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THE GLOBAL UNIVERSITY OF ISLAMIC FINANCE

The Role of Technology in Reshaping the Sukuk Market

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Content

- 1.0 Introduction
- 2.0 Types of technology compatible
for sukuk market
- 3.0 Case Studies
- 4.0 Conclusion



1.0 Introduction

- With Industry 4.0, the digitization and digitalization have begun which has led to digital transformation in the finance industry.
- COVID-19 pandemic has further accelerated the process.
- Sukuk Market is no exception to this.
- The objective of this presentation is to show the use of technology in sukuk market.

Digital transformation has long been a strategic goal of Islamic finance industry as well.



2.0 Types of technology compatible for sukuk market

Blockchain technology is a structure that stores transactional records, also known as the block, of the public in several databases, known as the “chain,” in a network connected through peer-to-peer nodes.

Blockchain technology

Big data analytics examines large amounts of data to uncover hidden patterns, correlations and other insights.

Big data analytics

Artificial intelligence/machine learning

Artificial intelligence is a field of computer science that makes a computer system that can mimic human intelligence. It is comprised of two words “Artificial” and “intelligence”, which means “a human-made thinking power.” Machine learning enables a computer system to make predictions or take some decisions using historical data without being explicitly programmed.

Cloud computing

Cloud computing is the delivery of computing services, such as servers, databases, storage, networking, software, analytics, amongst others, over the internet (“the cloud”).

2.1 How is the adoption of technology in bond market?



23 August 2022 - IDB Group and Davivienda Bank announced the issuance of Colombia's first blockchain bond (<https://www.iadb.org/en/news/idb-group-and-davivienda-bank-issue-colombias-first-blockchain-bond>)

26 July 2022 - BME, BBVA and IDB Issue Spain's First Blockchain-Based Regulated Bonds (https://www.bolsasymercados.es/ing/Media/Press-Release/20220726/nota_20220726_4/BME_BBVA_and_IDB_issue_the_first_regulated_bond_in_Spain_registered_with_Blockchain)

2 June 2022 - PDS Group launches DLT-based digital bond, issued by UnionBank (<https://www.pds.com.ph/index.html%3Fp=104045.html>)

1 June 2022 - OCBC Bank digitises Euro Commercial Paper from issuance to settlement on Marketnode platform (<https://corp.sgx.com/media-centre/20220601-sgx-cdp-makes-available-marketnodes-dlt-enabled-direct-depository>)

20 April 2022 - Singtel partners UOB and ADDX on digital sustainability-linked bond (<https://www.singtel.com/about-us/media-centre/news-releases/singtel-partners-uob-and-addx-on-largest-foreign-currency-digital>)

2.1.1 How is the adoption of technology in bond market?

15 February 2022 – FQX and SIX Digital Exchange to collaborate on Blockchain-based short-term debt instruments (<https://www.sdx.com/news/fqx-and-six-digital-exchange-collaborate-blockchain-based-short-term-debt-instruments>)

14 February 2022 - Japan Exchange Group announces research to commence on digitally tracked green bonds using security tokens (<https://www.jpx.co.jp/english/corporate/news/news-releases/0010/20220214-01.html>)

9 February 2022 – Fnality, Nivaura and Adhara collaborate with NatWest and Santander to execute pilot debt transaction (<https://www.nivaura.com/media/uk-fnality-nivaura-adhara-natwest-and-santander-first-crosschain-pilot-debt/>)

11 January 2022 - FQX, Credit Suisse (Schweiz) AG, SFS & Mikron announce the completion of blockchain-based eNotes™ pilot (<https://blog.fqxnotes.com/https-www-bloomberg-com-press-releases-2022-01-11-fqx-credit-suisse-schweiz-ag-sfs-mikron-announce-the-successful-completion-of-a-pilot-using-enotes/>)

2.1.2 How is the adoption of technology in bond market?

16 December 2021 – Banque de France experiment on issuance of a digital bond and subscription with settlement in CBDC (<https://www.banque-france.fr/en/communique-de-presse/banque-de-france-has-successfully-completed-first-tranche-its-experimentation-programme-central-bank>)

14 December 2021 - DekaBank issues bearer bonds on the blockchain (<https://www.deka.de/deka-group/media-research-en/media-releases/archive/archive2021/december/dekabank-issues-first-crypto-securities-on-the-blockchain>)

8 December 2021 – BIS, Banque de France and SNB wholesale CBDC experiment, including issuance, transfer, and redemption of tokenised euro-denominated French commercial paper (<https://www.bis.org/press/p211208.htm>)

6 December 2021 - Match On firstwire: Vasakronan Issues First DLT-Based Green Note ([Press Release: Firstwire enables Vasakronan and DekaBank to trade first DLT-based green note](#))

18 November 2021 - SIX placed the first senior unsecured digital CHF bond with a total volume of CHF 150 million and maturity in 2026 (<https://www.six-group.com/en/newsroom/media-releases/2021/20211118-six-sdx-digital-bond.html>)

2.1.3 How is the adoption of technology in bond market?

28 April 2021 - EIB issues its digital bond on a public blockchain (<https://www.banque-france.fr/en/communiqu  -de-presse/experiment-use-central-bank-digital-currency-cbdc>)

15 April 2021 - Societe Generale issues structured product on public blockchain (<https://www.societegenerale.com/en/news/press-release/first-structured-product-public-blockchain>)

13 January 2021 - Vonovia issues First Fully Digital Note via Online Marketplace firstwire (<https://presse.vonovia.de/en/aktuelles/210113-vonovia-emittiert-erstmalig-vollstaendig-digitale-schuldverschreibung>)

7 December 2020 - UnionBank, Standard Chartered pioneer blockchain-enabled bond issuance in the Philippines (https://av.sc.com/corp-en/nr/ph/content/docs/SCB_PR-UnionBank-Standard-Chartered-pioneer-blockchain-enabled-bond-issuance-in-the-Philippines-.pdf)

2.1.4 How is the adoption of technology in bond market?

11/12 November 2020 - Statements by Fusang Exchange and China Construction Bank Corporation Labuan Branch (<http://my.ccb.com/malaysia/en/ggxx/202011121605186966.html>)

11 November 2020 - CCB and FUSANG Exchange take lead to bring to market the first blockchain-based digital bond accessible to global investors (<https://www.fusang.co/new-listing-release-longbond>)

11 September 2020 - Bank of Thailand launches new Government Bond Infrastructure with Blockchain Technology (<https://www.bot.or.th/English/PressandSpeeches/Press/2020/Pages/n5963.aspx>)

14 May 2020 - Societe Generale performs the first financial transaction settled with a Central Bank Digital Currency (<https://www.sgforge.com/societe-generale-performs-the-first-financial-transaction-settled-with-a-central-bank-digital-currency/>)

2.1.5 How is the adoption of technology in bond market?

12 September 2019 - Santander launches the first end-to-end blockchain bond

(https://www.santander.com/csgs/Satellite/CFWCSancomQP01/en_GB/Corporate/Press-room/2019/09/12/Santander-launches-the-first-end-to-end-blockchain-bond.html)

16 August 2019 - Bond-i tap – managed by CBA, RBC and TD – increases liquidity of Blockchain Bond and broadens market participation (<https://www.worldbank.org/en/news/press-release/2019/08/16/world-bank-issues-second-tranche-of-blockchain-bond-via-bond-i>)

11 July 2019 - YES BANK implements Asia's First Commercial Paper Issuance on Blockchain

(<https://www.yesbank.in/media/press-releases/yes-bank-implements-asias-first-commercial-paper-issuance-on-blockchain>)

19 June 2019 - EIB, Euroclear, Banco Santander & EY developing blockchain solution for the issuance and settlement of ECPs (https://www.euroclear.com/newsandinsights/en/press/2019/2019_mr-11-Euroclear-developing-Blockchain-solution.html)

18 April 2019 - Societe Generale issued the first covered bond as a security token on a public blockchain

(<https://www.societegenerale.com/en/newsroom/first-covered-bond-as-a-security-token-on-a-public-blockchain>)

2.1.6 How is the adoption of technology in bond market?

21 February 2019 - Continental, Commerzbank and Siemens Successfully Field-Tested Blockchain Technology on Money Market (https://www.commerzbank.de/en/hauptnavigation/presse/pressemitteilungen/archiv1/2019/quartal_19_01/presse_archiv_detail_19_01_79242.html)

19 February 2019 - BBVA issues the first blockchain-supported structured green bond for MAPFRE (<https://www.bbva.com/en/bbva-issues-the-first-blockchain-supported-structured-green-bond-for-mapfre/>)

2 October 2018 - Start of blockchain application for Austrian government bond auctions (<https://www.oekb.at/en/oekb-group/news-und-wissen/news/2018/blockchain-einsatz-bundesanleihebegebungen.html>)

23/24 August 2018 - World Bank Prices First Global Blockchain Bond, Raising A\$110 Million (<https://www.worldbank.org/en/news/press-release/2018/08/23/world-bank-prices-first-global-blockchain-bond-raising-a110-million>)

15 August 2018 - BMO Capital Markets Launches First-of-its-Kind Blockchain Pilot to Mirror Canadian Dollar Fixed Income Issuance Transaction with Ontario Teachers' (<https://newsroom.bmo.com/2018-08-15-BMO-Capital-Markets-Launches-First-of-its-Kind-Blockchain-Pilot-to-Mirror-Canadian-Dollar-Fixed-Income-Issuance-Transaction-with-Ontario-Teachers>)

2.1.7 How is the adoption of technology in bond market?

9/10 August 2018 - World Bank Mandates Commonwealth Bank of Australia for World's First Blockchain Bond
(<https://www.commbank.com.au/guidance/newsroom/cba-picked-by-world-bank-to-deliver-world-s-first-standalone-blo0-201808.html?ei=card-view>)

20 April 2018 - National Bank of Canada (NBC) and J.P. Morgan test blockchain technology with NBC debt issuance in the US Financial Markets (<https://www.jpmorgan.com/country/GB/en/detail/1320566740924>)

28 February 2018 - Telefónica Deutschland raises EUR 250 million in Schuldschein transaction including a blockchain tranche (https://www.lbbw.de/konzern/news-and-services/medien-center/presseinfos/20180208-lbbw-presseinformation-telefonica-deutschland-erzielt-250-mio.-euro-in-schuldscheintransaktion-mit-blockchain-tranche_7x1yujiz1_m.pdf)

22 November 2017 - Nivaura executes world's first automated cryptocurrency bond issuance supported by Allen & Overy
(<http://www.allenoverly.com/news/en-gb/articles/Pages/Nivaura-executes-worlds-first-automated-cryptocurrency-bond-issuance-supported-by-Allen-Overy.aspx>)

25 September 2017 - Commerzbank, KfW and MEAG simulate security transaction via Blockchain (https://www.kfw.de/KfW-Group/Newsroom/Latest-News/Pressemitteilungen-Details_434560.html)

2.1.8 How is the adoption of technology in bond market?

28 June 2017 - Daimler and LBBW successfully utilize blockchain technology for launch of corporate Schuldschein
(<https://media.daimler.com/marsMediaSite/en/instance/ko.xhtml?oid=22744703>)

25 January 2017 - Commonwealth Bank and QTC create first government bond using blockchain (https://www.commbank.com.au/guidance/newsroom/CBA-and-QTC-create-first-government-bond-using-blockchain-201701.html?ei=gsa_newsroom_QTC)

2.2 What about the adoption of technology in sukuk market?



The fact that blockchain provides real-time and a uniform view of transaction data, devoid of the need for many reconciliations, will go a long way in reducing costs and removing certain inefficiencies and frictions that plague the financial system

Increases
transparency of
underlying assets
and cash flows

Enhance investors'
decision-making given
the wealth of
information it makes
available

2.2.1 Advantages of using blockchain technology in sukuk market

- Jibrel (2019) explains that there are six ways in which reorganisation of the management of multiparty activities in its blockchain improves issuance and trading of sukuk.
 - First is in the efficiencies of clearing and settlement processes of securities, whereby blockchain helps institutions save thousands of dollars in back office and operational costs.
 - Second is in the reduction of risk exposure, particularly with respect to settlement, which is lowered by more than 99%, bringing down costs dramatically. With settlement occurring in real time, counterparty risk is dispelled as well.
 - Third is the reduction of issuance cost because of removal of superfluous intermediaries and the associated fees involved. Consequently, the operational risks and administrative burden of the traditional sukūk issuance, which is often a manual and multi-tiered process, are lessened.

Cont..

- Fourth is the relatively low cost of creating the blockchain system and of its continued application, not only to render transactions faster but cheaper too.
- Fifth is the 24/7 uptime and availability of the system with absolute replication among participants on the network, which ensures seamless and foolproof synchronisation within its infrastructure.
- Last is the transparent, traceable and auditable nature of transactions on the system. These enable a single record view to effect a faultless auditing process, enabling regulators to observe more easily and intervening only when needed.

2.2.2 Challenges

Legal
Challenges

Regulatory
Challenges

Shariah
Challenges

3.0 Case Studies: Wethaq's blockchain sukuk

Blockchain for Banking • News

R3's partner Wethaq issues its first blockchain sukuk

November 28, 2019 • by Ledger Insights

On November 17, Dubai-based blockchain fintech Wethaq issued its first pilot Sukuk on its securities market platform for Islamic capital markets. The Dubai Financial Services Authority (DFSA) supervised the issuance of the Sukuk. The company did not disclose the amount raised in the deal.

A Sukuk is a type of Islamic financial instrument which is interest-free and represents the ownership of an underlying asset, service or investment. A Sukuk is based on asset financing, compared to a conventional bond based on debt financing. Just like traditional bonds, there are several parties involved in the issuance of Sukuk.

Wethaq's solution is built on R3's Corda blockchain. Ledger Insights previously explored the partnership between R3 and Wethaq for blockchain Islamic finance. The platform integrates SWIFT's payment and settlement functionality allowing investors to use traditional methods to invest in blockchain Sukuks.

For the pilot Sukuk, Al Ghurair Investments LLC acted as the issuer, advised by Mashreqbank PSC acting as the lead arranger, Clifford Chance as legal counsel and the Dubai Islamic Economy Development Centre as a mentor.

The decentralized platform automated the roles of a registrar, CSD, trustee-delegate, paying agent, calculation agent and transfer agent.

"We are one step closer to releasing our infrastructure to the market and facilitating the Islamic capital market to reach its 4x growth potential," said Mohammed Alsehli, CEO of Wethaq.

With a Sukuk, the financing is achieved by the investor providing money often to fund an asset. The asset is rented out or leased with the income going to the investors. It does not work like a conventional bond where the investor receives a fixed amount of money on maturity. Instead, part of the income is from a capital gain (or loss) if the underlying asset appreciates by maturity.

Last year, Abu Dhabi's Al Hilal Bank executed a Sukuk transaction using blockchain. And in October, Indonesia's BMT Bina Ummah raised 710 million rupiahs (\$50,000) through a blockchain Sukuk issuance using the SmartSukuk platform from Blossom Finance.

Case study 2: Al Hilal Bank's Blockchain sukuk transaction in the secondary market

Al Hilal Bank has become the world's first Islamic bank to use Blockchain technology for the resale and settlement of an Islamic Sukuk (Sharia-compliant bond). It was used to transact a secondary market deal in Al Hilal Bank's \$500m Senior Sukuk maturing in September 2023.

Tue 27 Nov 2018

Al Hilal Bank executes world's first Blockchain Sukuk transactions

Collaboration with ADGM and Jibrel Network paves way for accelerated growth in the fast-growing asset class

Al Hilal Bank's CEO, Alex Coelho, said that the technology will improve the security of similar transactions, paving the way for further digitised "Smart" Islamic Sukuks: "The advantages of using smart contracts range from safer transactions with robust Shariah compliance, to the unlocking of new opportunities."

The initiative is the result of the collaboration of Al Hilal Bank Digital Transformation team with Jibrel Network, a UAE-based FinTech. The collaboration was made possible thanks to the support of Abu Dhabi Global Markets' (ADGM) FinTech platforms that foster an interactive, collaborative and vibrant ecosystem for innovation to take root in Abu Dhabi and the region.

Case Study 3: Blossom's Blockchain Sukuk

World's first blockchain sukuk: BMT Bina Ummah raises \$50K

October 23, 2019



BMT Bina used the SmartSukuk platform introduced by Blossom Finance to fund micro-SMEs and entrepreneurs

Indonesia's BMT Bina Ummah has raised \$50,000 through world's first sukuk issuance on a public blockchain, the local media reported. It is also the world's first micro sukuk.

The aim of BMT Bina is to have sukuk issuance on the blockchain to fund micro-SMEs and entrepreneurs. The use of blockchain is expected to reduce issuance costs and attract retail investors, according to Khalid Howladar, Chief Strategy Officer at Blossom Finance.

BMT Bina used the SmartSukuk platform introduced by Blossom Finance. According to Blossom Finance CEO Matthew Martin, the SmartSukuk platform makes micro investments accessible, transparent and tradeable — by overcoming the existing conventional barriers in financing.

Blossom Finance launched the SmartSukuk platform in May last year. The platform was launched to standardise and automate the bonds' legal, accounting and payment systems.

The SmartSukuk platform uses ethereum smart contracts to boost efficiency and put sukuk issuance on a global scale.

BMT Bina Ummah is an Islamic micro finance cooperative based in Yogyakarta. The institution also supports micro-SMEs and entrepreneurs who do not receive conventional financing. BMT Bina general manager Arif Yuliyanto, told the media that, "The additional funds provided by this sukuk offers longer term stable funding and increases the overall amount of financing that we can offer our members."

In recent times, Islamic finance companies are including environment-friendly and sustainable models in finance to attract all types of target audience in the Gulf and Southeast Asia.

Technologies such as blockchain and smart contracts are playing a vital role in the bonds market.

Case Study 4- Sukuk Prihatin

- Sukuk Prihatin was launched as a call for national solidarity to support the Government's recovery effort and each other by funding targeted economic relief measures.
- Funds raised through Sukuk Prihatin was used to enhance connectivity in rural schools, finance eligible micro enterprises (with a focus on women entrepreneurs) and research grants for infectious diseases.

Full Redemption of Award-Winning Sukuk Prihatin, Malaysia's First Digital Sukuk

PRESS RELEASE | 24 SEPTEMBER 2022

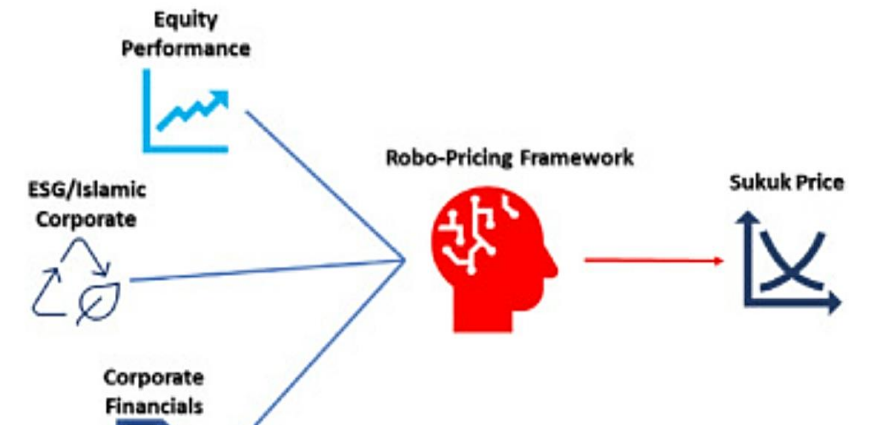
The Sukuk Prihatin issuance which had to be upsized by RM166,417,500 due to overwhelming response, was subscribed by 2,436 individuals and corporate holders, with a final total subscription value of RM666,417,500.

The sukuk was fully redeemed on 22 September 2022.

4.0 Way Forward



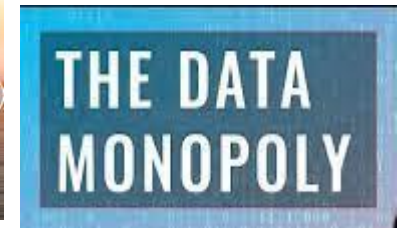
Robo-sukuk pricing Artificial Intelligence for Sukuk Rating



Source:
<https://www.sciencedirect.com/science/article/pii/S221484502200028X>



Legal, regulatory and governance framework is required.



Thank You

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