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Contribution of Chatbot Applications to Attaining Digital Financial Inclusion -Analysis and Evaluation of America's Chatbot Erica Experience

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Abstract

This study aimed at highlighting the contribution of Chatbot applications to attaining digital financial inclusion, attempted to answer the related problem and verified the proposed hypothesis, which indicates that digital financial methods such as Chatbot applications contribute to expanding the scope of digital financial inclusion by making people who are financially deprived of access to banking services more active. To achieve the objective of the present study, an analytical descriptive approach and bank of America's AI- Chatbot Erica were adopted. The study concluded that the applications related to Chatbots (customer service) contributed strongly to the achievement of digital financial inclusion, similar to the positive results achieved by bank of America's AI- powered Chatbot Erica, which was based on the involvement of people deprived of financial services and those with low income in the banking system by providing solutions tailored to the needs of customers based on AI apps.

✓ Chat Applications. Chatbot. Digital Financial Inclusion. Erica.

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1. INTRODUCTION

Technological innovation and digitization have posed a challenge to the financial sector worldwide, especially with the launch of FinTechs, which is considered a new economic revolution. Innovation in FinTech has become one of the world's endeavors to adopt and use the technology in all transactions. Banks and financial institutions have become dependent on digital methods through the direct application of AI apps. The digital financial inclusion has become increasingly central to the debate about how people at a lower levels of the pyramid become financially active using the digital financial methods to include those who are financially unbanked and underbanked. As demand for services is high and customer experience is vital, Chatbots in banking can effectively improve service quality. Chatbot technology can greatly reduce the workload of customer service advisors and provide a fast and efficient support system for attaining transactions, viewing balance and billing information, getting their credit scores, and even doing simple things like accessing to their account numbers.

From this standpoint, the problem of the research paper can be as follows:

Study problem

How did Chatbot apps contribute to achieving digital financial inclusion in light of one of the pioneering experiments in the field?

Study hypothesis

Digital financial methods such as Chatbots help expand digital financial inclusion by making unbanked people financially active.

Study objectives

The objectives of the study can be summarized in the following basic elements:

- Identifying Chatbots in terms of concept and development, characteristics and how to use, importance and advantages they provide;

- Investigating the contribution made by Chatbots to achieving digital financial inclusion and customer service;
- Accessing to the most important factors that contributed to the success and superiority of Chatbots in achieving digital financial inclusion through a presentation, analysis and evaluation of one of the pioneering experiences in this field.

Study methodology

In line with the nature and objectives of the research, the analytical descriptive approach was used to describe the concepts related to chat applications - Chatbots - and digital financial inclusion, while a case study approach was applied in order to analyze and evaluate the experience of bank of America's AI- powered Chatbot Erica.

Previous studies

"Industry 4.0 in Finance: The Impact of Artificial Intelligence (AI) on Digital Financial Inclusion" by David Mhlanga, School of Accounting, University of Johannesburg, Johannesburg 2006, South Africa Int. J. Financial Study.

The study aimed at investigating the impact of AI apps, including Chatbots, on digital financial inclusion. The study used conceptual and documentary analysis of peer-reviewed journals, reports and other authoritative documents on AI and digital financial inclusion to assess the impact of AI on digital financial inclusion. The study concluded that AI has a strong influence on digital financial inclusion in areas related to risk detection, measurement and management, addressing the problem of information asymmetry, availing customer support and helpdesk through Chatbots and fraud detection and cybersecurity. Therefore, it is recommended that financial institutions and non-financial institutions and governments across the world adopt and scale up the use of AI tools and applications as they present benefits in the quest to ensure that the vulnerable groups of people who are not financially active do participate

in the formal financial market with minimum challenges and maximum benefits.

"The Role of Artificial Intelligence in Financial in Developing Countries" By Kshetri Nir, Journal of Global Information Technology Management 24(1). 2021".

This study aimed at determining the extent to which AI applications, including Chatbots, contribute to enhancing and activating digital financial inclusion. The study demonstrated the ability of AI in the field by performing tasks and analyzes that cannot be done manually, which leads to raising the efficiency of FinTech companies and increasing the number of customers.

What differentiates the current study from previous studies?

The two previous studies dealt with the contribution of AI apps in general in promoting and activating digital financial inclusion at the macro level. Notwithstanding the fact that, the present study will focus only on one of the applications of AI. This concerns the Chatbots and their contribution to attaining digital financial inclusion at the micro level by analyzing and evaluating the experience of bank of America's AI- Chatbot Erica.

Study division:

The study was divided into three main parts: (i) dealt with the nature of the first variable, which is related to Chatbot apps; (ii) devoted to define the second variable of the study, which is related to digital financial inclusion, as well as an attempt to highlight the relationship between the two previous variables; and (iii) included a case study of Bank of America's AI-powered virtual assistant 'Erica'.

2. The general framework of chat apps – Chatbots

One of the requirements of global development in this century has been digital transformation and innovation in AI systems, which is considered one of the most important pillars of the future at all levels. These new changes would change the image of the world in which we live to a digital world in which machines often replace

humans via robots or other types of AI apps, which have become an essential element in the economies of developed countries.

2.1 Chatbot overview

Originally Chatterbot and shortened to Chatbot, which are words that are formed by the melding of two unrelated words ‘Chatter’ and ‘Bot’ for respectively ‘chatting on the internet’ and ‘robot’ to create a new word.

It is actually a software designed to simulate natural language conversation through voice commands or text chats or both. You often encounter this software while browsing websites, as it appears in the form of a cartoon character or in the form of a dialog box on which we read "Ask your question here". Chatbot colonizes social networks day after day to provide assistance to Internet users, whether it is solving a problem, requesting a product or service, or seeking guidance on the most appropriate service. Although the concept of a Chatbot is popular today, it is not new, as it appeared in the year 1960 with the Eliza program. This program simulated the psychotherapist's pattern, for example, by asking questions to any individual, and continuing the conversation with him/her by rephrasing the answers (Salah Sameh, 2023). As for banking Chatbots, they are basically conversational Chatbots, deployed by banks to enhance customer experience on all digital banking platforms. Banking Chatbots help improve customer engagement and streamline legacy processes, making banking services more accessible in this era (Ananya Azad, 2023). Chatbot statistics can help prove that banking Chatbot solutions are a major game changer in the financial industry. Tasks that used to be completed by talking to a human in a branch or on the phone are now done in a conversational interface with virtual assistants for automated support. Banking Chatbots also provide financial institutions with the ability to talk to millions of customers simultaneously, and alert customers in advance of potential problems or upcoming payments (Emily Cummins, 2023).

2.2 Use cases of Chatbots in banking

Nowadays, most banks have implemented Chatbots to handle routine tasks such as transferring money between accounts, resetting mobile banking passwords, paying bills, and even opening a new checking account in the following manner (Shambhavi Sin, 2023).

- Offering Money transfer: Users can use Chatbots to pay bills, set or cancel payments, track DFTs, and pay credit card bills.
- Answering basic questions: Chatbots can answer numerous basic questions regarding customer accounts or banking products. For example, Chatbots can answer questions such as “How do I apply for a credit card.”
- Providing timely offers reminders and notifications: Most banks use Chatbots to offer their customers timely reminders and regular notifications regarding their bank accounts. Some of these frequent reminders are often related to their bill payment deadlines, last day loan offer, etc.
- Checking Account Balance: Users can ask Chatbots to provide them with account balance details in their names. They can also alert customers if their account balance is at risk of falling below the average balance.
- Providing complete account details: Aside from the account balance, users can also ask about other account details, such as payments, recurring expenses, and money transfer limits. One can also retrieve their account details and make changes such as updating existing address or phone number.
- Real-time location tracking: Depending on the location, answers to user questions may vary. For example, if a user asks "Where is the nearest bank branch?". In this scenario, Chatbot will respond based on the user's location. Additionally, Chatbot can track location through a real-time mobile GPS tracker, thus providing accurate answers every time.
- Resolving urgent priority issue: These issues include opening or closing and resetting cards, verifying bank statements, and completing money transfers. The

AI-powered Chatbot also allows customers to complete the entire process without waiting on the phone (Saurabh Singh, 2023).

2.3 Chatbot business idea

The way Chatbot works is a combination of AI and NLP-powered tools. These tools also work in parallel to analyze emotions with other programs that the robots provided with to solve feasible queries automatically through (Muhammad Montaser, 2023):

- Artificial Intelligence (AI): AI is a simulation of human intelligence with machines and programs, through different algorithms and codes that give machines and programs special capabilities that make them capable of performing human tasks and making decisions.
- Natural Language Processing (NLP): One of the tasks of AI-powered Chatbots is to help different devices read and understand human language, in a way that NLP programs are used to process the context and meanings of user messages and provide correct responses.
- Machine Learning (ML): ML is a branch of AI that allows machines to learn without programming. It does not only make hardware and software intelligent, but also gives them the ability to analyze, predict and make decisions.
- Sentiment Analysis (SA): It is a quantum leap in the world of AI-powered Chatbots, despite being a sub-field of programming science, where NLP is used with ML to measure feelings and text tone or spoken language, which analyzes messages and determines positively or negatively the customer's attitude towards the service or product.

In the business environment, Chatbot is usually added to answer frequently asked questions or perform simple, repetitive tasks, for example: Chatbot enables sales representatives to obtain phone numbers quickly. Besides, one of the most important

ways through which Chatbot services improve the customer experience can be mentioned as follows (Jana Hanna, 2023):

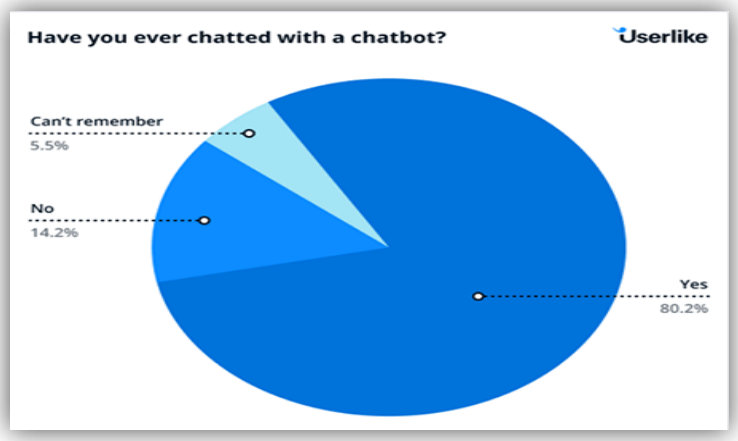
- Reducing customer wait times and providing immediate answers;
- Offering customers 24/7 customer support;
- Removing the potential for unpleasant human-to-human interactions that moods and emotions of both the service or sales representative and the customer dictate;
- Reducing wait times and streamline conversations to minimize the potential for customers' stress and annoyance;
- Enhancing the redirection of customer queries.

2.4 Most important statistics of Chat apps - Chatbot Stats in 2023

Stats shows Chatbots are becoming more and more widespread across different industries. The following are some statistics on the percentage of Human-Chatbot interactions, as well as the marketing revenues, in addition to individuals' preferences for communication using Chatbot during the current year 2023 (Nicola Bleu, 2023):

- **About 80.02% of people have interacted with chatbots.** Although the industry is still growing, Chatbots are becoming a feature of many websites and social media pages. According to statistics published by Userlike, the majority of internet consumers had interacted with chatbots at least once that year – 80% to be exact, while 14.2 % of users have not tried a Chatbot before. These statistics show that a good percentage of internet users already have some experience with Chatbots and are becoming more comfortable with them which will allow this industry to continue to grow further in the future.

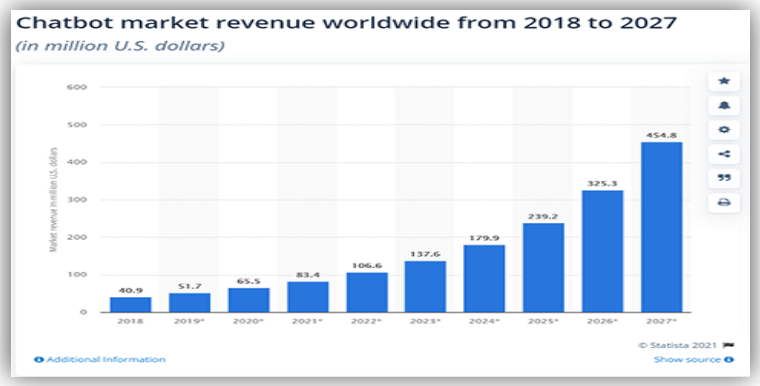
Fig.1: Number of Chatbot users in 2023



Source: (Nicola Bleu, 2023)

- **The global Chatbot market revenue stood at $83.4 million in 2023.** According to figures published by Statista, revenue generated by the Chatbot industry was approximately $83 million in 2021. As part of the same study, Statista calculated the predicted revenue growth for the industry over the next few years. The study found that the market will continue to grow significantly, and it is expected to grow to approximately $454.8 million by 2027.

Fig.2: Global Chatbot market revenues by 2027

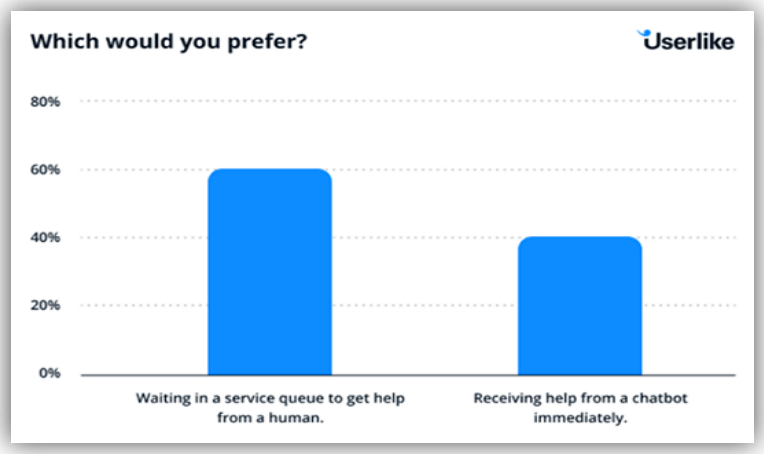


Source: (Nicola Bleu, 2023)

- **The majority of people (60%) still prefer speaking to live agents to using Chatbots**. Although Chatbots offer a good alternative for resolving simple issues, many people still aren't sold on the idea. According to a study by Userlike,

60% of people would still prefer to talk to a live agent than use a Chatbot even if it meant they had to wait in a queue. However, this may be due to many things. For example, some people may prefer to use traditional methods to contact business like telephone due to hesitancy about using computers. Perhaps as younger generation get older, Chatbots will become the most popular type of communication.

Fig.3: Individuals' preferences to use a Chatbot



Source: (Nicola Bleu, 2023)

3. The applications of Chatbot to attain digital financial inclusion

This part deals with the theoretical framework related to the digital financial inclusion, in terms of concept and importance. This part is also an attempt to highlight the contribution of chat applications to attain DFI from a theoretical point of view.

3.1 The concept of DFI

The term DFI refers to the digital channel that extends formal financial services to the un- or underbanked members of the society. Digital refers to the use of information technology (IT), the Internet and Information and Communication Technologies (ICT). In brief, DFI refers to financial inclusion achieved via digital technologies (BEI Duoguang CHENG Hua, JU Congyi LI Cungang, LI Yan LIU Chengqing, LUO Yu MO Xiugen, WU Cong ZHANG Yingxin, s.d., p. 2). Hence, DFI

is defined broadly as digital access to and use of formal financial services by excluded and underserved populations. These services must be appropriate to customer needs, delivered in a responsible manner, at a reasonable cost to customers and sustainable service providers (Timothy Lyman, Kate Lauer, 2023).

3.2 The importance of DFI

DFI helps reduce dependence on traditional financing methods and financial services. It also covers a wider geographical scope, which helps provide financial services faster, more efficiently and at a low cost, and thus increases access to affordable financial services and products in meeting the diverse financial needs of all segments of the society. Its importance may appear particularly in exceptional circumstances such as the pandemic caused by Covid-19. Efforts made to enhance digital financial inclusion also help achieve Sustainable Development Goals (SDGs), especially those related to reducing poverty, supporting economic growth, creating job opportunities, and empowering women (Fatih Meroud, 2022, p. 86).

3.3 The contribution of Chatbot for DFI

Chatbot is being hailed as a potential tool that will enable businesses to serve customers in meaningful ways at a significantly reduced cost. Customer engagement is a key factor in driving underserved and low-income individuals to access and, more importantly, use an adequate range of safe, convenient and affordable financial services. In this way, particular attention has been paid to Chatbot technology so that its application have had far-reaching positive impacts on DFI in the digital era.

It is easy for users to get excited about Chatbots because they can be embedded into existing social media channels such as Facebook, Messenger, WhatsApp or Skype, allowing instant access to customers. They are also available 24/7 on a smartphone or web page, making them uniquely positioned to provide timely automated information. Chatbots also enable users to avail a financial service in a short time resulting in

increased transactions and all at a lower cost. These services will benefit many customers who live outside the major cities because they can deal with banks or financial institutions remotely (Accion, 2023). Chatbot also depends on a conversation technology that allows humans to interact with digital devices as if they were communicating with a real person, so Chatbot Banking allows customer reporting actually and increases access to products from remote sites. In the future, conversation robots can play an educational or advisory role. For this, it can be said that the use of conversation robots in banking operations has high capabilities to push the DFI, and that the involvement of people deprived of financial services and those with low-income is the key to their access to financial services in general (Abenaa Addai, 2023).

4. Analysis and evaluation of Bank of America's AI-powered Chatbot ‘Erica’

Below is a presentation and analysis of the experience of an American bank -Bank of America Corporation (BofA Corp.) -, which is one of the leading banks in the field of banking technology. One of its most competitive advantages is the possession of the Chatbot Erica, an AI-powered virtual assistant developed by the Bank itself to help customers.

4.1 About the Bank of America (BofA)

The Bank of America Corporation is an American multinational investment bank and financial services holding company headquartered in Charlotte, North Carolina. This bank was founded in San Francisco, in 1998. It is the second largest banking institution in the United States, after JPMorgan Chase, and the eighth largest bank in the world. BofA serves approximately 10.73% of all American bank deposits (Bank of America Corporation, 2023). The bank also provides updates to its website and mobile app to further customize its user experience. BofA has more than 38.3 million active digital banking users, along with 29.2 million active mobile banking users worldwide (PYMNTS, 2023). The corporation provides unmatched convenience in the United States, serving approximately 67 million consumer and small business clients with approximately 16,000 ATMs and award-winning digital banking with approximately

55 million verified digital clients. It offers industry-leading support to nearly 3 million small business households through a suite of innovative, easy-to-use online products and services. BofA operates in the United States and its territories and approximately in 35 countries (Bank of America Corporation, 2023).

4.2 An overview of Erica Chatbot

Erica - BofA's new AI- powered virtual financial assistant. Billed as the first widely-available virtual assistant in financial services, in essence, she is a Chatbot, now available for free within the BofA mobile app to 25 million customers. Erica was nitially piloted among BofA employees in late 2017. A month later, she was rolled out to eight more states, and within merely two months of launch, BofA announced that Erica Chatbot had amassed more than 1 million mobile customers (WBR Insights, 2023).

Erica is a digital personal assistant with two main functions: answering questions easily and showcasing financial transactions. Customers can ask questions about anything related to their accounts, and Erica answers most of the questions. First, one must download the mobile app to benefit from the services, as it gives customers immediate information about their accounts with a quick overview of checking account balance and tracking latest spending and obtaining monthly snippets. The app also uses voice recognition technology to facilitate accessibility (Jennifer Saibil, 2023).

Erica is AI-driven and combines predictive analytics and natural language to help BofA mobile app users access balance information, transfer money between accounts, and schedule meetings in financial centers. Customers can interact with Erica in any way they choose, including voice commands, text messages, or tapping the Settings on the home screen for any other option.

BofA’s Chatbot integrates with the bank and connects to customer service agent consoles in contact centers. This means that, Erica can help you connect with your Merrill advisor from the Mobile Banking app. Since users are already authenticated

while using the BofA app, they do not have to re-identify themselves to the agent. Since users are already authenticated while using the BofA app, they do not have to re-identify themselves to the agent. What's more, the agents themselves can see what the customer has been doing and asking about in Erica, so customers don't even have to re-explain what they're having trouble with (WBR Insights, 2023).

4.3 Erica features and function:

Erica Chatbot has a working method in addition to many features stated as follows:

- **Erica Features:**

The Chatbot has the undermentioned features (Harriet Taylor, 2023):

- Erica will use artificial intelligence, predictive analytics and cognitive messaging to help customers do things like make payments, check balances, save money and pay down debt. She will also direct people to look up their FICO score and check out educational videos and other content;
- Through Erica, Bank of America hopes to extend some of the benefits of the one-to-one personal service and advice usually reserved for top-tier customers;
- The bank's customers did more than 246 billion payments via the Mobile banking app. Thy logged into their accounts more than 950 million times — or 46 times per user — over the same period;
- Unlike BofA’s human employees, Erica will be available 24/7 to provide guidance and execute transactions;
- Erica is designed to streamline the banking process, not replace functions;
- Over time, BofA's programmers will add new features and make the AI-powered Chatbot Erica "smarter" thanks to the vast amount of data she will handle;
- In a statement by the head of digital banking for BofA, she confirmed that “Erica will be smarter than a robot because she will bring up topics on her own, using predictive analytics as opposed to only answering questions customers ask” (David Henry, 2023).

- **Erica Function:**

Erica leverages the latest technologies, in advanced analytics and cognitive messaging to serve as your trusted financial assistant. Erica is able to consider a range of data within BofA, such as cash flow, balances, transaction history and upcoming bills, to help you stay on top of your finances. This will be explained next (Meet Erica, 2023):

- At the moment, Erica is exclusively available in the Mobile Banking app;
- Customer will receive the confirmation sms for IMPS transaction via via the BofA Mobile banking app. All transactions can be done online or through your financial institution's mobile app;
- Erica learns from BofA’s chatters. She has a dedicated team who is constantly working to expand the capabilities offered;
- Nowadays, Erica is only available in English, but she is expected to be programmed in Spanish;
- A record of your conversations with Erica is kept for quality assurance, to maintain an accurate account of your requests, identify opportunities to make Erica's responses more useful and ensure Erica's performance is optimal. When you interact with Erica by voice, the discussions are recorded and saved for 90 days so they can be analyzed to help refine listening skills;
- Two-factor authentication (2FA) is a key feature in AI-powered Chatbot Erica;
- Interactions with Erica are protected with the same industry-leading privacy policy and security measures as BofA’s Online and Mobile Banking app;
- Mobile Banking requires that you download the Mobile Banking app and is only available for select Android mobile devices. Message and data rates may apply and your chat may be recorded and monitored for quality assurance.

5. Evaluation of BofA's AI-powered Chatbot Erica for DFI

Digitization is an essential first step in the digital transformation journey, which help the poorest people to fully participate in the financial system, as digital financial services can unlock, and increase-banking access for those currently trapped in the formal system. In fact, the shift to digital financial inclusion has already begun. As numerous people have mobile phones, tens of millions of previously excluded people are now storing money digitally on their phones and using their mobile devices to make purchases using AI apps (Abena Addai, 2023).

It's worth mentioning, in this context, that Erica leads 1 billion interactions with customers, and most recently has approximately 1.5 million interactions per day. The award-winning technology, powered by AI, officially launched in 2018 and has since helped nearly 32 million customers to help manage their daily financial needs. "Erica is the definition of how Bank of America is delivering personalization and individualization at scale to our clients," David Tyrie, BofA's chief digital officer and chief marketing officer. "We expect the second billion to come even more quickly as we continue to evolve Erica's capabilities, providing clients with the shortest path to the answers they need about their financial lives (Bank of America Corporation, 2023). She is based on conversational technology that allows individuals to interact with digital devices as if they were communicating with a human element. Therefore, BofA's Chatbot allows customers to be effectively communicated with Personal Touch and increases access to products from remote locations to include rural and remote areas. Also, the Chatbot could play an educational or advisory role to help with digital literacy in the future (Accion, 2023).

By using Erica Chatbot, BofA achieved the following (Bank of America Corporation, 2023):

- 37 million proactive insights recorded to help customers review their finances and reduce recurring subscription fees that may have increased unexpectedly, or know when they have received a refund from a merchant or have recurring

charges as a convenience for those who are unable to afford the additional burden;

- More than 4 million proactive notifications were sent to customers to obtain new features in the app to ensure that these services include those who do not have experience with digitization in banking;
- 60 million Spend Path insights also helped customers understand their finances through a weekly snapshot of spending, to reduce digital illiteracy, as many still do not know how to direct their savings.

To achieve a broader degree of inclusion, Erica seeks in the first half of 2023 to provide new financial products and services by experts to improve their use and delivery to consumers, such as such as forfeit, credit card, or deposit account (28). Erica represents an opportunity for financial service providers to offer solutions tailored to the needs of inexperienced customers with the aim of attaining DFI. If the customer for instance makes frequent inquiries about their checking account balance, the bot can suggest budgeting or money management tips. Such suggestions will enable customers to be aware of other available options. As an example, More than 98% of clients get the answers they need using Erica. In September 2022, BofA launched 'Mobile Servicing Chat' by Erica to connect clients for a live chat with reps to handle more complex servicing questions, , with more than 170,000 chats having already taken place (Bank of America Corporation, 2023).

5. CONCLUSION

The United Nations (UN) 2030 Agenda and its 17- sustainable development goals (SDGs) include end poverty, reduce inequality and achieve more financial inclusion (FI) to provide the availability and equality of opportunities to access financial services for all various groups of the society (Nelly Kambiwa, 2023). This is reflected in mobile banking apps will be the dominant channel for chatbot-driven customer communications, accounting for 79% of successful interactions in banking customer

service by 2023. This dominance is due to several reasons, primarily an increase in user preference for app-based banking, as well as the strong performance of banking chat programs. The biggest example of this is BofA's AI-powered Chatbot 'Erica', which has greatly contributed to attaining DFI by bringing the financially excluded people into an AI-driven formal financial service system (BANK COST SAVINGS VIA CHATBOTS TO REACH $7.3 BILLION BY 2023, 2023).

The study of the experience of BofA's AI- powered Chatbot 'Erica' concluded with the following most important points:

- BofA's AI- powered Chatbot has a key contribution to question answering and providing the consultations more than 98 % of customers needed. The bot also helped 60 million of customers understand their financial resources. This is to reduce digital illiteracy and recurring subscription fees, which may be an additional cost to vulnerable groups of society;
- As for USA experience, the reasons for banks success were due to the fact that the banking services provided to individuals are competitive, as there are approximately 2,000 American banks constantly competing with their peers in the industry, and more recently with FinTechs, to provide the best services to their clients;
- Given the fact that 95 % of all American households have bank accounts, it is obvious that BofA ranks first with total deposit market share of banks in the US, serving 1/3 American households, with about 37 million online and 27 million mobile app users.

From the above, it can be concluded that AI-driven Chatbots as a virtual assistant in Banking and Financial Services industries have contributed significantly to expanding digitalization and access to digital financial services to all age groups, helping accordingly vulnerable groups that were previously un- or underbanked, and thus attaining DFI for the purpose of achieving 17-SDGs. These findings, however, well confirm the initial hypothesis that Digital financial methods such as chat apps help

expand the scope of DFI by making people deprived of banking services financially active.

Study suggestions:

Imitating successful experiences in any field requires providing great financial, human and moral capabilities. As for Algeria, it can be said that it banks policy still suffering from a very slow process of transformation towards digitization due to the presence of several reasons and factors that hinder the spread of the latter. Among the reasons that made Algeria backward in this field, the following can be clearly stated:

- The vulnerable use of mobile banking apps in the Algerian banks. With the exception of services related to checking the balance and paying bills, Algerian banks do not use mobile banking apps as a main channel to provide services;
- The lack of strong incentives and necessary planning and coordination efforts from the administration to prepare the banking environment for the transition towards digital management, with traditional methods dominating the administrative work atmosphere that hinder the rapid advancement of digital technologies, in which postponements to expand digital services is constantly caused;
- The vulnerable use of national bank cards. As for international cards such as MasterCard and Visa, their use is limited to some well-known hotels and private business companies with limited services provided most of which are merely withdrawing or checking the balance;
- The lack of remote dealing and e-marketing culture in the Algerian society;
- The lack of experience and training in modern banking technologies industry and the reluctance of highly qualified people to work due to low wages and the lack of advanced programs approved in the banks;
- The lack of software to monitor intentional hacking, which results in some customers fearing the possibility of their money being stolen or their private data being exploited.

Therefore, based on the results of the aforementioned study, we can offer some suggestions that will contribute to spreading the culture of digital transactions:

- Providing the infrastructure, such as setting a legislative framework for digital financial services, which clarifies all the obligations that must be respected by Algerian banks and their clients;
- Encouraging a marketing policy in digital services that suits the rhythm of the modern era and in a way that attracts investment and increases the intensity of competition;
- Training bank employees and expanding the culture of digitalization and AI in banking to customers;
- Training Algerian banks and financial institutions staff on the necessity of using AI-driven apps;
- Allocating a financial cover that allows the purchase AI- driven apps, as they will have a positive return on financial institutions;
- Paying attention to the training process for employees to use digital and AI apps with the aim of abandoning foreign mental capabilities and creating job positions for Algerian employees;
- Encouraging scientific research in this field and establishing research centers prepared for the purpose of developing local competencies and benefiting from them as much as possible;

All in all, this study recommends that it would be suitable if the financial and non-financial institutions adopt and expand the use of AI-driven apps, in general, and AI-powered Chatbot apps, in particular. This is due to the benefits they provided in seeking to ensure the inclusion of people who were previously unable to participate in the formal financial market as they can do so quite easily and at the lowest costs within a digitalized environment.

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