

Digital Banking Transformation with Essential Eight Services: With Special Reference to Artificial Intelligence

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Abstract: The pandemic has brought a tremendous change to our lives, in the aspects of digitization. One of the major reforms is the adoption of the essential eight technologies used as a service provider in almost all sectors. The automated services consist of Artificial Intelligence (AI), Augmented Reality (AR), Blockchain, Drones, the Internet of Things (IoT), Robotics, 3D printing and Virtual Reality (VR). India was completely manual in its operations until the recent past and gradually we have adopted technology in all blocks of life. We have grown into a technologically independent economy over the past decade to adapt to changing conditions. For the need of the hour banking industry has adopted the eight essential technology services to provide a better banking facility for its customers. The adoption of mechanization of the work has led to digital transformation in the banking sector. There is a spectacular digital transformation in the banking sector as they have come up with digital payments, cash deposit machines, passbook kiosks, robots in bank branches to guide customers and other automated services which provide customers with convenient banking opportunities yet the challenges are galore.

Keywords: Artificial intelligence, Automation, Banking sector, Robotics.

I. INTRODUCTION

Banks have grown to be efficient, customer friendly, trustworthy, and understanding with the usage of Artificial Intelligence in the Banking Sector. They have achieved a competitive edge over the others in the digital era. Further it has minimised the operational costs with the improvisation of

customer support and automation [1]. Today banks are trying to enhance customer relationships with the banks via the usage of artificial intelligence. It has occupied a prominent position, particularly in the financial services sector. With this development banks any come up with new customer-friendly apps that are technologically relevant [2].

Emerging technologies which may have a greater impact across industries are studied and the ones with the most potential are called the Essential Eight. They are artificial intelligence (AI), augmented reality (AR), blockchain, drones, Internet of Things (IoT), robotics, 3D printing and virtual reality (VR) [3].

Today these recognised services have evolved and created a niche during the pandemic accelerating emerging tech adoption. AI has become an integral part of various companies today across the globe while 3D printing, is confined to manufacturing. Latest developments like quantum computing and nanotechnology will have a profound impact in the next five years and be a part of growth in essential eight technology services [4].

The Eight Technology Services [3]

- *Artificial Intelligence (AI):* AI is a software working similar to the human mind on observation of the cognitive process. AI when used as a tool in the banking sector helps in internal operations and customer facing applications to improve customer services. It also helps in fraud detection and money management. AI has also empowered banks to handle huge volumes of data with valuable insights at unparalleled speed.
- *Augmented Reality:* Augmented reality (AR) is an enhanced version of the real physical world that is achieved through the use of digital visual elements, sound, or other sensory stimuli and delivered via technology. It is a growing trend among companies involved in mobile

computing and business applications in particular. Retailers and other companies use augmented reality to promote products or services, launch novel marketing campaigns, and collect unique user data.

- *Blockchain*: Blockchain technology is a decentralized, Distributed Ledger Technology (DLT) that stores the record of ownership of digital assets. Any data stored on the blockchain is unable to be modified, making the technology a legitimate disruptor for industries like payments, cybersecurity and healthcare. Blockchain is making the history of any digital asset unalterable and transparent through the use of a decentralized network and cryptographic hashing.
- *Drones*: A drone is an unmanned aircraft that work in conjunction with onboard sensors and a global positioning system (GPS). These drones are used in predictive analysis, cost reduction and improve customer experience. New opportunities and growth models are based on such predictive analysis.
- *Internet of Things (IoT)*: The Internet of Things (IoT) is a name for the aggregate collection of network-enabled devices, excluding traditional computers like laptops and servers. It helps in connecting the ATMs, POS and mobile banking apps to the internet. These devices collect and transmit data and allows the banks to manage transactions, enhance the assets security etc.
- *Robotics*: Robotics is the intersection of science, engineering and technology that produces machines, called robots, which replicate or substitute for human actions. Robotics is the engineering and operation of machines that can autonomously or semi-autonomously perform physical tasks on behalf of a human. Typically, robots perform tasks that are either highly repetitive or too dangerous for a human to carry out safely.
- *3D Printing*: 3D Printing in the banking sector has opened new vistas of automation, cost reduction and achieving greater efficiency. It also enables the banks to introduce new products at a reduced price, or customising products according to the needs of the customers.
- *Virtual Reality (VR)*: VR banking is a complete makeover from the frustrating traditional banking model. This offers multiple opportunities to upsurge customer engagement with latest products and services. Customers have the facility to view account balances, conduct transactions like bill payments using VR. This has helped customers to manage their finances in a better fashion.

II. REVIEW OF LITERATURE

Dr Navleen Kaur *et al.* (2020) [5] AI is the simulation of human intelligence in machines, from Siri to self-driving cars. This research focuses on the impact of AI on banking, how it has brought revolutionary changes and its impact on

human manpower. AI is revolutionizing the banking industry, enabling increased penetration, cost-effectiveness, and small-value transactions. Banks can use AI to improve the client experience by empowering frictionless, round-the-clock client associations.

Marina Ryzhkova *et al.* (2020) [8] This article examines the impact of artificial intelligence (AI) on banking development. It finds that Russian businesses and consumers perceive AI positively, consider its assistance in performing routine operations, and are not afraid of dismissals. However, there are fears associated with technical failure, unauthorized transmission of personal data, lack of privacy, and unexpected consequences of AI implementation. State and financial mediators can create necessary conditions for banking development based on modern technologies. Despite this, employees experience pressure and perceive AI as a threat, but after a period of adaptation, they could benefit from new technology and improve their job performance.

Mohamed Hussain Thowfeek *et al.* (2020) [6] This study analysed the drivers and barriers to successful AI implementation in the banking sector. The study participants highlighted implementation complexity and quality assurance as the main hindrances to AI adoption in banks. In the organizational dimension, the dearth of AI-proficient employees and poor support from the top management were identified as the key hindrances. In the environmental dimension, AI adoption was slowed down by moral apprehensions and market regulations. Data issues related to customer and transaction data were also identified as a major challenge. To leverage AI applications, AI-supported roles such as AI trainers need to be introduced to current IT job descriptions. AI governance is also needed to address concerns related to the black box phenomenon. Banks that refuse to adapt and adopt may experience significant losses in terms of turnaround time, cost and market share.

Praveen Kumar Donepudi (2017) [7] Machine Learning and Artificial Intelligence applications in the financial sector have been thriving in the recent past, with their immense power being harnessed to offer business solutions in front-end and back-end processes to create efficiency and improve customer experience.

A. Statement of the Problem

Indian banks were completely working on the manual mode until the midst of the 90's but gradually with the introduction of computerization the face of banking changed completely. The next phase of revolution came with the introduction of artificial intelligence in banks. In this article the researcher has analysed how artificial intelligence has been accepted and adopted in the banks.

B. Research Gap

Previous studies carried out in the Indian context have looked at various aspects of artificial intelligence adoption. But

the relationship between the different sector (public sector, private sector or cooperative sector) of banks and the benefits of adoption of these services is left untouched. Further, the researcher has also tried to analyse the relationship between gender and the adoption of these AI services.

C. Objectives of the Study

- To study the impact and benefits of Artificial Intelligence on the Banking Sector (public, private and cooperative banks) in India.
- To analyse the relationship between gender and usage of AI in banking services.
- To examine the challenges faced by banks with the implementation of Artificial Intelligence.

D. Scope of the Study

The study is based on the benefits, impact and challenges of implementation of artificial intelligence in the banking sector.

III. RESEARCH METHODOLOGY

A. Source of Data

This study has used both sources of data i.e., Primary and Secondary. Primary Data is collected through a structured questionnaire. Secondary data on artificial intelligence in the banking sector has been collected from journals, newspapers, conference proceedings.

B. Sampling Method and Size

Random sampling has been used in the study. A total of 120 questionnaires were circulated amongst the people, out of which only 108 completely filled and usable data for research was obtained. The study is confined only from the bank customer perspective.

C. One Sampled T-Test

One sampled t-test is a statistical hypothesis test used to determine whether a population mean is quite different from the specific value.

IV. DATA ANALYSIS

Hypothesis of the Study

Hypothesis 1

H₀: There is no significant relationship between the Banking Sector and the benefits of the usage of AI in Banking.

H₁: There is a significant relationship between the Banking Sector and the benefits of the usage of AI in Banking.

Hypothesis 2

H₀: There is no significant relationship between the Gender and AI service used by them in banking transactions.

H₁: There is a significant relationship between the Gender and AI services used by them in the banking transactions.

Demographic Profile of the Respondents

TABLE I: TABLE SHOWING THE DEMOGRAPHIC PROFILE OF THE RESPONDENTS

<i>Gender</i>	
Male	31
Female	77
<i>Occupation</i>	
Professional	18
Salaried	36
Student	46
Business	2
Homemaker	6
<i>Income</i>	
0-20,000	51
20,000-40,000	34
40,000-60,000	11
60,000 and above	12

Source: Primary Data, 2023.

Interpretation: From Table I, it is observed that the number of female respondents are more (77) than the male respondents (31). Majority of the participants are students or the salaried class. Only 18 respondents of the total 108 were into a profession. 51 respondents have an income range of Rs.20000 while 34 of them are there in the Rs.20000 to Rs.40000 range.

TABLE II: TABLE SHOWING THE TYPE OF BANK ACCOUNT OF CUSTOMER AND THE VARIOUS AI SERVICES USED BY THEM

<i>Bank Account – Sector</i>	
Public Sector Bank	36
Private Sector Bank	36
Co-operative Bank	2
Both Public and Private Sector Bank	25
All of the above	9
<i>Digital Transformation in the Banking Sector</i>	
Strongly Agree	29
Agree	56
Neutral	16
Disagree	1
Strongly Disagree	6

<i>AI Services Used in Banking Transaction</i>	
Intelligent Robotic Assistant (IRA)	11
Digital Payments	100
Chatbots	32
Cash Deposit Machine	53
Pass-Book Kiosk	44
<i>Frequency of Usage (Span of One Month)</i>	
0-5 times	51
5-10 times	32
10-15 times	25

Source: Primary Data, 2023.

Interpretation: From Table II, it is seen that 36 respondents are having an account in the public sector or the private sector banks. Around 25 respondents are having both in the public sector and the private sector banks. 56 respondents of the total 108 have accepted that there is digital transformation in the banking sector, while 29 of them strongly agree for the transformation. Around 16 respondents are neutral on the changes happening in the banking sector. AI services used in the banking transactions mostly are digital payments, cash deposit machine, pass book kiosk, chatbots. 51 respondents are using these AI based services 5 times in a month, 32 respondents are using around 5-10 times and 25 of them are using it around 10-15 times.

TABLE III: BENEFITS OF USAGE OF AI IN BANKING

Improved service responses	7
Reduction in human error	6
Personalized options in the making	5
Strengthening customer base by increasing satisfaction and trust	5
Reducing time to travel locations	13
All of the above	72

Source: Primary Data, 2023.

Interpretation: From Table III, it is observed that (7) customers have seen an improvised customer service response, (6) customers observed reduction in the human errors, (5) customers saw better options for their decisions, trust and satisfaction of the customer has increased, time taken to visit the branch is reduced. Overall majority of the customers are happy on usage of AI based services in banks.

TABLE IV: IMPACT OF AI IN BANKING SECTOR

Cuts Operational Cost	13
Improves Customer Support	17
Picks credit worthy clients to disburse loans	2
AI helps banks run under regulatory compliance	5
All of the above	71

Source: Primary Data, 2023.

Interpretation: From Table IV, around 71 customers have opined that the overall impact of AI on the banking sector has really improved. It has brought down the operational costs (13 customers), improved the customer support (17 respondents), helps in choosing the customer who are trustworthy for disbursing the loans (2 respondents) and helps the banks in regulatory compliance (5 respondents).

TABLE V: CONFIDENCE IN AI BASED DECISION AND OUTPUTS

Strongly Agree	12
Agree	55
Neutral	38
Disagree	3
Strongly Disagree	0

Source: Primary Data, 2023.

Interpretation: From Table V, 55 respondents have strongly agreed that they have complete confidence on AI based decision in banks while 12 of them have strongly agreed upon the benefits of AI in banks, 38 respondents have reacted in a neutral manner. They are unable to decide on the usage of AI in banks. But 3 respondents are not happy with the usage of AI at all in the banks.

TABLE VI: CHALLENGES FACED BY BANKS WITH THE IMPLEMENTATION OF AI

Trust Issues	24
Limited Knowledge	23
Cyber Threat (Privacy issues)	61
Not willing to adopt to new methods	14
Attack on confidentiality (Data poisoning attack)	35
Attack with minimal manual effect	11
Lack of integration	18
All of the above	37

Source: Primary Data, 2023.

Interpretation: From Table VI, 61 respondents fear cyber threats/privacy threats, 35 fear an attack on confidentiality (data poisoning attack), 24 face trust issues while 23 respondents have limited knowledge in banks. 18 respondents face lack of integration in work with the implementation of AI in banks, 14 respondents are not willing to adopt new methods for banking purpose, 11 respondents face attack with minimal manual effect. 37 respondents have agreed that they have experienced all these challenges when using the services of banks. Such challenges keep the customers away from the adoption of AI based services.

One Sample T-Test for Hypothesis 1

TABLE VII: ONE-SAMPLE STATISTICS FOR HYPOTHESIS 1

	N	Mean	Std. Deviation	Std. Error Mean
In which sector do you have your bank account?	108	2.40	1.374	.132
Benefits of usage of AI in Banking	108	5.10	1.564	.151

One-Sample Test						
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
In which sector do you have your bank account?	18.144	107	.000	2.398	2.14	2.66
Benefits of usage of AI in Banking	33.891	107	.000	5.102	4.80	5.40

Source: SPSS Output.

Interpretation: The given output represents a significant relationship of one-sample t-tests conducted on two different variables i.e., the sector of having a bank account and the benefits of usage of AI in banking. This is because the significant value is less than 0.05 i.e., (0.000<0.05), the low p-values indicate that there is strong statistical evidence, suggesting that these

variables have a meaningful impact in their respective contexts. Through this the researcher concludes that the alternative hypothesis is accepted. There is significant relationship between the Banking Sector and the benefits of usage of AI in Banking.

One Sample T-Test for Hypothesis 2

TABLE VIII: ONE-SAMPLE STATISTICS FOR HYPOTHESIS 2

	N	Mean	Std. Deviation	Std. Error Mean
Gender	108	1.71	.454	.044
AI services have you used or experienced in your banking transactions	108	6.85	4.524	.435

One-Sample Test						
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Gender	39.169	107	.000	1.713	1.63	1.80
AI services have you used or experienced in your banking transactions	15.741	107	.000	6.852	5.99	7.71

Source: SPSS Output.

Interpretation: The given output represents a significant relationship of one-sample t-tests conducted on two different variables i.e., the gender and the AI services used in the banking transactions. This is because the significant value is less than 0.05 i.e., (0.000<0.05).

The analysis shows highly significant differences, as evidenced by the t-values, very low p-values and confidence intervals, indicating significant gender differences in the first variable and significant differences in AI services usage in the second variable among the participants. Through this the researcher concludes that the alternative hypothesis is accepted. There is significant relationship between the Gender and AI service used by them in the banking transactions.

V. FINDINGS OF THE STUDY

- Female respondents are more than the male respondents. Majority of the respondents are salaried employees. Employees belong to the Rs.20000 income category.
- Respondents are equally spread in the public sector and private sector banks and around 9 respondents are having an account in the public sector banks, private sector banks and cooperative banks. 56 respondents agree that there is real digital transformation in the banking sector. 100 respondents agree that digital payments have picked up the momentum for digital transformation in the banking

sector. Respondents are using these services at least 5 times in a month.

- Digital transformation has enormous potential in the banking sector as it has reduced the human errors, customers need not visit the home branch for completing their transactions and can get tailor made solutions based on their needs.
- AI has helped the banks to maintain regulatory compliances, cut down on operational costs, providing 24/7 customer support and decide upon the borrower's intention to disburse loans or not.
- Customers are generally happy with the implementation of the AI in the banking sector but fear cyber threats at the same time. They fear that the confidentiality of the data is affected and have limited knowledge towards acceptance of the digitization of the services.

VI. SUGGESTIONS OF THE STUDY

Implementation of AI is a very expensive affair for the bank. So, it is important that banks get sufficient return on their investments. Banks should impart good training to the employees so that the transaction is completed on time in a hassle free manner. Customers also need to adopt digital transactions to keep themselves in the flow. Education camps for creating awareness in usage of AI services needs to be augmented.

VII. CONCLUSION

AI has numerous advantages in the banking sector and is proved from the research. AI has reduced the work pressure when compared to the work of yesteryears in banks. The transparency in the completion of the transaction has improved the trust of the customers. An indepth study in each services and banker's perspective can be taken up in the future research.

REFERENCES

Websites

- [1] Accessed: Aug. 13, 2024. [Online]. Available: <https://star-knowledge.com/blog/ai-in-banking/>

- [2] N. Larsen, "AI's rapid evolution means a bright future awaits the banking sector." Accessed: Aug. 13, 2024. [Online]. Available: <https://internationalbanker.com/technology/ais-rapid-evolution-means-a-bright-future-awaits-the-banking-sector/>
- [3] Accessed: Aug. 13, 2024. [Online]. Available: <https://www.pwc.com/us/en/tech-effect/emerging-tech/essential-eight-technologies.html>
- [4] Accessed: Aug. 13, 2024. [Online]. Available: https://www.mckinsey.com/~/_media/mckinsey/industries/financial%20services/our%20insights/building%20the%20ai%20bank%20of%20the%20future/building-the-ai-bank-of-the-future.pdf

Research Papers

- [5] N. Kaur, S. L. Sahadev, M. Sharma, and L. Siddiqui, "Banking 4.0: The influence of artificial intelligence on the banking industry & how AI is changing the face of modern-day banks," *International Journal of Management*, vol. 11, no. 6, pp. 577-585, 2020. [Online]. Available: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3661469
- [6] Mohd. Hussain Thowfeek, S. Sabraz Nawaz, and Mohd. B. Fathima Sanjeetha, "Drivers of artificial intelligence in banking service sectors," *Solid State Technology*, vol. 63, no. 5, 2020. [Online]. Available: <https://www.semanticscholar.org/paper/Drivers-of-Artificial-Intelligence-in-Banking-Thowfeek-Samsudeen/57403f3b9dce42ae540fdb72d03f237389f90cf1>
- [7] P. K. Donepudi, "Machine learning and artificial learning in banking," *Engineering International*, vol. 5, no. 2, 2017. [Online]. Available: <https://abc.us.org/ojs/index.php/ei/article/view/490>

Conference Proceedings

- [8] M. Ryzhkova, E. Soboleva, A. Sazonova, and M. Chikov, "Consumer perception of artificial intelligence in banking sector," *SHS Web Conference: XVII International Conference of Students and Young Scientists "Prospects of Fundamental Sciences Development" (PFSD-2020)*, vol. 80, 2020.