

E-banking innovation and the determinants of its impact on organization and adoption behavior: A systematic review of the literature

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Abstract-- E-banking plays a fundamental role both for the financial association and for the client, so that all institutions can be delivered quickly. Nevertheless, the variation of this development is difficult, and depends on different variables that have an impact on the bank and its customers, although with the emergency of the Coronavirus, E-banking becomes a necessity to be realized. This article is devoted to a study of the literature characterizing first the two key concepts, E-banking and innovative thinking, as well as their meanings in times of emergency covid-19, while taking into consideration the Diffusion of Innovation Theory (DIT) by Everett Rogers (1995), which characterizes innovation as "the process by which an innovation is communicated, through some channel, over time, among the members of a social system". Furthermore, in a second step, a model will be developed to characterize the drivers of E-banking

innovation adoption and their impact on organizational performance and adoption behavior.

Keywords: E-banking; Innovation; Covid-19; DIT

I- Introduction

In an undeniably technological existence where the idea of virtuality is beginning to materialize through applications that have brought people closer together, despite potential problems and geological distances, business sectors have begun to incorporate new advances to help customers deliver their services effortlessly, but also to facilitate the work of management organizations through the Web in B to B and B to C. The new information technologies have brought many

benefits by helping organizations disperse data at any time and allowing the customer to access the data without moving. The sectors that have adopted the new innovation are very diverse, but the main sector that has been impressed is the financial sector, due to the level of rivalry and the high demands of customers who need a complete help of value, handiness and simplicity to perform a financial activity, and especially for people who do not have time or cannot move due to various conditions, so banks had to naturally coordinate the new innovation in their business processes. Therefore, banks are beginning to implement the new innovation that will meet the demands of customers and market needs, and have found that the coordination of this mechanical methodology has advantages and disadvantages for the association itself and not only for the customer.

Today, the technological services offered by banks are many, but vary from country to country, due to the presence of many elements, the level of development of each bank and the response of the adopter.

The E-banking strategy has been a success since its inception, but its adoption by the bank and the customer has increased since the appearance of COVID-19. The crisis of COVID-19 has created a great need for new technologies and their new trends, as well as their roles in this era, that of adaptation and protection against the virus, and maintaining physical distance in all activities. Therefore, for the bank to maintain its business and consumer does not cease its operations, the wave of launching products and services with a digital flavor begins, which is called technological innovation, but the dissemination of technological innovation by the organization is not a simple or easy step, on the contrary, it is based on various factors can influence the process of dissemination, noting that there are factors that also have an impact on the adoption by customers of E-innovation. Through this rapid analysis, we call the following problematic and research questions that will answer this article:

What factors influence E-banking innovation, and how do they

impact organizational performance and adoption behavior?

Research Questions:

What factors influence the adoption of E-banking innovation?

What are the effects of E-banking on organizational performance and consumer behavior? And, how important is E-banking innovation in the face of the emerging COVID-19 crisis?

These questions will be explained and interpreted in our research. This paper will proceed as follows: the methodology of the literature search will be presented, followed by the literature review. Then, the importance of E-banking innovation in the period of Covid- 19, finally the conclusions of the review will be discussed.

II- Methodology

Preliminary research has been directed before the choice to turn to this article, whose methodological objective is to identify through a literature review that is based on a theoretical and empirical examination of the factors influencing the adoption of E-banking by banks and customers, Based on Everett Rogers' Diffusion of Innovation Theory (DIT) [1], examine the concept of E-banking innovation through a review of the literature, interpreting to understand, and verify the role of technological innovation in the Covid-19 period; the factors that prevent the adoption of this innovation within the bank; as well as the effect of the diffusion of internet innovation on banking performance and consumer behavior. We used as bibliographic databases citing Scopus, Google Scholar, ScienceDirect, and Cairn to compile the literature for our literature review.

III- Review of the literature and synthesis of previous work

The concept of e-banking has been the subject of much research. Each author has come to a different conclusion from the other, but the primary objective remains the same because all are customers or prospects looking for evolution, simplicity, ease and especially efficiency of use. This innovation arrives gradually and the devices help the consumer to try to adopt it regularly, but everyone recognizes

it in his own way. This evolution affects not only consumers or adopters, but also financial institutions that seek organizational success, such as issuers, providers or distributors. This literature review has provided us with different angles from which to evaluate the idea of e-banking as a revolutionary invention, as well as existing and previous work to consider the future. This literature review has provided us with.

A) E-banking Concept

The concept of "electronic banking", also known as "E-banking", emerged in the 1970s and refers to any banking service or activity that is performed digitally. E-banking, according to Kirsner and Balbi [2], is a concept of competence and professionalism that promotes know-how, creates effective alliance networks, achieves productivity gains and participates in innovation to increase market share and Internet penetration worldwide so that the bank has a credible information system and is accessible through all networks (mobile, Internet....).

Online banking is a solution that simplifies the process of management and interaction of institutions with their customers by allowing them to access many financial services online or through mobile devices.

According to Diniz [3], e-banking is a service provided by a set of banks that allows users to perform financial transactions over the Internet using a PC, mobile device, minitet, etc. For some countries with Pure Players, E-banking already offers a full range of services, making it a remote bank as well as a complete bank. According to the master [4], remote banking is likely to change or intensify financial competitiveness and encourage universal access to new technologies.

Today, remote banking is increasingly popular, but its development requires strategies and evolutions in the banking business model to make it a pillar of performance in a robust and adaptable technological environment. Even if the use of E-banking is at the heart of this change and of the new technological innovations available on the market, each trend

or innovation allows the latter to gain competitiveness, market share, but also an opportunity to meet customer expectations, as well as an instrument to improve the commercial relationship with customers. This flexibility is manifested in the unexpected change of technology.

In this technologically advanced age where everything works, including e-commerce, which requires international means of payment, the adoption of E-banking is not a choice, but rather a necessity. In response to this need, a number of players have been innovative, including GAFAs (Google, Amazon, Facebook and Apple) and NATUs (Netflix, Airbnb, Tesla and uber) as well as the new non-bank FINTECH institutions. All of these players have forced banking to advance using new technologies, but the most important factor is that all banking and non-banking players share the same goal of strengthening customer relationships by meeting people's needs and demands. As a result, e-banking is constantly evolving to become a fully virtual bank, improve organizational performance and impact adoption behavior. Direct interaction with the business and electronic services promote new forms of customer relationships and involvement, which has a good impact on organizational performance, as noted by Medberg and Heinonen [5].

Organizational performance varies from bank to bank depending on the overall strategy of each bank; some banks have chosen to operate only online (PurePlayers), while others prefer to have both physical and electronic presence (Click and Mortar). Yoon and Steege [6] and Shankar and Jebarajakirthi [7] found, for example, that online banking offers special services that are not available with offline banking, such as access to banking services from any location, at any time.

According to all of the authors' views, it was determined that combining online and offline banking would be a wise financial move, which leads to the conclusion that internet banking enhances offline banking. Although clients have everyday access to the virtual mode at any time and anywhere, direct contact continues to be an important phenomena that has

impacted the connection between the bank and the customer. As a result, the adoption of electronic banking services can be viewed as an eye-catching technological development that may have an impact on the relationship between the bank and the customer. This is due to the sense of connection that enables maintaining the emotional notion in the relationship requires that electronic banking services be viewed as an additional, non-essential service.

B) Concept of innovation

If a new technology is adopted by the banking industry and its use is novel or improved, it is referred to as a technological innovation. If a service is effective, uses a particular technology, and is embraced by the customer, it is seen as a technical innovation. There are three types of innovation, according to Robertson [8]: continuous (updated products), dynamically continuous (new products), and discontinuous (new but unknown product). The selection of a category affects the provider of innovation diffusion based on adoption behavior.

According to Rogers E.M. and Shoemaker [9], the adoption process is the collection of conceptual steps that a person uses to decide whether to accept or reject an innovation.

As a result, according to a number of marketing authors including Rogers [10] and Robertson [8,] the adoption process differs from the diffusion process. They claim that although dispersion is a societal phenomenon, adoption is an individual phenomenon.

In particular, the individual phenomenon focuses on the customer's adoption behavior, and his adoption process is based on various factors that influence whether the innovation will be accepted or not. The social phenomenon, on the other hand, focuses on the bank or organization as the diffusion source (or disseminator) of the innovation. The technical innovation has substantial spread and acceptance elements in both phenomena, which we will go into depth about.

The theory of Everett Rogers [1], which defines innovation as "the process by which an innovation is conveyed, through specific channels, through time, among the members of a

social system," is the theory that best fits the subject of analysis of this study. Similar to Rogers [10], Robertson [8], Rogers E.M., and Shoemaker [9], adopters are divided into many categories based on their propensity to embrace innovations and their pace of adoption. Innovators, early adopters, the first majority, the second majority, and the refractory fall into these categories.

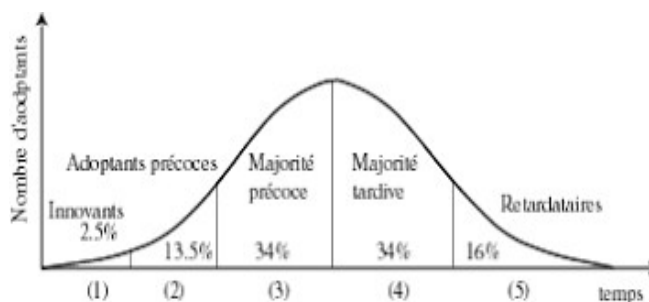


Fig. 1. Roger's diffusion of innovation curve (1962).

This classification is a part of the social and individual frameworks. The social framework focuses on the diffusers, who are categorized based on how quickly they spread the innovation relative to their rivals, and the individual framework identifies each behavior based on how quickly they adopt the innovation, which we refer to as "intelligent behavior."

C) Factors influencing the adoption of e-banking and the diffusion of innovation

Different elements that can affect both the organization that disseminates the invention and the consumer who accepts it on a regular basis can affect how an innovation is adopted by both. The diffusion cell develops and disseminates a number of innovations while emphasizing that this production is not at all a straightforward process and instead relies on several concepts to get to the point of diffusion. The adoption behavior, which also has many affecting factors, repeats the same process. As an example, based on a single variable or other variables for each service, a consumer may embrace an innovation.

Our study presents a review of the literature of previous studies, but considered different factors on which the final decision to diffuse and studies, but it took into consideration

different factors on which the final decision to disseminate and adopt E-banking is based, when presenting the review, citing general factors that can influence the choice of adaptation including, customer relationship, CRM, competition, new trends, customer demand, openness to creativity, consumer requirements, etc.

Scientific studies that have evaluated and studied the factors using various research methodologies have been conducted based on these earlier studies, helping to focus the subject and identify the influential aspects as they relate to various tabs. Although there are many elements, they may be broken down into two categories: individual and organizational. Individual factors include behavioral, demographic, and other variables, while organizational factors include structural, strategic, and industry-specific aspects.

We attempt to classify the influencing factors as follows:



<u>Individual Variables</u>	<u>Organizational Variables</u>
Age	Organizational capital
Gender	Marketing strategy
Income	Competition
Groups (membership, references)	National positioning
Attitudes	International positioning
Education level	Risk management capacity
Perceived need	Digital infrastructure
Ease of use	New trends
Usefulness	Performance
Security	Mastery of technology
Perceived Risk	Staff competence
Novelty perceived	Co-innovation
Culture	Customer needs
Low cost	The wealth of the country
Channel	Legal
Motivation	

Perception	
Type of bank account	

Source: Authors

1. Individual variables:

Age: Various authors have expressed conflicting views on the impact of age on the adoption of E-banking; in fact, some have demonstrated that age plays a significant part in adoption behavior while others are opposed to the age element and its connection to innovation adoption. Contrary to other research that have indicated that age is connected with the acceptance of innovations, Robertson [8], for instance, argues that the age variable has no effect on the adoption of innovations by consumers. While Dean [11] believes that these technologies lead to the disappearance of human interaction, Simon and Usunier [12] prefer direct contact with staff while using self-service technologies offered by a merchant, other research has found that older consumers are less comfortable than younger consumers with these technologies.

Gender: Studies on e-commerce demonstrate that gender differences in behavior and perception play a significant influence in the process of establishing market niches. Women have substantially lower levels of trust in e-commerce, report Cho and Jialin [13]. According to CEFRIO [15], Puschel et al [16] and Joshua and Koshy [17] have revealed that the

majority of people who use e-banking are men, which contradicts Garbarino and Strahilevitz's [14] claim that women perceive higher levels of risk while using credit cards and buying online.

Income: Numerous studies have demonstrated that this type of demographic element significantly affects the adoption of E-banking innovation, particularly for high-income persons who execute more diverse transactions than households who have used E-banking less. Others have demonstrated that the consumer is unaffected by this factor. High-income clients utilize online banking more frequently than low-income ones, according to Ismail & Osman's research [18]. This conclusion is consistent with the results of studies by Yuan, Lee and Kim [21], Karjaluto [19], Laforet and Li [20], Wu [22], and Karjaluto [19]. Gender, income, and perceived trustworthiness were, however, statistically unimportant influences in customer attitude, as demonstrated by Fonchamnyo [23] in his empirical investigation. Their findings concur with those of Baraghani [24], Wu and Chen [25] and other studies.

Membership and reference group: These factors have a significant impact on the various tabs, membership, and reference groups have an impact on the innovation adopter's judgment process, particularly in the selection to use E-banking, if recommended by individuals, or to use it to improve an individual's self-image or status in his social institution, Ailli [26].

Attitudes: This association between the attitude factor and information technology adoption, which affects consumer intention, has been demonstrated by many authors. Laforet, S. & Li, X. [20] found that attitudes toward computers had an impact on attitudes and behaviours toward online banking. According to Karjaluto et al. [27], attitudes regarding information technology have an impact on both actual actions and attitudes for the adoption of online banking. There is a big and significant association among attitude and intent to adopt electronic banking toward the consumer, according to Frini and Limayem [28].

Level of education: Considering that education is a confounding factor and can influence the adoption of E-

banking among the consumer, this varies from study to study, some authors claim that the level of education contributes to the adoption of the innovation and others are opposite. The study by Laforet, S & Li, X [20] results that the level of education does not affect the adoption of E-banking innovation. Burke [29] suggests that educational clients, such as university graduates, are more comfortable with the use of technology since education is positively correlated with an individual's level of knowledge about new technologies.

Perceived Need: The need to adopt an innovation, significantly affects the adoption of the innovation, offering an innovative and relevant service by the electronic bank, creates a perceived need by the consumer, if he is aware that there is a better product in the market. Hassinger [30] the consumer, even if he is exposed to innovation, will be interested in it if it perfectly meets his needs. There is a strong relationship between the supply of the innovation and the demand or need of the customer.

Ease of use and perceived usefulness: These two factors are part of the criteria that should be taken into account in order to present consumers with useful and easy-to-use products and services, so as not to waste time and effort on a service that does not meet customers' needs. However, Fonchamnyo's [23] perceived ease of use affects the perceived usefulness of e-banking adoption. Perceived usefulness appears to be the most important factor influencing usage intention, Cheikho [31]. If banks produce innovative services that are effective and efficient for the user but difficult to use, this may affect the user's adaptation to e-banking services.

Security and perceived risk: Thinking that they are among the most important factors for banking and there is no innovation without the presence of these two factors. Maruf Gbadebo Salimon et al [32] concluded in their studies that there is a positive relationship between perceived security and online banking adoption. This is consistent with the results of previous studies (Nor et al [33]; Susanto et al [34]; Yousafzai et al [35]). The presence of security is a motivator for the adopter of e-banking services and without it, it can create a

barrier between the bank and its customers. The notion of perceived risk is also interesting in the adoption of e-banking innovation, its place exists where the bank proposes a new product/service, the individual puts himself in a risk situation either to use it or not because of its novelty compared to already recognized services or products, the risk is composed of three categories according to Cheikho [31], the risk of confidentiality, security, physical risk.

Perceived security and perceived risk have significant effects on the intention to use the E-banking innovation.

Perceived novelty: According to Rogers [10] who was the first author who defined the notion of diffusion of innovation and simplified the different profiles of the individual or the adopter of the innovation and their reactions to it. adaptation to novelty. Thus, it is the perceived novelty that makes the innovation, all new products are innovations, whatever the new or modified product, the transition from traditional banking to electronic banking is an innovative novelty. Hirschman [36] indicates that consumers who adopt new services are creative consumers with a high capacity to adopt the new product or service in order to solve a consumption problem.

Culture: Previous studies have argued that culture plays a key role in the adoption of electronic banking services (Baptista & Oliveira, [37]; Elbadrawy & Aziz, [38]). The organization will have to take into account the culture as a basis of decision before and during the diffusion of the innovation, especially for the banks which want to improve the rate of diffusion of the E-banking services on different countries, its importance contains an important role in the decision of the adopter. And a few studies have confirmed this role, China, for example, has a high rate of perceived risk due to a lack of e-commerce regulation and due to its ancient traditions and beliefs in personal financial management, Laforet, S & Li, X [20].

Low cost: The influence of this factor on the decision to adopt the innovation has been tested by many authors (Luarn and Lin, [39]; Wang et al., [40]; Wessels and Drenman, [41]). Several results contradicted each other. Wai-Ching Poon [42], states that a minority of respondents (8%)

have used online banking services before, but they discontinued the services due to the fees charged to them. Selvanathan & al [43] showed that there is no significant relationship between the cost and the adoption of online banking services. This incompatibility of the results retained is due to the number of samples, to the population of respondents and above all to the social influence whatever the service offered is high or low, being influenced by someone, this can motivate to use the services. online, Tan , Chong, Ooi and Chong [44] argue that social influences may have more impact than costs among young people knowing that the costs related to E-banking services have decreased in recent years, we can say that banks benefited from economies of scale.

Channel: the choice of channel to perform online banking services, whether online, via the Internet or mobile, is a matter of attitude and convenience and is driven by consumer confidence, lifestyle factors, motivations and emotional reactions, Nancy Jo Black [45]. Day and Hubbard [46] state that customers are not limited to one channel, rather they choose the one that is most convenient or effective for their needs. The channel replaces the traditional relationship, it has become the intermediary that unites the customer with the bank, so the multitude of channels is a plus to enhance the customer experience.

Motivation: according to Karjaluo et al [19] is also a factor affecting the adoption of online banking services by consumers. The motivation to adopt E-banking materializes with the presence of several determinants such as perceived usefulness, perceived security, and above all perceived ease, which is one of the best ways to increase the pleasure of using E-banking innovation for consumers because it assures them that the platforms are very easy to use, Maruf Gbadebo Salimon [32]. However, several studies on E-banking have confirmed the positive relationship between motivation and the adoption of innovation which is otherwise known as perceived pleasure (Amin, et al. [47]; Suki, [48]).

The type of bank account: A Sudanese study by Ismail & Osman [18] showed that there is a significant relationship between the type of bank account and the adoption of E-banking, and that customers who have current accounts are more likely to

adopt e-banking.

2. Organizational variables:

The organizational variables contain economic, social, financial, strategic, operational and legal sub-variables, as a legal example, the crypto currency system is legally prohibited in most countries, which makes it difficult for the innovation to spread. Another example in the economic sense, banks may face challenges in their operational models because the new technology facilitates the entry of different non-banking institutions whose transactions take place without financial intermediation. Therefore, the consideration of these variables is taken according to the nature of the product or service being delivered, the authors indicate that, in general, these factors put pressure on the company at all levels of its business. This pressure becomes particularly important when it is a question of introducing a diffusion of innovation within the organization.

B) The impact of the diffusion of E-Banking innovation on organizational performance

The incorporation of digital into the company's strategies is a great move for positioning the business, but the use of digital as an innovation tool enables the organization to enhance many financial, operational, and administrative procedures. According to Munos [49], the spread of e-banking innovation has a significant impact on the organization's ability to improve organizational performance, which entails strengthening actions, making a distinction from the competing, possessing a financial results, quality of service, establishing a customer experience, gratification, cost reduction, CRM, and the battle against the competition.

Financial performance: Strauss et al [50] and Myers [51] deduce from their respective research and experience that the use of "internet" technology generates significant financial gains. Forrester Research has clarified that ROI should not be considered as a performance indicator until at least the third year. Rabut [52] explains that the returns on investment are guaranteed according to the financial productivity of the adoption of new technologies. Within the framework of our

study and according to several paradoxical studies, two indicators can achieve financial performance, innovative productivity, that is to say, the achievement of the objectives set having allowed a significant return on investment, and the reduction of the cost in terms of reducing staff and bank branches, several banks are trying to become online banks and the dematerialization of tasks helps the latter to reduce the number of staff.

An innovative quality service: The new technology is a means through which all operations are carried out quickly, both by the bank and by its customers. Focusing on the organization, quality service can transform the way the bank can carry out its daily tasks, including the evolution of the environment, activities, and skills of the profession of Back office manager, bank adviser, and branch manager.

The customer relationship: The choice of the bank to invest in new technology has shown that the latter thinks "customer" and not "product", its objective is to value the customer which will allow him to live a digital banking experience, Badoc, Lavayssiere and Copin [53] affirm that the competitive advantage of electronic banks stems from the enhancement of the "customer experience" which has led to making the bank-customer relationship the major axis of differentiation. Thinking about the customer, that is to say putting him at the center of his interests, creating services adapted to his needs, in other words personalizing the service. The personalization of banking services according to needs creates a competitive advantage, which leads to the pyramid of customer relations: satisfaction, trust, and commitment.

Cost reduction: Companies that operate online report that they have seen an immediate decrease in operating costs (Bernstein, [54]). Online banking has benefited from cost reduction in terms of improved productivity factors such as the ability to communicate or share information online at a much lower cost but to a wider customer base and in terms of reduced personnel costs.

Adopting the Internet allows the bank to invest in the diffusion of innovation, but the return will be much more beneficial. In

an increasingly Internet-based market, the more people connect, the more value and interaction take their place, the greater the economies of scale will be. Chabaniex [55] points out that automation pushes the bank to benefit from transactions that have led to significant economies of scale allowing for a decrease in the processing cost per customer.

Conquest of new markets: The diffusion of innovation has another impact that presents itself in the conquest of new markets, including the reduction of cost, the expansion of the range of products or services, the development of the client-bank relationship, and the use of virtual distribution channels. We can conclude that the use of new technologies allows the conquest of new markets.

C) The impact of the diffusion of the E-Banking innovation on adoption behavior

Electronic banking has a positive impact on those who have adopted digital banking in their daily lives and for those who have tested digital transactions for the first time and are adapted to the new technology, and another negative one for those who do not adopt it due to behavioral, demographic and other factors that influence the adoption of this innovation. Other factors that may influence adoption behavior according to Rogers [56] are relative advantage, complexity, testability, compatibility, and observability:

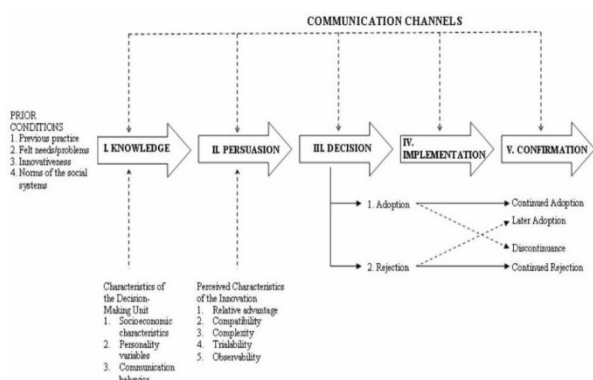


Fig. 2. Diffusion of innovation according to Rogers (1995)

- **Relative advantage:** corresponds to the perception by consumers that the innovation is better or more

efficient than existing or proposed solutions on the banking market.

- **Complexity:** Perceived complexity has never been a barrier to using a service because increased use can make the service easy to adopt. Therefore, repeat adoption aimed to reduce the number of barriers and improve the chances of successful adaptation, (Rogers, [1]).
- **Testability:** means having tested an innovation for the first time in order to see if the innovative service offered by the bank is a quality, effective, fast, useful and efficient service.
 - Factors influencing: Effort expectancy, Perceived usefulness, Perceived ease, Search for novelty and Performance.
- **Compatibility:** is a factor that includes whether the service and adoption behavior are compatible.
 - Factors influencing: Habit, Motivation, Income, Level of education, sex, and age.
- **Observability:** is seeing the outcome of these digital services through adoption behavior or others using it.
 - Influencing factors: Perceived risk, Perceived usefulness, Perceived ease, Reference groups, Belonging groups.

Consumer demands are increasing as a result of innovation diffusion, necessitating customization of services, personalization of consulting services, and personalisation of the expansion of sales channels. If the services/products, reception quality, which is crucial for receiving information about new technologies, channel strategy, and other aspects discussed in this research are not taken into consideration, customers may switch banks. In order to avoid trying to adopt alternative electronic banking services, today's customers look for the security, ease, and speed that these services give as well as occasional innovations. several banks.

IV- The importance of embracing technological innovation in times of crisis Covid- 19

The development of electronic banking has demonstrated its

significance during the Covid 19 health crisis. Finding a solution to an out-of-control issue during this delicate time necessitates a great deal of creativity. Avoiding the complete spread of the virus and helping to protect the nation are both innovations in themselves. The responsibility of the bank has been both straightforward and challenging, being straightforward in the advancement of online banking in the methods of protection. Despite being challenging in light of customer demands, using new technology or electronic banking was really acceptable by customers because it was the only option available during the curfew time for avoiding viral attacks and adhering to official decrees.

In our study and in accordance with Rogers [1], the "diffusion of innovation" is categorized into the 5 stages already mentioned and occurs when the use of digital is now applicable and adopted by the bank and its customers. As a result, customer demands rise, and banks start to intervene with the concept of digital innovation in their strategies in accordance with market trends. Banks or broadcasters have introduced a variety of cutting-edge services for users or consumers, including the following:

Innovation in payments: several contactless payment techniques have been proposed by banks internationally, the creation of different varieties of payment is done according to each need and each type of customer "personalization", among which we can mention :

-NFC technology: a contactless or wireless payment method, which requires a device equipped with NFC technology, and works with the installation of a Google pay or Apple pay application, it is among the fastest and most secure payment methods. The Saudi Central Bank (SAMA) announced that the Kingdom of Saudi Arabia has recorded the highest adoption of NFC payments in the Middle East and North Africa, above the European Union average, and ahead of Hong Kong and Canada.

-QR (Quick Response): QR code technology requires no additional equipment other than scanning the code to make

the payment. Dynamic codes are specific to each transaction.

-Contactless bank card payment: another means of payment that allows you to make purchases without having to insert the card into the payment terminals and without entering a secret code.

-Online bank transfer: another option to make contactless financial transactions.

-Payment via cryptocurrencies: a virtual payment system whose transactions are made anonymously, it is preferred by consumers because it is based on the blockchain system that offers efficiency, security, and speed of transactions.

Innovation in customer relations: the possibility of contacting the bank advisor remotely is an innovation being developed with new Chatbot and AI technologies, such as the IBM Watson artificial intelligence computer program used by banks internationally, which aims to answer questions formulated in natural language.

Innovation in risk management: There are four main types of private information leakage such as hacking of private information databases, insider leakage, negligence in private information management, misuse, and abuse of private information by unauthorized transmission. Therefore, the protection of consumer data has been and will always be a responsibility to maintain the trust gained and to provide customers with a stable environment worthy of comfort and security. And to cope with the aforementioned risks, cybersecurity becomes a top priority.

V- Discussion

On the basis of an empirical assessment of various prior research by expanding the IDT, this study aimed to describe the elements determining the effect of E-banking adoption by consumers and the impact of the dissemination of E-banking innovations on banks. The findings of this study (Saidul Hasan et al., [57]) support the findings of Cho and Jialin [13], Garbarino and Strahilevitz [14], CEFRIO [15], Puschel et al. [16], and Joshua and Koshy [17] that male customers were more interested in e-banking than female respondents.

In a study by Saidul Hasan et al [57], the percentage of

respondents was higher when the monthly income was also higher than other respondents.

According to a study by Cameron University, e-banking adoption is positively influenced by customer attitude. This suggests that customers' willingness to use e-banking will increase if they adopt it with a positive attitude, if they are more comfortable doing so, and if they believe it will add value to their lives. This result is consistent with the findings of Al-Somali et al, [58]. But, other results indicate that customers' attitude towards adopting electronic banking will decrease with the increase in the cost of the service provided, Fonchamnyo, [23]. However, over time, fees for internet banking have become less expensive. The price of Internet banking may not have a big impact on its uptake if people utilize individual banking services for a long time. According to Tan, Chong, Ooi, and Chong [44], social influences may matter more to young people than cost. Social impact was not a significant component, according to Phiri's [59] study. Age has an impact on how bank clients behave as well, especially for the elderly, whose health deteriorates with age, affecting things like vision, mental reflexes, memory, etc. Bellahcen and Khedim, [60]. Meanwhile, he noticed that young people embraced Internet use more swiftly (Saidul Hasan et al, [57]).

The findings of Fonchamnyo [23] and Ndawnga [61] regarding the role of perceived ease of use and its effects demonstrate that perceived ease of use influences both perceived usefulness and attitudes toward the adoption of e-banking. This finding conflicts with that of Liu et al. [62], who discovered that perceived ease of use had no bearing on attitudes toward adoption but does have an impact on perceived usefulness.

Noting that the determinants of occupation and income also have a primary weight on employment, which is supported by the findings of Khedim and Bellahcen [59], this appeals to the factor of education which is an extremely important influencer of customers' attitudes towards the adoption of E-banking. In contrast, a research by Saidul Hasan et al. [57] asserts that

clients who are illiterate do not experience problems because of their computer literacy. Masoud, E., & AbuTaqa, H., [63] found that the cultural component can cover the degree of education due to its favorable impact on how easily consumers can use electronic banking services.

Considering the fact that even taking into account these variables, if banks are unable to supply measures of innovation or novelty, perceived need, CHENCHEH, [65], and security, clients would resort to other rivals and readily embrace and use their online banking services. As a result, according to Laforet et al [26] and Selvanathan et al [43], perceived security has a major impact on customers' views toward adopting e-banking. Therefore, banks should work to increase client trust by enhancing and strengthening bank security.

A different tab's empirical review revealed that many scholars, including ELISSAR [66] and CHENCHEH [65], concur that the majority of organizational elements influencing the bank's dissemination of innovation are true. such as the organization's capital factor, marketing strategy, competitiveness, positioning on the national and international stage, risk management capabilities, digital infrastructure, performance, technological mastery, personnel competency, and consumer needs.

Conclusion and managerial implication

The spread of innovation in electronic banking allows the bank to establish a reputation as an innovative bank that fully appreciates the needs of customers and spreads new ideas widely based on what technology has to offer. This raises the performance level of the organization while satisfying the needs of the customers. Different authors and research methodologies have both supported and contradicted each of the specific elements examined in this study. Each element evaluated had a significant influence or no effect on adoption behavior, depending on the demographic tested and the nation of choice, and each element is related to the others. We would like to see future research focus on a number of organizational aspects, such as nation wealth, co-innovation, and emerging

trends, as they have a significant impact on E-banking adoption and will allow banks to bypass the growth period and reach technological maturity.

On the other hand, the theory of planned behavior and the theory of reasoned action are two theories that emerged from this study that may point in different directions or open new areas of research. When the bank views the customer as an external actor who will help provide services as a co-producer of innovative ideas, this additional direction, known as collaborative innovation, can create positive outcomes.

Theme of the research	Authors	Theory	Research method				
A relational classification of online banking customers	Lova Rajaobelina et al. (2013)		Quantitative	banking par la clientèle bancaire (particuliers) au Maroc : contraintes et opportunités marketing	Souad AILLI (2014)		Quantitative
A Review on E-Banking Adoption in the Context of E-Service Quality	Gayan Nayanajith, D. A. et al. (2019)		Literature review	Les facteurs influençant l'utilisation des services bancaires électroniques par les clients des banques camerounaises	NDANGWA LUCIEN	TAM	Quantitative
L'adoption des innovations technologiques par les clients et son impact sur la relation client - Cas de la banque mobile -	Avin Cheikho (2015)		Quantitative	The Impact of Cost, Customer Experience, Ease of Use, and Trust towards Adoption of Online Banking	Selvanathan et al (2016)		Quantitative
Adoption of e-banking in Bangladesh: An exploratory study	Hasan et al. (2010)		Exploratory study	Les facteurs influençant l'adoption de l'e-banking par les clients des banques algériennes	Mohammed Bellahcene et al (2016)		Quantitative
Customers' Perception of E-banking Adoption in Cameroon: An Empirical Assessment of an Extended TAM	Dobdinga Cletus Fonchamnyo (2012)		Quantitative	Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators	Gonçalo Baptista et al (2015)	TAM	Quantitative
Factors Affecting Customers' Adoption of E-Banking Services in Jordan	Emad Masoud et al. (2017)		Quantitative	The relationships between electronic banking adoption and its antecedents: A meta-analytic study of the role of national culture	Yun Zhang et al (2018)	TAM Étendu	Quantitative
The Adoption of E-banking in Developing Countries: A Theoretical Model for SMEs	Al Nahian Riyadh et al (2009)		Quantitative	Covid-19 : L'impact sur les banques et le rôle des médias sociaux dans le marketing bancaire. « Cas des banques commerciales au Maroc »	Rachid AMIN et al (2020)		Quantitative
Pratique de l'e-				La transformation	AIT OUHAMMOU MERIEM et al (2019)		Quantitative

digitale : quel impact sur les metiers bancaires ? cas des banques marocaines	Sylvie Laforet et al (2005)	Relationship marketing theory	Quantitative	liban			
Consumers' attitudes towards online and mobile banking in China	Raechel Johns et al (2008)		Quantitative et Qualitative	Users' adoption of e-banking services: the Malaysian perspective	Daka, C. G et al (2019)	TAM	Quantitative
The impact of internet banking on business-customer relationships (are you being self-served?)	Mohamed belabdi (2010)		Quantitative et Qualitative	Factors Driving the Adoption of E-banking Services Based on the UTAUT Model			
Détermination du profil des utilisateurs d'internet-banking au quebec	Oussama chencheh (2011)	The theory of the diffusion of innovation	Quantitative et Qualitative	References [1] Rogers, Everett M. (1995), Diffusion of Innovations, Fourth edition, New York, Free Press. Google Scholar [2] KIRSNER, D. et BALBI D .(1997), “ Les besoins des banques”, Banque, n 586, p 38-39. [3] DINIZ, E. (1998), « Web Banking in USA », Journal of Internet Banking and Commerce, vol.3, n°2. [4] LEMAÎTRE, PIERRE. 1997. « Les enjeux de la banque à distance». Banque. No. 587, p.63-65. [5] Medberg, G., & Heinonen, K. (2014).Invisible value formation: a netnography in retail banking. International Journal of Bank Marketing, 32(6), 590–607.doi:10.1108/ijbm-03-2014-0041. [6] Yoon, H. S., & Steege, L. M. B. (2013). Development of a quantitative model of the impact of customers' personality and perceptions on Internet banking use. <i>Computers in Human Behavior</i> , 29(3), 1133-1141. [7] Shankar, A., & Jebarajakirthy, C. (2019). The influence of e-banking service quality on customer loyalty: A moderated mediation approach. <i>International Journal of Bank Marketing</i> . [8] ROBERTSON, THOMAS, S. (1971), “ Innovatrice behavior and communication”, New York, Holt, Rinehart and Winston. [9] Rogers, E. M., & Shoemaker, F. F. (1971). Communication of Innovations; A Cross-Cultural Approach. [10] Wilkening, E. A. (1963).DIFFUSION OF INNOVATIONS. By Everett M. Rogers. New York: The Free Press of Glencoe, 1962. 367 pp. \$6.50. Social Forces, 41(4), 415–416. doi:10.2307/2573300. [11] Dean, D. H. (2008). Shopper age and the use of self-service			
Les déterminants de l'adoption du e-banking par les institutions financières et la clientèle organisationnelle, et son impact sur l'approche relationnelle: cas de l'internet-banking en tunisie.	Gilles Roehrich (2015)		Quantitative				
Nouveauté perçue d'une innovation	Fred D (2013)		Quantitative				
Perceived usefulness , Perceived ease of use , and user acceptance of information technology	Maruf Gbadebo Salimon et al (2017)	TAM	Quantitative				
The mediating role of hedonic motivation on the relationship between adoption of e-banking and its determinants	TOUFAILY ELISSAR (2004)	Quantitative et Qualitative					
Adoption de la banque électronique et son impact sur la performance organisationnelle : cas du secteur du marché du	Wai-Ching Poon (2008)	Quantitative					

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