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Using Artificial Intelligence (AI) in Banking Services

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This booklet intends to benefit the young generation with limited prior knowledge of financial services and is willing to discover how Artificial Intelligence can help in this industry

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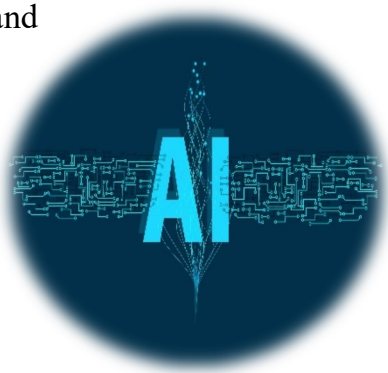
Preface

Artificial Intelligence (AI) and machine learning (ML) have rapidly changed the financial sector. This booklet highlights the advantages of these technologies and their impact on individuals and societies.



This booklet sheds light on a new generation of financial services that benefited from the evolution of AI driven mobile phones and internet applications. For instance, cellphones are rapidly used to make transactions through financial institutions' accounts.

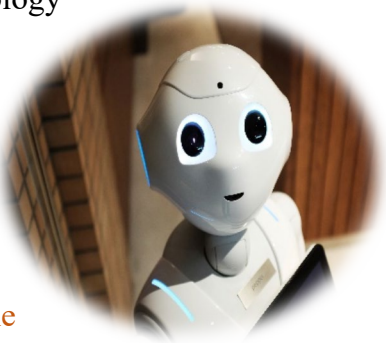
The Covid-19 Pandemic has further expedited the use of new digital channels such as Microsoft teams, Zoom, TikTok, and many other products that came into our daily lives and changed the way we interact.

On the other hand, the booklet highlights how machines and intelligent robots are expected to carry out most regular

activities which require human intelligence and significantly impact our lives.

Artificial Intelligence VS. Machine Learning Simple Definition

Artificial Intelligence is the imitation of peoples' behaviors in an intelligent way using robots or machines with a built-in system enabling them to think the same cognitive way as humans do and perform tasks such as problem-solving, decision making, speech recognition, translation [1] and much more.



According to Financial Technology Glossary issued by the Arab Monetary Fund, Artificial Intelligence has defined as an advanced computer system that is capable of simulating human skills, using a set of rules [2] [3], while; Machine learning (ML): is a method for obtaining a set of actions to solve issues that optimizes itself through previous

[1] Bernard Marr (2018). "The Key Definitions of Artificial Intelligence (AI) That Explain its Importance", Forbes, Feb.
[2] ISACA. (2015). "Glossary of Terms: English-French (3rd. ed)". ISACA.
[3] Youssef, N. Saleh, A, (2021). "Financial Technology Glossary", Arab Regional Fintech Working Group, AMF.

experience with little or no human participation, depending on statistics and mathematics theory. [4]

Artificial Intelligence, Financial Technology (Fintech) and Financial Inclusion

Financial Technology (Fintech) Refers to the use of technology to transform the way financial services are being done with the help of artificial intelligence and information technology. In another way, it is the intersection between finance and technology. It also enables more people to easily access different financial services and use them to pay their bills, send money, or even open a new account, increasing financial inclusion.

Financial technology (Fintech) has become one of the most important pillars for improving the financial sector, where most customers prefer to carry on their transactions using mobile applications and intelligent solutions.

Digitalizing finance is not new; it began several years ago; in 1967, the first ATM (Automated Teller Machine) was introduced by Barclays Bank in the UK. This machine was a kind of innovation and allowed an enormous transformation of how people could get their money quickly [5].

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[4] FSB. (2020). "The Use of Supervisory and Regulatory Technology by Authorities and Regulated Institutions: Market developments and financial stability implications".

[5] Available at: corporatefinanceinstitute.com/

In the 70s, banks introduced card-based payments, while online banking was widely accepted starting from the year 2000, and by 2010s mobile-based "on-the-go banking" became popular [6].

Financial technology and artificial intelligence are the innovations trying to tackle the gap between what financial institutions offer and clients' expectations. It is one of the most exciting developments in financial technology today.

Furthermore, technology-driven financial services help achieve financial inclusion, which aims to provide financial products and services at an affordable cost to every segment of the society, including women, youth, SMEs [7], to meet their basic needs regardless of their income, through providing them with many financial services such as payments, savings, loans, and insurance [8]

[6] Suparna Biswas et al. (2020). "AI-bank of the future: Can banks meet the AI challenge?", McKinsey & Company, September, article.

[7] Center for Financial Inclusion (2018). "TOOLKITS AND GUIDES: Financial Inclusion Glossary", October.

[8] The World Bank (2018). "Financial inclusion is a key enabler to reducing poverty and boosting prosperity". Available at: https://www.worldbank.org/en/topic/financialinclusion/overview#1

Traditional and Automated Financial Services

Automotive, healthcare, education, finance, entertainment, and other industries have customized AI solutions to meet their demands.

AI and machine learning in the healthcare business have accelerated the speed of innovation, but they also transformed entire operating models. AI can help doctors analyze thousands of stored data and reports to determine the best treatment plan for each patient.

In Singapore, for example, a research institute has launched an AI-pharmaceutical platform that can quickly analyze patients' data and provide them with the recommended drug based on their historical data [9].

AI systems is primarily utilized in self-driving cars in the automotive industry, with these systems projected to become standard in new vehicles in the long term.

In the education field, AI is expected to change the learning models by analyzing students' behaviors and habits, then develop personalized learning programs for each student [10].

The Covid-19 Pandemic brought a dramatic change to almost every industry, including financial services, which created an

[9] Huawei (2021). "Intelligent world 2030" Building a Fully Connected, Intelligent World", September.

[10] Dev Mehta, Leonie Senn-Kalb (2021). "In-depth: Artificial Intelligence", Statistical Digital Market Outlook, August.

opportunity for financial institutions to innovate by shifting to automated-driven financial services to help improve the customer experiences. Subsequently, financial service providers started to employ Artificial Intelligence (AI) to deliver innovative financial services.

Accordingly, mobile banking applications have grown by approximately 20 to 50 percent and are forecasted to continue until the pandemic is over. On the other hand, around 15 to 45 percent of consumers are expected to reduce their branch visits after the crisis. (11)

Artificial Intelligence can help improve traditional financial services in many ways, such as automating repetitive front-office services and answering customer queries more efficiently.

Moreover, using Artificial Intelligence in banking and financial services can help cut operational costs, boost the efficiency of financial institutions, eliminate the daily routine work, which in turn helps accelerate the innovation cycle.

Thanks to a slew of AI applications that will help achieve substantial gains over the next decade. By 2030, It is expected that using AI in financial services will lead to a cost saving of more than USD 1 trillion, with traditional banking institutions

(11) Suparna Biswas et al (2020). "AI-bank of the future: Can banks meet the AI challenge?", McKinsey & Company, September, article, Ibid.

saving around 22 percent of their total cost [12]. Indeed, artificial intelligence can better provide cash-based alternatives that are more affordable and reliable [13].

According to Mckinsey's Global AI survey report, the most used AI technologies in financial institutions are robotic-process automation (36 percent) for conducting repetitive tasks, virtual assistants/ chatbots (32 percent) for customer services, and machine learning techniques (25 percent) to avoid scams and help mitigating the associated risk [14].

Moreover, (AI) can help digitize payments, enhance the speed of payments, and lower the cost of disbursing and receiving them. It can also improve payments security and reduce the risk of related crime. It was proven that carrying payments via digital methods rather than cash increases transparency and reduces corruption.

AI-based chatbots can assist clients in reaching their needs faster by giving financial advice when needed, answering inquiries about customers' accounts, and help transfer money among their accounts quickly, submitting a loan request, and even detecting fraud through machine learning techniques.

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[12] Marsh & McLennan (2019). "Artificial Intelligence applications in Financial Services".

[13] Asli Demirguc-Kunt, et al., (2017). "The Global Findex Database: Measuring Financial Inclusion and the Fintech Revolution", World Bank Group.

[14] Suparna Biswas et al (2020). "AI-bank of the future: Can banks meet the AI challenge?", McKinsey & Company, September, article, Ibid.

Furthermore, chatbots can help recommend some financial products to customers after analyzing their data with the help of AI, which triggers marketing the bank's products and improving its sales [15].

In UAE, "EVA" is the first virtual assistant in the Middle East and North Africa to recognize your language, whether it is in Arabic or English, and talk to you naturally. [16]

"Banky" is another AI-based virtual assistant launched in Kuwait to interact and respond to customers' queries regarding bank products and services in a safe, reliable, and fast way. [17]

In Egypt, "Zaki" has been announced as intelligent virtual assistance that allows clients to know all the new decisions of the Central Bank of Egypt and assist them in searching among banks different products and services in an easy and fast way[18].

Worldwide, banks have launched mobile banking apps that remind clients to pay their obligations like bills, plan their budget, and connect with their banks more efficiently, from receiving information to completing transactions.

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[15] PIOTECH (2020). "Why Having a Banking Chatbots in 2020", September.

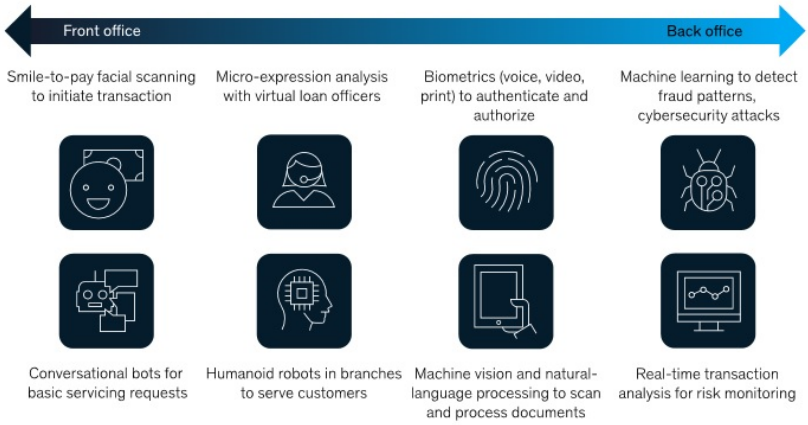
[16] Available at: https://www.emiratesnbd.com/ar/personal-banking/ways-of-banking/phone-banking/eva/

[17] Available at: https://www.burgan.com/burganar/CustomerCommunication/Pages/Bankichatbot.aspx

[18] Available at: https://www.bankygate.com/9547

On the other hand, AI has a massive impact when it comes to risk management. It allows enormous volumes of data to be processed quickly, and cognitive computing aids in the direction of analyzing organized and unstructured data. The graph below demonstrates how banks are extending their use of AI technologies to enhance customer experience.

Figure (1): How banks are extending their use of AI



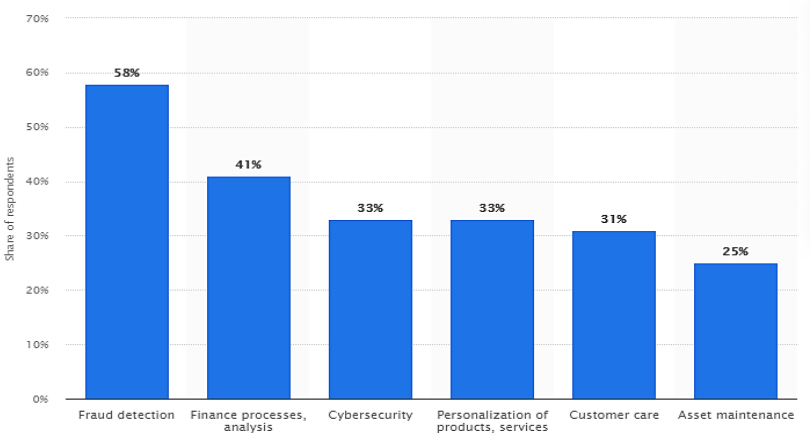
Source: McKinsey & Company, (2020). "AI-bank of the future: Can banks meet the AI challenge?".

Moreover, Artificial intelligence has successfully prevented banking fraud for several years now. It can help detect credit card fraud, which has skyrocketed in recent years as e-commerce and internet transactions have grown. When something seems out of order, fraud detection systems assess clients' behavior, location, and buying patterns and activate a security mechanism.

According to the Association of Certified Fraud Examiners, 13 percent of businesses employed AI to detect and prevent fraud in 2019. Moreover, 25 percent more businesses intended to utilize these technologies in 2020 [19].

Banks also use artificial intelligence to deter and prevent another common type of financial crime, which is money laundering, by recognizing the irregular activity and decreasing the cost of analyzing Know Your Customer schemes, as shown in the below graph, the use cases of AI in the financial services industry as of 2020 [20].

Figure (2): Use cases of AI in the financial services industry across the world as of 2020 technologies to enhance customer experience



Source: Statista.com.

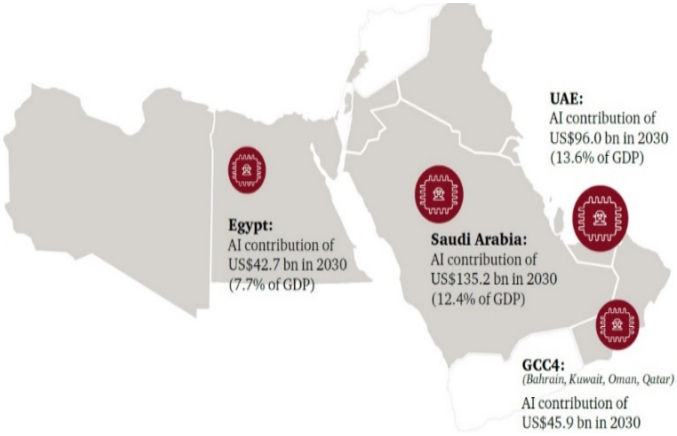
[19] Hussain Abusaaq (2021). "The impact of AI on the development of financial sector", Saudi Data and Artificial Intelligence Authority.

[20] available at: Statista.com. "AI use cases in financial services industry worldwide as of 2020".

Artificial Intelligence and its impact on Arab Countries

As per PWC, the economic gains of using artificial intelligence in the Middle East are expected to record USD 320 billion by 2030[21]. Saudi Arabia is predicted to benefit from AI, with a value of about USD 135 billion (around 12.4 percent of the GDP). The expected gains in The United Arab Emirates are expected to reach 14 percent of GDP in 2030, as shown below.

Figure (3): The influence of artificial intelligence on the middle east economy



Source: PWC, (2018). "US$320 billion by 2030? The potential impact of AI in the Middle East", Available at: www.pwc.com/m1/en/publications/ potential-impact-of-AI-in-the-Middle-East.html.

(21) PWC, (2018). "US$320 billion by 2030? The potential impact of AI in the Middle East", Available at: www.pwc.com/m1/en/publications/ potential-impact-of-AI-in-the-Middle-East.html.

In 2017, the United Arab Emirates launched its strategy for Artificial Intelligence aiming to be the first global open lab for implementing the fourth industrial revolution technologies targeting many sectors, including transport and health, space, renewable energy, education sector, and environment sector [22].

According to a report issued by the Telecommunications and Digital Government Regulatory Authority (TDRA) in the UAE, digital payments in 2020 recorded about USD 18.5 billion, while residents spent around USD 320 billion on smart applications.

"W@reed" is a typical case of using Artificial Intelligence technologies in managing the health sector in the UAE. It provides all required information that medical staff needs to track the patients' medical records. Smart robotic pharmacy and "Shefaa" are other digital channels that serve the health sector relying on AI, especially after the Covid-19 Pandemic[23].

"Madrasa" is the largest free eLearning platform in the Arab world, launched in UAE in 2018, offering 5,000 free videos in various subjects to students in different grades [24].

Saudi Arabia expects that AI will contribute around USD135 billion to its GDP by 2030. Furthermore, around 70 to 96

[22] Digital Transformation in UAE 2020.
[23] Ibid.
[24] The official website of the United Arab Emirates' Government Portal.

percent of "Saudi Vision 2030" goals related to utilizing artificial intelligence and machine learning. For example, "Numou Center for Education", is a new AI-powered education platform created specially to serve students in Saudi Arabia using machine learning to provide personalized education depending on their weaknesses, behavior, and habits[25].

In Egypt, by 2030, every 10,000 workers will be matched by 390 robots. Furthermore, 7 percent of the company's total technology investments will come from artificial intelligence computing [(26)].

In 2019, the Egyptian government formed the National Council for Artificial Intelligence to develop Egypt's AI strategy [(27)]. Which will help improve the ranking of Egypt in relevant global indicators. According to the 2020 government AI Readiness Index report, Egypt ranked 56th among 172 countries[(28)].

[(25)] Available at: https://numoucenter.org/page/mission-vison-history-who-we-are

[(26)] Huawei (2021). "Intelligent world 2030" Building a Fully Connected, Intelligent World", September. Ibid.

[(27)] Available at: https://mcit.gov.eg/en/Artificial_Intelligence, Ministry of Communication & Innovation Technology, Egypt.

[(28)] Eleanor Shearer et al (2020). "Government AI Readiness Index 2020", 3rd edition. Oxford Insights.

Future of the AI and the most significant challenges

As AI is rapidly reshaping the financial industry landscape, all kinds of digital assistants and apps will continue to improve if machines and intelligent robots are able to plan and carry out short- and long-term activities, such as paying bills and preparing tax filings.

As natural -language processing progresses and learns more from the enormous data pool of experience, we should expect to see better customer service that incorporates sophisticated self-help Virtual Reality systems.

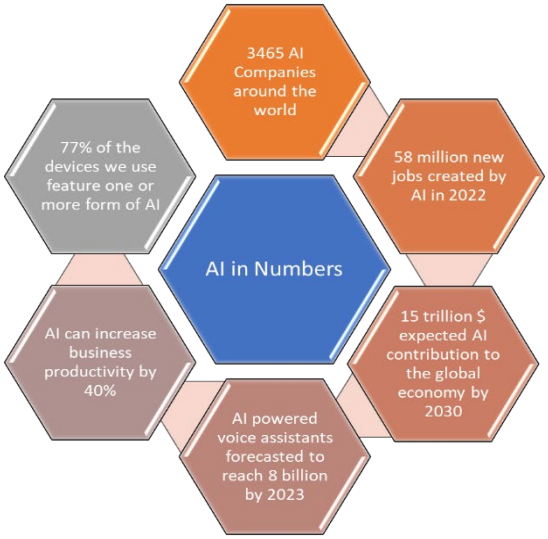
More complete and accurate know-your-client reports, as well as more rigorous due diligence checks, will bring a new level of transparency, which currently take too many human labor hours [(29)].

Artificial Intelligence will have a tremendous impact on the labor market. Some indicators show that artificial intelligence will affect but even eliminate some jobs and increase the inequality gap.

[(29)] Arthur Bachinskiy (2019). "The Growing Impact of AI in Financial Services: Six Examples", Feb.

According to a report published by "Accenture", AI, robotics, and big data will boost labor productivity in 12 developed economies by 40 percent by 2035, with most of the increase coming from these new technologies. While this may result in a loss of human employment, businesses will save money and make more revenue by implementing AI, thus being more able to establish new projects and create job opportunities[30].

Figure (4): AI in figures



Source of data: the National Council for Artificial Intelligence, Egypt. Available at: https://ai.gov.eg/

[30] Hussain Abusaaq (2021). "The impact of AI on the development of financial sector", Saudi Data and Artificial Intelligence Authority. Ibid

On the other hand, Challenges facing the spread use of AI in financial services include but are not limited to insufficient technology infrastructure, lack of data, and financial resources required to deploy these technologies.

Conclusion

In a nutshell, this booklet covered the overlap between artificial intelligence and machine learning, their impact on different industries, including the financial sector, and the main technologies and innovations used in this industry.

Banking activities, such as preventing fraud, customer services, back-office activities, and wealth management, have already been impacted by artificial intelligence. AI will be more clearly used on a profound and bigger scale because it genuinely improves productivity, saves expenses, offers creative insights, and enhances the user experience.

The booklet highlighted the impact of applying artificial intelligence in some Arab countries and its economic impacts. Finally, it sheds light on the future of AI and the challenges that face using these technologies at a broader scale.

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