A Study of the Technology Readiness Behavior among Elderly Users of E-Banking Services: A Reflection on the Public Sector Banks of Egypt

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Abstract:

As the Egyptian banking sector undergoes digital transformation, understanding the factors influencing the adoption of e-banking services among elderly users becomes imperative. This paper investigates the relationship between technology readiness compromising perceived ease of use, perceived usefulness, and perceived risk and the usage of e-banking services among elderly users in Egypt. Moreover, a

conceptual model arguing for the relationship between the current paper variables is developed. As well as a qualitative approach was also applied, drawing on a sample of 30 elderly e-banking users, data was collected through in-depth interviews assessing technology readiness dimensions and e-banking service usage. The Research sample was planned to be derived from greater Cairo residents. The research sample is a non-probability Judgmental sample drawn from elderly users of Egyptian E-Banking Services aging (60 +). The sample also included the largest two public Egyptian Banks according to their market share in pension systems. On the academic level, this paper paves the way for further future research about elderly behavior and its relationship to technology acceptance and elaborates on the scarcity of theoretical conceptual frameworks in this area. On the practical level of application, the current paper aims to provide valuable insights for banks and policymakers seeking to enhance the public sector e-banking accessibility and usability for elderly users in Egypt, ultimately fostering financial inclusion and digital empowerment aligning with the 2030 strategy. The findings revealed that Technology Readiness significantly affects E-banking service usage as most of the respondents highlighted internet connectivity and convenience as their main concerns. Furthermore, the respondents were found to trust the level of protection for the use of internet platforms and the safety of their personal data usage which confirms the effect of the perceived

risk on the E-banking services usage. The overall findings concluded that elderly respondents usually face many health problems that make E-banking services more logical and convenient for mobility. However, they also face some challenges like memorizing the passwords or the process steps to handle their bank accounts on their own which results in asking for help from their family members. Accordingly, this paper suggests some empirical solutions for supporting elderly users and for enhancing the e-banking provided services.

Keywords: Technology Readiness – E-Banking Services- - perceived ease of use- perceived usefulness - perceived risk – discomfort - insecurity.

1. Introduction

In the dynamic business world, technology has profoundly altered organizational Behavior inside the organization, shifting from traditional to digital practices. The Egyptian public sector banks are directed that electronic banking (E-banking) will help them provide a better service delivery to encompass a greater outreach for the elderly end-users. Spreading the culture of change can often be a threat to those who are unable or unwilling to learn; and the success of innovation requires creating a positive climate and behavior towards adopting new strategies and reform visions aimed at development, opening effective communication channels is a fundamental pillar for advocacy of such change.

The Egyptian financial public sector has been transformed from traditional bank activities to a more open digitalized effective and competitive system, which can offer a wide range of electronic services such as ATM, Internet banking, and mobile banking. The use of E-banking services stems from the revolution in the way business operations are executed in the banking sector. In Egypt with 39 total banks (5 public and 34 private), the public banks are considered the largest amounting to 50% of total banking assets in Egypt (Abdel Aziz, 2014). The respondents were found to focus on Bank Misr and the National Bank of Egypt as they are the largest banks in pension systems. The categories of E-banking services are Internet Banking which allows greater financial accessibility of transactions; mobile banking applications entail the use of smartphones or other mobile devices; automated teller machines ATM allow fast cash withdrawals and telebanking which allows elderly users to interact with customer service agents or an automated system. The development and use of Information and communication technology (ICT) because of the introduction of these innovations are magnifying at a great speed across the world. The number of Internet users increased by 27% from 1993 (14 million) until 2017 (3,885,567,619) users according to Internet World statistics but just 16% for those 65+ categorized as elderly users (Al Majzoub, 2018).

Consequently, due to the novelty of this research topic and its application among the Egyptian Public banks, as well as the elderly users. The research gap emerges due to the limited research tackling the technology readiness among elderly users related to research areas. Accordingly, the researchers can formulate the research questions as follows:

Is there a relationship between technology readiness dimensions and e-banking service usage among elderly Egyptians?

Thus, the current research aims to identify the relationship between technology readiness dimensions represented in perceived ease of use, perceived usefulness, perceived risk, and e-banking service usage. Whereas, the following sections will be discussed subsequently, literature review, research framework and methodology, research results, discussion, and conclusions.

2. Literature review:

2.1Technology Readiness

As defined by Parasuraman (2000), technology readiness is the level of willingness to use technology among people. Marketing Managers usually Adopt a Technology readiness index to decide which new technologies can be employed in the company platform interactions, the types of technologies to introduce, the level of progress/development, and the needed tier of customer support (Blut and Wang, 2020). Previous research

indicated that Technology readiness levels could be traced at home and work, represented in Internet banking, mobile technologies, self-checkout terminals, and remote services (Ramirez-Correa et. al, 2023). The Technology acceptance model (TAM) suggested that technology readiness could be measured through the following dimensions: Perceived ease of use, Perceived Usefulness, and Perceived risk (Yaseen and Qirem, 2018). Accordingly, the following sections will focus on the above-mentioned three dimensions of Technology readiness.

2.1.1 Perceived ease of use from accessibility and knowledge use perspective:

In 1985, Davis studied the level of users' acceptance of new banking technologies by adopting the Technology Acceptance Model (TAM): to measure user perception of the ease of use and usefulness from the perspective of technology-based delivery channels and electronic payment systems. In a study by Younis et al. (2024), TAM was used in a different context to measure the impact of Artificial Intelligence on organisational behaviour and the two indicators of the model perceived usefulness and perceived ease of use were also very crucial in determining results. The first refers to the degree to which AI is seen as beneficial, while the second refers to the extent to which AI is seen as easy to use and understand (Venkatesh and Davis, 2000). These two dimensions interact with the idea of trust associated with the cultural background of the end-users of the service who

for a long time were not accustomed to the use of E-banking facilities (Kamel & Assem, 2002). Trust in the service comes as a barrier to change and innovation when we study the elderly users of these services as they are still faced with the challenges of user's choice between traditional and unconventional banking instruments, and this is because they may be less familiar with technology and have concerns about security and privacy.

Other researchers tackled the phenomena of the digital divide to explain Generation X usage of E-banking with 32% for those aged 55–64, and just 16% for those 65+ (Hanif et al., 2021). According to Curwen & Whalley (2016), the digital divide is defined between "those who have access to a particular technology and those who do not" (Choudri et al. 2018). The access here is relevant to the perceived use variable encompassing having the knowledge and acceptance capacity to perform E-banking tasks online. The reasons for this phenomenon according to Dasgupta et al. (2001); Van Laar et al. (2017) were multidimensional and identified as the internet access cost and the media use. Moreover, the preference for human contact, digital literacy, and technology anxiety helped to explain the behavioral constraints for the use of this utility service (Ferilli et al. 2024). In developing countries, technology proficiency infrastructure and the literacy rate among the elderly are considered a crucial determinant of the adoption rate of Internet banking (Naeem et al.2021). For the elderly, internet accessibility features such as screen compatibility and clear navigation menus to help

with vision-related problems; step by step instructions through customer support chat or email help to overcome the technical issues of E-banking platforms. A very interesting example is the ease of use of the password for tokens and a password which was a hindrance to the use of mobile banking for the elderly rather than the younger generation (Kruzikova et al.,2022). The importance of individual differences for behavioral change adoption towards the use of technology entails awareness trials through customized training programs addressing mechanical skills and financial literacy to avoid barriers to innovation (Ryu et al., 2009). Other studies related the perceived use of E-banking services in Generation X to the aging factor both on a physiological level and a psychological one as well. As for the former, gradual losses to the sensory and motor systems such as vision, hearing and chronic diseases such as arthritis hinder the use and need extensive help from socialization agents such as grandchildren at home who can address the crucial urge behind the E-banking services to ease financial transaction and facilitate technology cognitive steps towards adoption (Yap et al., 2023). Moreover, other studies tackle psychological issues such as fear of use and personalization issues, especially for 65+ can undermine the usage and can be solved by training programs via customer service deploying the use of video cameras and solving issues in a face-to-face technological interaction to alter attitudes towards the adoption of a broader range of online activities (Ryu et al., 2009). More psychological factors

relate to the idea built into the cognitive construct of the elderly that using the internet is "non-essential" (Choudrie et al., 2018).

From the above, the researchers can conclude the following hypothesis:

H1a: There is a significant relationship between Perceived ease of use and E-banking services usage.

2.1.2 Perceived Usefulness

Perceived usefulness is a crucial dimension in evaluating the effectiveness and acceptance of e-banking services. According to (TAM), this concept explains the level of users' belief that using a specific technology can improve their performance as well as their convenience (Yaseen and Qirem, 2018). From the perspective of e-banking, perceived usefulness includes several dimensions, such as user-friendliness, service level, and the quality of the information provided (Nayanajith et al, 2021). User-friendliness is characterized by effortless design, ease of navigation, and simplicity or low complexity levels, enabling users to perform their transactions and access services easily and efficiently. Previous studies have shown that effortless navigation (user-friendly browsing) and clear design elements eliminate cognitive effort and help in enhancing the perceived value of e-banking platforms (Nayanajith et al, 2021; Gefen et al., 2003). From the users' perspective, service level refers to the availability, accessibility, and reliability of all banking-requested operations such as fund transfers, bill payments, and

account inquiries. Previous research shows that consistency in service quality and timely problem-solving improves customer satisfaction and customer trust, accordingly, supporting the perceived utility of e-banking services (Gunaratne, P., 2022; Parasuraman et al., 1988). The elderly do appreciate platforms that offer an extensive package of services, allowing them to handle financial tasks easily and with reliance. The quality of information provided through E-banking on different platforms is another dimension of perceived usefulness. Users value accurate, relevant, and up-to-date content that helps with decision-making and boosts their overall experience. Starting with navigation through pages, clarity of displayed information, and ending with freshness of updates are elementary factors creating positive customer perceptions and experiences as well. For instance, detailed transaction histories, and personalized financial advice directly enrich the positive perception of usefulness (Zhou, 2011). Furthermore, the integration of real-time alerts and interactive dashboards fosters greater engagement and trust in the platform.

From the above, the researchers can conclude the following hypothesis:

H1b: There is a significant relationship between Perceived usefulness and E-banking services usage.

2.1.3 Perceived Risk

Ghosh (2019) defined perceived risk as unpredictable emotions and the possibility of a negative impact on something that will happen in the future. Meanwhile, Martinsa et al. (2013) viewed perceived risk as "the potential for loss in the pursuit of a desired outcome of using an E-service." Due to the role of perceived risk in shaping elderly users' behavior towards Internet banking usage, managers should guarantee its security and technicality to decrease the risk of using Internet banking. Hill, Beynon-Davies, and Williams (2008) mentioned in their study that elderly people's perception of Internet banking benefits was lower than their perception regarding other technologies they use due to uncertainty and insecurity. The primary reason that elderly users perceive the banks' platforms as risky is that they are not familiar with these platforms and lack sufficient experience in dealing with them (Gunaratne et al., 2022). Another study conducted by Lichtenstein and Williamson (2006) on elderly Australian low-income users examining reasons for not using Internet banking revealed that this is due to the absence of Internet usage and reliance, limited knowledge and guidance for the main platform setup steps, insecurity, and a lack of trust in these services, as well as the belief that there is a high privacy risk. Therefore, managers should make announcements to current elderly users about the Internet banking platform's security and trustworthiness. Moreover, they should reassure them regarding their concerns about conducting

transactions free of mistakes, illegal computer acts, and privacy breaches. Elderly users need to know that the procedures from their personal computers to the bank server are safe, and sessions are conducted with secure codes. Additionally, there are strategies that banks can adopt to enhance their confidence in online transactions, such as assuring a money return in case of any problem; these strategies effectively reduce risk and help users feel more protected and secure (Martinsa et al., 2013). Banks should adopt a culture of high information protection, aligning with the necessity of data privacy. Consequently, users will believe that they have high control over their online activities, and they will only use online banking when information is not communicated, seen, kept, or changed by any unauthorized groups through the system platform (Kala et al., 2022). This will assist them in lowering their tension and risk regarding the banks' platforms. Unpleasant or frustrating online practices might lead to resistance in future participation, primarily due to the heightened perception of risk (Gunaratne et al., 2022). This can lead to an improvement in the amount of online banking service usage. On the contrary, banks that fail to ensure full privacy will lose their elderly users' confidence, and as a result, they might stop using their services altogether (Kala et al., 2022).

a) Discomfort:

Discomfort refers to considering technology as unmanageable and believing it to be overwhelming due to its prevalence

(Parasuraman, 2000). Some elderly users use technology, but they lack adequate skills, which leads to a disconnection from its usage. Most of them are not familiar with digital technology, as they did not learn it while they were young. This is the main reason why the elderly face problems when dealing with digital technology services and opportunities (Smith, 2014). For the elderly to ensure engagement in the digital age, they should acquire suitable skills and involvement (Funmilola O. O. & Tolulope A. A., 2020). A study conducted by Piiparinen (2014) on the attitude of elderly online banking users in Finland aimed to understand why they are reluctant to use online banking. The results showed that they avoid online banking due to a lack of opportunities to use it or a lack of understanding of how to use computers. Similar results were obtained in a study conducted in the USA by Rock, Hira, and Loibl (2010), which found that the decline in online banking usage among the elderly is due to the complexity of banking websites, which might lead to confusion. Consequently, they prefer face-to-face communication with bank employees. Senali (2017) explored the reasons why elderly Australian users are not significantly using mobile banking applications. The study revealed that some elderly individuals lack the skills to use these applications, some choose not to use them for psychological reasons, and others face technological barriers. Another study conducted by Camilleri and Grech (2017) showed that the primary reasons for the declining usage of Internet banking among the elderly in Malta are Internet

shortages, the absence of human interaction, the unavailability of information about online services, and a lack of knowledge about using computers. The authors recommended that to improve Internet banking usage, banks should simplify platform designs, add suitable guides, and encourage family and friends to motivate the elderly to use online banking services. Elderly users sometimes prefer using ATM services over Internet banking due to the traditional procedures they follow when using ATMs and because they perceive Internet banking as difficult, time-consuming, and insecure (Martinsa, C., et al., 2013).

b) Insecurity:

Perceived security refers to how users believe that the actions taken by sellers in using technology are appropriate and consequently free of risk. It relates to the level of confidence end-users have in web techniques to transfer confidential information (Gunaratne P., et al., 2022 & Merhia, M., et al., 2019). Cyber intrusion is considered one of the main reasons why users avoid retrieving confidential information online. This concern also applies to mobile banking applications, affecting elderly engagement levels. Insecurity is regarded as the greatest threat to adopting Internet banking, as users fear data breaches by hackers. As a result, insecurity is one of the most significant obstacles to the usage and development of mobile and e-banking (Merhia, M., et al., 2019). Worrying about financial loss for elderly users will

be to lose money because the organization offers distorted services. Elderly users are unlikely to accept technology that carries the possibility of financial loss. Regarding Internet banking, they will avoid any technology they associate with financial loss due to distorted services or breaches of personal information by third parties, which could result in the misuse of this information (Jibril, B., et al., 2024).

The expansion of E-banking technology necessitates the implementation of security procedures. Since the elderly do not directly control the technology, they rely on security measures provided by banks, such as passwords, validation processes, and secret phrases. Additionally, E-banking service providers ensure robust security procedures for their end-users. Therefore, perception of these procedures, based on their experience, becomes crucial. Currently, the elderly are more concerned about E-banking security, and any inconsistencies they encounter while using e-banking services can negatively impact their trust and usage (Kala K., et al., 2022).

Elderly users often worry about the security of their confidential information, whether personal or financial, when dealing with unfamiliar websites and technologies. Other factors contributing to perceived risk include their inability to tangibly inspect the products they are considering, lack of control over the security of their confidential information, and concerns about receiving incorrect products, services, or

information (Gunaratne P., et al., 2022). Previous studies in Nigeria demonstrated a negative effect of the perceived fear of financial loss (insecurity) on users' intention to use online banking (Jibril, B., et al., 2024). Enhancing factors that positively influence their perceived security can increase the likelihood of acceptance (Gunaratne P., et al., 2022).

There is a positive relationship between perceived security and user's intention to use e-banking services. Moreover, clarity and reliability positively affect their perceptions of security, while concerns about confidentiality negatively impact their perception (Gunaratne P., et al., 2022). Trust and security have been identified as significant barriers to E-banking usage in Thailand, particularly among individuals not currently using these services. They often lack the trust needed to conduct financial transactions online and are reluctant to adopt e-banking services (Martinsa, C., et al., 2013). Numerous studies focus on the factors influencing mobile financial services usage, emphasizing the novelty of these technological advancements, particularly for elderly users who may require guidance or training. Security and trust are among the most critical considerations for this group, as these factors significantly impact their willingness to adopt, approve, and utilize mobile banking services (Jibril, B., et al., 2024). It has been observed that elderly users' concerns about privacy and security surpass their expectations regarding bank customization. Despite the rise in

internet fraud, elderly users' usage of e-banking services has not been significantly affected due to their increased trust in these services. Consequently, banks should prioritize trust and security issues, addressing their concerns promptly and effectively. While elderly users are not inclined to change E-banking providers due to the limited customization of digital platforms, they are likely to do so immediately if they encounter security or privacy shortcomings (Gunaratne P., et al., 2022).

Based on the above, the researchers propose the following hypothesis:

H1c: There is a significant relationship between Perceived risk and E-banking services usage.

2.2 Reflections on the international 2030 sustainability perspective for usage of E banking for elderly users:

If sustainability perspectives for 2030 agenda emphasize the need of the public sector to tailor policies towards technological innovation therefore, in this study we are also on suggestions to sustain the behavior of the end-users of the service of E-banking. According to (Brown & Garcia, 2018), the financial empowerment and well-being of the elderly users is a direct result stemming from the use of E-banking services which puts a greater challenge as well on the banks to improve the long-term use of their e- services. This includes huge investments in technology and cyber security systems to maintain credibility for their users, (Chang and Wang 2021). In 2003, the UN announced Public Service Day (UN,2016)

encouraging public institutions to implement sustainable Development goals by ensuring effective and equitable innovative delivery of services in all sectors. According to Byanyima, (2015) public service delivery requires adequate financial resources and prioritization of target segments to ensure equity in an era of digitilization and innovation. From the perspective of SDG 10 related to Inclusion, governments must support mechanisms of including elderly population usage of public services to create the value for sustaining diversity regarding age and capacity for learning (Abhayawansa et al. 2021).

Omotayo and others in (2020) studied The Case of Internet Banking Use and Non-Use among elderly citizens in Ekiti State, Nigeria. The study revealed their fragility and their need for assistance as 34.4% under study preferred visiting the bank for their financial transactions, while 37.5% were not interested in the use of E banking services and 15.6% did not have the ease of learning and using these services. In south Africa, a study by Msweli (2020), indicated that a lack of knowledge and understanding, security, trust, demographic factors, language, the complexity of mobile banking applications, and resistance to change are barriers that influence adoption of mobile banking services. In Cameroon on the other hand, internet penetration rate for the elderly is 30% since 2020 which needs further efforts especially from national banks to highlight the effective benefits behind the service (Kamdjoug, 2022). In sub-Saharan Africa,

Abdul Bashiru (2024) showed internet banking adoption by the elderly to remain relatively low in the region e.g. Ghana invests to bridge the gap of digitalization, but still non-adopters of the technology of internet banking reaches 18.7 million because of the risk of fraud. Another study by Eghebi, in UK (2019) showed that the benefits from E-banking such as IT competence, social implications and the security issues, are significant factors in the explanation of elderly usage symptoms for E banking. In a global perspective, according to (Apak et al., 2012), banking is essential, but banks are not, which implies that with technological advancement E-banking seems to be a necessity and not just an alternative. In Spain the percentage of use for Internet banking is just 32% in general but diminish to 24% and 15% for ages 55-74 respectively (Gaitan et al. 2015). Estonia in Eastern Europe is leading Internet banking with a proportion of 18 percent of the population on world rankings, they present a free of charge easy to- use software (Mia, 2007). Ainin et al. (2005) and (Laukkanen et al. 2007) related their research to a dual relationship between age and E-Banking adoption as the elderly citizens have negative attitude towards the usage of services. They reflected on Sohail (2004) who argued that age and educational qualifications of technology adoption had a minimal impact on E-banking usage and on the other hand more factors intervened like accessibility, awareness and trust in device technology are more important factors.

2.3 An overview of the Banking sector in Egypt

The Central Bank of Egypt (CBE) concentrates mainly on enhancing financial inclusion by integrating important ministries and officials to increase financial services reach. The main reason for this is to have sustainable finance and to stabilize the economy, as it was recorded in March 2024 that the users of financial services are 47.4 million. The most important thing for the CBE is to construct and improve the e-payment system's financial infrastructure and to guarantee their accessibility and safety following international standards, as they affect attaining and guaranteeing financial stability. The CBE takes successful steps to strengthen user safety principles and improve user trust in the banking sector. This is done by following the regulatory instructions concerning improving the delivery of financial and banking services and making sure to preserve users' rights, to increase users' confidence in the banking sector and reach financial stability (CBE annual reports, 2024). In this direction, Bank Misr advocated a new innovation of application in the digital market of banking users, and it will be ready by 2025, it is called" Nexta" which is a service platform that provides an accessible banking experience with insurance against risk and total ease of use because of the features of Biometrics for each user to enhance the E-banking services experience with the elderly across Egypt (ElKady, 2024). On the other hand, to financially include segments of the elderly Egyptian users who suffer from disabilities in many forms Bank Misr took the initiative to introduce the "Al-

Momken" program (ElKady, 2024). This falls under the umbrella of the Central Bank's effort to ensure equitable delivery of banking services to all segments of society, and it includes also a customized training program for employees of government banks to learn how to deal with different age groups with different disabilities. According to the circular for 30-9-2021, by the Central Bank of Egypt, there is a direction for a one-stop-shop service for the e-banking services for the elderly population aged 65-up to avoid congestion in delivery. (CBE, 2021).

3. Research Framework:

Based on the above, the researchers suggest the framework below.

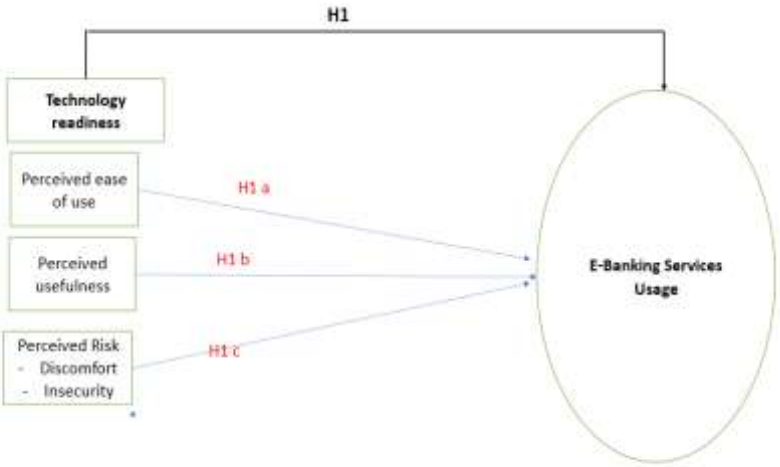

Fig (1): The research proposed framework

Source: Developed by the researchers

4. Research Design and Methodology

This research is Qualitative in nature, the researchers will rely on in-depth interviews. The research population is as follows:

a- All Elderly Users of Egyptian E-Banking Services

b- All Public Banks that operate inside the Egyptian Market.

The Research sample is planned to be derived from greater Cairo residents. The research sample is a non-probability purposive sample drawn from elderly users of Egyptian E-Banking Services aging (60 +).

The sample also will include the largest two public Egyptian Banks according to their market share in pension systems as follows: National Bank of Egypt (NBE) and Bank Misr (BM).

Since there is no specific framework for this community the researchers decided to determine a selection of 30 respondents with a confidence level of 95 % and error limits of 5%. The approach used in this research is qualitative, accordingly, the researchers relied on NVivo software to interpret the collected data.

5. Research Results and Discussion

5.1 Descriptive Statistics

The descriptive statistics analysis illustrates that the gender distribution is evenly split, with female respondents comprising 50% of the total and male respondents making up the remaining

50%, and the Age of the respondents aged from 60 to 65 years old is 40 %, 26.7% of them aged from 66 to 70 years old, 16.7% of them aged from 71 to 75 years old, while 16.7% of them aged from 76 to 80 years old. As for the Education level, the results showed that 10% of respondents have a high school education, 53.3% of them hold a university degree, and 36.7% of them have completed a postgraduate degree.

5.2 In-depth Interview Analysis

- **Bank Account Ownership**

It was found that all respondents agreed that they have a bank account with NBE and BM. However, not all respondents have only one bank account; some respondents possess more than one account.

- **Awareness of E-banking Services Provided by Banks**

All respondents indicated that they are aware of the E-banking services provided by their banks. This suggests that there is a strong understanding among the participants regarding the digital banking services available to them, highlighting the widespread adoption and knowledge of online banking options.

- **Usage of E-banking Services Provided by Bank**

The data showed that nearly all respondents utilize the E-banking services offered by their banks, with 96.7% highlighting the widespread adoption of digital banking among participants. However, one respondent, a female aged 81 with a high school education, reported not using these services by herself.

- **Preferred Banking Services: Physical vs. E-banking**

The respondents indicated that 63.3% preferred E-banking services, while 20% favored physical banking services, either through the branch or the call center. Additionally, 16.7% of respondents preferred both services, indicating that they would visit the branch when necessary, such as for handling large amounts of money or addressing specific needs.

Table (1): frequency distribution of respondents according to their preferred banking services by their gender, age range, and educational level (n=30)

Demographic Characteristic \ Preferred Banking Services			Physical	E-Banking	Both	Total
Gender	Female	Frequency	4	9	2	15
		Percentage	26.7%	60%	13.3%	100%
	Male	Frequency	2	10	3	15
		Percentage	13.3%	66.7%	10%	100%
Age Range	60 – 65	Frequency	1	2	9	12
		Percentage	8.3%	16.7%	75%	100%
	66 – 70	Frequency	3	1	4	8
		Percentage	37.5%	12.5%	50%	100%
	71 – 75	Frequency	0	1	4	5
		Percentage	0%	20%	80%	100%
	76 – 80	Frequency	2	1	2	5
		Percentage	40%	20%	40%	100%
Educational Level	High School	Frequency	2	0	1	3
		Percentage	66.7%	0%	33.3%	10%
	University Degree	Frequency	3	5	8	16
		Percentage	18.8%	31.2%	0.5%	53.3%
	Postgraduate Degree	Frequency	1	0	10	11
		Percentage	9.1%	0%	90.9%	36.7%

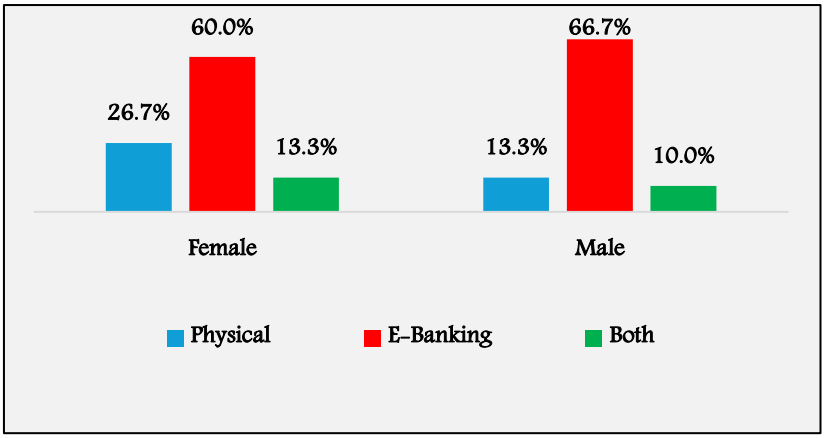

Figure (2): relative distribution of respondents according to their preferred banking services by their gender

The previous Table (1) and Figure (2) illustrate that the banking preferences show clear gender differences. Among female respondents, E-banking is the most popular choice, with 60% relying on it, followed by 26.7% who use physical banking and 13.3% who use both methods. Males exhibit a similar trend, with 66.7% favoring E-banking, but slightly fewer rely on physical banking with 13.3%, and 10% using both. These findings highlight E-banking as the dominant choice for both genders, but females show a marginally higher likelihood of using physical banking compared to males.

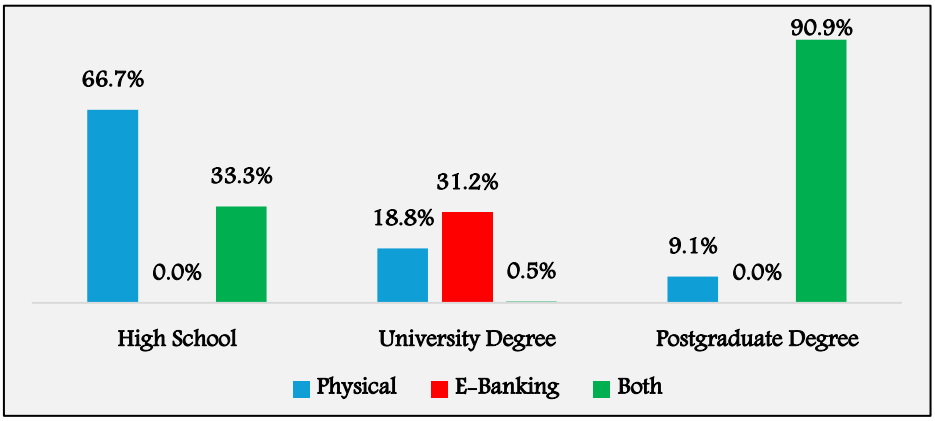

Figure (3): relative distribution of respondents according to their preferred banking services by their educational level

The previous Table (1) and Figure (3) illustrate that education plays a critical role in determining banking preferences. Respondents with a high school education predominantly rely on physical banking (66.7%) and show no usage of E-banking alone, reflecting potential barriers such as limited digital literacy. University degree holders display a more balanced approach, with 31.2% favoring E-banking and 50% combining both methods. Postgraduate degree holders exhibit the highest flexibility, with 90.9% using both physical and E-banking, and minimal reliance on either method alone.

- **Feelings toward E-banking**

In response to the question about their feelings toward E-banking, all respondents expressed that E-banking is easy to

access, helps them complete banking tasks more quickly, is convenient to use, and reduces both time and transaction costs. Most of the respondents also mentioned that they use E-banking due to encouragement from their bank, as well as support from family and friends. Also, they are aware of the benefits E-banking offers and they possess the necessary skills to use computers, smartphones, and ATMs, in addition to having the knowledge and resources to access the internet.

Some respondents shared comments in response to this question. One respondent mentioned that E-banking can be accessed at any time since it doesn't have specific working hours. Another respondent noted that a lack of knowledge about how to use a computer, smartphone, or ATM makes E-banking difficult. Meanwhile, another respondent stated that having internet access makes E-banking easy, but only if one knows how to use the internet effectively.

- **Easiness of Logging into the System through E-banking Service**

The results also showed that 93.3% of respondents found logging into the system and completing transactions through E-banking services easy, while only 6.7% of them reported that they found the process difficult to manage.

One respondent stated that while the process is easy, she prefers to share her credentials with a family member to complete the transactions, as she lacks the patience to do it herself.

Another respondent, who found logging into the system and completing transactions through E-banking difficult, mentioned that he struggles with signing in and remembering his password.

- **Perceptions of the Simplicity of Using Digital Banking**

Most respondents believe that using digital banking is simple and not exclusively designed for individuals who master technology. However, some respondents feel that digital banking is tailored for technologically proficient users. Others noted that basic technological knowledge, such as understanding the steps and remembering passwords, is necessary to effectively use digital banking.

- **Evaluating the Speed, Accuracy, Availability, and Dependability of E-banking Channel**

A significant percentage of respondents agreed that the E-banking channel offers acceptable speed, accuracy, availability, and dependability. However, several concerns were raised regarding its speed and reliability. Some respondents expressed fears of hacking, while others worried about internet speed issues. Additionally, a few mentioned that bank systems occasionally go offline, and ATMs can sometimes be overcrowded or run out of cash. Notably, respondents rarely rely on the web for their E-banking needs, preferring other channels such as mobile apps or ATMs.

- **Challenges and Issues Faced in Using E-banking Service**

The challenges faced by the respondents primarily revolve around two main areas: challenges related to using E-banking applications (such as mobile apps or Instapay) and challenges associated with using ATMs. For the applications, difficulties include slow internet speed, unstable network connections, frequent password changes by the bank that users may forget, leading to account lockouts, the unavailability of certain services, delayed updates, confusion caused by one-time OTPs, limited interest in technology, and high costs associated with updating iOS.

For ATMs, the challenges include crowded machines, server downtimes, machines running out of money, cards without Wi-Fi capability that can become stuck in the machine in case of errors, missing information on screens, limited ATM availability in some locations, and instances where money is withdrawn from accounts but not dispensed physically.

- **Evaluation of the Service Level Provided by E-banking Providers**

A large percentage of respondents agreed that the banks provide a high level of E-banking services. However, some respondents indicated that the service level is good for online services but poor for in-person interactions. A few reported a lack of updates on the available services, while others stated that the service level is moderate, particularly because ATMs do not always have money available. Some mentioned limitations in

customer service, and some respondents expressed concerns about internet connectivity and system updates. Additionally, one respondent noted that they did not believe any other bank offered better services than NBE.

- **Evaluation of the Usefulness and User-Friendliness of E-banking Services**

Many respondents agreed on the usefulness and user-friendliness of E-banking services. However, one respondent noted that although the services are useful, they are not particularly user-friendly. Another respondent mentioned that the ease of use depends on the user's skills, as some level of expertise is required to navigate them effectively. One respondent suggested that simplifying the instructions, especially with human assistance for the elderly, would add value. Additionally, one respondent said that the services are somewhat complicated.

- **Evaluation of the Quality of Information Provided by E-banking Services**

Most respondents agreed that the information they receive through E-banking services is of high quality, with easy navigation and up-to-date content. However, one respondent felt that customer service provided more updated information than the E-banking system. Some respondents mentioned difficulties in navigating the E-banking systems on their own, while one noted that navigation improves with practice and frequent use. Additionally, one respondent expressed frustration, stating he

wasted several hours trying to apply his request without success, feeling that he needed an intermediary to resolve the issue.

- **Ease of Using the E-banking Guide**

Many respondents think the E-banking guide is easy to use. However, one respondent commented that they found it very boring, while another described it as silly. One respondent noted that there is no guide available in the application, and the ATM requires personal assistance. Some respondents mentioned that the E-banking guide is not easy to navigate at all, with others expressing that customer service is more helpful in this regard. Additionally, one respondent stated that the E-banking guide is complicated, and they often forget their password.

- **Feelings and Reactions When Facing Issues with E-banking**

Most respondents stated that they feel embarrassed, particularly for simple issues, while others view it as a normal occurrence. One respondent mentioned feeling panic when encountering a problem, while another expressed frustration. One respondent was terrified when her account was hacked. Several respondents indicated that rather than feeling embarrassed, they typically call customer service to resolve any issues with the E-banking service.

- **Opinion on Using E-banking Versus Physical Banking**

Over 75% of respondents believe that E-banking services are more advantageous than physically visiting the bank. However, both E-banking and physical banking have their respective advantages and disadvantages. The advantages of E-banking

include saving time, cost, and effort, as well as being faster, more transparent, and making life easier. On the downside, there are some concerns about online transactions and some individuals lack the knowledge to access the information they need through E-banking. In contrast, physical banking offers the benefit of personal interaction, allowing for direct communication with bank staff, providing more personalized assistance, and offering the opportunity for in-person consultations. However, physical banking has its disadvantages, including additional charges, long waiting times, and the inconvenience of stairs in some locations.

- **Opinion on the Level of Protection in Internet Banking Platforms**

All respondents agreed that the level of protection provided by the bank on the Internet banking platform is very strong. One respondent mentioned that mistakes are rare. Another respondent stated that the application and website are highly secure, but noted that ATMs are more vulnerable, as sometimes they overhear people behind them correcting their transactions, which he attributed to the Egyptian culture. One respondent shared that she is always afraid to share her information. However, another respondent said he feels reassured due to the warning messages sent by the bank. Some respondents emphasized that they trust their bank, considering the protection level to be excellent.

- **Disputes Regarding Loss of Money in Bank Accounts**

The results illustrated that 86.7% of respondents didn't have any dispute with their bank over a loss of money in their account,

while 13.3% of them had such a dispute. Most of the respondents expressed trust in the bank's handling of transactions, believing that if they lose money through E-banking, it will be refunded based on their prior experiences or expectations. One respondent mentioned that while the money would eventually be refunded, it would require several arguments with the bank. Another respondent noted that having good relations with bank staff might be essential to securing a refund. One respondent shared a negative experience where a transaction on an ATM failed, the money was not dispensed, and losing the receipt prevented them from recovering the funds. Some respondents stated that if money is lost, it is the bank's responsibility, and therefore, the money should be refunded. A few respondents noted that public banks are generally better than private banks in this regard.

- **Opinion on the Amount of Personal Information Held by E-banking Service Provider**

All the respondents believe that the amount of personal information held by their bank for E-banking services is reasonable. One respondent noted that the information helps him feel safer, as it prevents anyone from conducting transactions on his behalf. Another respondent mentioned that he is not concerned about the information held, as the bank occasionally asks for additional details when receiving money or processing transactions. Additionally, one respondent emphasized that the amount of information held is in line with the bank's level of protection.

- **Bank Sharing Personal Information with Third Parties**

The results showed that 93.3% of respondents believe that their bank does not share personal information with third parties for advertising or other purposes, while 6.7% of them believe that their bank shares their personal information.

One respondent emphasized that the bank can't do so. Another respondent expressed trust in the bank, suggesting that if personal information were shared, it would be due to unethical behavior by an employee, without the bank's knowledge. Some respondents, however, had doubts about the security of their information. One respondent speculated that the bank may unintentionally share personal details, while another mentioned that only basic information such as names and phone numbers might be shared. Another respondent was certain that the bank shares personal information, citing concerns over employee control. One respondent mentioned receiving numerous advertising calls and questioned how her phone number was obtained!

- **Perception of Data Safety and Privacy in E-banking**

Most respondents feel confident that E-banking transactions are secure, with their data being protected from external access and processed accurately to the intended destination. However, one respondent expressed that while they trust the system, they do not consider it 100% trustworthy. Another respondent highlighted the bank's reliability, sharing a personal experience where the bank

proactively contacted him to correct a wrong account number before successfully processing the transaction within 48 hours.

On the other hand, some respondents voiced concerns about the possibility of hackers, especially from outside Egypt, gaining access to their data. One respondent specifically expressed worry about the potential for hackers to steal money

- **Future of E-banking Considering Rising Cybersecurity Threats**

Most respondents expressed a positive outlook on the future of E-banking, despite the growing concerns about cyber fraud. They emphasized the need for banks to enhance their E-banking security measures and to actively communicate these improvements to users to maintain their trust. If banks fail to do so, the users might revert to physical banking. Additionally, respondents suggested implementing a clear protocol for addressing hacking incidents and possibly offering insurance for customer accounts.

Some respondents believe that the increasing rate of cyber fraud could push E-banking systems to become more secure. However, one respondent warned that rising cyber fraud could undermine trust in the reliability of online banking, posing a threat to the future. Others expressed concerns about the potential for theft due to cyber fraud, with one commenting that human nature is prone to theft.

To mitigate the risks of cyber fraud, one respondent offered advice on avoiding cyber fraud, such as refraining from sharing

personal information, not using debit cards for online shopping, and avoiding online updates to bank accounts. Another respondent noted that the level of trust and perception of risk will influence people's willingness to continue using E-banking services.

5.3 Discussion

The current paper presented a conceptual framework aiming to have a better understanding of elderly behaviours through using technology in the context of technology readiness levels in e-banking-provided services. It can be concluded that technology readiness shows a critical potential in shaping elderly users' behaviours since most of the interviewed respondents perceived great usefulness and lots of benefits from using different forms of E-Banking. This confirms the acceptance of H1 and agrees with the results of the following studies (Ramirez - Correa et al., 2023; Blut and Wang, 2020). However, some respondents highlighted that internet connectivity and speed as their main concerns. They also added that some of the ATM cards do not support Wi-Fi which might lead to withdrawal of the card in some cases (Forgetting the password), as some of them mentioned that memorizing passwords, details or steps shapes a challenge for them at their age. Some respondents also mentioned that they might feel embarrassed in front of others if they faced any problem while using E-bank services, others expressed that they felt angry since they should go to the branch and panic when someone got hacked. Accordingly, H1a and H1b are accepted, which in turn agrees with the following study's

findings (Kamel and Assem, 2002; Ferilli et al., 2024; and Nayanajith et al., 2021).

Moreover, most of the users trusted the level of protection for the use of internet platforms and the safety of their personal data usage, and they highlighted that they have good faith in their banks. They also added that cyber fraud and hacking are a great threat and are expected to increase in the future and the banks have no other choice but to increase their protection level. As a result, H1c is accepted, which aligns with the results of (Martinsa et al., 2013; and Kala et al., 2022).

6. Conclusion

The current paper studied the technology readiness behavior among Elderly users in the context of Public E-banking services in the Egyptian market. Perceived ease of use, perceived usefulness, and perceived risk related to security and discomfort were the main dimensions for tackling the technology readiness level. Consequently, the paper results validate the research conceptual framework, reinforcing that technology readiness plays an important role in achieving satisfaction among elderly users for all the E-banking services provided.

Moreover, the paper in hands points out that the level of performance and expectancy from the perspectives of elderly users are considered drivers of perceived usefulness. The

findings also confirmed a positive outlook on the future of E-banking from a Technology readiness perspective. However, there are growing concerns around cyber fraud from the perspective of perceived risk related to insecurity. The current paper emphasizes the need for banks to enhance their E-banking security measures and to actively communicate these improvements to users to maintain their trust.

7. Theoretical Implications

The current paper contributes to the Behavioral Economics theory which aligns with both the Social marketing theory and public policy implementation (Chetty, 2015), and which is a reflection on better understanding decision making and how cognitive biases and emotional reactions influence the direction towards users' attitudes and choices, by aligning a novel focus on the technology readiness perspective among Egyptian elderly users of E-banking services, which benefits the service-providing banks, and society as well. This research incorporates the Technology Acceptance Model (TAM) theory in assessing the level of technology readiness among elderly Egyptian E-banking users. Only a few previous studies in the literature integrated technology readiness and its effect on consumer usage of the provided services in the Egyptian context in many sectors. However, the paper in hand focused on elderly users in the banking sector.

8. Practical Implications

Policymakers are advised to integrate platforms with ultimate security and privacy levels as well as designing more user-friendly security measures, such as biometric authentication which will guarantee providing trustworthy E-banking services. Also, offering interactive platforms would provide more assistance to elderly users.

Extending financial consultancy and promotional incentives through dealing with the bank's online platforms will reinforce users' trust in E-banking services, thus encouraging the elderly to rely more on E-banking services which will eliminate the burden on physical branches.

Additionally, the results suggested implementing a clear protocol for addressing hacking incidents and possibly offering insurance for elderly accounts, as the increasing rate of cyber fraud could make E-banking systems more insecure.

It is also suggested that holding returned or rejected transfers shouldn't take a lot of time as it usually takes 15 working days to resolve the issue. Customers can accept this in small amounts of money, but it is not accepted with larger amounts of Money as it affects the satisfaction and technology usage/reliance level.

9. Limitations and Direction for Future Research

The present paper's findings should be interpreted with some caution based on several limitations. However, necessary corrective actions have been taken to minimize the possible

effect of these limitations on the results. Since this research is qualitative, generalizing the findings is inherently limited.

Moreover, the data of this research were obtained from a specific demographic group: elderly users of E-banking services. However, the researchers anticipate that applying the proposed conceptual framework in other demographic groups or other sectors may lead to different findings.

Lastly, the current paper prioritizes technology readiness level but does not consider other factors, such as emotions, attitudes represented in E-trust, or other barriers that elderly users might face.

Future research is recommended to measure the effect of security and privacy concerns on the adoption behavior of elderly users.

Future research also should keep on exploring the elderly users' behaviors and interactions with technology but with different contexts such as E-government platforms, E-health platforms, and commercial platforms.

Conducting similar research in other Egyptian cities is believed to provide a deeper understanding of the effect of cultural, economic, and technological factors influence on the behavior of elderly E-banking users.

References:

- Abdel Aziz, Rasha; Rehab El Badrawy and Miran Ismail Hussein. "ATM, Internet Banking and Mobile Banking Services in a Digital Environment: The Egyptian Banking Industry". International Journal of Computer Applications (0975 – 8887) Volume 90 – No 8, March 2014.
- Abdul Bashiru Jibril, Frederick Pobee, Saikat Gochhait & Ritesh Chugh (2024) Breaking boundaries: unveiling hurdles in embracing internet banking services in Sub-Saharan Africa, Cogent Economics & Finance, 12:1, 2330436, DOI:10.1080/23322039.2024.2330436
- Abhayawansa S, Adams CA and Neesham C (2021) Accountability and governance in pursuit of sustainable development goals: Conceptualizing how governments create value. Accounting, Auditing & Accountability Journal 34(4): 923–945
- Abikari, Masoome, Peter Öhman and Darush Yazdanfar (2023). Emotions and consumer behavioural intention to adopt emerging e‐banking technology. Journal of Financial Services Marketing (2023) 28:691–704. https://doi.org/10.1057/s41264-022-00172-x, published on line 8 August 2022.
- Al Majzoub, Khaled and Vida Davidaviciene (2018). "Organization behavior change caused by Information and Communication Technologies". 10th International Scientific Conference Business and Management 2018. May 3-4, Vilnius, Lithuania. EISSN 2029-929X EISBN 978-609-457-921-9 DOI:10.3846/bm.2018.XX
- Ainin, S., Lim, C.H., Wee, A., (2005). Prospects and challenges of e-banking in Malaysia. The Electronic Journal of Information Systems in Developing Countries 22, 1, 1-11.
- Apak, S., Tuncer, G., Atay, E., Naime, İ., 2012. Insights From Knowledge Management to Radical Innovation: "Internet Banking Applications in the European Union" 41, 45– 50. https://doi.org/10.1016/j.sbspro.2012.04.006

- Blut M, Wang C. (2020) Technology readiness: a meta-analysis of conceptualizations of the construct and its impact on technology usage. Journal of the Academy of Marketing Science. Vol. 48: 649–669. https://doi.org/10.1007/s11747-019- 00680-8
- Brown, A., & Garcia, R. (2018). Enhancing Financial Literacy among Elderly Customers through E-Banking: A Case Study. Journal of Banking & Finance, 25(3), 112-125.
- Byanyima, Winnie (2015) How can we eradicate poverty by 2030?' World Economic Forum. Available at: https://www.weforum.org/agenda/2015/09/how-can-we-eradicate-poverty-by-2030/
- Camilleri, S. J. & Grech, G. (2017). The relevance of age categories in explaining internet banking adoption rates and customers' attitudes towards the service, Journal of Applied Finance and Banking, Vol.7, No.2, pp.29-47; https://ssrn.com/abstract=293479 0
- Central Bank of Egypt, (2021), Annual Report.
- Central Bank of Egypt, (2024), Financial Stability Report.
- Chang, L., & Wang, Y. (2021). Sustainable E-Banking Services for the Elderly: Challenges and Opportunities. Journal of Financial Technology, 15(2), 45-58.
- Chetty, Raj. (2015). "Behavioral Economics and Public Policy: A Pragmatic Perspective." American Economic Review, 105 (5): 1–33
- Choudrie, Jyoti; Chike-Obuekwe Junior; Brad Mckenna and Shahper Richter (2018). "Understanding and conceptualizing the adopting use and Diffusion of Mobile banking in older Adults: A Research Agenda and Conceptual Framework". Journal of Business Research volume 88, El Sevier February 2018. pp. 449-465. https://doi.org/10.1016/j.jbursres.2017.11.029

- Curwen, P., & Whalley, J. (2016). Mobile telecommunications in a high-speed world: Industry structure, strategic behavior and socio-economic impact. CRC Press.
- Cybercom Group. (2021). Digital sustainability: Global sustainability as a driver of innovation and growth.
- Dasgupta, S., Lall, S., Wheeler, D., (2001). Policy reform, economic growth, and the digital divide: an econometric analysis. World Bank Working. World Bank, Washington.
- Eghebi, Meg Chioma. (2019). An Investigation of the Factors that influence E-banking Adoption by Older Users. A thesis submitted in partial fulfilment of the requirements of the University of Sunderland for the degree of Doctor of Philosophy. April 2019, university of Sunderland, UK.
- Elbayoumy, Osama and Xiu-Hao Ding (2023). Attributes of innovation and adoption of mobile banking in Egypt. International Journal of Research in Business and Social Science (2147-4478) December 2023 DOI: 10.20525/ijrbs. v12i9.3040- IJRBS Vol 12 No 9 (2023) ISSN: 2147-4478
- ElKady, Amr (2024), Chief operating officer Bank Misr, Personal interview with the author, 6th November 2024.
- Ferilli, Greta Benedetta; Egidio Palmien; Stefano Miani and Valeria Stefanelli (2024). "The Impact of Fintech Innovation on Digital Financial literacy in Europe: insights from the Banking Industry". Research in International Business and Finance volume 69. January 2024. El Sevier. https://doi.org/10.1016/j.ribaf.2024.102218
- Figueira, Inês; Ana Rita Domingues; Sandra Caeiro; Marco Painho; Paula Antunes; Rui Santos; Nuno Videira; Richard M. Walker; Donald Huisingh, and Tomás B. Ramos (2018). "Sustainability policies and practices in public sector organizations: The case of the Portuguese

Central Public Administration". Journal of Cleaner Production. Volume 202, Pages 616-630, ISSN 0959-6526, https://doi.org/10.1016/j.jclepro.2018.07.244.

- Funmilola O. Omotayo1 & Tolulope A. Akinyode , (2020). Digital Inclusion and the Elderly: The Case of Internet Banking Use and Non-Use among older Adults in Ekiti State, Nigeria. Covenant Journal of Business & Social Sciences (CJBSS) Vol. 11, No.1, pp. 2006-0300.
- Gaitán, Jorge Arenas, Begoña Peral-Peral and Maria A. Ramón-Jerónimo (2015) Elderly and internet banking: An application of UTAUT2. The Journal of Internet Banking and Commerce, Volume 20(1). (http://www.arraydev.com/commerce/jibc/)
- Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. MIS Quarterly, 27(1), 51–90.
- Gerrard, P., Cunningham, J. B. & Devlin, J. F. (2006), 'Why consumers are not using internet banking: a qualitive study', Journal of Services Marketing, 20(3), 160.
- Ghosh, M., (2019). Analysing the Engagement and Attitude of Elderly Towards Digital Platforms in India. Journal of Creative Communications, Vol.14, No. 3, pp. 214-234.
- Guandalini, Ilaria (2022). Sustainability through digital transformation: A systematic literature review for research guidance. Available online 18 May 2022 Received 10 May 2021; Received in revised form 26 April 2022; Accepted 5 May 2022 URL https://doi.org/10.1016/j.jbusres.2022.05.003 /Crown Copyright © 2022 Published by Elsevier Inc.
- Gunaratne, P. (2022). Emerging digital banking service quality dimensions and their impact on elderly customer satisfaction and engagement: a study in Sri Lankan context. in partial fulfilment of the requirements of The University of Salford for the degree of PhD in

Business and Management. University of Salford, Salford Business School, Manchester, UK.

- Hanif, Yasmeen and Harjinder Singh Lallie (2021). "Security factors on the Intention to use Mobile Banking Applications in the UK Older Generation (55+): A Mixed- Method study using Modified UTAUT and MTAM- with perceived Cyber Security, Risk and Trust". Technology in Society volume 67. El Sevier, September 2021.https://doi.org/10.1016/j.techsoc.2021.101693
- Hill, R., Beynon-Davies, P., & Williams, M. D. (2008). Older people and internet engagement: Acknowledging social moderators of internet adoption, access and use, Information Technology & People, Vol. 21, No. 3, pp. 244- 266.
- Jibril, A., B., Pobee, F., Gochhait, S., & Chugh, R., (2024). Breaking boundaries: unveiling hurdles in embracing internet banking services in Sub-Saharan Africa, Cogent Economics & Finance, Vol.12, No.1, 2330436, DOI: 10.1080/23322039.2024.2330436
- Kamdjoug, Kala, J. R., Ndassi Teutio, A. O., Tchakounte Tchouanga, U., & Gueyie, J.-P. (2022). Use of E-Banking and Customer E-Engagement in Developing Countries: Case of NFC Bank Cameroon. Theoretical Economics Letters, 12, 1378-1406. Doi: 10.4236/tel.2022.125076.
- Kamel, S. & Assem, A. (2002). Using TAM to Assess the Potentials of Electronic Banking in Egypt. ISOneWorld Conference Proceedings, Las Vegas, NV, USA, 3-5 April.
- Kitsios, F.; Giatsidis, I.; Kamariotou, M. (2021). Digital Transformation and Strategy in the Banking Sector: Evaluating the Acceptance Rate of E-Services. J. Open Innov. Technol. Mark. Complex. 2021, 7, 204. https://doi.org/10.3390/joitmc7030204

- Kruse, L., Wunderlich, N., Beck, R., 2019. Artificial Intelligence for the Financial Services Industry: What Challenges Organizations to Succeed.
- Kruzikova, Agata; Lenka Knapova; David Smahel; Lenka Dedkova and Vashek Matyas (2022). "Usable and Secure? User perception of four authentication Methods for Mobile Banking". Computers and Security volume 115. El Sevier. https://doi.org/10.1016/j.cose.2022.102603
- Kuisma, T., Laukkanen, T. & Hiltunen, M. (2007), Mapping the reasons for resistance to Internet banking: a means-end approach. International Journal of Information Management. Vol. 27. No. 2, 75-85.
- Laukkanen, T., Sinkkonen, S., Kivijarvi M., Laukkanen P. (2007). Innovation resistance among mature consumers. Journal of Consumer Marketing 24, 7, 419-427. http://dx.doi.org/10.1108/07363760710834834
- Lichtenstein, S. & Williamson, K. (2006). Understanding consumer adoption of internet banking: An interpretive study in the Australian banking context, Journal of Electronic Commerce Research, Vol.7, No. 2, pp. 50-66.
- Martinsa, C., Oliveiraa, T., & Popovic, A., (2013). Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application, International Journal of Information Management, Vol.34, pp. 1-13.
- Mckinsey, 2020. Reimagining customer engagement for the AI bank of the future (2020).
- Merhia, M., Honea, K., Tarhinib, A., (2019). A cross-cultural study of the intention to use mobile banking between Lebanese and British consumers: Extending UTAUT2 with security, privacy and trust, Technology in Society, Vol.59, 101151.

- Mia, Md. Abdul Hannan, Mohammad Anisur Rahman and Md. Main Uddin (2007). E-Banking: Evolution, Status and Prospects. The Cost and Management. Vol. 35 No. 1, January-February 2007 pp. 36-48. ISSN 1817-5090
- Msweli, Nkosikhona T (2020). Factors Influencing the Adoption of Mobile Banking Technology by the Elderly In South Africa, University of Pretoria. Thesis in completion for a master's degree at faculty of Engineering, built environment and information technology.
- Naeem, Muhammad and Wilson Ozuem (2021). "The Role of Social Media in Internet Banking Transition during Covid19 Pandemic: Using Multiple Methods and Sources in Qualitative Research". Journal of Retailing and Customer Services volume 60. El Sevier February 2021. https://doi.org/101016/j.jretconser.2021.102483
- Nayanajith, D. A. G., Dissanayake, D. M. R., Weerasiri, R. A. S., & Damunupola, K. A. (2021). Perceived trust of e-services, perceived usefulness, and adoption of e-banking amongst the students of University of Kelaniya: A relational study. Vidyodaya Journal of Management, *7*(1), 27–59.
- Oktadini N.R., Fernando J., Sevtiyuni P. E., Buchari M. A., Putra P., and Meiriza A., (2022), Measuring Technology Readiness Index (TRI) of Management Information System Adoption in Higher Education, Ultima Infosys: Jurnal Ilmu Sistem Informasi, Vol. 13, No. 2
- Omotayo, F.O. and Akinyode, T.A. (2020) 'Digital Inclusion and the elderly: The case of internet banking use and non-use among older adults in Ekiti State, Nigeria', Covenant Journal of Business & Social Sciences, 11(1). doi:10.47231/edju4275.
- Parasuraman A. (2000) Technology Readiness Index (TRI): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies.

Journal of Service Research; 2: 307–320. https://doi.org/10.1177/109467050024001

- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. Journal of Retailing, 64(1), 12–40.
- Piiparinen, M. (2014). Attitudes of seniors' using cash services towards online banking, Bachelor thesis, Turku University of Applied Sciences, Finland; https://www.theseus.fi/bitstream/handle/10024/97354/ThesisMonaPiiparinen%20- %20Copy.pdf?sequence=1&isAll owed=y.
- Ramı´rez-Correa PE, Arenas-Gaita´n J, Ronda´n-Cataluña FJ, Grandon EE, Ramı´rezSantana M (2023) Adoption of social networking sites among older adults: The role of the technology readiness and the generation to identifying segments. PLoS ONE 18(4): e0284585. https://doi.org/10.1371/journal.pone.0284585
- Rock, W., Hira, T.K., & Loibl, C. (2010). The use of the internet as a source of financial information by households in the United States: A National Survey, International Journal of Management, vol. 27, No.3, pp.754-778.
- Ryu, Min-Ho; Seongcheol Kim and Euehun Lee (2009). "Understanding the factors affecting online Elderly User's participation in Video UCC services". Computers in Human Behavior volume 25. El Sevier, October 2008 online. Doi: 10.1016/j.chb.2008.08.013
- Senali, M. G. (2017) Mobile banking adoption by senior citizens in Australia, ECU Posters; http://ro.ecu.edu.au/ecuposters/19
- Sherif Kamel: Kamel, S. & Ahmed Hassan (2003). Assessing the Introduction of Electronic Banking in Egypt Using the Technology Acceptance Model. Journal of Cases on Information Technology · January 2003 DOI: 10.4018/978-1-59140-061-5.ch001

- Smith, A. (2014). Older adults and technology use. Washington, DC: Pew Research Centre; http://www.pewinternet.org/2014/ 04/03/older-adults-and- technology-use/
- Sohail, M, Shanmugham, B., (2004). E-banking and customers' preferences in Malaysia: An empirical investigation. Information Sciences, Informatics and Computer Science: An International Journal 150, 207-217. http://dx.doi.org/10.1016/s0020-0255(02)00378-x.
- Thornton, J. and White, L. (2001), "Customer orientations and usage of financial distribution channels", Journal of Services Marketing,15(3),168-85.
- Ulrike Stefanie Foerster-Metz, Katrin Marquardt, Nina Golowko, Andreas Kompalla and Christian Hell (2018)," Digital Transformation and its Implications on Organizational Behavior" Journal of EU Research in Business, Vol. 2018 (2018), Article ID 340873, DOI: 10.5171/2018.340873
- UN (2016) Department of Economic and Social Affairs https://www.un.org/en/desa/un-highlights-importance-public-service-achieving-sdgs
- UNDP (2022). "Science, Technology and Innovation for achieving the SDGs: Guidelines for Policy Formulation". United Nations Inter-Agency Task Team on Science, Technology and Innovation for the SDGs and UNIDO WORK STREAM 6: UN capacity-building programme on technology facilitation for SDG. April 2022. https://sustainabledevelopment.un.org/topics/technology
- United Nations (2001). E-commerce and development report 2001. New York & Geneva: united Nations.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management science, 46(2), pp. (186-204).

- Villarejo-Ramos, Angel Fco., Begoña Peral-Peral and Jorge Arenas-Gaitán (2014). Gender Differences Among Elderly in the use of Internet Banking Services. The International Journal of Management Science and Information Technology (IJMSIT). Special Issue: 2014 Spanish Portuguese Scientific Management Conference (45 - 52). North American Institute of Science and Information technology.
- Vullings, Ramon and Willem Storetelder (2012), "Business Creativity and Innovation", Workshop by Nexus Training Solution, Holiday Inn Hotel, Cairo, Egypt, 18h-19th march, 2012.
- Yap, Yee-Yann; Siow-Hooi tan; Siow- Kian Tan and Shay- Wei Choon (2023). "Online Grocery Shopping Intention: Elderly's perspective in Malaysia". Heliyon volume 9. Cel Press, October 2023. https://doi.org/10.1016/j.heliyon.2023.e20827
- Yaseen S. G and Qirem I. A (2018). "Intention to use e-banking services in the Jordanian commercial banks". International Journal of Bank Marketing Vol. 36 No. 3, 2018 pp. 557-571.
- Yaseen, S. G., & El Qirem, I. A. (2018). Intention to use e-banking services in the Jordanian commercial banks. *International Journal of Bank Marketing*, *36*(3), 557-571. https://doi.org/10.1108/IJBM-06-2017-0132
- Younis, Z. Ibrahim, M., & Azzam, H. (2024). The Impact of Artificial Intelligence on Organisational Behavior: A Risky Tale between Myth and Reality for Sustaining Workforce. European Journal of Sustainable Development, 13(1), 109. https://doi.org/10.14207/ejsd.2024.v13n1p109, **ISSN:** 2239-5938, **EISSN:** 2239-6101
- Zhou, T. (2011). An empirical examination of initial trust in mobile banking. Internet Research, 21(5), 527–540.