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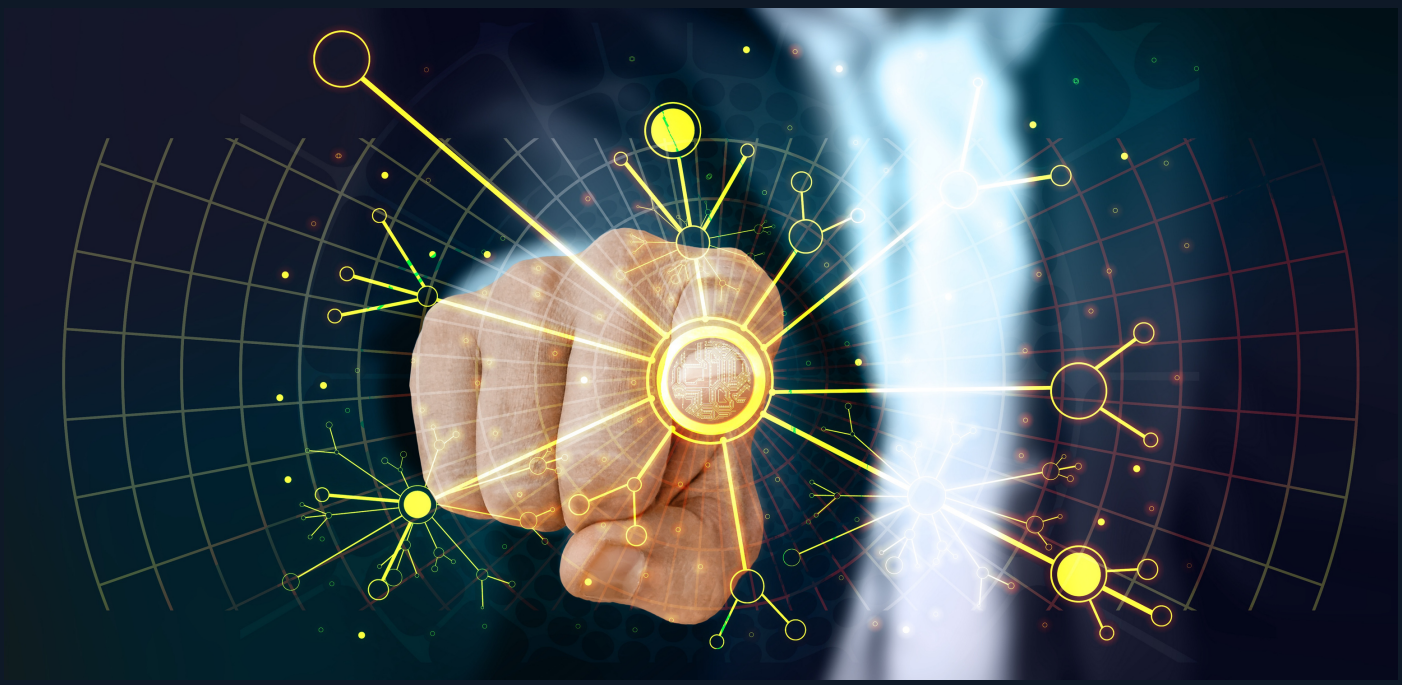
ISLAMIC FINANCE 1ST

Islamic Finance 1st is a Monthly Islamic Finance e-Notes published by SALIHIN Academy

- Smart Contract & Blockchain -

Editor's Note: *The topic for this month Islamic Finance e-Notes is Smart Contract & Blockchain, where in this edition, we aim to briefly highlight these two terms. The aggressive development of technology nowadays initiate different kind of digital assets namely tokens, cryptocurrencies, smart contracts based on blockchain platform. The efficiency of blockchain technology has opened-up a window to revolutionize the digital assets and created an advanced integrated protocol identified as smart contracts.*



Smart Contract

Smart contract is one of the unique features of blockchain, it is regarded as one of the innovative concept in technology, legal, Shariah and other fields. It is a traditional contract, which features and method of execution have been converted to specific codes and protocol administered by technology.

Smart contract could be designed based on Shariah principles.

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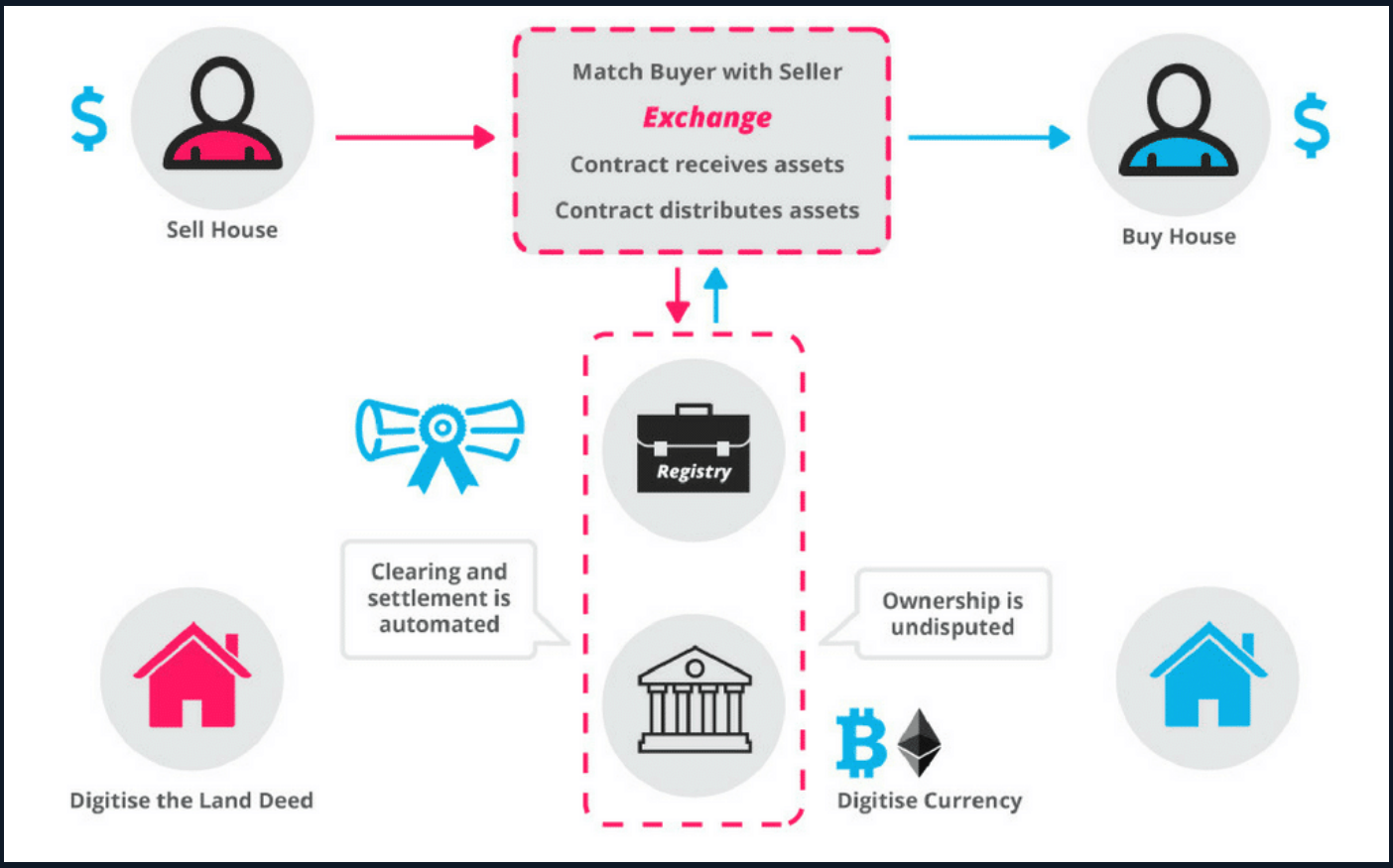
Definition of Smart Contract

Smart contracts are programming code which stored on blockchain and automatically execute when predetermined and programmed terms and conditions are met. A smart contract is a legal contract between two parties in the form of programming code (Sheikh, Azmathullah & Rizwan, 2019). Original definition of smart contract can be traced back by Nick Szabo in 1996. As cited in Lab Commodity Futures Trading Commission (2018), Nick Szabo defined smart contract as "A set of promises, specified in digital form, including protocols in which the parties perform on the other promises. The basic idea of smart contract is that many contractual clauses (such as liens, bonding and delineation of property rights) can be embedded in the hardware and software, in such a way as to make breach of contract expensive (if desired, sometimes prohibitively so) for the breacher." An analogy for smart contract is that, it is similar to a vending machine. In order for someone to get a bottle of drink from the vending machine, one must insert coins. When the coins inserted is equal to the price of the chosen beverage, the machine will accept the transaction and take the beverage out. There is a logical concept where codes have been inputted into the machine. If the codes is fulfilled, then the machine will automatically execute the transaction and smart contract works in similar way. If both parties fulfilled the right equation of the code, the terms of agreement of the smart contract will be self-executed on a blockchain and the transaction will be executed automatically.

How Smart Contract Works?

Example of smart contract application in buying and selling of residential property.



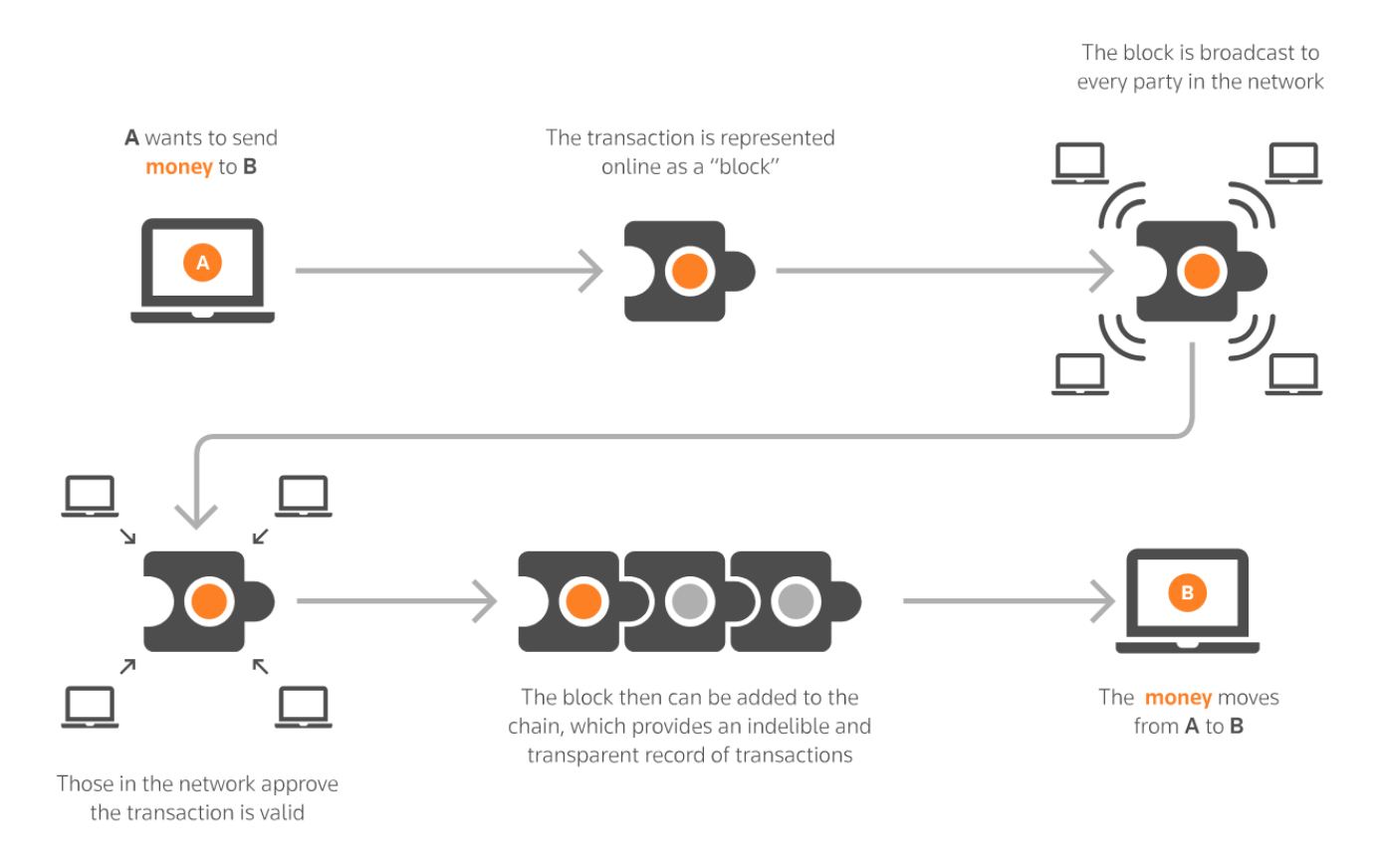
SOURCE: BLOCKGEEKS

Blockchain

There are several definitions regarding blockchain from experts. Melani Swan, the founder of Institute for Blockchain Studies, stated that blockchain is an essential public ledger with potential of various applications; decentralized record for registration, inventory, and transfer of all assets with and not just financial transactions, but property and intangible assets such as votes, software, health data, and ideas (Swan, 2015). Other scholars stated that blockchain is a distributed database of records, or public ledger of all transactions or digital events that have been executed and shared among participating parties (Crosby, Nachiappan, Pattanayak, Verma & Kalyanaraman, 2016). Simple illustration of blockchain can be explained by making reference to Google Docs, a platform in which many people can participate in recording, editing and sharing of information.

How Blockchain Works?

Example of blockchain application for peer-to-peer version of electronic cash transfer.



SOURCE: THOMSON REUTERS

Blockchain Features

The important features of blockchain can be summarized as follows:

- *Open decentralized database*
- *Access to transactions on blockchain via internet*
- *Create a record that the authenticity can be verified by the entire community*
- *Reduce financial fraud occurences*
- *Promote transparency and disclosure*
- *Record every transactions on public and distributed ledger, which is accessible by anyone with the internet*

The above features provide clarity and transparency for blockchain as a potential alternative platform to transact more products and services.

Application of Smart Contract from Shariah Perspectives

One of the legal maxims state that "The original law of every mu'amalah is permissible." Thus, the advancement of technology such as blockchain and smart contract which are used in Islamic finance are not against Shariah principles. In fact, its application can improve transparency and efficiency. Nida Khan (as cited in Lacasse, Lambert, & Khan, 2017) mentioned that blockchain as technological support has the ability to enhance transparency which is the essence of every contract in Islamic finance. By looking at the criteria and features of the smart contract, it is mainly based on the self-execution protocol without external party intervention based on specific programming and coding. Hence, Shariah compliance can be met by ensuring that the programming and coding of the terms and conditions of the contract are in compliance to the Shariah requirements. The engagement and guidance of Shariah advisors is encourage in ensuring the programming and coding are in compliance with the Shariah principles.

Relationship between Smart Contract and Blockchain

Smart contract and blockchain are interrelated. Blockchain provides platform to execute smart contract. Programmer will write coding script in programming language for smart contract. During this phase, the programmer will put logical sequence "If... then..." into the script. A very simple logical script can be as followed: "If Taki transfers money USD60 to Anas for purchase 1 gram gold, Anas will deliver the gold ownership certificate to him." The logic has function as executable file behind a contract. After finalization of the full script, programmer will embedded it onto the blockchain, whenever the embedded logical is fulfilled by the parties, the blockchain will execute the transaction automatically. This shows that the transaction between Taki and Anas was executed without a middleman engagement for official documentation.

Examples of Blockchain Applications

Blockchain innovation can be adopted by various industries, such as banking, audit, trade, legal, Shariah, endowment, music, publication, education, healthcare and others. Organizations need to be creative and innovative to create a blockchain platform that can be used to ease and facilitate their business operations, such as record-keeping, payment processing, money transfer, and data sharing. Among the examples of application are:

- *The FINTERRA's Waqfchain which built on blockchain technology provides opportunities to Waqf entities, NGOs and other stakeholders to create fund causes, submit project outlines or plans which are required to fund Waqf or charitable projects.*
- *Credit and debit card provider, Mastercard has added three blockchain-based APIs for programmers to use in developing both person-to-person (P2P) and business-to-business (B2B) payment systems.*
- *CLS Group, provider of FX settlement services is using blockchain platform to expand the trade deals using different currencies.*
- *BitPesa (Africa-based) introduces B2B payments, where it allows money to be wired from one individual's bank account to another individual's account, internationally. It is peer-to-peer based transactions and encrypted.*
- *Credit Dream, Brazilian mobile blockchain platform connects lenders and borrowers in any country for affordable and verification of loans.*
- *HSBC and Infocomm Development Authority of Singapore (IDA) initiate the paper-intensive letter of credit (LC) transactions onto the blockchain.*
- *Mycelia, a blockchain-backed digital ecosystem where creators and media management representatives use digital identities, thus information on a song and its contributors would be stored securely, creating a seamless database that helps facilitate accurate and efficient royalty payments.*
- *BurstIQ's platform helps to manage massive amounts of patient data safely and securely in healthcare companies.*
- *Learning Machine with MIT Media Lab create Blockcerts, a platform for creating, issuing and verifying blockchain-backed certificates. Academic records (like academic transcripts and credentials) on a blockchain can be reviewed by recruiters.*

The trend of interest in blockchain applications indicates the acceptance of such technology in the business, which create a great potential for deeper market penetration in the future.

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