

## WILL ARTIFICIAL INTELLIGENCE REJUVENATE İSLAMIC FINANCE? A VERSION OF WORLD ACADEMIA

Yapay Zeka İslamî Finansa Canlılık Katabilecek mi? Bir Dünya Akademisi Örneği

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## Will Artificial Intelligence Rejuvenate Islamic Finance? A Version of World Academia

### Abstract

Modern Artificial Intelligence (AI) uprising has transformed the world of finance and financial institutions have taken it as the unprecedented challenge to gain a competitive advantage. The main objective of this paper is to evaluate the nexus of Artificial Intelligence and Islamic finance based on Islamic finance experts' opinions and assessments across the globe. Therefore, purposive sampling technique has been applied to collect the opinions. Narrative analysis was used to analyze the data. Henceforth, professors and associate professors were contacted through social networks such as WhatsApp, Facebook and emails messages as the author knows these experts individually. The respondents were chosen from Malaysia, UK, Qatar, Germany, Turkey, Indonesia, Brunei, Saudi Arabia, Jordan, USA, and Pakistan. Data were collected in the duration of one month. Majority of the respondents agreed that Artificial Intelligence can play an important role in almost every area. It can replicate human thinking in technical areas to a great extent. AI/Machine Learning & also Data Science & Data Analytics, can provide solutions involving automation and data...e.g banking services automation, robo-advisors, auto-trading, data services (like Reuters & Bloomberg), commodity trading, wealth management, rating agency services, and software (IOS/Android) development. Blockchain is separate (eg on crypto-currencies, but processing speed is slow) but anyway short term success for IF can be with Machine learning & Data Analytics rather than blockchain, but blockchain technology is improving and opening up new areas of application. Furthermore, in some countries, such as Pakistan, Islamic finance is personality driven. So Artificial Intelligence cannot replace actual persons in the short-run to create a credible trust. In the long-run gradually, it may be possible that robo Shariah advisory may be popular. Technology is important indeed. Maybe artificial intelligence will help Islamic finance to make people more financialized which is not good. However, we can look into the issue of how can we use artificial intelligence to support real sector. The Islamic banks are scaring to use partnership based financial instruments as Mudarabah and Musharakah when allocating their funds to customers. The reason is control function. Can artificial intelligence help to have the control of those deals? If so it is very good. Nonetheless, this study suggests that it will be great if we can archive such more systems at advance levels, but are we aware of the amount of programming to do that? Having overcome the Main framework, then Islamic Finance mitigation and Sariah framework can be adopted with less efforts. This study explores the needs and potentials of artificial intelligence for different avenues as it will improve the performance of Islamic Finance. However, we

should specify and narrow it as Islamic finance is very broad. This study, therefore, has opened many future research opportunities in the area of artificial intelligence in Islamic Banking and Finance. It discovers many new avenues that contribute to the development of artificial intelligence in Islamic Banking. Besides, the present study appears to be the first attempt to discuss the opinions and assessments of the experts of Islamic finance from across the globe. This study also helps to add the value to the existing literature in Islamic finance and financial technology.

Keywords: Artificial Intelligence, Digital Banking, Islamic Finance, Conventional Finance

## Yapay Zeka İslamî Finansa Canlılık Katabilecek mi? Bir Dünya Akademisi Örneği

### Öz

Modern Yapay Zeka (AI) yükselişi finans dünyasını dönüştürmüş ve finansal kurumlar bunu rekabet üstünlüğü elde etmek için eşi görülmemiş bir meydan okuma olarak görmüştür. Bu makalenin temel amacı, dünyanın dört bir yanından İslami finans uzmanlarının görüş ve değerlendirmelerine dayanan İslami finans ve yapay zeka ilişkisini analiz etmektir. Bu sebeple görüşleri toplamak için amaca uygun örnekleme yöntemi takip edildi. Anlatı analizi kullanılarak bilgiler tahlil edilmiştir. Görüşlerine başvuru alan doçent ve profesörler yazarın teker teker bildiği akademisyenlerdir. Bunların görüşleri Facebook, WhastApp, email gibi sosyal medya yoluyla alınmıştır. Katılımcı akademisyenler; Malezya, İngiltere, Katar, Almanya, Türkiye, Endonezya, Brunei, Suudi Arabistan, Ürdün, ABD ve Pakistan'dan seçilmiştir. Görüşlerinin toplanması bir ay gibi bir süre almıştır. Katılımcıların çoğunluğu, yapay zekanın neredeyse her alanda önemli bir rol oynayabileceği konusunda hemfikirdir. Yapay zeka, teknik alanlarda insan düşüncesini büyük ölçüde kopyalayabilir. Yapay Zeka/Makine Öğrenimi ve Veri Analitiği, bankacılık hizmetleri otomasyonu, robo-danışmanlar, otomatik ticaret, veri hizmetleri (Reuters ve Bloomberg gibi), emtia ticareti, varlık yönetimi, derecelendirme kuruluşu hizmetleri ve yazılım (IOS/Android) geliştirme gibi otomasyon ve veri içeren çözümler sağlayabilir. Blockchain münferit bir durumdur. (kripto paralar üzerinedir. Fakat süreç hızı yavaştır). Ancak İslami finansın kısa vadede başarısı, blockchainin gelişmesi ve yeni uygulama alanları açmasına rağmen onun yerine makine öğrenimi ve veri analitiği ile olabilir. İslami finans Pakistan gibi bazı ülkelerde şahsiyetlerle işleyen bir finanstır. Bu yüzden yapay zeka kısa sürede inandırıcı bir güven oluşturarak gerçek kişinin yerini alamaz. Uzun dönemde ise zamanla robot şeriat danışmanı yaygınlaşıp ünlenebilir. Teknoloji gerçekten önemlidir. Belki yapay zeka İslami finansa insanları daha fazla finansal yapma konusunda yardım edecektir. Fakat bu iyi

bir netice değil gibi durmaktadır. Bununla birlikte, yapay zekayı reel sektörü desteklemek için nasıl kullanabileceğimiz konusu üzerinde durabiliriz. İslami bankalar, fonlarını müşterilere tahsis ederken Mudaraba ve muşaraka gibi ortaklığa dayalı finansal araçları kullanmaktan korkuyorlar. Bunun nedeni ise kontrol fonksiyonudur. Yapay Zeka, bu mualelerin kontrolüne yardımcı olabilir mi? Eğer olabilirse bu çok iyidir. Her şeye rağmen, bu çalışma, eğer biz ileri seviyelerde daha fazla sistem arşivleyebilirsek bunun müthiş bir gelişme olacağını ön görmektedir. Fakat biz bunu yapmak için gerekli programlamanın miktarı konusunda farkındalığımız var mı? Ana çerçeveyi oluşturduktan sonra, İslami finansın tahfifi ve şer'î çerçeveye adapte olmak dah az enerji ile mümkün olabilir. Bu çalışma yapay zekanın İslami finansın gücünü artıracığı için onun potansiyel ve gereksinimlerini incelemiştir. Bununla beraber İslami finans çok geniş olduğu için onun detaylarını belirleyip sınırlandırmalıyız. Çalışma, bundan dolayı İslami bankacılık ve finans alanında yapay zeka konusunda bir çok araştırma fırsatlarının kapısını açmıştır. O, İslami bankacılık alanında yapay zekanın gelişimine katkı sunan bir çok yeni yollar keşfetmiştir. Bunun yanında, sunulan çalışmanın, dünyanın dört bir yanındaki İslami finans uzmanlarının görüş ve değerlendirmelerini tartışmak için ilk girişim olduğu görülmektedir. Ayrıca İslami finans ve finansal teknoloji alanında mevcut literatüre bir değer de sunmuş olmaktadır.

**Anahtar Kelimeler:** Yapay Zeka, Dijital Bankacılık, İslami Finans, Konvansiyonel Finans

### Introduction

In the modern era, it is imperative to know What is Artificial Intelligence (AI)? How does it work? Who will use it? How it can be used? These are the possible questions that are being addressed by different fields such as, medicine, military, transport, security, and manufacturing. But how would it work for the Islamic banking industry? Or to what extent it would be helpful are the potential questions that have been raised through this study. The term "AI" has been tossed by Professor McCarthy at 1st Artificial Intelligence conference (Bogue, 2014). It is an intelligent mechanism to accomplish a task with optimal success chances (Bogue, 2014). It becomes critical via technology usage (Pan, 2016). Hassabis et al. (2017), Pan (2016), and Bogue (2014) define AI as "it is the machine and has the ability to think or the possibility of using computers to simulate human intelligence". It offers rapid advancements in technology as Abdullah (2018) identified that we have entered the age of artificial intelligence and digital bank 4.0, FinTech banking, robo-advisors are the potential application since recent years. Kmeid (2017) proposed a conceptual framework of digital banking, Figure 1, and the capability of AI to promote Islamic finance by utilizing machine learning algorithms. Equally,

Abdullah (2017) also stated that we have entered the era of artificial intelligence, Islamic Fintech, and Digital Bank 4.0. He divided the Digital Banking Evolution into four ages such as, Digital Bank 1.0 (1998-2002) that bounded to Email, internet banking, database, and then Digital Bank 2.0 (2003-2008) that comprised web-based, online payment, KYC, digital channel, data warehouse and then Digital Bank 3.0 (2009-2016) that covered big data, cloud banking, mobile transaction, 360 customers and now Digital Bank 4.0 (2017-onwards) which consist of Fin-Tech banking, artificial intelligence, virtual banks, virtual branches, and inter-cloud interaction. Therefore, it was necessary to know the diverse thoughts of academia on this blistering and steady evaluation.

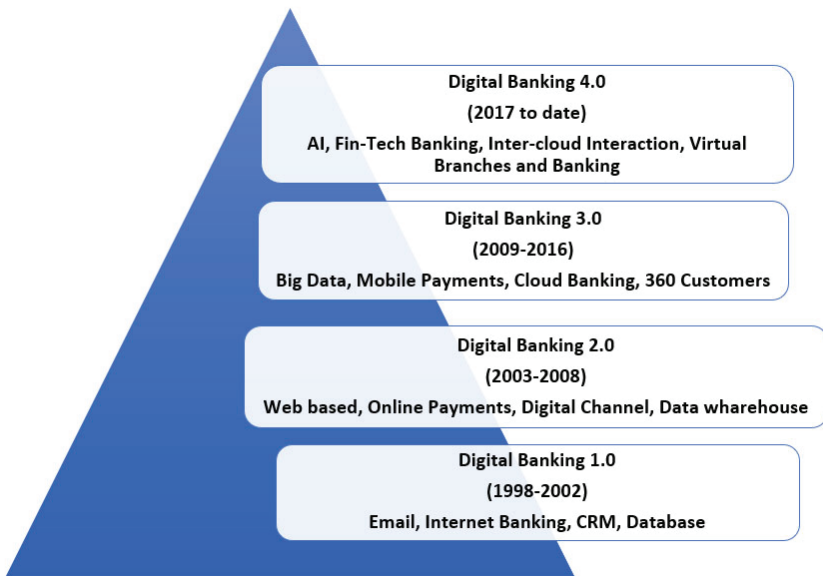


Figure 1. Evolution of Digital Banking

We have some examples of AI applications in banking such as AI on the front-end to secure customer identities, AI on the back-end to assist employees, AI on payment services to detect and prevent fraud and the most prominent application of AI robots is the chatbot. Baidu developed platforms to provide financial services in China (Pan 2016). Chatbots are handling balance inquiries, bank account, and loan account details. Recently, US-based Ally Bank has launched Ally Assist in 2015. Ally Assist is a virtual assistant that can be accessed via voice or text to perform functions such as making payments, fund transfers, peer-to-peer transactions, and deposits. However, this study explores the needs and potentials of AI for Islamic Finance.

Therefore, The primal of this paper is to evaluate the opinions and assessments of the experts of Islamic finance from across the globe. To do this, a Narrative analysis will be conducted to unveil the role of AI in Islamic finance in the light of experts opinions from Malaysia, the UK, Qatar, Germany, Turkey, Indonesia, Brunei, Saudi Arabia, Jordan, USA, and Pakistan, respectively.

### Literature Review

Margaret (1998, P.347) explains that Creativity is a unique feature of human intelligence and a challenge for AI. AI techniques may create new ideas in three ways “by producing novel combinations of familiar ideas; by exploring the potential of conceptual spaces; and by making transformations that enable the generation of previously impossible ideas. AI will have less difficulty in modelling the generation of new ideas than in automating their evaluation”. It means that these machines are associated with activities of human intelligence to solve problems and to make decisions. AI can be a pivotal solution to design machines by studying the human brain (Hassabis et al. 2017). It contributes to molecular medicine, genetics and also tackles mental diseases (Hamet and Tremblay, 2017).

However, it's very critical when it comes to applying the technology (Pan, 2016) as Pan reviewed the 60-year developmental history of AI and the core idea behind AI 2.0 development. As the author further defined AI 2.0 as the new generation of AI, based on the new information environment and new development goals. This indicates that the emergence of new technologies also promotes AI to a new stage. AI is capable of creating machine learning tools and deep neural networks to bring a whole new experience to the finance industry (Rohaya et al., 2018; Rahim et al., 2018). Robots can handle big data and cloud computing from various databases through AI (Dirican 2015). It will have an incredible influence on Islamic finance in the future (Rahim et al., 2018). Furthermore, they suggested that AI can provide new horizons for a better banking experience with its customers (Rohaya et al., 2018; Rahim et al., 2018).

Alzaidi and Kazakov (2008) proposed a supply chain network to control links and data flows in the prevailing system. Rohaya et al, (2018) examined the two important aspects of the latest technology issues in Islamic finance that related to artificial intelligence (AI) and smart contract. They investigated that digital smart contracts can replace traditional forms of paper contracts and these smart contracts would help to provide more credible transactions without jeopardizing authenticity and its credibility (Rohaya et al., 2018). The smart contract can be used to buy a particular product at a defined price from a digital wallet (Giancaspro, 2017). The nature of Smart contracts determines the Blockchain and pre-determined features (Savelyev, 2017). Smart contracts accelerate financial services such as credit cards and installment loans (Szabo 1997).

## Methodology

The present research is an attempt to evaluate the nexus of Artificial Intelligence and Islamic finance based on Islamic finance experts' opinions and assessments across the globe. Therefore, the Purposive sampling technique has been applied to collect the opinions. Narrative analysis was used to analyze the data. Henceforth, Professors and Associate Professors were contacted through social networks such as WhatsApp, Facebook, and emails messages as the author knows these experts individually. The respondents were chosen from Malaysia, UK, Qatar, Germany, Turkey, Indonesia, Brunei, Saudi Arabia, Jordan, the USA, and Pakistan. Data were collected for the duration of one month.

## Results

### 4.1-When asked about the application of AI for the Islamic Banking system,

Prof. Dr. Ahmed Kameel Mydin Meera, former Dean, Institute of Islamic Banking and Finance at International Islamic University Malaysia and CEO, Z-Consultant Malaysia, provided the following thoughts:

“AI can be used in any area. It can replicate human thinking in technical areas. So yes, how we analyze Islamic Finance, structure products, projects evaluation, zakat, wakaf, inheritance etc can be done using AI.”

### 4.2-When asked about the application of AI for the Islamic Banking system,

Prof. Dr. Adam Abdullah, Associate Professor at the IIUM's Institute of Islamic Banking and Finance (IiBF) Malaysia, provided the following thoughts:

“AI/Machine Learning & also Data Science & Data Analytics can provide solutions involving automation and data...e.g banking services automation, robo-advisors, auto-trading, data services (like Reuters & Bloomberg), commodity trading, wealth management, rating agency services, and software (IOS/Android) development. Blockchain is separate (eg on crypto-currencies, but processing speed is slow) but anyway short term success for IF can be with Machine learning & Data Analytics rather than blockchain, but blockchain technology is improving and opening up new areas of application.”

### 4.3-When asked about, Will Artificial Intelligence Rejuvenate Islamic Finance?

Dr. Marjan Muhammad, Researcher at the International Shari'ah Research Academy for Islamic Finance (ISRA) Malaysia, provided the following thoughts:



“Yes, through simplifying the transaction processes, hence ensuring the efficiency. Also, to mitigate any non-compliant events as the execution is automated.”

#### **4.4-When asked about the application of AI for the Islamic Banking system,**

Prof. Dr. Mustafa Omar Mohammed, Associate Professor at the Kulliyah of Economics and Management Sciences, IIUM Malaysia, provided the following thoughts:

“Yes, through simplifying the transaction processes, hence ensuring the efficiency. Also, to mitigate any non-compliant events as the execution is automated.”

#### **4.5-When asked about the application of AI for the Islamic Banking system,**

Prof. Dr. Aly Khorshid, Dean of Faculty Management and Economics, LU Executive Education, London, UK, provided the following thoughts:

“That’ll be great if you can archive such system, are you aware of the amount of programming to do that, I think it will be a lot. Having overcome the Main framework, then Islamic Finance mitigation and Sariah framework can be adopted with less efforts. I then can help to adopt the global Islamic Finance mitigation.”

#### **4.6-When asked about the application of AI for the Islamic Banking system,**

Prof. Dr. Tariqullah Khan, Professor of Islamic Finance at Hamad bin Khalifa University, Qatar Foundation, provided the following thoughts:

“In some countries, such as Pakistan, Islamic finance is personality driven. So AI cannot replace actual persons in the short-run to create a credible trust. In the long-run gradually, it may be possible that robo Shariah advisory may be popular. Technology is important indeed!”

#### **4.7-When asked about the application of AI for the Islamic Banking system,**

Dr. Muhammad Ashfaq, Professor of Islamic Finance and CEO Amanah Institute of Islamic Finance and Economics, Germany, provided the following thoughts:

“AI is a new concept. It will take time as I don’t see any development for Islamic Finance in near future.”



#### **4.8-When asked about the application of AI for the Islamic Banking system,**

Prof. Dr. Necdet Şensoy, former Deputy Rector of Istanbul Commerce University and Board member at TCMB Turkey, provided the following thoughts:

“It is an interesting question. Actually AI is a tool easing the operations and making possible to respond quickly to the needs of clients. Helps to enhance financial inclusion. However the Islamic finance has deeper issues as the risk of converging to conventional finance. The intrinsic problem of Islamic finance is an inclination towards a deviation from supporting real economy. May be AI will help IF to make people more financialised which is not good. You can look into the issue of how can we use AI to support real sector. The Islamic banks are scaring to use partnership based financial instruments as mudarabah and musharakah when allocating their funds to customers. The reason is control function. Can AI help to have the control of those deals? If so it is very good.

May be AI will help IF to make people more financialised which is not good.

You can look into the issue of how can we use AI to support real sector.

The islamic banks are scaring to use partnership based financial instruments as mudarabah and musharakah when allocating their funds to customers. The reason is control function. Can AI help to have the control of those deals ? If so it is very good.”

#### **4.9-When asked about the application of AI for the Islamic Banking system,**

Dr. Murniati Mukhlisin, Professor of Islamic Accounting at University of Essex and STEI Tazkia, Indonesia, provided the following thoughts:

“Yes. It will. Through AI technology that makes machine forefront doing some human jobs, Islamic Finance can be spread out widely. IF Education and services will be enjoyed by the people in the deprived areas hence will upgrade their standard of living. Currently, IF is still exclusive.”

#### **4.10-When asked about the application of AI for the Islamic Banking system,**

Dr. Muhamad Abduh, Assistant Professor of Islamic Finance at the UBD School of Business and Economics, University Brunei, provided the following thoughts:

“The application of AI in financial industry has helped financial companies to save time, reduce costs, and add value. AI has also helped financial

companies to analyze and understand how their customers spend their money, invest and make financial decisions so they can customize the advice given to particular customers. The AI will definitely improve the performance of Islamic finance industry as already done upon conventional finance industry. However, there is a big challenge for AI in Islamic finance when it comes to a decision of whether a proposed contract is shariah compliant or not. This area is still the undisputed area of shariah scholars.”

#### **4.11-When asked about the application of AI for the Islamic Banking system,**

Prof. Dr. Tahar Tayachi, Chair of the finance department at [Effat University](#) Saudi Arabia, provided the following thoughts:

“Its new technology (using neural networks or genetic algorithms) and its impact on Islamic finance would be interesting. However, we should specify and narrow it as Islamic finance is very broad.”

#### **4.12-When asked about the application of AI for the Islamic Banking system,**

Dr. Khawla Al Nobani Specialist Advisor Islamic Banking, Sukuk & Takaful, Jordan, provided the following thoughts:

“I believe that artificial intelligence can help rejuvenate, modernize and add value to IF if we use it in the right way.”

#### **4.13-When asked about the application of AI for the Islamic Banking system,**

Prof. Dr. Rahman, Chairman & CEO at [LARIBA Bank of Whittier](#), USA provided the following thoughts:

“We need to separate between three foundations for RF (Riba Free) banking.

Monetary Foundation 2. Fundamental reasons for RF banking and finance as a superior discipline. 3. Marketing the services.

AI is a tool for marketing and to enhance operations. For marketing, it may add value. A-we should not forget that the human factor is a fundamental foundation of a Jamaa in Islam and RF banking should be looked upon as the financial lubricant of the Jamaa , the community. In the US AI banks include that human factor because,

B-Banking in general and extension of credit are based on the fundamental rule of Know Your Customer KYC. Many Muslims who belong to the developing Islamic world think that in order to grow fast we should look for that magic pill that will cure instantly or that amazing technology that will grow our acceptance in the market using technology. There is no substitute to A. Working hard to popularize the REAL ADDED VALUE of the RF discipline. B. Working hard to develop the retail market not because we offer an Islamic solution only but because we also offer a real added value when compared with Riba-based banking.”

### Conclusion

Modern Artificial Intelligence (AI) uprising has transformed the world of finance and financial institutions have taken it as an unprecedented challenge to gain a competitive advantage. This study explores the needs and potentials of AI for different avenues as it will improve the performance of Islamic Finance. The majority of the respondents established the importance of AI as it can be used in any area. It can replicate human thinking in technical areas. AI/Machine Learning and also Data Science & Data Analytics can provide solutions involving automation and data, e.g, banking services automation, robo-advisors, auto-trading, data services (like Reuters & Bloomberg), commodity trading, wealth management, rating agency services, and software (IOS/Android) development. Actually, AI is a tool easing operations and making it possible to respond quickly to the needs of clients. It helps to enhance financial inclusion.

Conversely, Islamic finance has deeper issues as the risk of converging to conventional finance. The intrinsic problem of Islamic finance is an inclination towards a deviation from supporting the real economy. Maybe AI will help Islamic Finance to make people more financialized which is not good. However, we can look into the issue of how can we use AI to support the real sector. The Islamic banks are scaring to use partnership-based financial instruments as Mudarabah and Musharakah when allocating their funds to customers. The reason is the control function. Can AI help to have control of those deals? If so it is very good. We have some examples of AI applications in banking such as AI on the front-end to secure customer identities, AI on the back-end to assist employees, AI on payment services to detect and prevent fraud and the most prominent application of AI robots is the chatbot. Chatbots are handling balance inquiries, bank account, and loan account details. Recently, US-based Ally Bank has launched Ally Assist in 2015. Ally Assist is a virtual assistant that can be accessed via voice or text to perform functions such as making payments, fund transfers, peer-to-peer transactions, and deposits.

Nonetheless, this study suggests that it will be great if we can archive such more systems at advanced levels, but are we aware of the amount of programming to do that? Having overcome the Main framework, then Islamic Finance mitigation and Sariah framework can be adopted with less effort. This study explores the needs and potentials of AI for different avenues as it will improve the performance of Islamic Finance. However, we should specify and narrow it as Islamic finance is very broad.

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