will provide us with the potential convincing results.
Descriptive analyses are deployed in the section of literature research aiming to provide the contextual spectrum of this research with the various thoughts and evidences different authors described and explained the impact of digital technology on the banking sector, respectively the transformation of banking sector operations into technology-based operations.
Quantitative research methods are used to explain phenomena by collecting numerical data that are analysed using basic mathematical (statistical) methods, i.e., SPSS software platform. The data are collected by conducting a survey with banking business representatives from main banking enterprises operating within the country.
A structured and closed-ended Likert scale questionnaire is deployed to 52 people engaged in daily and in strategic banking operations. Branch managers, IT managers and operations managers are three groups characteristic to this research.
In conclusion, the association method was used to analyse the sensitivity of the method provided for the impact of Digital Technology on Banking Operations from this research.

Our impression is that the results make well sense, notwithstanding, some of them were not expected. The reliability analyses conducted by the correlation analyses shows the results to be reliable since the main indicators such as corelation ratio and significance ratio appear to be sufficiently high.
Results may not be necessarily used for the generalisation proposes in the field of banking, however, they can be utilised as a supportive tool for researchers from the developing countries or other interested researchers and readers to get more informed about the state-of-the-art in the setting of digitalization effects in banking sector.
Since this research maybe quantified as an initial version in itself, the next extended version of this research topic will provide the readers with more specifics related to more wide-ranging market in the setting of banking industry and business operations digitalization process. The extended version is not expected to undermine the persuasively approach to the problem and the relevance of results obtained from this research.
Finally, we concluded that Financial Institutions are in the process of digital transformation into modern digital Banks. This process requires additional research to provide banking professionals with adequate technology-based knowledge and skills.

However, there is no significant evidence showing that the implementation of digital technologies in banking sector is strongly and positively correlated with the bank efficiency and bank effectiveness, respectively with the bank operations productivity. We decided to test the banks in Kosova in order to provide with more clarification in this context.

5. Results analyses

Hypothesis testing

We are aware that the results analyses based on statistical model may lack the accuracy due to the data breaches, nonetheless, we believe that the following hypothesis testing has provided with original variety related to the implementation of digital technology in banking operations productivity.

Basic Hypothesis: *the utilization of digital technology (DT) significantly increases the productivity (PR) of bank operation*s is strongly accepted. The Pearson correlation factor is appeared to be r= 0.799**, and the *p* value = 0.00. (accordingly, *p*=0.01).

Conferring to the Pearson correlation analyses requirements, these conditions provide with the very well-defined situations which support strongly acceptance of main hypothesis.

We may conclude that the digitalization of banking operations provides increased productivity in this industry. The limitations of this finding lie in the metrical expression of the productivity.

The first supportive hypothesis: *the utilization of digital technology (DT) increases the efficiency (EFI) of bank operations (cost reduction)* is also strongly accepted. The Pearson correlation factor is appeared to be r= 0.882**, and the *p* value = 0.00. (accordingly, *p*=0.01).

Conferring to the Pearson correlation analyses requirements these conditions are the very well-defined situations which support strongly acceptance of first supportive hypothesis.

The second supportive simple hypothesis *utilization of digital technology increases the effectiveness of bank operations (achievement of targeted results)* is strongly accepted. The Pearson correlation factor is appeared to be r= 0.747**, and the *p* value = 0.00. (accordingly, *p*=0.01).

Conferring to the Pearson correlation analyses requirements these conditions are the well-defined situations which support strong acceptance of second supportive hypothesis.

The banking officials should probably be interested to know more about the correlation of arguments expressed directly into productivity metrics (percentage or ratio). The next extended version of this research will provide the readers with advanced correlation analyses, i.e., regression analyses where metrics are expressed in causality terms.

The second assumption related to the return on investment in digital technology in banking sector may be adopted as relevant taking into account the productivity and consisting factors of effectiveness and efficiency are strongly increased as a result of digital technology implementation. Furthermore, this hypothesis could be a subject of a future study related to this study field.

6. Conclusions and recommendations

Banks have been challenged with changes in the economic and technological aspects in one side, and in the client needs and requirements in another side in the same time. The complexity of changes required from banks to increase the ability to cope with customer behaviour change and technology adoption.

Banks possesses the needed resources to digitally transform business processes and to increase the service level up to the desired level. The implementation of digital technologies in the banking sector has led banks to increase their efficiency and effectiveness, respectively to increase overall productivity.
The digital technology implementation effects are shown in reduction of transactions cost. The transaction cost reduction made this service to be the cheapest customer service.
With the implementation of digital technologies, the banking services are become more secure since the process environment is become more controlled. Clients are also provided with the data security services including encrypted passwords dedicated to their data security. The bank also offers data security while operating on the e-banking platform.
The implementation of digital technology has positively affected the competitive advantage for banks, since banks are enabled to offer a wide range of operational banking services based on digital technology. This trend is expected to continue in coming years and perhaps in coming decades.

Digital technology implementation created value in banking operations by enabling direct processing, automation and digitalization of service creation and service offering processes.
To end, we conclude that digitalization is a tool for fostering innovation in all operational products and business models, explicitly in the banking industry.

Since our second hypothesis is moderately accepted, we conclude that the research world discussing about the effectiveness of digital technology implementation should be focussed in more detailed indicators related to the effectiveness. The real-time response to the clients requests and real time transactions will require the implementation of sophisticated digital technologies such as Artificial Intelligence and maybe blockchain technology.

In the case the future developments will provide with the safe and original digital currencies, banks should be very prepared to make the biggest step to very digital transformation. Consequently, we recommend the future research to be directed in upcoming high impact of digital technologies in order to provide financial enterprises with more scientific insights for more secure and sustainable financial operations.

7. References

1. Skinner, C. (2007), *The Future of Banking in a Globalised World*, John Wiley& Sons
2. Hakman A. (2006) *Electronic Financial Services,*Chandos Publishing,Oxford
3. Kotler K & Amstrong G. (2011), Principles of Marketing , 2nd edition 1998 & 14th edition
4. King B. (2014), Breaking Banks,John Wiley & Sons Singapore Pte,LTD

5. Gardner, J. (2009), Innovations and Futureproof Bank, A practical guide to doing business- as --usual, John Wiley & Son LTD Publication
6. Scardovi, C. (2016) Restructuring and innovation in Banking,Alix Partners,LTD
7. Claessens, S., Glaessner, T. and Klingebiel, D. (2001), E-finance Emerging Markets: Is Leapfrogging Possible? Financial Sector, Discussion Paper, The World Bank, Vol. 7.
8. DeYoung, R., Lang, W. W. and Nolle, D. L. (2007), How the Internet affects Output and Performance at Community Banks, *Journal of Banking & Finance*, Vol. 31, pp. 1033–1060. England
9. Skinner, C.(2018), Digital Human, The fourth revolution of humanity includes everyone, Marshal Cavendish International (Asia),Pte.Ltd
10. Laudon, D.P. and Laudon, J.P. (1991), *Business Information System*: A Problem-Solving Approach, New York, HBJ, College Publishers. 21.
11. Rajaraman V. (2018). Introduction to Information Technology/Third edition, Published by Asoke K. Ghosh, PHI Learning Private Limited, Rimjhim House 111
12. Anderson, C. G.; Maxwell, D. C. (2004) *Starting a Digitization Center*, Chandos Publishing
13. Lemke, J. (2003) Finding Strength for the Journey, Publisher: Five Loaves; Study Guide
14. Bulow, A., Ahmon, J. (2011) *Preparing Collections for Digitization*, Facet Publishing,
15. Gaurav S. (2017) . What is Digital Banking? [Online] https://www.ventureskies.com/blog/digital-banking
16. Wewege, L. (2017), The Digital Banking Revolution, Publisher Lulu.com
17. Delgado, J. and Nieto, M. J. (2004), Internet Banking in Spain. Some stylized facts: Monetary Integration
18. Rieker, F. (2018), Digital Magazine, Embracing Digital Transformation: The Future of Banking [Online] https://www.digitalistmag.com/customer-experience/2018/02/21/embracing-digital-transformation-future-of-banking-05880240/
19. Loader, D. (2007) Operations risk, Managing a key component of operational risk under Basel II, Butterworth Heinemann, Elsevier Ltd
20. Grym A., Koskinen, K. Manninen O. (2018) Nordic banks go digital. [Online] https://www.bofbulletin.fi/en/2018/2/nordic-banks-go-digital/
21. Boobier, T. (2020), *AI and the Future of Banking*. John Wiley and Sons Ltd
22. CBRK (2019) Annual Report. [Online] https://bqk-kos.org/publications/cbk-annual-report/?lang=en
23. CBRK (2020). Usage of Cards in Kosovo. [Online] https://bqk-kos.org/wp-content/uploads/2020/10/Use-of-bank-cards-in-Kosovo-2018.pdf
24. EFSE (2016), Digital Banking Services in Kosovo [Online] https://www.efse.lu/news-events/news/detail/study-outlines-how-digital-services-improve-retail-banking-in-kosovo/