

Digital Banking Transformation and Role of Emerging Technologies



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Technology has played an important role in the digital transformation of traditional banking systems to Digital banking systems with the objective of improving customer service and satisfaction. This article aims to focus on the emerging financial trends, challenges faced by the Fintech start-ups, and factors of customer adoption and customer satisfaction in digital banking products. The study adopted an empirical and quantitative research approach. The study selected closed-ended Likert scales (1-5) to map the customers' perceptions, and explore their opinions regarding ease of technology usage, ease of technology-enabled digital banking usage by customers, and opinions regarding facilities under the preview of technology enhancement. The sample frame comprises in order to derive better results, selecting an appropriate sample is an important aspect in any study with specific reference to the objectives and needs of the study. A sample size of 600 customers from banks and the Fintech industry was appropriate to understand the customer's perceptions of the impact of technology on banking payment systems and measure customer satisfaction. The data hence collected were subjected to analysis with SPSS and SEM modeling to figure out the impact of influencing factors on the dependent outcomes. The results and hypothesis examination reported a statistically significant relation between technology and quality of the service with respect to various factors which impact customers' preferences for adaptation to E-Banking and measuring customer satisfaction in the banking sector.

Keywords: E-Banking, Digital Transformation, Fintech, Customer Services, Technology adoption

1. Introduction

On 25th March 2021, RBI Governor Shri Shaktikanta Dass during his address at IEC 2021 (Indian Economic Conclave) said that with an 87 percent Fintech and Digital Banking adoption and usage rate as against 64% of the global average, the Indian economy is on the verge of becoming Asia's top financial technology (Fintech) hub. The valuation of the Fintech market in India stood at Rs. 1.9 trillion in the year 2019 and expected to touch Rs. 6.2 trillion in the year 2025. Traditional Banking System has witnessed digital transformation through meaningful E Collaboration and technology partnership with Fintech in various fields like digital lending, digital payments, crowdfunding, Artificial Intelligence, Machine learning, Blockchain technology, peer-to-peer lending (P2P), Big Data, and Distributed ledger technology. Indian Commercial Banks especially Private sector banks regulated by RBI was fast to adopt the technological changes in their core banking system to respond to the tech-savvy needs of the customers by partnering and working in tandem with Fintech.

Financial Technology (Fintech) is the intersection of Financial Services offered by banks and technology companies and played an important role in strengthening Fintech has become popular including online lending, mobile payments, and digital currency, and has assisted people during the financial hardship of the Covid-19 pandemic. "Global Fintech Regulatory Rapid Assessment Study by Cambridge Centre for Alternative Finance (CCAF), University of Cambridge, World Bank and Judge Business School demonstrates that the Covid 19 has increased the prioritization of Fintech among bankers and financial regulators and has posed a number of key challenges in the regulatory approach to Fintech and Digital Payment Services.

Fintech is a combination of two words – Finance plus Technology (Fintech) which explains the integration of technology to automate and improve the delivery of financial products and services to customers. The main objective of Fintech companies is to support, manage and streamline the business processes of Banks, Financial Institutions, corporate, Entrepreneurs, and startups with the increased usage of computers, smartphones, and internet banking. Initially, Fintech was adopted by banks and financial institutions for the automation of back-office processes of routine nature and transaction processing. Fintech has since grown in the last decade and shifted to a more customer-oriented definition across various industries and sectors such as retail banking, education, insurance, investment management, and fundraising companies. Fintech also plays an important role in the issuance and management of cryptocurrencies such as Bitcoin in many countries.

Mr. Gandhi, Former Deputy Governor while addressing the Digital Payment Conference 2018 organized by Indian Bank Association on the theme "How can Banks and FinTech coexist and complement even as they successfully negotiate serious disruptions said that Fintech companies are creating disruptions in the financial system and will going

to be real competition in the payment ecosystem. He further said that there will be two options – One the banks can expand in the payment sector through strong IT infrastructure or they collaborate with each other through joint ventures and partnerships. The Definition of Fintech underwent a big change as the traditional banks started partnering with the Fintech Companies for virtual banking, virtual currencies, and the use of new emerging technologies like Artificial intelligence, Machine learning, Blockchain, Robot Process Automation (RPA), Big data and Chatbots.

Infosys released a report “Perspective – Fintech Revolution in Banking – Leading the Way to Digital” through an external document in the year 2018 explains an overview of the Role of Traditional banks, Globalization of the banking space, Technology in Banking, Rise and Working of FinTech. The report explains the focus of Fintech Firms on the following four parameters to create more value for the end users:

- Identifying, specializing, and excelling in a niche products/service area
- Providing Customer Centric Operations
- Innovation and cost-effectiveness
- Reducing delivery turnaround time (TAT)

The various issues and challenges that led to the digital transformation, disruptions, and Fintech Revolution in the traditional banking sector which gave birth to the new era of alternative finance are reflected in Table 1.

Table 1 Traditional Bank’s Issues leading to Fintech Revolution

Issues	Explanation
Highly Regulated	More focus on rules, regulations and compliance
Rigid Structure	High Operating Costs due to Large network of branches all over the country
Averting Risk Propositions	Poor visualization beyond the traditional business lines
Low Involvement	Low involvement of customers in the centre of operations
Low Investment	Low investment in value creation from ideas, innovations and technology
Low Collaboration	Low collaboration with progressive minds to build capabilities and competencies
Neutral Approach	Lack of focus on individual profit-making products / services
CBS Infrastructure	Difficulty in upgrading or replacing legacy core banking infrastructure built over a long period

Source: Infosys Report 2018 – Fintech Revolution in Banking

The fintech revolution in India started with the proliferation of Internet Banking in the 1990s followed by Mobile Banking and other technology trends that propelled more innovation in the Fintech Business to a new height, web-based models, web-based shopping, electronic installment framework, paperless-lending, and portable banking. The Fintech Market in India, 2020 report by Research and Market’s.com state that India is one of the fastest growing Fintech markets, out of all the emerging markets in the world with an 87% Fintech adoption rate. 64% was the global average adaptation rate. The report also states that the Fintech market in India is expected to touch Rs. 6207.41 billion by 2025 as compared to the Indian fintech market valued at Rs. 1920.16 billion in 2019. The annual compounded growth rate (CAGR) OF 22.7% is expected during the 2020-25 period. With the growth of startups in India, the Fintech industry in India has attracted huge investments through Crowdfunding Platforms where consumers can pool funds from diverse resources. GoFundMe and Patreon are examples of crowdfunding Fintech companies. The various initiatives by RBI, NPCI Government of India, and Banks to drive digitalization through banking reforms like demonetization, GST, Financial Inclusion scheme Pradhan Mantri Jan Dhan Yojana (PMJDY), Unified Payment Interface (UPI) and Aadhar Enabled Payment Systems. (AEPS). Increased adoption of Internet & Mobile banking and improved digital infrastructure have contributed to the growth of the Fintech Industry in India.

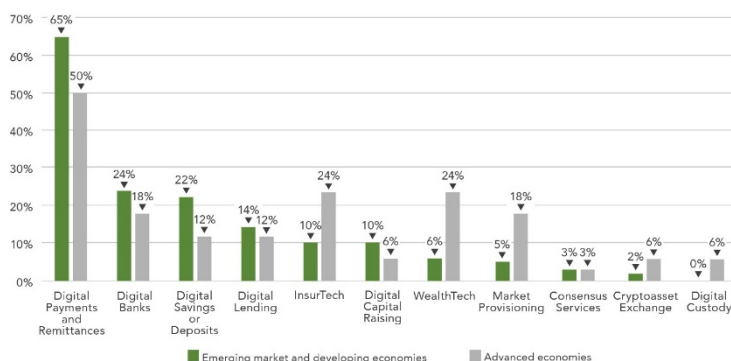


Figure 1 Increase in Fintech Products

Source: Global Fintech Regulatory Rapid Assessment Study

The Key catalyst behind the rise of the Indian Fintech Revolution are:

- The Increasing demand for Digital Finance

- The Mushrooming of Smartphones
- Need for Easy Payments
- Support from Regulatory Bodies like RBI and SEBI.
- The Arrival of API Based Services
- The interest of Venture Capitalist

Figure 1 explains the increase in adaptation and usage of Fintech products.

2. Literature Review, Aims and Research Questions

In order to understand the theme of the study, more than 125 published research papers, reports, and articles from banking and finance journals were studied and referred.

Singh & Srivastava (2018) in their study identifies various parameters which impact the acceptance of mobile banking in India. In their study, they developed a new model empirically and explain the behavioral intention of customers for using mobile banking applications in the Indian banking sector. Their proposed model is based on the important constructs, namely perceived financial cost, social influence, cost, trust, and security of mobile applications. The model attempts to establish a relationship between the various parameters with the help of a survey questionnaire with a sample of 855 bank account holders.

Zhang, Lu & Kizildag (2018) – This study aims to investigate the various factors which influence the customer's behavior for acceptance and adoption of bank's mobile applications offered for using various banking transactions. To test the relationship between various factors and customers' decision to adopt mobile applications, a line survey, and structural equation modeling test was conducted. In previous studies, TAM (Technological Model Acceptance) has identified perceived ease of use as an effective factor to analyze and influence customers' intention for acceptance of mobile banking services.

Chawla & Joshi (2017) – This paper aims to examine the Indian customer's mobile banking adoption factors through an online survey of 367 Mobile users. Data collection was done through personal interactions, meetings, and group discussions and exploratory factor analysis test, cluster analysis and structural educational modeling were done for mobile users' customer segmentation.

Muslim Amin, (2016) – in his study focuses on e-customer satisfaction and e-customer loyalty on internet banking service quality in Malaysia. Out of 1000 developed structural questionnaires distributed, 520 bank customers present in the sampled banks for their routine banking transactions for a week or month responded. A structure modeling was done to estimate the parameters for identifying e-customer satisfaction and e-loyalty for internet banking services. Results have shown the four dimensions – personal need, friendliness, site organization, and efficiency of the website are confirmed distinct constructs.

Dhananjay & Suresh (2015) has studied that the formation of NPCI was a revolutionary landmark initiative that contributed to the significant development in the improvement of retail electronic payment products. They studied and analyzed the data for retail electronic payment from the period 2006-2007 to 2013-14 to develop an alternate hypothesis. The result of data testing reflects the significant improvement in retail electronic products of NPCI. A comparative study of the promotion and growth of retail payment patterns prior to and after the establishment of the National Payment Corporation of India was studied.

Bhasin & Rajesh (2015) in their conference proceedings paper presented and published in Thirteenth AIMS International Conference on Management at IBA, Bangalore titled "Improving Customers Services through Technology in Indian Banking Sector" studied in detail the multiple variables which impact customer's attitudes to adopt online banking products and digital services according to their needs and requirements.

Kesharwani & Bisht, (2012) – This study attempts to extend the TAM (Technology Acceptance Model) with reference to data security and customer privacy in the adoption of Internet Banking in India. The study focused on dual key areas. One is risk in digital banking as one of the barriers that slow down mobile and internet banking adoption and the second important role of a well-designed bank website which also play an important role in meeting customer's perception of the convenient use of internet banking

Alain Yee-Loong Chong, Keng-Boon Ooi, Binshan Lin, and Boon-In Tan, (2010) in their empirical research design study, explore the impact of the customer's adoption of technology-based net banking transactions. The findings and results of this study reflect that trust of the customer, perceived usefulness, convenience, easy to access online banking, and government and regulatory support of the regulator bank of the country, positively improves and impact the intention of the customers to use online and net banking.

Kolodinsky, Hogarth, & Hilgert, (2004) in their article highlights the factors that influence the intentions of US Banking customers in adaptation of e banking technologies. In their study, they selected three e banking technology – Automated Bill Payment (ABP) – Preauthorized debit, Phone banking, and PC banking. This paper focus on Technology Acceptance Model (TAM) proposed by Davis (1989) and is based on Fed Reserve Board Commissioned data.

Jennifer Mullan, Laura Bradley, and Sharon Loane, (2017) focused on the various barriers and obstacles which slow down the growth of acceptance of online and mobile banking from a stakeholder perspective. Various previous studies have focused on factors influencing bank adoption across the globe. This study used the diffusion of innovation theory

by taking the views and opinions of 72 people from 6 industries stakeholders through blogging. The applicability of DOI theory indicates the key driver of bank adoption was competitive advantage due to the increase of global mobile companies' penetration. Stakeholders' partnerships, customer convenience, customer demand, and strategic importance are other important factors that impact customers' decisions.

Aims of the study are :

1. To understand the Emerging Financial Technology Trends in Indian Financial Markets.
2. To ascertain the challenges faced by the Fintech Startup in India and the Support required from the Government
3. To analyze the customer satisfaction and adoption of Digital Banking and Fintech Products through the SEM model.

Research Questions and Hypothesis

- To classify the factors which impact the technology adoption and usage of digital banking products and services by customers.
- To analyze the relationship between the factors shaping customer banking facilitation by shifting from paper-based payment instruments to E-Banking / Digital Banking products.

The finding of this study will be important for mobile industry players to understand the customer's requirements to improve customer relations and increase profitability and market share. All the stakeholders like banks and mobile payment gateway vendors have to work together to increase the awareness of mobile banking features and products to remove the barriers.

3. Methodology

The study adopted an empirical and quantitative research approach. The study selected closed-ended Likert scales (1-5) to map the perceptions of the customers and explored their opinions with regard to ease of technology usage, ease of technology-enabled digital banking usage by customers, and opinions regarding facilities under the preview of technology enhancement. The research covered rural, semi-urban, and urban branch-based customers and examine their opinions and establish the variations regarding sense-making from technology-enabled digital banking facilitation.

The study was conducted for a time of three months and data was collected from across customers. The data hence collected was subjected to analysis with SPSS and SEM modeling to figure out the impact of influencing factors on the dependent outcomes. The pilot testing of the questionnaire was conducted with a smaller sample size of 50. The reliability of responses was established with Cronbach alpha measure. The validity assessment was undertaken with extractive and confirmatory factor analysis respectively. The study deployed the descriptive and exploratory research design and relied on a number of sources:

- Exploratory Research – Review of literature, Scholarly articles, Journals, and published reports from RBI, NPCI, IBA, and other Fintech and Payment Service, Operators
- Descriptive Research Design - RBI Payment System indicators, RBI Payment System statistics, and NPCI data were studied for the last five years

The secondary data has been collected from various sources as mentioned below

- Reserve Bank of India: Monthly Bulletin, Retail Electronic Payment Products by National Payment Corporation of India and Statistical Tables Relating to Payment System Indicators.
- Indian Banks Association: IBA Bulletins, IBA Publications.
- Banks Annual Reports, Publications, and Bank bulletins like Bank Quest and IIBF Vision by the Indian Institute of Banking and Finance
- Collection of data in the National Capital Region - New Delhi, Gurgaon, and Noida.
- Collection of data from Reserve Bank of India Website www.rbi.org.in – Library, RBI reports and E-Mail and Personal Interviews of RBI Delegates, New Delhi.
- The review of existing literature also points towards the prevalence of uni-dimensional and multidimensional as well as formative and reflective measures of customer satisfaction in the payments ecosystem. The scale items for factors were screened from various articles and finally, item selection was undertaken with aid of the expert advice. The factors considered were derived from the list and were ranked by the finance faculty members on appropriateness. The factors were screened from across the competencies embarked on by leading experts on the subject matter. The sample frame comprises in order to derive better results, selecting an appropriate sample is an important aspect in any study with specific reference to the objectives and needs of the study. A sample size of 600 customers was appropriate to understand the customer's perceptions of the impact of technology on banking payment systems and measure customer satisfaction.

Discussions

India's Fintech revolution heralded an innovative age of banking and Covid 19 pandemic was a tailwind for the Fintech Sector in 2020. Various startups saw unprecedented growth in the users and transaction volumes in various segments – online brokerages, gained momentum enabling IPOs, ETFs, and mom-and-pop investors to buy equities and mutual

funds. In order to maintain social distancing as an important Covid safety norm, more customers shifted their physical visits to markets with cash payment to online and e-commerce shopping with payment modes Paytm, Debit / Credit Cards, UPI, IMPS, and digital wallets. Key Fintech players like Paytm, Zerodha, Phone Pe, Mobile Pe, and Groww, have witnessed an increase in their transaction volume as people turned to digital solutions. The emerging Fintech Trends in India in the year 2021 are explained as below:

Open Banking

Mr. M Rajeshwar Rao, Deputy Governor in his consolidated remarks on the Open banking webinar organized by TCS Consultancy Services (TCS) on 14th April 2021 said that Open Banking regulatory frameworks are structured to enable third-party access to customer-permission data, requiring licensing or authorization of third parties, and implementing data privacy and disclosure and consequent requirements. The main advantages of Open Banking are that it de-risks the financial system from the concentration and centralization risk and too much dependence on a single retail payment operator. Recently RBI published a consultation paper in January 2019 to discuss the pros and cons of a single retail payment operator managing Immediate Payment System (IMPS), National Financial Switch (NFS), and Unified Payment Interface (UPI) along with other digital payment systems..

NEO / Digitalized Banks

NEO Bank literally means “new bank” derived from the Greek word “Neos” and is an umbrella term for the new generation offering fully digital banking services. Digital Banks and Neo Banks are the term used mutually and are not quite the same even though they’re based on the mobile-first approach and based on digital operating models. A Neo bank does not have physical branches and exists solely online or in collaboration with financial institutions and traditional banks. NEO banks are also called as Virtual Banks, Smart banks, and Challenger Banks and offer the following features which can be accessed through personal computers, Laptops, and smartphones.

Four top Neo Banks in India innovating and transforming the banking space are:

Instant Pay is India’s largest NEO Banking platform which offers various solutions like Personal Banking, Business Banking, Inclusive Banking, and API Banking. The various products offered by Insta Pay are Current & Savings Bank Accounts, Payments, Cards, loans, Investments, Insurance, Financial Inclusion services, and other utility payments. As per the Insta Pay website, ten million active customers every month, and more than one million transactions are processed daily with a volume of \$ one billion.

Niyo is India’s fastest-growing Fintech in India which has partnered with IDFC First Bank which provides superior digital banking solutions through smart, secure, and transparent banking applications. The various products offered by Niyo are NiyoX-Equitos, Niyo Money, Global, and Bharat . NiyoX-Equitos provides bank accounts in partnership with Equitos Small Finance Bank with zero balance savings accounts, zero percentage commission on mutual funds, and 7% interest per annum in savings accounts. Niyo Money offers a digital application for customers to invest in mutual funds and stocks with more than 75000 customers with one million transactions. Niyo Global Application is a digital-first solution for the travel and forex needs of the customer and issue International Niyo Global card in partnership with DCB Bank. Niyo Bharat offers a lifetime zero-balance prepaid card with easy funds transfer and multilingual application in partnership with ICICI Bank, Yes Bank, and DCB Bank.

Open is Asia’s first NEO Bank with online bank accounts with Visa business cards and offers banking, accounting, payments, and expense management in one application. The various products offered by Open are Current Accounts, Payment gateway, payments, cards, App store, payroll, accounting, virtual accounts, virtual cards, UPI autopay, cash management, invoice management, and payout services. Various business solutions like freelancers, SMEs, startups, developers, and partnerships are offered to more than ten lakh businesses in India.

Razorpay is a new-age banking platform that provides updates on local and global digital banking and Fintech Ecosystem. Razorpay offers payments and banking services through payment gateways and payment links for the acceptance and disbursement of funds. RazorpayX provides business banking solutions by managing company finances through a fully digital current account, automation of payables and compliance payments, the simplified track spends with corporate cards and view facility for financial insights at glance,

Aggregators and Insurtech

Web Aggregators compile and provide information about the insurance policies of various companies on a website. IRDAI websites provide a list of twenty-four web aggregators on their websites. Since web aggregators offer claim settlements, price comparisons and broad features are very active on TV Channels motivating people to buy insurance online. Web aggregators need to be transparent and must explain the features of the insurance products to the customer and ensure one-to-one discussion or explanation of the customer’s queries.

Digital Lending /Micro Lenders

The adaptation of digital lending platforms for credit and finance for MSMEs has increased as compared to traditional banking channels. Growing internet penetration, digital route to secure instant credit, and adaptation of smartphone

devices have attracted new-age borrowers from metro cities and the Indian hinterland. Indifi disbursed over 35000 loans across more than 650 cities over 12 industries with a network of more than 20 lenders. Neo Credit Growth . The various challenges and opportunities faced by Fintech Startups in India

Challenges That Fintech Startups Face in India

Some common issues and challenges being faced by the Fintech companies are long fund-raising cycles, increasing losses and missed out targets, Mismanagement of the lending lifecycle, and regulatory compliances are the main challenges that Fintech start-ups in the country face every day. Other challenges are:

Compliance Laws and Government Regulations

Regulations and laws relating to Fintech Startups in India are complex and have led to the slowdown of the Fintech businesses in Indian financial markets. Recently RBI issued two circulars on digital lending and loading credit on prepaid markets which is likely to adversely hits the profits of Fintech. Such complex regulations make it difficult for Fintech players to earn revenue in Indian markets. RBI has focused on Compliance laws to prevent fraud and improve customer trust in Fintech payment systems.

Data Security and Cyber Threats

Cyber security and data privacy are the major issues in the Digital and Internet Banking world including mobile banking, Fintech, and funds transfer applications. The traditional banking system has the disadvantage of the slow speed of funds transfer, paper documentation, and high cost but on the same hand, they have secured and safe security measures like the presence of security guards, vaults, CCTVs, and high bulletproof cash storage doors. Fintech startups require to invest in Biometric authentication, two-factor authorization, data encryption real-time alerts, predictive and behavior analysis to protect sensitive customer data.

Big Data and AI Integration

Another important challenge for Banks and Fintech Companies is to integrate Big Data and Artificial Intelligence through E Collaboration with traditional banks. The Banking sector generates a massive amount of data through various transactions like account opening, cash deposits, and withdrawals through debit and credit cards, funds transfer through various payment systems, and investments. Big data becomes an important tool of risk assessment in digital lending, credit rating, and high-risk-bearing products like derivatives and cross-border forex transactions. With AI and Big data integration, the risk measurement and mitigation process become smooth and manage financial transactions easily.

Blockchain Integration

Integration of Blockchain with the Fintech Industry and Digital Banks is a new challenge for generating more profit, improving customers' experience, and delivery process, reducing risk in business transactions and improving efficiency. The fintech Blockchain market has huge potential and is expected to touch \$36.04 billion in the financial year 2028. Decentralized financial or (Defi) is a new emerging Fintech trend in the evolution stage that will merge FinTech with Blockchain and leads to decentralized smart contracts. Challenges like dependency on centralized systems, slower processes, and high operations costs, can be resolved through the implementation of Blockchain. P2P and Banking payments, crypto lending, trading, trade finance, digital identity, regulatory compliances, auditing, and new crowdfunding are the ways through which Blockchain can revamp the Fintech Industry.

3.1 Customer Satisfaction and Customer Adaptations Factor for Digital Banking and Fintech products

Effective payment, banking, and settlement systems are like the backbone which strengthens the financial systems of any economy. RBI payment & settlement system vision document 2019-2021 states the substantial and innovative development in the last decade. PSA Act, 2007 defines the payment and banking system of a country as a financial system that connects beneficiaries and payers for commercial transactions through clearing, funds transfer, payment, and settlement service. Information technology has been of great essence in any country and has played an important role in achieving the objective of an efficient payment system that connects banks, financial markets, and customers digitally through online and mobile banking channels. (Dan Golani, 2011) Innovations in technology have resulted in an increase in the number of online bank account openings and the usage of digital banking products by customers. Therefore, to meet the tough competition (Kaplan,Mikes,2012), banks started shifting their traditional manual banking operations to computerization on a large scale. A number of new initiatives and technological innovations (Garicano, 2015) were introduced in the banking sector to resolve complaints and increase customer satisfaction. Banks started identifying their potential customers and maintained close interactions with them to meet their needs by developing new digital and electronic products and services. Customer Relationship

3.2 Customer Satisfaction in Evolving Technology-Driven Payments: Indian Perspective

The studies highlight the role of trust as vital in shaping the success and endurance of online payments and evolving payment ecosystems. The customer satisfaction models (Cabanillas,Leiva, 2022) depict a dismal picture that is far

away from ground realities. Technology-mediated satisfaction stimulus in new virtual models of banking without brick and mortar seems to be a new theme of research attention. The common factors that echo well across major literature are data accuracy, internal controls, technology infrastructure, access system security, digital literacy, possession, information technology infrastructure, availability, adaptation, digital fintech, and financial literacy. Customer satisfaction as such is not a standalone phenomenon yet comprises the collective role of “data adequacy”, “internal controls”, “technological infrastructure”, “access system”, “security”, and “digital literacy” as well. The bank-generated “data adequacy”, “internal controls”, “access system”, and “security”; seem to cast a significant impact on the “adaptation” prospects. The “technological infrastructure”, “digital literacy” and respective “possession” of devices seem to impact the “adaptation” and “customer satisfaction” prospects. The debate (Tingting, Zhang., Can, Lu. Murat, Kizildag,2018) is ripe with regard to the exact nature and scope of the competencies (Singh,2016) that can either be learned or harnessed for staying relevant in the vocation concerned. The core identifiers (Table 2) that equip the Yester year librarians to stay relevant in post-pandemic phase have been identified as under:

Table 2 Summarizing the Indicators

Article	Data Accuracy	Internal Controls	Tech Infra	Access System	Security	Digital Literacy	Possession	IT Infrastructure Availability	Adaptation	Digital Fintech	Financial Literac
Alain Yee, Loong Chong, Keng-Boon Ooi, Binshan Lin, Boon-In Tan, (2010)	*				*	*	*	*			
Zhang, Lu & Kizildag (2018)				*	*	*	*	*	*	*	
Singh & Srivastava (2018)		*	*	*	*		*				
Muslim Amin, (2016)		*		*		*	*	*	*	*	*
Kolodinsky, Hogarth, & Hilgert, (2004)		*		*	*	*	*	*	*	*	*
Bhasin & Rajesh (2015)	*	*		*	*	*	*	*	*		*
Alain Yee-Loong Chong, Keng-Boon Ooi, Binshan Lin, Boon-In Tan, (2010)	*		*	*	*	*	*	*	*		*

4. Results

4.1 Factors / Variables Identified

Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), Culture, Perceived Risk (PR), Perceived Usefulness (PU), Digital Awareness, Data Privacy, Website Design,

4.2 Hypothesis

With regard to TAM, the following hypotheses are proposed:

- **H1:** Perceived usefulness has a positive effect on consumers' intention toward the use of digital banking services.
- **H2:** Perceived usefulness has a positive effect on consumers' attitude towards the use of digital banking services.
- **H3:** Perceived ease of use has a positive effect on consumers' attitude towards the use of digital banking services.
- **H4:** Perceived ease of use has a positive effect on consumers' perceived usefulness towards the use of digital banking services.
- **H5:** Attitude has a positive effect on consumers' intention towards the use of electronic banking services.

4.3 Reliability of Scale Elements

The reliability assessment is vital for the evaluation of the internal consistency of the responses collected from the Likert scaling instrument. Reliability is deemed essential to ascertain the nature of responses that have been received. The existing literature identifies that internal reliability analysis is crucial for the ascertainment of that-based internal consistency. In order to achieve the internal reliability assessment, Cronbach alpha figures are the most prominent tool. When examined for internal reliability vis a vis the constituent scale items representing the individual determinants and behavioral prospects, the cronbach alpha measure of 0.865 was observed which is tentatively in the satisfactory range of 0.5 to 0.99. This calls for the satisfactory achievement of the internal consistency of responses with regard to individual aspects.

4.4 Dimensional Validity

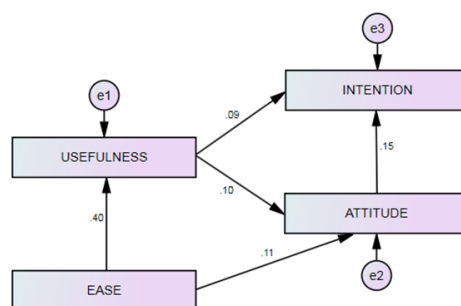
The KMO measure for “individual influences” on respective adaptability was observed to be 0.903 which is in the satisfactory range of 0.7 to 0.99. This is tantamount to saying that data collected with regard to factors comprising the scale; is factorable. The Bartlett test of data sphericity revealed a p-value of 0.000(<0.05) which stands for the satisfactory presence of statistically significant variance across the data collected with regard to scale. The significant “p-value” in other words points towards the significant utility of the data and suitability of the data for consideration with regard to factor analysis.

4.5 Tools and Approach

The study leveraged the IBM AMOS software for the evaluation of cross-factor impact, path-based influence, and respective assessment of the structural relationships. The evaluation of structural relationships is deemed essential to ascertain the vindication of the assumed hypothesis and the respective assessment of the cross-factor impact. The AMOS version release 23.0 was harnessed to accomplish the evaluation of structural relationships amongst the concerned factors.

4.6 Hypothesis Vindication

The hypothesis catered to an investigation of the relationship between technology and quality of the service with respect to various factors which impact customers’ preferences for adaptation of e-banking and measuring customer satisfaction in public sector banks and private sector. The hypothesis in addition studied the various problems being faced by the bank’s customers is using electronic payment systems and their impact on customer satisfaction. The hypothesis analyzed the new combined role of Digital Banks and Fintech Companies in improving customer services. The hypothesis examination revealed the incidence of the significant impact of system infrastructure on the perceptions of adaptability and customer satisfaction.



			Estimate
USEFULNESS	<---	EASE	.398
ATTITUDE	<---	USEFULNESS	.098
ATTITUDE	<---	EASE	.106
INTENTION	<---	USEFULNESS	.091
INTENTION	<---	ATTITUDE	.149

Hypothesis	Outcome
H1: Perceived usefulness has a positive effect on consumers' intention toward the use of digital banking services	Supported
H2: Perceived usefulness has a positive effect on consumers' attitudes toward the use of digital banking services	Supported
H3: Perceived ease of use has a positive effect on consumers' attitudes towards the use of digital banking services	Supported
H4: Perceived ease of use has a positive effect on consumers' perceived usefulness towards the use of digital banking services	Supported
H5: Attitude has a positive effect on consumers' intention toward the use of electronic banking services	Supported

The hypothesis examination above reported a statistically significant relation between technology and quality of the service with respect to various factors which impact customer’s preferences for adaptation to e-banking and measuring

customer satisfaction in the banking sector. In terms of restraining factors, IT infrastructure availability in a homogenous manner as well as possession of 4G or 5 G-friendly mobile handsets; were figured out as exerting challenges to customer adaptation and respective threats to customer satisfaction from electronic payment mechanisms. In nutshell, the IT infrastructure availability and possession of upgraded handset figures as the major problem being faced by the bank's customer is using electronic payment systems and its impact on customer satisfaction.

5. Conclusions

5.1 Theoretical Implications

Theoretical implications of the research focus on the empirical exploration of the influences of the factors which impact risk and complaint management and the quality of e-banking adaptation across the regional perspective. The study-based outcomes point towards the incidence of the impact of factors as assumed in the study. The study-based findings hold relevance for the retail and domestic bank services user's adaptation to e-banking platforms, user's psychological attributes as well as implications for shaping e-banking adaptation patterns. The facilitator factors were observed as data-based security as well as the user's possession of handsets or instruments. The restraining factors were observed as the current state of IT infrastructure. The research-derived theoretical implications are focused on the exploration of ways and means of seeking sustainable change in existing approaches to banking services usage, creating motivation for the adoption of new mindsets, and effective management of the transition to e-banking platforms. Reserve Bank of India and the National Payment Corporation of India has always promoted digital banking product and implementation of a payment system vision. As studied in the literature review, the brief summary of payment system vision and recent data of various payment settlement data on RBI and NPCI Platform reflects the increasing adaptation of electronic banking products. The advantage of increased usage of digital banking with the introduction of a Unified and integrated ombudsman w.e.f June 2021 by RBI will ensure faster resolution of customer complaints and more new users joining the digital and Fintech world. Respondents also suggested that one e-integrated ombudsman for all banking, non-banking, and digital banking complaints will improve customer trust and satisfaction.

5.2 Recommendations

Customer satisfaction in the banking sector refers to the level of customers' happiness in using technology-based banking products that meet their expectations and perception. This study attempted to measure customer satisfaction by using survey and questionnaire techniques. The core recommendations from the research are summarized here:

- Customer Awareness and Adaptation of Electronic / Digital Banking products by the bank's customers are increasing due to initiatives taken by RBI, the National Payment Corporation of India, Banks, and the Government of India.
- Financial Technology (Fintech) is playing an important role along with the bank's electronic products as the data reflects the increased usage like the Use of ATMs, Debit and Credit Cards, Less use of cheques and customers replacing cash which shows the paradigm shift from traditional ways of banking to modern banking.
- Increased frequency usage of Online and Mobile Banking, user-friendly websites, NEFT, and RTGS transactions by customers indicate positive signs of the future of banking technology.
- Role of the Bank's digital Relationship Manager and Fintech companies service providers to the customers to measure customer satisfaction
- Customer satisfaction level on with e-banking services provided by the banks or a number of problems faced by the customers in using e-banking services.
- Number of complaints or frauds in digital banking usage by customers should be reduced by customer's awareness of how to lodge the complaints first at the branch level

5.3 Limitations

The research relied only on the existing literature and the publications that surfaced with keyword searches. The primary data was incorporated in form of a closed-ended 5-point Likert scale. The sample survey covers a geographical area that was conducted in Delhi. NCR region where the respondents (bank's customers) are mostly (78%) aware of existing electronic funds transfer payment systems and problems faced by them in adoption, awareness and usage of digital banking products are being escalated to Ombudsman. The demographic location of respondents reflects that 41.7% of respondents belong to Noida, Uttar Pradesh India and 38.2% of respondents belong to Gurgaon which makes the outcome of the study difficult to generalize the results to the entire sample population. The findings and observations of the research study are based on the assumption that the respondents have provided information that is authentic and unbiased.

5.4 Directions for Future Research

The conclusion summarizes further areas of research that could probably enhance and enrich the prospects for digital customer satisfaction in the age of IoT and online banking. The future scope of the study is to conduct the research through surveys in semi-urban and rural areas where financial and digital literacy levels are low. Financial inclusion in an unbanked rural area is important to bring the whole country into the digital era. Understanding the characteristics

of the place and people and the effort to reduce cash and educate customers in rural areas to use simple digital banking products will be the major challenges.

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