



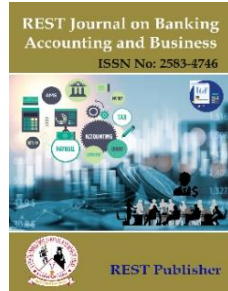
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# Analysis of Electronic Banking and Information Technology using the TOPSIS Method

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**Abstract:** Electronic banking, sometimes referred to as electronic transfer of funds (EFT), is the process of moving money electronically from one account to another. A 2015 Treasury Department poll found that 22% of mobile telephone owners conduct banking transactions online or over the phone as opposed to in person. They accomplish this via computer technology, telecommunications, and mobile payments. Automatic bill and paycheck deductions, computerized money transfers for online spending, and payment machines (ATMs) are some of its features. In the banking sector, information technology refers to the application of cutting-edge computer science and information and communication technologies. It retains a strategic advantage over all the other banks by offering its customers safe, dependable, and inexpensive services. A variety of banking services and other facilities that use electronic technology are referred to as electronic banking. Services for debit cards and ATMs. Banking over the phone. Online banking is one of the main services offered by banks, and it is also a relatively safe platform. Banks often use encryption technology to safeguard all client data and stop security lapses. Last, it provides protection from online scams and account hacking. Electronic banking, sometimes known as e-banking, is a broad term for using technology to access banking services, Internet banking, on the other hand, is a type of electronic banking. It employs electronic ways to move money straight from one accounts to another and is also referred to as an "Electronic Funds Transfer" (EFT). Automatic Teller Machines (ATMs) are online banking facilities that let customers do transactions without going to a bank location. Some ATMs only let you withdraw cash, while others let you do a wide range of things like check deposits, current accounts, and bill payments. Mobile banking is only possible through mobile devices, but digital banking gives you access to a variety of banking options from your desktop, tablet, laptop, etc. Also, you can do mobile banking through SMS or banking applications without the need for the Internet. By replacing document and labor-intensive techniques with automated processes, internet banking has become an effective resource for increased productivity and profitability, operational control, and cost savings. Examining how online banking affects consumer happiness is the goal of this empirical study. The goal of electronic banking is to increase customer happiness and lessen crowding in bank lobby areas. Banks have not adequately utilized these facilities despite their introduction. Customers' unhappiness and being crowded in the financial institutions are results of this. To convey different financial services and goods, telecommunication systems and electronic networks are used. A customer can use his or her computer or mobile device to access his or her account and manage several transactions with e-banking. E-banking has become a more important aspect thanks to advancements in financial innovation and inventiveness of the banking sector. In the present day, e-banking has changed everyone's lives. The wave of the information revolution is taken into consideration after the farms and factories revolutions. Prior to the introduction of online banking, customers had to physically visit the credit union to conduct their savings account operations. Many computer-savvy people enjoy using e-banking. Since the number of individuals using the internet has expanded over time and more people are becoming aware of the numerous advantages that online banking offers, its popularity has surged rapidly. TOPSIS method of ranking evaluated based on enhanced ambiguity comparison with weighted average. One of the typical approaches Multiple responses in the process used in TOPSIS to improve problems, reduce uncertainty determining the weight of each response and manageable at the same time A global approach continuously. Magnetic ink character recognition (MICR) technology, Real time gross settlement (RTGS), National electronic fund transfers (NEFT), Cheque truncation system (CTS), Automated teller machines (ATMs), Smartcard banking, Core banking solutions (CBS), Mobile banking and Internet banking. Global financial environment, financial innovations and technologies and Information technology. Electronic Banking and Information Technology. Automated teller machines (ATMs) is got the first rank whereas is the National electronic fund transfer (NEFT) is having the Lowest rank. Electronic Banking and Information Technology. Automated teller machines (ATMs) is got the first rank whereas is the National electronic fund transfer (NEFT) is having the Lowest rank.

**Keywords:** MCDM, Cheque truncation system (CTS), Automated teller machines (ATMs), Smartcard banking, Core banking solutions (CBS), Mobile banking and Internet banking.

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## 1. INTRODUCTION

The additional expense to the customer is kept to a minimum using electronic banking solutions. With currently available standard infrastructure and software, users can conduct e-banking. This increases the allure of electronic banking but, regrettably, can reduce the amount of safety that even the service can provide. In reality, banks strive for a minimal level of protection that minimizes the majority of dangers while maximizing ease [1]. E-banking is now a vibrant sector of the banking industry because to advancements in financial ideas and technologies. That after agricultural and industrial revolutions, e-banking has now completely transformed people's life, which is thought to represent the fourth phase of the digital revolution. Prior to the introduction of online banking, account holders had to physically visit a bank branch to conduct transactions involving their savings. Despite the fact that e-banking has long been popular among tech-savvy people, it is becoming increasingly popular as internet usage rises, more people become aware of the many advantages that online banking has to offer. E-banking has developed into a crucial component of the international economy environment in today's more integrated financial systems confronting high volatility, high rivalry, and high time restrictions in order to meet the variety of needs of banking sector consumers. the banking system in India. This study makes an effort to evaluate how e-banking and information technologies have affected the banking industry's workforce [2]. Is there a revolution in American e-banking? Many e-banking technologies are being used by millions of Americans, and millions more are anticipated to go "online." Millions of people, though, either won't or don't. This article looks at the variables that affect whether or not three e-banking technologies are adopted, as well as how these variables have changed over time. They discovered that perceived advantage, complexity/simplicity, comparability, learnability, risk profile, and product participation were related to adoption using a data set commissioned by the Federal Reserve Board [3]. Ethiopian electronic banking services Ethiopia's reserve bank is still immature in comparison to the global average. Cash is still the most widely used method of payment in Ethiopia, while e-wallets are nonetheless in their infancy. Dashan Bank, a private corporate bank that has made a lot of effort to become a leader in payment technology, has overtaken the Traditional Bank of Ethiopia (CBE), which pioneered the deployment of a Right know payment system. By the end of June 2009, Dashan Bank has placed over 40 ATMs at its regional branches, on college campuses, in retail centers, and in other public places. Hotel and dining establishments and has continued to take the lead in developing e-banking in Ethiopia. The main barriers to the growth of internet banking in Ethiopia include the absence of an adequate regulatory and legislative framework, the high rates of illiteracy, the frequency of rolling blackouts, and security concerns. Every bank in Ethiopia is running too late to adopt modern technology. They should make a clear schedule for organizational integration and technological development in order to promote and establish successful e-banking in Ethiopia [4]. Impact of electronic banking services on bank costs, revenues and profits and productivity The goal of this study is to discuss how electronic banking services affect banks' profits. The findings of this research are anticipated to shed light on how electronic banking services affect bank profitability as well as other relevant concerns [5]. Compared to traditional banking goods, technology-based products have the potential to provide considerable cost advantages, boost profitability, and lower risk. Additionally, research has shown that investments in the field will pay off quickly if there is enough client demand for an institution's technology-based offerings. Empirical research carried out in a number of nations have shown that online banking capabilities enhance bank performance. However, because the capital investment could not be made sufficiently and because customers prefer conventional branch-based banking, the anticipated results have not been observed in several less advanced and developing countries [6]. Electronic banking software for instance, according to a recent analysis from Deutsche Bank Research, several German banks have already included social networking tools into their e-banking strategy, but we were unable to locate any academic studies on this subject. Because it enables a greater awareness of customer behavior towards cutting-edge e-banking technologies, a quick study of research in this field through interviews with several bank managers' practitioners is welcomed [7]. The writers created and evaluated electronic banking services, and four websites were chosen. After reviewing each website, disagreements among the group were settled through conversation, with an original consensus of 97%. The websites that were chosen included a variety of confidentiality features, labels, and statements, as shown in Table 1. Two of the four websites belong to banks that have the same name as their physical counterparts, while the other two have distinct names. The security and privacy rules of each website vary [8]. A collection of methods used by any consumer to conduct bank transfers electronically without going to the bank is referred to as "e-banking services" (Mehmood et al., 2014). Jordanian banks work to set themselves apart from the competition by adapting some of their conventional functions, as well as aligning their services with customers' expanding needs, which lowers the administrative costs of the bank and its facilities (Abu-Assi et al., 2014). In order to make their services more practical and effective for consumers, a rising number of Jordanian banks are now also looking for novel ways to offer them, such as internet banking.

The level of support and client satisfaction with online banking are significant factors for banks to consider [9]. The "clock speed" of the information technology (IT) sector, which measures how quickly the business environment is changing, is at its peak (Fine 1998, Mendelson and Pillai 1998, 1999a). Because processor clock speeds increase dramatically due to Moore's Law, which asserts that the transistor density on a semiconductor twice every 18 months, IT products are always changing. Product life cycles are increasing shorter, as are the times needed for development, and commercial operations are getting quicker. A record amount of fresh information is being received, so it must be processed fast and effectively [10]. Our data is sourced from IT business divisions. In 1996, the sector's whole worldwide output was more than \$500 billion (cf. Electronics Business Today 1997). This industry produces devices that use integrated circuit chips to support diverse information processing functions. As a result, our model has business units that operate in environments with various clock speeds, but they all work to develop and provide information processing that is based on the same fundamental technology [11]. Companies have an added incentive to establish strategic alliances with businesses in these developing economies because of the IT sector. It enables businesses to provide top-tier goods and services for one-fourth of the price of comparable offerings. These types of coalitions reduce economic nationalism and foreign protectionism. The widening of the Indian market has been a huge blessing for us, said a senior executive of a major telecom business. India can provide us with high-quality software at competitive prices, giving us a significant competitive advantage. We are intending to approach the country aggressively with the aid of regional businesses because we can find the greatest software developers there [12]. (1) lowering one's own switching costs with respect to suppliers, (2) increasing a which is thought to represent the fourth phase of the digital revolution. Prior to the introduction of online banking, account holders had to physically visit a bank branch to conduct transactions involving their savings, and (4) shared information. Collaboration with specific rivals via technical means, the employment of information technology in place of labor, a greater ability to segment and use information, and better customer satisfaction [13].

## 2. MATERIALS AND METHOD

**2.1. Magnetic Ink Character Recognition (MICR) Technology:** The introduction of this technology in the middle of the 1980s marked a significant improvement over the paper-based settlement procedure. With the help of this technology, customers can quickly obtain loans to get beyond the restriction of clearing checks during the constrained banking hours. Machine-readable checks have MICR codes added to them. The bank can transport checks to the appropriate bank locations using this technology. This system facilitated swift settlement.

**2.2. Real Time Gross Settlement (RTGS):** The Reserve Bank of India launched RTGS in 2004 to boost the effectiveness and speed of something like the check settlement mechanism. After the programmer had undergone thorough testing and was properly trained, the system was launched. Those who use commercial banks. The system is made to enable bulk or "real-time" settlement of transactions and large-scale fund transfers in a timely manner. It is the financial system's quickest method of money transfer. Real-time settlement settles transactions instantly after they are finished, with no waiting period. Because there is a 1 lakh rupee minimum, the Bank - to - bank system is designed for high value transactions. rupees. RTGS transactions are not subject to any ceilings.

**2.3. National Electronic Funds Transfer (NEFT):** The NEFT system allows for rapid transfers of money between bank branches across the country. In November 2005, NEFT was introduced, and it appears to be a significant step towards the revolution. The system operates on the idea of a centralized accounting system and places no limitations on any particular region of India. According to this arrangement, the beneficiary can only receive a loan within two days, depending on specific circumstances.

**2.4. Check Cut System (CTS):** 2008 saw the debut of CTS. To "cut off" something is to put a stop to it. The goal of this system was to finish the physical transfer of checks with one branch to another. When the electronic images of the check had been sent to the other branch together with all pertinent information, such as MICR, the physical instrument was no longer needed under this approach. With the help of this technology, both the time and money needed to move checks physically have been decreased. This approach also guarantees speedy check clearance. Bank customers must obtain Before to December 2012, fresh chequing accounts from their separate banks in order to deploy this system.

**2.5. Automated Teller Machines (ATMs):** In the early 1990s, ATMs were implemented in the Indian financial system. This still stands as one of the key aspects of e-banking. Customers use plastic cards to access ATMs. The customer's information is stored on a magnetic strip in these plastic cards. According to the bank's policies, they are used for withdrawals, balance inquiries, and other services. For use of the ATM, a valid customer ID and password must be entered. Debit cards are accepted on ATM machines in addition to ATM cards. For cardholders, easy access to Terminals has made internet banking possible. These cards guarantee that the ideas of "Any Time Banking" and "Any Wear Banking" are effectively applied.

**2.6. Smart Card Banking:** Magnetic stripe banking is the practice of conducting financial transactions using electronic cards like ATM, debit, and credit cards. Customers can easily receive money, send money, and get account information using this banking system without physically going to a bank location. Hotels, marketplaces, transportation hubs, shopping centers, and many more locations in cities offer smart card services. There are several sorts of cards available

**2.7. Core Banking Solutions (CBS):** In order for consumers to manage their balances from any bank branch, even if they are not at a branch, CBS connects all of the bank's branches together. All branches were networked together, allowing for centralized data administration. This system utilizes cutting-edge technology to consolidate all of a bank's branch activities into a single platform. The introduction of computers to automated branch activities under central banking systems marked the beginning of the computerization of bank branches.

**2.8. Mobile Banking:** It involves carrying out business operations using wireless fixed or mobile phones. When voice or text messages are used to communicate instructions to the computer, mobile banking occurs (SMS).

**2.9. Internet Banking:** Customers of financial institutions can perform online financial transactions at a website run more by institution from the convenience of their homes and offices using internet banking, also known as virtual banking. Internet banking is used for trades, payments, and other activities over the internet using the secure website of the bank, credit union, or community. It enables banking from anywhere, at any time. Internet banking is the practise of carrying out financial transactions online. Customers have the option to use financial services through internet banking at the ease of their residences and places of business. Consumers can use internet banking to place online orders, have the items delivered to their selected location, and instruct their institutions to pay the supplier the proper invoice amount. Because Internet banking makes it simpler to pay cellular, credit card, and insurance costs bills because each bank has connections to a number of utilities, service providers, and insurers across the country and the globe.

**2.10. Global Financial Environment:** The foreign flows on commercial investment funds and trade financing are facilitated by the global financial system, which is a structure of institutions, institutions, both official and informal economic actors, and legal agreements. The World Bank, large private international banks, financial institutions, governmental treasuries and monetary agencies, and the Worldwide Monetary Fund are examples of financial institutions on a global scale.

**2.11. Financial Innovations and Technologies:** Finance innovation consists of creating new financial or investment goods, services, or methods. updated tools, risk assessment, risk transfer, and the creation of credit or equity, and many more innovations are among these improvements. The creation of new financial institutions, markets, institutions, processes, and goods is referred to as financial innovation. A few examples are weather derivatives, digital currencies issued by central banks, QR code money, cordless ATM services, hedge funds, and exchange-traded funds.

**2.12. Information Technology:** Any position involving an information and technology job is one that involves developing, implementing, supporting, maintaining, repairing, or securing data or computer systems. For the most part, IT professions involve creating, deploying, or maintaining programmers or systems that are utilized by others. An IT professional is qualified to install, monitor, and repair various software and hardware elements of a company's computers. Furthermore, they offer on-site or remote management assistance for these systems as needed by managers within their company.

**2.13. Method:** TOPSIS method of ranking evaluated based on enhanced ambiguity comparison with weighted average. One of the typical approaches Multiple responses in the process used in TOPSIS to improve problems, reduce uncertainty determining the weight of each response and manageable at the same time A global approach continuously [14]. The TOPSIS process is an advanced and simple ranking engine used. The state-of-the-art TOPSIS technique tries to simultaneously choose alternatives with very short of the best-correct solution far and far from the worst-case-scenario solution. A better superior response increases the benefit criteria and lowers the price criterion, while a worse superior response raises the price Criterion and Advantage Reduces criteria TOPSIS makes full use of the attribute records [15]. TOPSIS method, two fuzzy Member Respectively Activities and a census sheet. of this title Basic attributes of FMCDM Motivations for use, open challenges and constraints to its use, and recommendations for researchers to increase FMCDM acceptance and use [16]. Topsis is another mead because of its characteristics More effective than heuristics Fewer parameters, more stability multiple response values when the value changes contain The TOPSIS algorithm was developed [17]. TOPSIS rankings are given by five distance measurements, different Random problems of sizes are created are calculated in the numerical example. We conduct a comprehensive comparative study of preference ranking orders, including consistency ratio, odds ratio of best alternatives, and mean Pearson coefficients of relationship. The Relationship Between the two variables is the last. The number of options over the coefficients' mean Count and distance between qualities the second is to realize the influence of measurements Row regression will be implemented. "Proximity to ideal" is developed by compromise programming system. It is the "majority" and the minimum Provides maximum "group utility" for the individual grievance to "opponent". TOPSIS method for ideal solution short range and negative-optimal Determines the solution with these distances Not considered significant [18]. The Topsis (of the optimal solution Order by unity technique for option) technique offered to indicate TOPSIS, a multi-criteria

technique for identifying selected opportunity need to most from the grand perfect solution shorter distances worse at best Stay away from the solution [19]. TOPSIS may also seem reasonable however it's far undoubtedly now not. One complaint is that the relative significance of the 2 separations is not considered, the hassle taken into consideration, and they amplify TOPSIS to solve the multi-goal selection-making (MODM) hassle. PIS Short distance from and NIS longest distance), then a “satisfiability condition” for each criterion is delivered, followed through max-min operator for those criteria Eliminate conflict between uses Ultimately “harmony is solution where the satisfaction [20]. TOPSIS (A Technique for Optimal Solution-like Regulatory Performance) is an effective. Perform analysis, comparisons and rating of options. Accordingly, appropriate Therefore, this takes a look at will amplify TOPSIS to actual assignment-oriented group decision-making surroundings. A whole and efficient selection-making procedure is then supplied [21]. TOPSIS has been carried out. First, based on a big range of statistics and theoretical evaluation, the consequences of EW at the system of attribution in decision-making or assessment are analyzed. Then from the perspective of specific and bilateral stage selection-making or assessment effects, the consequences of EW on TOPSIS are similarly analyzed. E-TOPSIS is used to regulate the function of EW in selection-making or assessment [22].

### 3. RESULTS AND DISCUSSION

TABLE 1. Electronic Banking and Information Technology

	Global financial environment	Financial innovations and technologies	Information technology
Magnetic ink character recognition (MICR) technology	0.1090	0.0960	0.1400
Real time gross settlement (RTGS)	0.0840	0.1100	0.0390
National electronic fund transfer (NEFT)	0.0690	0.0836	0.1530
Cheque truncation system (CTS)	0.1170	0.0954	0.1210
Automated teller machines (ATMs)	0.0790	0.1040	0.0250
Smartcard banking	<b>0.1930</b>	<b>0.1320</b>	<b>0.1760</b>
Core banking solutions (CBS)	0.0987	0.0940	0.1200
Mobile banking	0.0680	0.1430	0.0590
Internet banking	0.1830	0.1420	0.1670

Table 1 shows the Electronic Banking and Information Technology for Analysis using the TOPSIS Method. Global financial environment, Financial innovations and technologies and Information technology Evaluation parameters. Magnetic ink character recognition (MICR) technology, Real time gross settlement (RTGS), National electronic fund transfers (NEFT), Cheque truncation system (CTS), Automated teller machines (ATMs), Smartcard banking, Core banking solutions (CBS), Mobile banking and Internet banking Alternative value.

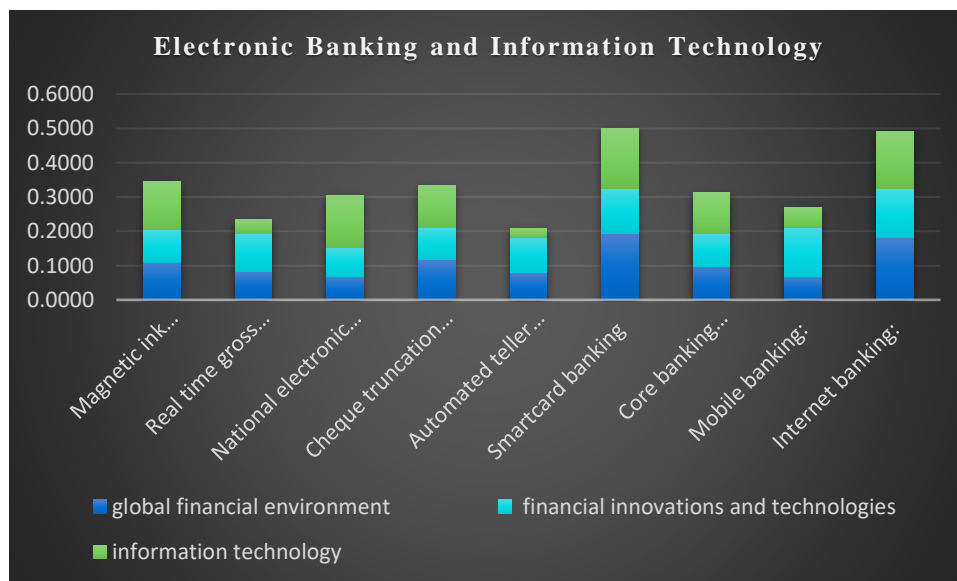


FIGURE 1. Electronic Banking and Information Technology

Figure 1. Shows Electronic Banking and Information Technology Magnetic ink character recognition (MICR) technology, Real time gross settlement (RTGS), National electronic fund transfers (NEFT), Cheque truncation

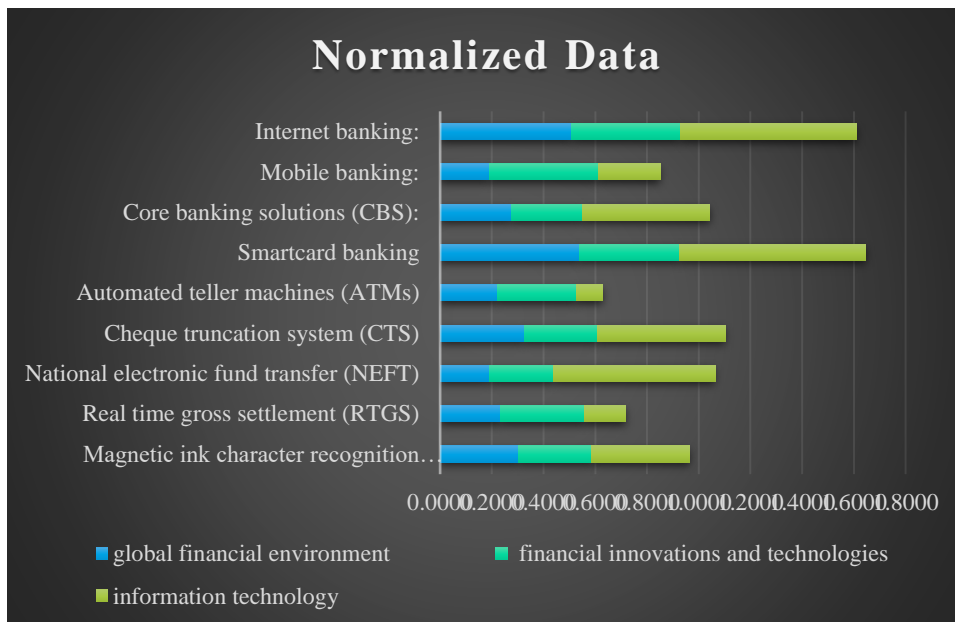
system (CTS), Automated teller machines (ATMs), Smartcard banking, Core banking solutions (CBS), Mobile banking and Internet banking from the figure 1 and table 1 it is seen that Smartcard banking is showing the Highest Value for Global financial environment and Mobile banking is showing the lowest value. Mobile banking is showing the Highest Value for Financial innovations and technologies and National electronic fund transfer (NEFT) is showing the Lower value. Smartcard banking is showing the Highest Value for Information technology and Automated teller machines (ATMs) is showing the lowest value.

$$X_{n1} = \frac{x_1}{\sqrt{(x_1)^2+(x_2)^2+(x_3)^2\dots}} \quad (1).$$

**TABLE 2.** Normalized Data

	Global financial environment	Financial innovations and technologies	Information technology
Magnetic ink character recognition (MICR) technology	0.3038	0.2830	0.3789
Real time gross settlement (RTGS)	0.2341	0.3242	0.1595
National electronic fund transfer (NEFT)	0.1923	0.2464	0.6257
Cheque truncation system (CTS)	0.3261	0.2812	0.4948
Automated teller machines (ATMs)	0.2202	0.3066	0.1022
Smartcard banking	0.5379	0.3891	0.7197
Core banking solutions (CBS)	0.2751	0.2771	0.4907
Mobile banking	0.1895	0.4215	0.2413
Internet banking	0.5100	0.4186	0.6829

Table 2 shows the various Normalized Data for Global financial environment, Financial innovations and technologies and Information Technology Normalized value is obtained by using the formula (1). Table 3 shows Weightages used for the analysis. We taken same weights for all the parameters for the analysis.



**FIGURE 2.** Normalized Data

Figure 2 Normalized Data Global financial environment, Financial innovations and technologies and Information technology Evaluation parameters. Magnetic ink character recognition (MICR) technology, Real time gross settlement (RTGS), National electronic fund transfers (NEFT), Cheque truncation system (CTS), Automated teller machines (ATMs), Smartcard banking, Core banking solutions (CBS), Mobile banking and Internet banking it is also Normalized Data Value.

**TABLE 3.** Weightages

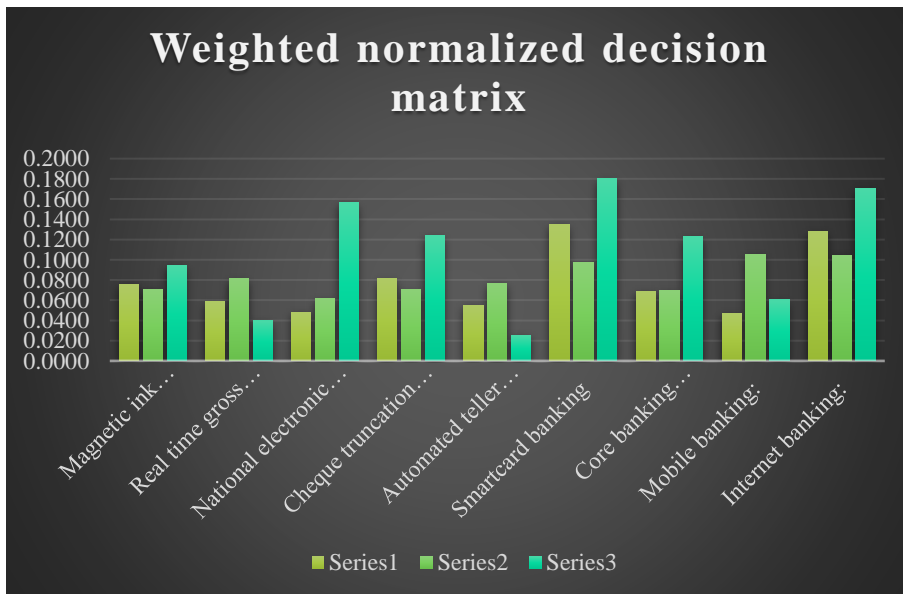
Weightages		
0.25	0.25	0.25
0.25	0.25	0.25
0.25	0.25	0.25
0.25	0.25	0.25
0.25	0.25	0.25
0.25	0.25	0.25
0.25	0.25	0.25
0.25	0.25	0.25
0.25	0.25	0.25

$$X_{wnormal1} = X_{n1} \times w_1 \tag{2)}$$

**TABLE 4.** Weighted normalized decision matrix

Weighted normalized decision matrix		
0.0759	0.0707	0.0947
0.0585	0.0811	0.0399
0.0481	0.0616	0.1564
0.0815	0.0703	0.1237
0.055	0.0766	0.0256
0.1345	0.0973	0.1799
0.0688	0.0693	0.1227
0.0474	0.1054	0.0603
0.1275	0.1046	0.1707

Table 4 shows weighted normalized decision matrix for Global financial environment, Financial innovations and technologies and Information Technology to figure out the weighted normalized decision matrix, we used the formula (2).



**FIGURE 3.** weighted normalized decision matrix

Figure 3 shows weighted normalized decision matrix for Global financial environment, financial innovations and technologies and Information Technology to figure out the weighted normalized decision matrix, we used the formula (2).

**TABLE 5.** Positive and Negative Matrix

Positive Matrix			Negative Matrix		
0.1345	0.1054	0.0256	0.0474	0.0616	0.1799
0.1345	0.1054	0.0256	0.0474	0.0616	0.1799
0.1345	0.1054	0.0256	0.0474	0.0616	0.1799
0.1345	0.1054	0.0256	0.0474	0.0616	0.1799
0.1345	0.1054	0.0256	0.0474	0.0616	0.1799
0.1345	0.1054	0.0256	0.0474	0.0616	0.1799
0.1345	0.1054	0.0256	0.0474	0.0616	0.1799
0.1345	0.1054	0.0256	0.0474	0.0616	0.1799
0.1345	0.1054	0.0256	0.0474	0.0616	0.1799

Table 5 shows Positive and Negative Matrix for Magnetic ink character recognition (MICR) technology, Real time gross settlement (RTGS), National electronic fund transfers (NEFT), Cheque truncation system (CTS), Automated teller machines (ATMs), Smartcard banking, Core banking solutions (CBS), Mobile banking and Internet banking. In various Positive Matrix in Maximum value 0.1345, 0.1054, Minimum value 0.0256 is taken and for Negative matrix the Minimum value 0.0474, 0.0616 and Maximum value 0.1799 is taken.

**TABLE 6.** Final Result of Electronic Banking and Information Technology

	SI Plus	Si Negative	Ci	Rank
Magnetic ink character recognition (MICR) technology	0.0970	0.0903	0.4822	<b>4</b>
Real time gross settlement (RTGS)	0.0810	0.1418	0.6365	<b>2</b>
National electronic fund transfer (NEFT)	0.1628	0.0235	0.1263	<b>9</b>
Cheque truncation system (CTS)	0.1169	0.0664	0.3621	<b>7</b>
Automated teller machines (ATMs)	0.0845	0.1553	0.6477	<b>1</b>
Smartcard banking	0.1546	0.0941	0.3784	<b>6</b>
Core banking solutions (CBS)	0.1227	0.0616	0.3342	<b>8</b>
Mobile banking	0.0938	0.1274	0.5760	<b>3</b>
Internet banking	0.1453	0.0914	0.3861	<b>5</b>

Table 6 shows the final result of TOPSIS for Electronic Banking and Information Technology. Figure 3 shows the TOPSIS Analysis Result of Electronic Banking and Information Technology. In Table 6, Si positive is calculated using the formula (3). From figure 4, In Si positive, National electronic fund transfer (NEFT) is having is Higher Value and Real time gross settlement (RTGS) is having Lower value. Si Negative is calculated using the formula (4). In Si Negative, Automated teller machines (ATMs) is having is Higher Value National electronic fund transfer (NEFT) is having Lower value. Ci is calculated using the formula (5). In Ci, Automated teller machines (ATMs) is having is Higher Value and National electronic fund transfer (NEFT) is having Lower value.

$$X_{si+1} = \sqrt{((X_{wn1} - X_{p1})^2 + (Y_{wn1} - Y_{p1})^2 + (Z_{wn1} - Z_{p1})^2)} \tag{3}$$

$$X_{si-1} = \sqrt{((X_{wn1} - X_{n1})^2 + (Y_{wn1} - Y_{n1})^2 + (Z_{wn1} - Z_{n1})^2)} \tag{4}$$

$$X_{ci1} = \frac{X_{si-1}}{(X_{si+1}) + (X_{s(i-1)})} \tag{5}$$



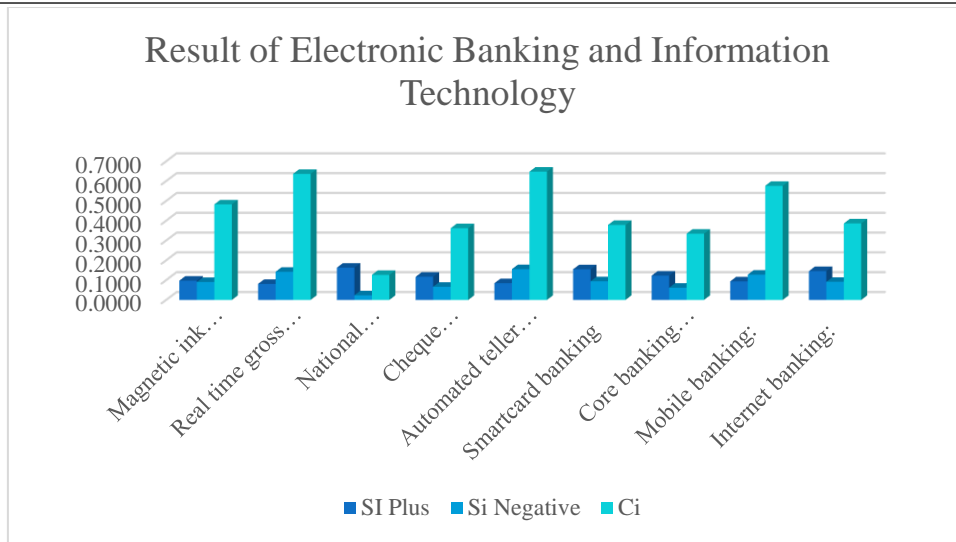


FIGURE 4. Result of Electronic Banking and Information Technology



FIGURE 5. Shown The Rank

Figure 5 Shows the Ranking of Electronic Banking and Information Technology. Automated teller machines (ATMs) is got the first rank whereas is the National electronic fund transfer (NEFT) is having the Lowest rank.

#### 4. CONCLUSION

Electronic banking, sometimes referred to as electronic transfer of funds (EFT), is the process of moving money electronically from one account to another. A 2015 Treasury Department poll found that 22% of mobile telephone owners conduct banking transactions online or over the phone as opposed to in person. They accomplish this via computer technology, telecommunications, and mobile payments. Automatic bill and paycheck deductions, computerized money transfers for online spending, and payment machines (ATMs) are some of its features. In the banking sector, information technology refers to the application of cutting-edge computer science and information and communication technologies. Mobile banking is only possible through mobile devices, but digital banking gives you access to a variety of banking options from your desktop, tablet, laptop, etc. Also, you can do mobile banking through SMS or banking applications without the need for the internet. By replacing document and labor-intensive techniques with automated processes, internet banking has become an effective resource for increased productivity and profitability, operational control, and cost savings. Examining how online banking affects consumer happiness is the goal

of this empirical study. The goal of electronic banking is to increase customer happiness and lessen crowding in bank lobby areas. Banks have not adequately utilized these facilities despite their introduction. The additional expense to the customer is kept to a minimum using electronic banking solutions. With currently available standard infrastructure and software, users can conduct e-banking. This increases the allure of electronic banking but, regrettably, can reduce the amount of safety that even the service can provide. In reality, banks strive for a minimal level of protection that minimizes the majority of dangers while maximizing ease. The introduction of this technology in the middle of the 1980s marked a significant improvement over the paper-based settlement procedure. With the help of this technology, customers can quickly obtain loans to get beyond the restriction of clearing checks during the constrained banking hours. Machine-readable checks have MICR codes added to them. The bank can transport checks to the appropriate bank locations using this technology. This system facilitated swift settlement. The Reserve Bank of India launched RTGS in 2004 to boost the effectiveness and speed of something like the check settlement mechanism. After the programmer had undergone thorough testing and was properly trained, the system was launched. those who use commercial banks. The system is made to enable bulk or "real-time" settlement of transactions and large-scale fund transfers in a timely manner. TOPSIS method of ranking evaluated based on enhanced ambiguity comparison with weighted average. One of the typical approaches Multiple response in the process used in TOPSIS to improve problems, reduce uncertainty determining the weight of each response and manageable at the same time A global approach continuously. Magnetic ink character recognition (MICR) technology, Real time gross settlement (RTGS), National electronic fund transfers (NEFT), Cheque truncation system (CTS), Automated teller machines (ATMs), Smartcard banking, Core banking solutions (CBS), Mobile banking and Internet banking. Global financial environment, Financial innovations and technologies and Information technology. Electronic Banking and Information Technology. Automated teller machines (ATMs) is got the first rank whereas is the National electronic fund transfer (NEFT) is having the Lowest rank.

## REFERENCES

- [1]. Claessens, Joris, Valentin Dem, Danny De Cock, Bart Preneel, and Joos Vandewalle. "On the security of today's online electronic banking systems." *Computers & Security* 21, no. 3 (2002): 253-265.
- [2]. Gupta, Sweety, and Anshu Yadav. "The impact of electronic banking and information technology on the employees of banking sector." *Management and Labour Studies* 42, no. 4 (2017): 379-387.
- [3]. Kolodinsky, Jane M., Jeanne M. Hogarth, and Marianne A. Hilgert. "The adoption of electronic banking technologies by US consumers." *International Journal of Bank Marketing* 22, no. 4 (2004): 238-259.
- [4]. Fekadu, Gardachew Worku. "Electronic Banking in Ethiopia: Practices, Opportunitites and Challenges." *Opportunitites and Challenges (October 21, 2009)* (2009).
- [5]. Siam, Ahmad Zakaria. "Role of the electronic banking services on the profits of Jordanian banks." *American Journal of Applied Sciences* 3, no. 9 (2006): 1999-2004.
- [6]. Akhisar, Ilyas, K. Batu Tunay, and Necla Tunay. "The effects of innovations on bank performance: The case of electronic banking services." *Procedia-Social and Behavioral Sciences* 195 (2015): 369-375.
- [7]. Hoehle, Hartmut, Eusebio Scornavacca, and Sid Huff. "Three decades of research on consumer adoption and utilization of electronic banking channels: A literature analysis." *Decision Support Systems* 54, no. 1 (2012): 122-132.
- [8]. Yousafzai, Shumaila Y., John G. Pallister, and Gordon R. Foxall. "Strategies for building and communicating trust in electronic banking: A field experiment." *Psychology & Marketing* 22, no. 2 (2005): 181-201.
- [9]. Rawwash, H., F. Masad, O. Enaizan, B. Eneizan, M. Adaileh, A. Saleh, and R. Almestarihi. "Factors affecting Jordanian electronic banking services." *Management Science Letters* 10, no. 4 (2020): 915-922.
- [10]. Mendelson, Haim. "Organizational architecture and success in the information technology industry." *Management science* 46, no. 4 (2000): 513-529.
- [11]. Mendelson, Haim, and Ravindran R. Pillai. "Clockspeed and informational response: Evidence from the information technology industry." *Information Systems Research* 9, no. 4 (1998): 415-433.
- [12]. Rai, Arun, Santanu Borah, and Arkalgud Ramaprasad. "Critical success factors for strategic alliances in the information technology industry: an empirical study." *Decision Sciences* 27, no. 1 (1996): 141-155.
- [13]. Kim, Namwoon, Dae Ryun Chang, and Allan D. Shocker. "Modeling intercategory and generational dynamics for a growing information technology industry." *Management Science* 46, no. 4 (2000): 496-512.
- [14]. Zavadskas, Edmundas Kazimieras, Abbas Mardani, Zenonas Turskis, Ahmad Jusoh, and Khalil MD Nor. "Development of TOPSIS method to solve complicated decision-making problems—An overview on developments from 2000 to 2015." *International Journal of Information Technology & Decision Making* 15, no. 03 (2016): 645-682.
- [15]. Behzadian, Majid, S. Khanmohammadi Otahgsara, Morteza Yazdani, and Joshua Ignatius. "A state-of-the-art survey of TOPSIS applications." *Expert Systems with applications* 39, no. 17 (2012): 13051-13069.

- [16].Salih, Mahmood M., B. B. Zaidan, A. A. Zaidan, and Mohamed A. Ahmed. "Survey on fuzzy TOPSIS state-of-the-art between 2007 and 2017." *Computers & Operations Research* 104 (2019): 207-227.
- [17].Ravindran, D., & Venkatesakumar, R. (2017). Retail Preference of Promotion in Cashless Economy-FMCG Products. *Shanlax International Journal of Commerce*, 1, 457-462.
- [18].Shukla, Atul, Pankaj Agarwal, R. S. Rana, and Rajesh Purohit. "Applications of TOPSIS algorithm on various manufacturing processes: a review." *Materials Today: Proceedings* 4, no. 4 (2017): 5320-5329.
- [19].Opricovic, Serafim, and Gwo-Hshiung Tzeng. "Compromise solution by MCDM methods: A comparative analysis of VIKOR and TOPSIS." *European journal of operational research* 156, no. 2 (2004): 445-455.
- [20].Jahanshahloo, Gholam Reza, F. Hosseinzadeh Lotfi, and Mohammad Izadikhah. "An algorithmic method to extend TOPSIS for decision-making problems with interval data." *Applied mathematics and computation* 175, no. 2 (2006): 1375-1384.
- [21].Kuo, Ting. "A modified TOPSIS with a different ranking index." *European journal of operational research* 260, no. 1 (2017): 152-160.
- [22].Shih, Hsu-Shih, Huan-Jyh Shyur, and E. Stanley Lee. "An extension of TOPSIS for group decision making." *Mathematical and computer modelling* 45, no. 7-8 (2007): 801-813.
- [23].Chen, Pengyu. "Effects of the entropy weight on TOPSIS." *Expert Systems with Applications* 168 (2021): 114186.