International Journal of Advanced Research in Management (IJARM)
Volume 13, Issue 1, January-December 2022, pp. 89-98, Article ID: IJARM_13_01_009
Available online at https://iaeme.com/Home/issue/IJARM?Volume=13&Issue=1
ISSN Print: 0976 - 6324 and ISSN Online: 0976 - 6332
DOI: https://doi.org/10.17605/OSF.IO/AW5VU

BANKING 4.0 NEW ERA IN THE BANKING SECTOR

Dr. Balu. L[1] and Challa Rishitha[2]

[1]Assistant Dean School of Commerce, Presidency University, Bengaluru, India

[2]III Year BBA Student, Presidency University, Bengaluru, India

ABSTRACT

Technology is a paradigm of change across all areas of society. The breathtaking advancements in technology flourished many fields, banking is no exception. The paper mainly focuses on the new era; Experience Driven Banking- It is a race against time. With this, the banking sector will bring unrivalled progress in the growth, development, and data analysis. Banking sector is innovating at a faster pace by expanding services, integrating payments, delivering services, and using blockchain technology. It ameliorates employee engagement and customer satisfaction It also led to growth of Fintech firms which are cost effective, leverage technology to provide best services to the customers. AI gives Banking 4.0 a boost. It indicates how process of work done is changed. The tasks once performed by humans now being automated. The key advantages of adopting technology make its processes faster, accurate and efficient. This financial innovation facilitates trading, development of new ways and processes. To gain competitive edge, banks must find ways to evolve themselves, involve with customers and proactively recommend products and services. Innovations led to explore new avenues such as Internet banking, mobile banking, universal and offshore banking. This revolution led to introduction of plastic money, AI-driven predictive banking, microfinance, biometric technology and many more value-added product and servers. In this paper, researchers have made an attempt to provide insight of banking 4.0 which is a new era in banking.

Keywords: Banking 4.0, FINTECH firms, Block chain technology, digitalization, plastic money.

Cite this Article: Balu. L and Challa Rishitha, Banking 4.0 New Era in The Banking Sector, *International Journal of Advanced Research in Management (IJARM).* 13(1), 2022. pp. 89-98.
https://iaeme.com/Home/issue/IJARM?Volume=13&Issue=1

1. INTRODUCTION

Indian banking has been witnessed to number of changes in recent times and is never ending. At present the Indian banking sector is well regulated sector. The breathtaking advancements in technology flourished banking industry in unimaginable way. According to report 2020, there are total of 34 nationalized banks of which 12 are government and other 22 are private sector banks. Banking industry is gearing up for innovations to meet its developmental needs. The demands of the customers and marketers are being changed. To satisfy everyone's needs and meet their target all these transformations are being raised. This led to increase in customer-bank relationship which is crucial for development. All these developments led to create customers connected all over the world. Over the years HDFC stood best, as it has focused on enhancing its digital capabilities and providing great experience for customers. With the rise in technology there is huge growth many non-traditional firms like FinTech firms. These firms are cost-effective and leverage technology to provide best services to the customers. The industry is expanding services, integrating payments, delivering services to connect with customers and meet the needs. Technology is multi-dimensional which is enlarging its services and developing rapidly. To give easy access of transactions to customers the banking sector has come up with advanced technology which is internet banking and mobile banking. This is user friendly and the easily accessible in any place. All these technological revolutions led to introduction of Digitization, plastic money, microfinance, mobile banking, unified payment interface (UPI), AI driven predictive banking, biometric technology and block chain technology. With the outbreak of COVID-19 there was huge lose in banking industry and it was a declension. But there are powerful digital tools to shape up the loses like cryptocurrency, artificial intelligence, and machine learning.

1.1 Experience Driven Banking

The digital experience is drastically changing the way of traditional businesses. It is a race against time. To meet the developmental needs banking are grabbing the opportunity to involve with the customers, giving them advice, ways to save money and recommend products and services. Banks should deliver the experience driven banking to the customers to hold them, if not the competitors like amazon, meta, apple and google have a deeper reach through various initiatives like amazon pay, google pay, payment option in WhatsApp and apple pay. Recent times banks are empowering customers and by digitization they came up with internet banking, mobile banking and call centers around clock to meet the competitive edge. Although google pay, apple pay etc. are just intermediaries for transactions, if the banks seize the opportunity by digitization, they will no longer profitable than banks. Therefore, banks are way near to it. To succeed banks must adopt the smartest technologies by intelligent enterprises and providing responsive services to customers. And the new way of thinking is to be adopted for growth. There are certain trends which reshaped the banking industry. They are,

- Meeting customer expectations
- Evolution of banks into technology companies
- Omnichannel banking.

2. REVIEW OF LITERATURE

Today, the rate of technological change in the banking sector and the entire economic ecosystem is extremely high. These changes have a significant impact on the dynamism of individuals and the socio-political community that no one could have imagined. Increasing data usage, machine learning based on artificial intelligence, the Internet of Things, and digital technologies play an important role in this process. Banking 1.0 is what we call banking, and this is the same traditional banking that services are provided at certain times in the branch. The contemporary banking theory argues that commercial banks, composed with other financial mediators, are essential in the distribution of wealth in the economy **(Bhattacharya and Thakor 1993).** Then came the introduction of technologies such as the Internet and some Banking 2.0 services that were slowly pushing banking out of the branches. This is possible with the advent of ATMs and card readers, since we are witnessing the formation of off-branch services at different times. This period began in 1980 and lasted until 2007. With the advent of self-service banking, things have changed, and we have come to realize that banking can also be portable, which is Banking 3.0 (It is related to the supply and expansion of mobile services. These services may be provided on a smartphone platform or even portable card readers. This period lasted from 2007 to 2015), but banking 4.0 is a major transformation that will live with you. Topics such as intelligence, sharing, and evolutionary computing are discussed.

Harjanti et al. (2019) argued that digital transactions necessitate an improved banking experience, so the banking industry also conducts experiments by applying innovative technology in order to support mobility and increase transaction speeds and efficiency for its customers. Some previous studies suggested that the highest dilemma for the current banking system is to explain the high costs of branch banking but also to obtain an increase in profitability as branch-driven revenue growth **(Capgemini 2012).**

Athanasoglou et al. (2006), the size of banks contributes to recognizing possible economies or diseconomies of scale in the banking area considering cost differences, products, and risk diversification. The banking system represents a fundamental pillar of the economic growth and macroeconomic stability, especially in the context of globalization. However, the evolution of the banking sector in each country is affected by continuous changing dynamics of the international banking architecture and financial environment (Spulbar and Birau 2019b). Nowadays, a company or start up can provide banking services by providing financial technology (FinTech)-based applications. The use of artificial intelligence and intelligent, cognitive, and voluntary algorithms has entered banking in this period). The banking sector has been immensely benefited from the implementation of superior technology during the recent past almost in every nation in the world. Productivity enhancement, innovative products, speedy transactions, the seamless transfer of funds, real-time information system, and efficient risk management are some of the advantages derived through the technology (Saravanan and Muthu Lakshmi 2016). The new era of financial deregulation is supported by the revolution in information and communication technology, which helps banks ensuring innovation in their products and services at competitive prices (Turk Ariss 2008). Maturity models offer a complex guidance to define, assess, and evaluate the progress of the current state of the banking sector in its journey of Industry 4.0. (Bandara et al. 2019). Other researchers developed a maturity model using the existing model of Software Process Improvement and Capability Determination (SPICE) considering only two main dimensions, i.e., capability dimension and aspect dimension (Gokalp et al. 2017). On the other hand, the technology acceptance model is generally considered as the most influential theory in IT and information systems (Benbasat and Barki 2007). The paradigm shift from the concentrated market structure under financial repression to the competitive framework under financial liberalization has laid down the foundation for the emergence of private and foreign banks originally in developed countries and afterward in developing countries (Sohrab Uddin and Sohel 2018). Today, a significant portion of bank customers are young people and middle-aged people who have different expectations and preferences than the previous generation. Meeting these expectations and preferences is no longer possible with existing banking models and will only be possible with the use of fourth generation tools, technologies, and mechanisms. Banks can no longer begin their design with business goals and market share, but they need to know how to get their attention and preferences without directly interacting with the customer, thereby achieving business goals.Based on the definition of Temenos (2018), properly digitizing, or in other words Banking 4.0, means “Experience-Driven Banking” capability that requires coverage of both “Customer Experience” and “Execution Experience”

Christian Catalini, Chris Foster and Ramana Nanda (2018) in their work Machine Intelligence vs. Human Judgment in New Venture Finance study that machine learning models trained to mimic human evaluators performed relative to models trained purely to maximize financial success. They found out that (1) model trained to mimic the picks of humans performed well out-of-sample, implying that humans had a systematic pattern of early-stage investing that could be identified and replicated; (2) Models trained to maximize success strongly outperformed ‗mimic human models' when picking from a common out-ofsample applicant pool, implying that heuristics used by these evaluators were systematically overlooking certain high-potential applications that were identifiable ex-ante; (3) comparing the focus of the two models suggests that the differences arose in part due to human heuristics systematically under-emphasizing more ‗cognitively demanding' elements of the applications. Their findings have important implications for the selection and financing of high potential ideas, and more broadly for how Artificial Intelligence can help humans screen and evaluate information in an era of increasing ‗information overload'.

Jewandah S (2018, July) in her research paper ―How Artificial Intelligence is changing the banking sector - A case study of top four Commercial Indian Banks‖ studies the areas in which Machine Intelligence is being launched in the banks and applications of AI in principal commercial banks in India. There is advancement in traditional banking and gradually banks are adopting innovative technologies like AI, block chain, cloud computing but banks are still to reach the stage of AI revolution, human touch is still important. The banking sector in India is discovering the ways through which AI can be incorporated which improve working of banks and improve customer service in the near future. Andrew Ng (2016) in his research paper ―What artificial intelligence can do and cannot do right now discusses the implications of AI on business. He discusses about the automation age, how business is evolving because of robotics and machine learning. AI work requires cautiously picking A and B and providing the essential information to help the AI figure out the A→B relationship. Selecting A and B creatively has already revolutionized numerous industries. It is ready to revolutionize many more.

3. FINTECH

FINTECH (Financial technology) is a broad term which refers that a company applies technology to the world of Finance. It is an emerging industry that uses technology to improve activities in finance. It automates the process of delivering and using of financial services. It gives ability for investors to do their own research, choose stocks to invest on. It is empowering customers to take charge of financial lives. This is an excellent career option for entrepreneurs and tech developers. Firstly, fintech is referred to the technology in banks and other financial institutions. But presently upgraded towards the customer-oriented services to meet the developmental needs. Fintech includes, retail banking, education, investment management, fundraising, crowdfunding. It also helps to use of cryptocurrency and block chain technology. There are few examples of fintech and its revolution in banking industry they are:

3.1 Block Chain and Cryptocurrency

Cryptocurrencies are unique type of Fintech which has a potential o transform make investments, trading, and money lending. This is going to create a fintech ecosystem soon which can revolutionize finance industry completely. This cryptocurrency work with the blockchain technology, which allows to send or receive payments from one person to another person. And the transactions are recorded in distributed ledger called blockchain. This technology being invented for the usage of popular cryptocurrency called Bitcoin. It democratizes money management. There are different types of cryptocurrencies like, bitcoin, Ethereum, Dogecoin and many more. These are stored in digital wallets. There are some of the cryptocurrency platforms like Zebpay, Coin switch kuber, Binance, Unocoin etc.

3.2 Crowd Funding

A crowdfunding is considered as a fintech which connects investors and firms directly. Is a funding venture to raise money from large number of people for a cause. Fintech lenders can create credit scores and set interest rates. The crowdfunding helps many entrepreneurs to achieve their dreams. There are many crowdfunding platforms which works by fintech are Kickstarter, Wishberry, Indiegogo, ketto and Milaap etc.

3.3 Machine Learning

It has a played one of the important roles in Fintech. AI gives the technology a Boost. It has ability to run massive amounts of data and let us know the investment associated risks at the earliest.

- Fintech is changing the fate of stock market in unimaginable way. It is making one of the biggest spheres of technology in recent times.
- It is changing the stock market by bringing data analysis and innovative solutions.
- With the rise in technology, AI and machine learning have simplified the process and analysis.
- Fintech is making traders and investors making their job easy by giving a click or a swipe.
- And they get stock recommendations and tips while they are in the process and easily they can invest or buy shares in one go.
- Role of artificial intelligence help the intelligent investors a boon and get to play in the field of trading.

4. DIGITALIZATION

This is a new buzz in banking industry. Advancements in technology leads to conversion of data into digital format. With digitalization banks are offering to access with mobile devices which are user friendly. By digital banking they can pay bills, transfer money, make purchases from anywhere. To meet the competitive edge banks are looking forward with advancements in technology. This transformation leads to decrease manpower and thus decreases errors. This can provide enhanced customer services around the clock, saving time, and build customer loyalty. The main progress of digitalization is being seen after the introduction of ATMs. No looking back, India has become cashless and digitized economy. This led to developments like RTGS, telebanking, MICR etc. The COVID-19 pandemic accelerated the digitalization processes. Greater use of online services was made during the crisis. Deloitte survey tells there are 9% of the people made transactions via online for the first time. It boosts the digitalization processes in banking sector.

4.1 Advantages in Digital Banking

4.1.1 Easy & Convenient to the Customers: With the rise in technology, it made it easy and convenient for the customers and financial firms. Anybody can make transactions from anywhere in the world. They can review their transactions at any time. They can ask their queries with the call centers as they work around the clock.

4.1.2 Increased Customers & User Friendly: Digitalization not only increase customer satisfaction but also increases the customers. As this is user friendly, a 10-year-old and 70-year-old can easily operate at any time at any place. There are large number of people who are relaying on online banking solutions. This results in decrease in traditional banking. Consumer base is one of the biggest changes in digital banking.

4.1.3 Cost Efficiency: Digitization enabled cashless transactions which results in decrease of paper usage and time for banks and with the internet customer's need not to visit the banks very often, thereby it is very cost efficient. It has brought banking a tremendous ease of operation.

4.1.4 Enhanced Customer Services: With digitization banks are providing enhanced customer services, which automatically increase customer loyalty. They are providing financial literacy, data security, giving vouchers and rewards for customers.

4.2 Challenges Faced Due to Digitalization

There are few challenges being faced due to digitalization they are:

4.2.1 Cybercrime: It is one of the biggest challenges facing currently. Banks are more vulnerable by the cyber-attacks. Some people are using digital instruments in other way by making illegal transactions, committing fraud, and violating privacy. It is very risk both to customers and banks. One need to be very careful and must adopt safety and cybersecurity measures.

- There are lot of quality issues by digital banking as it has many bugs, which harms smart phones. Banks need to be very careful in their programming and should maintain more quality to retain the loyalty of customers.
- Technology is one of the never-ending processes, banks need to be very careful, they should upgrade to technology to meet the needs of the developmental needs.
- Some of the bank branches which are being in the remote areas are being ceased due to online banking.
- There are lot many issues faced by the customers in making complex transactions. Banks must upgrade to it.

5. MOBILE BANKING

This is a technological innovation in banking sector. It is a service provided by the banks or the financial institutions to the customers to make transactions with smart phone or tablet. It uses a software called app, provided by the banks. It mainly depends up on the internet or data connection to the respective device you are using in. It reduces the need of visiting the bank. Bank offers services around the clock. Customers can enable its use from anywhere in the world.

Mobile banking is of different types they are:

- Mobile banking over applications like YONO SBI & IMOBILE.
- Mobile banking by SMS
- Mobile banking over unstructured supplementary service data (USSD)

It provides many services like, it will give access to monitor all the information regarding your bank account like, viewing balance, e- passbooks, loan statements, transactions history, payments via, NEFT, RTGS, UPI, IMPS, MMID, mutual fund investments, portfolio management services, opening FDs and RDs.

It also gives the information of branches of banks, locations, cancelling or stopping of cheques.

- Banking over USSD provide services like balance enquiry, mini statements, transfer of funds via Aadhar, MMID, A/C no. changing MPIN.
- Basic charges of *Rs*0.50 is charged for USSD transactions.

6. PLASTIC MONEY OR POLYMER MONEY

Over the years, money has transformed coins to notes. with the rise in technology, it is transformed to plastic money. It is a technological innovation in banking which is an alternative to actual bank notes. To represent the monetary transactions there are different types of plastic money. They are debit cards, credit cards, ATM cards and charge cards.

6.1 Debit Cards

A payment card which is used to withdraw money from your bank account. This is also called check cards or bank cards.

- It is eliminating the use of cash or checks to make payments.
- Debit cards have the daily limit for the transactions.
- Debit cards charges an amount when drawn from the different bank than the bank your card is being issued in.
- Debit cards issue rewards and cashbacks in various transactions.

6.2 Credit Cards

These are the financial tools that gives holders a luxury of giving credit and paying back the amount later.

- Age and annual income determine the eligibility of credit cards.
- There are some of the banks which are offering credit cards easily they are: ICICI banks, HDFC banks, SBI CARD, AXIX, CITI banks, KOTAK MAHINDRA bank.
- There are different types of credit cards depends on the feature they offer, they are, reward credit cards, low-interest and balance cards and credit-building cards.
- A certain credit limit is being given to the cards and that should be paid back to the bank in due time.
- If the limit is used up, then the score will go down, then the holder responsible to pay the interest rates as per issuing bank. If not, loans are not being granted until the payment is done. Good credit score is 670 to 739.

6.3 Advantages of Plastic Money

- Transactions are made easy by plastic money. one can easily make payments, book tickets, pay bills, transfer money from home.
- If the holder has an internationally accepted cards, then they can make payments with the same card without converting the money.
- Carrying huge amount of cash is risky, results in increase in thefts. The introduction of plastic cards made easy.
- Cards are user- friendly, this can fit in the wallet easily and can be carried to any place.
- Cards provide credit facility, which is a boost for many holders, they can purchase what they want and can pay back later.

6.4 Disadvantages of Plastic Money

- The plastic money is replacement of cash, this won’t help in all times, if we go to remote areas where there are no POS machines or ATMs, it is very hard to make payments.
- If we make payments via cards in online, not all websites are safe to use. They take us all the provided information of card and hack the card.

- If the card is not protected properly, results in damage of card. The damaged card doesn't accept by ATMs.
- There is another biggest disadvantage is that there is minimum amount is being drawn in some ATMs. For example, only there is availability of 200 and 500 notes in bank, but your card contains only 150 rupees and wanted to withdraw only 100 rupees, then that is not possible.

7. CHALLENGES FACED DUE TO INNOVATION

Banking industry is one of the fast-growing industries. With rise in technology, there are few challenges need to be faced due to innovation.

- Rising expectations is one of the biggest challenges. The customer today is smarter than ever before. Tio meet the needs of the customer and their retention, banks need to upgrade to technology and changes each second.
- Increasing the competition is a biggest challenge, each day, people are coming up with number of new ideas and technology. To meet the competitive edge, banks must put efforts to maintain the loyalty if their customers.
- Today, digital world is expanding its wings in larger extent, banks need to be adjusted to cultural shift to meet the needs.
- Security is one of the nightmares in this sector. Banks need to be very careful in security issues.
- Banks must use the latest technology measures to keep customers safe. Like, biometric authentication, end to end encryption.
- skilled employees should be hired by the banks who solves the problems immediately.
- Language is also a barrier for innovation. India has 150+ languages which are being spoken by people. Banking innovations need to be very careful and their services in online should provide in different languages in order to reach out to wide range of population.

8. RESULTS

We are at a time when exciting things are happening in the banking industry. Non-stop technology is advancing, providing opportunities for institutions through which they can expand their services and eliminate traditional financial services altogether. These state-of-the-art technology networks will provide the opportunity to meet customer needs instantly and intelligently through various channels. This will be achieved when new strategies for computing and storage are explained, advanced analysis is performed, cyber security capabilities are upgraded, and a completely new perspective for banking services is outlined. Which technology has the greatest potential for the Industry 4.0 in Banking 4.0? The exact answer to this question is not clear, but there is no order in the application of the introduced trends, but it is these organizations that must prioritize and allocate the necessary capital to implement each of them. There are so many opportunities, and any passivity or desire to stay calm will put a high risk on the organization. Banking and payment services must move toward the formation of a fully intelligent network. Overall, improving the customer experience, using artificial intelligence, the emergence of databases, the use of identification algorithms, the use of machine learning methods, and data analysis are among the features of the new generations of banking. However, the important thing is that digital technologies have made major changes in banking. Traditional banks are migrating more digital services to digital channels every day. Customer preference for the increased convenience and availability of services is also strongly aligned with this change and gives it more acceleration. This has led to a change in the structure of the distribution network of banks, and in addition to reducing the need for physical branches, it has also changed the function and mission of branches. However, evidence from international banks and even some traditional industries shows that non-alignment with digital and technological developments, while reducing profitability and value creation, will also jeopardize the survival of these institutions. Today, banking is a cascade of multiple technologies, rules and regulations, and demographic factors that cut the length and breadth of its value chain. These factors affect the way businesses are run by banks, so that common banking practices are not enough to meet growing customer expectations as well as improve profitability. Therefore, the factors influencing the evolution of the banking industry can be divided into two main categories: business developments and technical developments. In the area of business developments, new non-bank actors in the form of FinTech or start-ups have disrupted the banking business and impaired the role of intermediaries in banks. However, in the technical sector, the emergence of new technologies such as block chain, robotics, etc., has had a significant impact on the performance of the banking industry.

9. CONCLUSION

Banks and FINTECHs have been working for years to find common ground. The FINTECHs have stepped in to gain market share and have been successful in injecting new concepts into banking. However, they ran into trouble when they tried to get a large scale of banks to be able to process and reach more customers. Banks initially looked at the FINTECHs with scepticism and distrust, but since then they have praised their entrepreneurial approach. Undoubtedly, due to the existence of old systems and cultural frustration with risking within banks, FINTECHs have breathed new life into the banking system. Both sides (banks and FINTECHs) have increasingly come to the conclusion that by combining and synergizing their strengths, they can create value. Banks need to change the way they think about the past and keep up with the advances in technology. Besides, the first thing they need to focus on is improving and providing services from the customer’s point of view so that they can create the key factor of customer experience in the best way. Therefore, the basis for valuing fourth-generation banks is based on the creation of cooperation between the bank and customers. Finally, banks need to work closely with technology and knowledge-based companies to introduce new operating methods. Banks will be very similar to technology companies, and they desperately need to work with these companies to accelerate the process of transformation and business transformation. From the point of view of Industry 4.0, a successful economy has the most assets, activities, and focus in digitizing its assets. The experience of using technology is very new, even in the world. However, the most important limitations of the research are the limitations of technology and culture, as well as the type of vision of customers regarding the nature of banking. A study of the structure of various industries and the lack of attention to the necessary infrastructure for the development of technologies required by Banking 4.0 in different countries shows that more studies should be done on the use of emerging technologies in various banking and industrial sectors. Future researchers are also advised to identify and prioritize the following: (1) the pathology of various emerging technologies in Banking 4.0 in terms of legal and regulatory structures and (2) the indicators of Industry 4.0 to enter Banking 4.0.

This paper is based on the few primary identifications and few secondary identifications of the Innovations in banking, banking 4.0. Based on the findings, technology has a great influence in modern banking era. Digital connectivity has expanded its wings and create many opportunities. Indian banking sectors is experimenting several innovations in technology in almost all areas. Banks should furthermore automate services. like loan recovery, loan disbursement. This technology enables the work done in much more convenient and smarter way, FINTECH is one of the breaking frugal areas which give access and use of financial services in easy way. Innovation converts traditional banking in to internet banking, mobile banking ATMs, plastic money. therefore, innovation led “conventional banking” to “convenience banking”

REFERENCES

[1] Ahmad, Khurshid. 2000. Islamic finance and banking: The challenge and prospects. Review of Islamic Economics 9: 57–82.

[2] Al-Fuqaha, Ala, Mohsen Guizani, Mehdi Mohammadi, Mohammed Aledhari, and Moussa Ayyash. 2015. Internet of things: A survey on enabling technologies, protocols, and applications. IEEE Communications Surveys & Tutorials 17: 2347–76.

[3] Anderl, Reiner. 2014. Industries 4.0-advanced engineering of smart products and smart production. Paper presented at the 19th International Seminar on High Technology, Technological Innovations in the Product Development, Piracicaba, Brazil, October 9; pp. 1–14.

[4] Agrawal, Anirudh, Sebastian Schaefer, and Thomas Funke. 2017. Incorporating Industry 4.0 in Corporate Strategy. Hershey: IGIGlobal. Apiacademy Homepage. 2018. Available online: https://www.apiacademy.co/lessons/2015/04/api-strategylesson101-what-is-an-api (accessed on 10 September 2018).

[5] Arner, Douglas W., Janos Barberis, and Ross P. Buckley. 2015. The Evolution of FinTech: A New PostCrisis Paradigm. Geo. J. Int’l L 47: 1271–71.

[6] Athanasoglou, Panayiotis P., Matthaios D. Delis, and Christos K. Staikouras. 2006. Determinants of Bank Profitability in the South Eastern European Region. Working paper no. 40.

[7] Athens: Bank of Greece. Atombank. 2016a. Fabulous Atom Questions. Available online: https://www.atombank.co.uk/ (accessed on 7 October 2016).

[8] Atombank. 2016b. The Future of Banking. Available online: https://www.atombank.co.uk/ (accessed on 7 October 2016).

[9] Atzori, Luigi, Antonio Iera, and Giacomo Morabito. 2010. The internet of things: A survey. Computer Networks 54: 2787–805. [CrossRef]

[10] Babiceanu, Radu F., and Remzi Seker. 2016. Big Data and virtualization for manufacturing cyber-physical systems: A survey of the current status and future outlook. Computers in Industry 81: 128–37. [CrossRef]

[11] Bandara, Oshadhi, Kasuni Vidanagamachchi, and Ruwan Wickramarachchi. 2019. A Model for Assessing Maturity of Industry 4.0 in the Banking Sector. Paper presented at the International Conference on Industrial Engineering and Operations Management, Bangkok, Thailand, March 5–7.