

ROBO-ADVISORY FOR ISLAMIC FINANCIAL INSTITUTIONS: SHARI'AH AND REGULATORY ISSUES

Asst. Prof. Dr. Auwal Adam Sa'ad, Assoc. Prof. Dr. Sayed Musa Alhabshi, Assoc. Prof. Dr. Azman bin Mohd Noor, Prof. Dr. Rusni Hassan

Abstract— Artificial intelligence (AI) is the next global game changer in all big data and other technology-based platforms including Islamic financial services. At the forefront of AI applications in financial services is Robo-Advisor. Its potential disruption of the Islamic financial services is imminent as it is being considered by some institutions due to its innovative virtual advisory and the absence of human factor intervention in the decision-making process. Currently the Islamic financial services industry is constantly guided by prescribed *Shari'ah* related fatwah or rulings for innovative financial products with reference to *Shari'ah* compliance. Robo-advisors may then be considered to ease the iterative juristic review process to facilitate timely and more robust *Shari'ah* legal opinions on those products. And since these Robo-Advisors are allegedly swift and smarter to support human judgment this might help achieve more timely, effective and efficient design and delivery of Islamic financial services. This paper aimed at investigating the potential *Shari'ah* and regulatory issues surrounding Robo-Advisors while adopting the relevant opinions and understanding of *Shari'ah* classical and contemporary scholars. It also seeks to examine the legal implications of Robo-Advisors in the Islamic financial industry and explore the technical requirements of this emerging phenomenon. The paper also looks into the current market volume of this new artificial intelligence mechanism and predicts the future of this disruptive technology in the Islamic finance industry.

Keywords- *Robo-Advisory; Islamic Finance; Shari'ah and Regulation*

I. INTRODUCTION

After the markets collapse and the financial crisis in 2007 and 2008, Robo-advisors started to surface in the mainstream financial advisory services, and started providing online investment solutions to various investors. This might be seen as an increasing suspicion by the young investors after the 2007 markets collapse, which comes out of the experiences of the then financial recession the following year. The market collapse has actually affected the financial advisors so badly, and took them a very longtime to regain their trust in the market. Within that period, most of the media headlines were calling for the end of financial advisors and at the same time called for the wealth managers to adapt the Robo-advisors so as to regain the market trust and take over from human advisors. This has also created another panic in the market, where the financial advisors believed that their job is going to be taken over by Robo-advisors. (Maurella van dar Ree, 2019).

These issues that instigated the emergence of Robo-advisors in wealth management might not be the same for Robo-advisors in Islamic Financial institutions. However, the disruption is still looming in the Islamic financial industry. The

duties of *Shari'ah* advisors of an Islamic bank or an Islamic financial institution is quite different from the wealth management advisors, *Shari'ah* scholars supervise and provide *Shari'ah* rulings and related fatwahs for the products and services of the Islamic Bank or an Islamic financial institution, this is however to maintaining the *Shari'ah* compliance in the products and services provided by the Islamic banks. Thus, when introducing Robo-advisors for *Shari'ah* related fatwas, many suggest that Robo-advisors will take over the jobs of *Shari'ah* advisors. However, this is not the main issue, Robo-advisors can serve as assistant to the *Shari'ah* advisors for now, as hybrid advisory is also possible, so as to make the advisory services more efficient and maintain quicker responses to the markets need, however the Islamic financial industry has to prepare itself for the modern technology disruption.

The current trend in the financial advisory is moving towards new generation of financial technology enhancement. The innovation in modern technology advancement was the result of the critical need for more transparency and accessibility into the longstanding and well-known wealth management services providing industry and other related financial services. This critical trend is also looming to the Islamic financial services, as well as Islamic wealth management services. Discussions across the Fintech advancement portfolios suggested that Robo-Advisory services would definitely disrupt the traditional wealth management services and other financial services across the globe. However, many other researchers have contrary believed that the dominant trend maybe of collaboration between the financial institutions and tech companies in the other hand, which will allow banks to improve their services offering and build up new revenue streams using the Robo-advisory services.

The purpose of this research is to provide an insight on why Islamic Banks and other Islamic financial institutions should leverage on this on-going crusade of Robo-advisors and serve many clients out there in need of this innovative and novel services and look into the *Shari'ah* related issues and regulatory requirements for Robo-advisory services as part of the preparation for the technology disruption in Islamic financial industry.

II. UNDERSTANDING ROBO-ADVISORS

The definition of Robo-advisors is not very clear as what to include in the definition, this is because Robo-advisory involves wealth management advices via automated processes that exclude human factor and influence. The novel technology uses mathematical algorithms instead to support market survey for investment decisions. This is however including many other

financial advisory services such as the advisory services practiced by the Islamic financial institutions and Islamic wealth management services. Robo-advisors delivered using online and mobile channels, it is an online portfolio management solution that aims to invest client assets by automating client advice. (Deloitte and Avaloq, 2017)

Some selective definitions of Robo-advisors are discussed here to understand the features and the scopes of Robo-advisors in the contemporary financial services. Robo-advisors could be defined as an online service that uses algorithms to automatically perform many investment tasks done by a human financial advisor. Angela Scott-Briggs also defines Robo-Advisors as online wealth management services that offer computerized, algorithm-based portfolio management without using human financial planners. Some other scholars defined Robo-advisory as an online portfolio management solution that aims to invest client assets by automating client advice. (Angela Scott-Briggs, 2016).

Robo-advisors platforms distinguish themselves with a unique market strategy by offering their investor's minimal capital requirements, low management fees and a simplified investment journey and initiate Minimal capital requests. Some Robo-advisors provide advisory services for a capital investment of USD50 fifty United States Dollars. Advanced pooling technologies make it possible for investors without a large capital to get started and build up their investment portfolio, hence addressing the needs of a new segment of investors that has previously been neglected by traditional wealth management. However, most of the established firms are still charging a portfolio management fee of between one to two percent if not more, for Assets Under Management (AUM), Robo-advisors are leveraging low-cost product portfolios such as ETFs that provide asset diversification. They are not only charging lower portfolio management fees, they are also providing a more simplified fee structure as opposed to the complex fee schedules of traditional human advisors. (Jonathan Walter Lam, 2016).

However, some critical researchers suggest that Robo-advisors providing equity portfolio recommendations are more suitable for short-term goals investments and not long-term. The reason behind this suggestion was that the researchers anticipate that Robo-advisors are only trying to reduce short-term volatility, though this is not necessarily convincing. However, the quality of questionnaires used by the Robo-advisors is very vital especially when it comes to ascertain the risk preferences of the client. (Wee Kee chia, Yash Shah, 2018). Many researchers believed that the questionnaires used by Robo-advisors for financial planning did not reliably followed the psychometric standards, there are mostly very brief and therefore may sustain reliability and validity issues. It is also advised that the future of financial advisory services could be a hybrid model, where analysis is done by an automatic algorithm but the procuring, retaining, motivating and reassuring of clients will be done by human financial advisors, this is if the technology cannot be able to provide such services. (Roszkowski, Davey, and Grable, 2005).

III. REGULATORY ISSUES FR ROBO-ADVISORS

Robo advisors are regulated under the Securities and Exchange Commission (SEC) in the United States. The commission takes charge of the federal securities laws and has the responsibility to protect the investors in the securities markets. And also regulates the services of human advisors as well as Robo-advisors registered under the investment portfolios. Under the US advisers Act of the 1940, Registered Investment Advisers RIAs are subjected to the imposed functional obligation have duty to provide advice in the best of their client investment interest, and if Robo-advisors hold an asset related to a customer, they would have to register with SEC and FINRA Financial Industry Regulatory authority as broker-dealers. At the moment, the Betterment holds customers' assets and is a registered broker-dealer, however, Wealthfront is not yet a registered broker dealer. (Jill E. Fisch, Marion Labouré, and John A. Turner, 2018).

The scope and the minimum protection afforded as the RIAs fiduciary duty was a matter of extensive debate in the United States, many scholars claim that the fiduciary obligation is vague and works with lack of predictability for the both parties, the investors and financial advisors. However, the fiduciary concept might be amended by contract. There is a potential advantage related to Robo-advisors in which the quality of their advice could easily be reviewed and assess by the regulator, the case is not the same with human financial advisors, it is almost impossible to monitor all the private conversations suggested by human advisors with their clients. (Jill E. et. 2018)

However, it is very feasible to record and evaluate computer models of advice, this unimagined transparency provides more preferences to Robo-advisors and made them more closely to the regulatory requirements. (Jill E. Fisch, Marion Labouré, and John A. Turner, 2018). In the year 2017, the division of Investment Management of the Securities and Exchange Commission, SEC, releases regulatory compliance for Robo-advisors, the commission realized that the unique business model offered by Robo-advisors deserved to be given more concern. It also identified the need to guarantee that the robo-advisor is providing an appropriate advice to its customers, and the need to embrace and implement suitable compliance programs designed to the automated nature of the Robo-advisor's services. (SEC 2017).

Some Robo-advisors firms got some decisive regulatory actions taken by the regulator in various jurisdictions, particularly among the regulators across UK and the United states. In May 2018, the United Kingdom financial conduct Authority has surprisingly issued a warning to various automated advisors for misleading their customers specifically on pricing as well as lack of adequate and sustainability assessment framework. In December 2018, Whealthfront advisers and Hedgeable which are two most prominent Robo-advisors in the US were penalized by the United States Securities and Exchange Commission. Wealthfront was fined

based on misleading and deceitful marketing and for having inadequate compliance program and Hedgeable was also penalized based on misleading performance reporting. (Maurella van der Ree, 2019).

IV. THE USE OF ROBO-ADVISORS FOR ISLAMIC FINANCIAL SERVICES

The *Shari'ah* advisors duties in the Islamic financial institutions have a special consideration under *Shari'ah* Governance Framework provided by many central banks including the Central bank of Malaysia. There are special guidelines on *Shari'ah* Governance and has specifically identified the duties of the *Shari'ah* advisory committee of an Islamic financial institution. According to the guidelines, every committee member, is anticipated to be engaged in researching *Shari'ah* issues provided by the bank, and the main responsibilities of the *Shari'ah* advisory committee is to advise the board of directors on *Shari'ah* matters relevant to its business operation, and endorse *Shari'ah* compliance guide, and validate relevant documentation, couple with addressing matter to be referred to the *Shari'ah* advisory council of Bank Negara Malaysia. (BNM, 2005).

The Islamic financial services atmosphere wasn't left behind in accepting Robo-advisor in simplifying the Islamic financial services and to ease the *Shari'ah* supervision activities in Islamic banking and finance. The Islamic advisory company *Wahed* becomes the first in the world to access *halal* Robo-advisor; this mechanism that was only available in the United States and the United Kingdom has now gone global. The *wahed* platform has now penetrated one hundred and thirty countries, MENA region is one of its key markets including Nigeria, Pakistan and India. *Wahed* being the first *Shari'ah* based robo advisory services provider in the United States of America is actually trying to change the way Muslims participate in the financial markets. *Wahed* has various activities including the investment S&P *Shari'ah* fund and sukuk vs commodity markets. *Wahed* maintained that no matter where geographically an ethical investor is situated and whatever income demographic they fall under, they can access a *Shari'ah* compatible and ethically related investment away from interest and other unethical investment portfolios. This is indeed a new development for Islamic investment services. (Journal.wahedinvest.com, 2019).

With the current evolution of artificial intelligence (AI) robo's are becoming very cognitive-enabled imitating human skills and emotional intelligence. Robo-advisors are actually disrupting the current method of traditional wealth management and promising to ease the need for financial advisory by reducing human factor. The current advancement in Fintech and artificial intelligence in the global financial markets and banking is overwhelming, banks and other financial institutions all over the world are expected to embrace these new innovations in order to achieve better in today's disruptive banking and financial industry. Artificial intelligence related virtual financial advisor provides an automated

financial planning, which is generated by algorithm-based software with a very slight human participation. The technology provides its financial services to many clients at less cost compared to traditional advisors. (Domini Jug, et, 2018).

The present-day preferences of digitally related economic ideas, has rendered Robo-advisors to becoming more popular and more demanding than ever before. Robo advisors facilitate providing financial advice online without human interaction and provide very reliable advice with lower cost. The conventional one to one advisory service is becoming less prevalent, and the trend shows that young generation has already started making firm financial decisions based on calculated results communicated by software rather than the predictable wisdoms of fellow human beings. These technological progressions, the preference of younger generation and immersing investors, and the growing popularity of Robo advisors have forced financial institutions to rethink their banking approaches. Robo advisor services offer clients financial advice and investment management services that have historically been accessible only to wealthier clients; it is now available to almost every client in need of the Robo-advisory services. (Collins, 2012).

In fact, Robo-advisors often promote their ability to outperform breathing financial advisors and it's clearly understood why the Robo-advisor market has been amazingly important. The markets value of Robo advisors' activities is overwhelming throughout the years. At the end of 2015, Robo-Advisors hit \$60 billion assets of clients managed by them and it is estimated that it will cross \$2 trillion by 2020. Individual Robo-advisor startups Betterment and Wealthfront have each attracted hundreds of millions of dollars in funding and now boast more than \$10bn in assets. That no doubt has not gone unnoticed by established firms, a growing number of which have launched their own Robo-advisor services. (Jonathan Walter Lam, 2016)

V. THE INNOVATION OF SMART MUFTIS FOR SHARI'AH ADVISORY SERVICES

The contemporary Islamic financial world lives in a new age of idealistic and tech investor mind-sets, it is anticipated that new technologies with customized features that cater to the Islamic finance industry will soon emerge for the success and relevant efficiency in dealing with the new technology-based financial products and services within the domain of Islamic banking and finance. In this context, it is good to know that Islamic investors have recently started embracing these new technologies. However, dealing with Islamic related businesses and products requires careful understanding and practice with more conscious to the restrictions and various *Shari'ah* injunctions for *Shari'ah* compliant investment in business activities. For instance, an authentic *halal* investment should be interest-free and away from gambling, alcohol, speculations and other prohibited activities in contracts. The *Maqasid al-shari'ah* or the purpose of Islamic law is to protect

the wealth and on top of that it gives emphasis on wealth circulations, speed dealing and financial literacy enhancement. Henceforth, good advisory services will be essential to investors for healthier Islamic investment and other Islamic business activities.

There are many challenges in executing the duties and fatwas related to Islamic banking and finance industry, more innovations are required to move the industry to the next level and away from replicating and imitating the usury based financial services. However, in other for the Islamic financial institutions to compete with their conventional counterpart, there should be innovative ideas that will give more advantage to the Islamic banking and finance institutions. There is a need of speed advisory and timely *Shari'ah* resolution and fatwas to the issues of Islamic financial institutions. It is obvious that delays and late resolutions cost loss opportunities for the bank, which is not in line of the *Maqasid al-Shariah*. However, *Shari'ah* advisors should also be careful in their duties, so as to make sure that their research work and any advice and endorsements have certified the *Shari'ah* recruitment and contributes to the wellbeing of the Islamic financial industry. (Akram Laldin, 2008). Therefore, the use of Robo-advisory or *Smart Muftis* will help in achieving a vibrant advisory services in Islamic financial institutions; it will facilitate research, generate data, analyze and even execute the fatwah in a very short time.

Islamic Banks may need to insert data into Robo Financial Advisors for the available *Shari'ah* complaint Investment portfolios; this might be endeavored to providing relevant Islamic wealth management structure for Islamic Robo-advisory purposes, it will definitely increase visibilities for those investments' portfolios. If a *Shari'ah* compatible business investor intends to know the investment return he may just insert his preferences and the Robo-advisors will analyze various patterns, trends and will suggest a better investment portfolio for the client. (Jonathan Walter Lam, 2016). This will give a chance for an Islamic universal wealth management preference. The system allows anyone from anywhere to access, compare and analyze the results given by Robo-advisor, and this will actualize the notion of the universal attitude of Islamic Financial products.

Smart Muftis or Robo-Advisors are future mechanisms that may possibly disrupt the Islamic financial institution's advisory services in the near future. Smart Muftis might be able to evaluate the *Shari'ah* sources and the existing rulings across the various Schools of Islamic jurisprudence and may suggest the best practices chosen by the contemporary Islamic scholars on a certain Issue or *Mu'amalat*, the activities of Smart Muftis will simplify the *Shari'ah* advisory services and ease the operations of Islamic banking and finance institutions across the globe. While, financial literacy is very important in the 21st century, and it is also a great potential that will add value to the knowledge sharing activities in Islamic banking and finance industry. Allah the almighty has asked those who have *Shari'ah*

knowledge to teach others and transfer the knowledge to the ummah. (Qur'an, 9:122).

Smart muftis will not only help in sharing the knowledge alone, but will create much needed awareness among the public on Islamic Banking and finance. Smart Muftis can replace Islamic financial literacy uplifting, corporate training and induction programs in the future. Allowing access to the public would also create greater awareness of the Islamic finance industry. When someone enters a question on a specific *Shari'ah* ruling, a humanoid Smart Mufti Robo software can answer the queries with details of a ready-made fatwah of the then and contemporary Islamic scholars in Islamic Banking and finance. However, a massive work is required to achieving these expectations. (Journal.wahedinvest.com, 2019).

There are many important takeaways by implementing Robo-advisory services in Islamic Banking and Finance industry, these takeaways are massive visibility, cost efficiency and increased productivity in Islamic banking and finance, as well as product development and financial literacy. With these takeaways, the Islamic banking and finance industry will welcome a new banking and financing experiences which will for sure benefit all the stakeholders in the Islamic banking and finance industry. The following paragraphs will identify how Robo-advisors will increase visibility, productivity, and efficiency in product development and solve the financial literacy issues among the stakeholders of Islamic banking and financial institutions.

VI. RESOLVING JURISTIC SHARI'AH ISSUES WITH ROB0-ADVISORS

In the history of Islamic jurisprudence, each and every school of thought has its own rules and reliable secondary sources in which they relied upon in the absent of primary sources of law in other to decide on a current issue. This has actually contributed in sustaining different opinions across the Islamic schools of thought. However, some of the scholarly rulings conducted by different schools might not be based on a reliable source, the reliable opinion might be acceptable in another school due to the authenticity of the source used by the Imam or his fellow students. Robo-advisors can have all this information and might be able to differentiate between authentic evidences, non-authentic and weak evidences. And then advise with the selected opinion, which has relied upon the most authentic sources of Islamic law. It is very important to mention here that most of the Islamic finance issues are not deducted based on a particular school of thought alone, but rather based on the most authentic evidences, which has been used to determine *Shari'ah* ruling according to comparative-jurisprudence.

For instance, Hanbali school might have a different view on a specific matter in Islamic finance. But that view might be used in the Malaysian system maybe because the

Shari'ah sources or evidences used to arrive to that ruling could be more authentic or the ruling was considered based on the *Maqasid al-Shari'ah* purposes, in contrary with the ruling in *Shafi'I* School which is the original School followed by many South East Asian countries and the dominant school of thought in Malaysia. Robo-advisors will be able to identify and analyze these kinds of issues across the *Shari'ah* rulings related to Islamic Banking and finance industry.

Robo-advisors might also help resolve many *Shari'ah* compliance issues in Islamic Banking and Finance. *Shari'ah* is a tech-friendly and it is in harmony with the purposes of *Shari'ah* "*Maqasid al-Shari'ah*" which signifies protection of wealth and its circulation. This might be related to the facts that Technology always played a role of an enabler to support financial institutions in the design and delivery of their products and services. The system does not dictate the features and functionalities of the banks' products and services; rather, it is the other way around. The requirements of products and services of Islamic banks dictate system functionalities. Before Islamic banks can offer products and services to the public, they have to obtain the approval of their *Shari'ah* committee. Therefore, the *Shari'ah* committee has the final say on the new introduced product or service and not the technology itself, therefore a controlled *Shari'ah* ruling and fatwah updates should be provided by *Shari'ah* experts to make sure Robo-advisors are doing the job correctly.

Shari'ah committee members will scrutinize the products and services to determine whether they comply with their *Shari'ah* guidelines. Once endorsed by the *Shari'ah* committee, the products or services are ready to be configured into the system. Therefore, the system just accepts and implement whatever inserted in it and will not act otherwise except by orders. Therefore, the system would have to be built with features and functions to support the requirements of the products and services. Once configured into the system, system users will have to perform user acceptance test to verify that the system is behaving according to their requirements. Here is the issue of the system control, is also in the hands of its handlers, and the technology is not in control of the information installed, as it can be augmented, changed or even removed, therefore the fatwahs installed in Robo-advisors could also be updated when necessary.

Shari'ah compliant requirement is quite subjective as it depends on interpretations by the *Shari'ah* advisors of a specific bank or a specific country. It also depends, to a certain extent, on the strictness or lenience of the *Shari'ah* committee members of the bank. This results in certain requirements being considered as *Shari'ah* compliant in one bank but not in another, this might obviously become a challenge to the Islamic Banking and finance for Robo-advisory services, technology wise. However, the rulings and the *Shari'ah* fatwahs could be based on the AAOIFI and IFSB *Shari'ah* standards and resolutions, which have already resolved many issues and widely accepted by many countries across the globe.

The example of this obstacle is the case of some products based on particular *Shari'ah* ruling, which has been approved in Malaysia for instants, but not approved in the Middle East; the reason to this might be *Mazhab* issue or from different understanding of the text, or hadith or other *Shari'ah* sources and evidences. The Robo-advisors or Smart Muftis might be designed to give fatwas according to the location, *Mazhab* or based on the fatwahs that relied upon the most authentic *Shari'ah* sources and evidences. Smart Muftis or Robo-advisors might also be made flexible with configurable parameters to provide different practices of *Shari'ah* requirements and rulings according to the practical approach of the Islamic banking and finance industry.

VII. HOW ROBO-ADVISORS WILL HELP IDENTIFY THE "SAHIH" AUTHENTIC AND "GHAIR SAHIH" UNAUTHENTIC HADITH

In other to smoothly come up with a *Shari'ah* ruling on a particular Islamic finance product or service, the *Shari'ah* advisor might need to properly look into the available sources related to that issue. One of the issues is the *hadith* authentication and identifying the correct, weak or non-authentic hadith. This practice could be based on the *Hadith* narration, the chain, *hadith* text or other issues. Identifying the authentic, weak or unauthentic hadith is one of the noble well-done efforts made by the prominent Muslim scholars in the past, and there are many of its kind contemporarily. Their work has a direct impact on the decision-making stipulated by the *Shari'ah* advisors of an Islamic financial institution. Robo-advisors could be designed to enable data storage, which include the hadith clarity and the hadith based on "*Sahih*" authentic or "*ghair sahih*" unauthentic Hadith follows with other hadith categories.

Fiqh and *Mazahib* juristic opinions are also among the most important job well done by the *fiqh* scholars in the past and present. Starting with *Al-ijma' al-Ijma'* is a series of *Shari'ah* rulings which has being accepted and anonymously agreed by the *Shari'ah* jurists without any report of conflicting opinion or interpretation in a particular time, society or jurisdiction. Robo-advisors' data might need to be entrenched initially with the *Ijma'* rulings on Islamic finance and economics matters and then followed by the information data of other juristic opinions according to the various Schools of jurisprudence, and then other contemporary *Shari'ah* issues discussed by the existing *Shari'ah* Scholars. Robo-advisors might use these big data to decide on a fresh case or product introduced by an Islamic financial institution for advice.

VIII. LEGAL IMPLICATIONS AND TLEGITIMACY OF ROBO-ADVISORS FOR ISLAMIC FINANCIAL INSTITUTIONS

Robo-advisors for Islamic financial institutions and their legality is a novel area of discussion for Islamic scholars as

well as the stakeholders in the Islamic banking and finance industry. Some scholars were reported to have disapproved the use of Robo-advisors for the Islamic fatwah in general and for Islamic financial institutions in particular, while some scholars are in support of Robo-advisors initiatives for Islamic fatwah. However, it is highly understood that Robo-advisors can assume the same responsibility as *Shari'ah* scholars do. It can scrutinize documents or data information injected into it in a very fastest way and gives either the existing fatwah or even a new ruling by analyzing the closest fatwah related to the new issue using artificial intelligence technology. One of the most important issues discussed for Islamic finance advisory services is possible negligence in addressing *Shari'ah* issues in accordance with the *Shari'ah* stipulated process of *ijtihad*, as any negligence may result in non-compliance and causes negative legal penalties. (Akram Laldin, 2008) Therefore, *Shari'ah* scholars may find Robo-advisors very helpful and will assist them in their extensive Fatwas and *Ijtihad* process.

Shari'ah advisors need to be well established in various areas before making *fatwa* pronouncement on product approval for endorsement, for instance a *Shari'ah* advisor of an Islamic bank required to have a good command of language and enough knowledge in *Shari'ah*, legal and operational aspect of the product in question and general knowledge on how Islamic banks operate. *Shari'ah* advisors should also understand the purpose of the product and its procedure, so as to make sure that the interest of both parties is secured before the endorsement. These are good areas and opportunities where *Shari'ah* advisors will continue to have a great impact in the era of Robo-advisors. Robo-advisors will also help in market survey and evaluation so as to identify the particular concern of Islamic financial services and figure out exactly that the Islamic finance products are not used as means to violate the precise Islamic principles and non-compliant activities. Robo-advisors will also be a good opportunity for the Islamic banking and finance institutions to stay away from products designated to replicate conventional way of banking business and it will be a tool to tackling issues such as legal trick “*hilah*” in the fatwas related to Islamic banking and finance matters.

IX. USING ARTIFICIAL INTELLIGENCE (AI) FOR SMART MUFTI DEVELOPMENT

Three different steps are to be followed in achieving the *Smart Mufti* initiative for better *Shari'ah* advisory services in Islamic Banking and Financial industry.

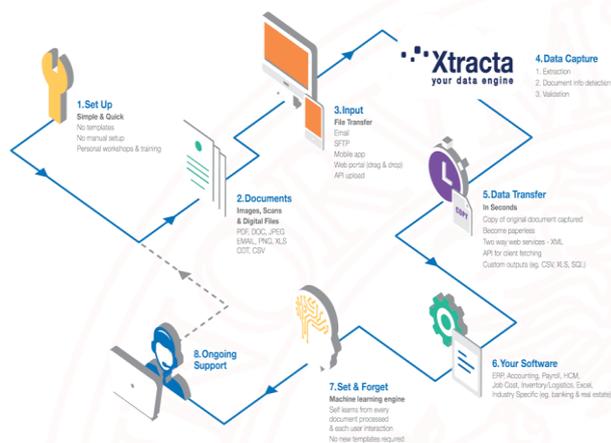
Phase 1, Building an Artificial Intelligence (AI) criteria for Identifying and Screening *Shari'ah* and Regulatory issues relating to Islamic Finance using AI technology. The first phase is to use the AI screening software to identify and classify the potential *Shari'ah* issues and also Regulatory issues involved in the proposed product or services of Islamic Banking and financial institution. By specifying the screening and discriminant criteria to extract and analyze *Shari'ah* rulings and opinions on *Shari'ah* and regulatory issues by

specific agency, AI could classify and tag similar interrelated rulings to facilitate cross referencing and elicit the nature of rulings. Using an iterative process of building a taxonomy or hierarchy of general and specific rulings and criteria to identify, recognize, elicit and classify ruling according to a robust classification of *Shari'ah* sources. With the dynamic yet robust classification, any new rulings can enhance the classification taxonomy and hierarchy to discern the maxim, method and ruling according to the classification nomenclature and criteria.

This will be powered by AI based chatbots functioning as high level matchmaker gathering basic data from the earlier provided information on possible *Shari'ah* issues criteria for Islamic banks, the system will be answering queries and creating a list of relevant *Shari'ah* issues for a particular product. Chatbot is an artificial intelligence AI program that simulates interactive human conversation by using key pre-calculated user phrases and auditory or text-based signals. Chatbots are frequently used for basic customer service and marketing systems that frequent social networking hubs and instant messaging (IM) clients. They are also often included in operating systems as intelligent virtual assistants. A chatbot is also known as an artificial conversational entity (ACE), chat robot, talk bot, chatterbot or chatterbox. The data to be used in this stage as criteria for the AI for screening *Shari'ah* issues could be generated from various sources such as the resolution of *Shari'ah* advisory council of the Securities commission, the *Shari'ah* resolutions of the *Shari'ah* advisory council of the central bank of Malaysia and other standards and criteria provided by other relevant regulators.

Phase 2, In this stage the process is to generate *Shari'ah* fatwah data base and feed the data into the Smart Mufti, the data to be feed-up are various fatwas provided by the Islamic scholars throughout the history of Islamic jurisprudence. This phase will also focus on process and pathways in terms of authentication, traceability and priority of sources, robustness of the methods and legitimacy as well as technical and social acceptance of rulings. The Fatwas and data should be in order and according to a specific *Shari'ah* principle, for instance; all fatwas related to bay' *Murabahah* would be generated together with the different views across the Islamic schools of jurisprudence as well as the fatwah of the contemporary scholars accompanied with the related authenticated sources, the data will also include all the relevant sources and relevant evidences used to construct the *Shari'ah* ruling. Therefore, a high standard software could be invented using AI solution to do the job, a good example of this is Xtracter. Xtracter has a technology that is powered by artificial intelligence which is automatically capturing data from documents in the form

of digital, photograph or scanned. The technology might be used in a virtual software application using Machine learning and Big data, it doesn't require manual template setup and can scale to a limited count of document design and its very good with document types such as invoice, contracts, receipt and so on. The diagram below explained how Xtracter technology works.



Source: <https://xtracta.com>

Phase 3, Robo advisors will be conducting *Ijtihad* via the Smart Muftis, in this stage, the Smart mufti will be used to conduct *ijtihad* based on protocol of specified categories of a newly proposed product which has no prior *Shari'ah* fatwah across the Islamic banking and finance industry. The Smart mufti will use the data available after screening the proposal and use the AI technology to look at the connecting factors and the relevant fatwahs and possible *Shari'ah* evidences to be used to make a proper decision on the new product. It is well said that once you have a machine and data an accurate prediction will be highly anticipated. This phase will be focusing on summative and formulative reporting to facilitate basis for *Shari'ah* ruling and report to disseminate the endorsed rulings as well as user *Shari'ah* friendly disclosures and literacy.

X. CONCLUSION

The formation of *Shari'ah* advisory committee for Islamic banking and finance is part of the *Shari'ah* Governance Framework introduced for the wellbeing of the Islamic banking and finance industry. The functions of *Shari'ah* advisory committee is to review, assess, evaluate and advise by expressing their opinions on the banking products or services and endorse framework, legal documentations, contractual obligations of the bank, standard operation procedure SOPs and other matters within the *Shari'ah* Governance Framework such as risk,

Shari'ah audit and compliance. Issues related to *Shari'ah* standards, requirements, policies and procedure. The *Shari'ah* advisory committee is independent from the board of directors and Management of an Islamic banking and financial institutions.

For effective *Shari'ah* advisory services, there should be a critical and constant advice to ensure that the activities of Islamic financial institutions products and services are compliant to the *Shari'ah*. For this to move smoothly, the involvement of Robo-advisory will help the process by evaluating the sources of *Shari'ah* on a certain issue to provide the necessary information available for the physical *Shari'ah* advisor to accomplish the ruling accordingly, Robo-advisors here act as assistant to the existing *Shari'ah* advisors of an Islamic financial institution. In the near future, the smart muftis might be able to execute in full the *Shari'ah* advisory services for Islamic financial institutions, this will probably be more relevant with the current Fintech initiatives of actualizing the virtual banks, once the Islamic virtual banks come into existence, Robo-advisors and Smart Muftis will be effectively in practice and relevant to digital Islamic banking and finance advisory services.

The *Shari'ah* scholars of Islamic financial Institutions will play a very important role in the making and updating the Smart Muftis for Islamic financial institutions. A very rigorous regulatory framework must be in place to make sure that the inventors of the Smart Muftis and Robo-advisors are competent *Shari'ah* scholars with the sound *Shari'ah* knowledge both by preaching, practicing and understanding of the *Maqasid al-Shari'ah* as well as knowledge and good experiences in Islamic banking and finance industry. A possible collaborative affords should also be made between the *Shari'ah* advisory firms and the tech companies for better services and mutual importance. *Shari'ah* research firms and educational institutions might also consider training young *Shari'ah* scholars with technology education and IT skills; this will help in market viability, stability and sustainability.

Furthermore, the legitimacy of Robo-advisors should also be in line with the legitimacy of the living Islamic scholar, although this is not an issue when it comes to using technology for advising, the competency of Robo-advisors has to do with the competency of the *Shari'ah* scholars behind the Robo-advisors technology. This is important for the Smart-Muftis innovation or Robo-advisors that provide specific fatwas and resolve issues such as the issues and fatwas related to Islamic banking and finance in a particular country or region or even a particular Islamic bank or Islamic financial institution. I believed in the near future, many *Shari'ah* advisory firms might be licensed to provide Robo-advisor services for Islamic financial institutions, this is for a

better response and market efficiency for Islamic banking, Finance, Islamic wealth management, Islamic capital markets, Sukuk Markets, Islamic Money Markets, Takaful and other important segments of Islamic banking and finance industry.

Islamic wealth managers should embrace Robo-advisor technology, as it possessed a great opportunity for the Muslims populations in the developing nations looking for affordable Islamic investment portfolios, there are millions of investors stranded with no access to huge capital to invest with the traditional wealth management services providers. While, Robo-advisors provide the opportunity for these people to invest with the little amount of wealth in their possession. Robo-advisors are not discriminating between the asset possessed by the middle-income individuals and the high-income ones, the investment is just the same and it most likely to assist investors from these segments of people in the developing nations.

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