



*Faculty of Business and Economics*

*Master of Business Administration*

**Will Blockchain Technology Disrupt the Banking Industry in Palestine?**

هل ستعمل سلسلة الكتل على اضطراب القطاع المصرفي في فلسطين؟

*Submitted by*

*Feda'a Ganeem Ghnimat*

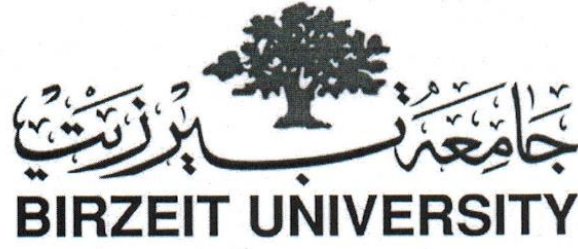
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*Palestine, Birzeit*



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## **Abstract**

Blockchain is a decentralized database technology, an innovation that will impact the various fields of our lives. Blockchain is an online database that allows millions of users to exchange cryptocurrency, such as bitcoin, securely and anonymously. Moreover, it is a comprehensive technology on which we can depend to create an integrated technological system.

**Purpose** - The research has two objectives; the first objective is to explore Blockchain technology theoretically. The second objective is to examine and investigate the tremendous expected impact of Blockchain technology on the banking sector and the current business model changes. The research tries to answer whether Blockchain technology and the business model's difference will disrupt. In doing so, the local ecosystem of the Blockchain in Palestine was explored. The main focus of the local Blockchain ecosystem concentrated on the financial banking sector and its regulatory institutions.

**Design Methodology** – This research uses a mixed approach to achieve the study's objectives, the quantitative method, and the qualitative approach. In this research, expert interviews mainly used 17 experts representing most of the banking sector in Palestine and the regulatory institutions that monitor and supervise the banking sector, including the Palestinian Monetary Authority (PMA). In the latter research, a questionnaire was used to support the information gathered from the qualitative research.

**Findings** –Through the research on Blockchain technology was complex. Notwithstanding, the field is still very young and full of potential for the banking sector in Palestine.

### **Here are some of the results of the research:**

- The regulator institutions and the banking sector need more knowledge to initiate the technology in Palestine
- The technological infrastructure is not yet ready or suitable to initiate projects that involve Blockchain technology.
- The financial sector regulator is adapting a very cautious strategy regarding the use of the technology and its applications.
- The financial sector regulator will accept Blockchain technology when it forces to use it (push technology) by other international organizations like SWIFT Company or the donors.

- As part of the Blockchain ecosystem, universities have to promote Blockchain technology-related courses to build the human capacities needed to meet these competencies' substantial potential demand.

## Abstract (Arabic)

سلسلة الكتل هي قاعدة بيانات لامركزية، وهو ابتكار سيؤثر على مجالات مختلفة من حياتنا. وهي قاعدة بيانات على الإنترنت تتيح لملايين المستخدمين تبادل العملات المشفرة، مثل البيتكوين، بشكل آمن ومجهول. علاوة على ذلك، فهي تقنية شاملة يمكننا الاعتماد عليها لإنشاء نظام تكنولوجي متكامل مثل الإنترنت الذي اعتدنا عليه.

**الهدف من البحث -** البحث له هدفان؛ الهدف الأول هو استكشاف تقنية سلسلة الكتل نظرياً والهدف الثاني هو فحص واستقصاء التأثير الهائل المتوقع لتقنية سلسلة الكتل على القطاع المصرفي والتغيرات في نموذج العمل الحالي. يحاول البحث الإجابة على سؤال هل ستعمل تكنولوجيا سلسلة الكتل على اضطراب القطاع البنكي.

**منهجية التصميم -** يستخدم هذا البحث نهجاً مختلطاً لتحقيق أهداف الدراسة، والنهج الكمي، والنهج النوعي. في هذا البحث، تم استخدام مقابلات الخبراء بشكل رئيسي والتي شارك فيها 17 خبيراً في تمثيل كافة القطاعات المصرفية في فلسطين بما في ذلك البنوك المحلية والأجنبية والمؤسسات الرقابية التي تراقب وتشرف على القطاع المصرفي بما في ذلك (سلطة النقد الفلسطينية). بالإضافة الى استخدام استبيان لدعم المعلومات التي تم جمعها من البحث النوعي.

**النتائج -** على الرغم من أن تقنية البلوكتشين كان جديدة وان المجال لا يزال صغيراً ومتطوراً للقطاع المصرفي في فلسطين. تم التوصل الى بعض النتائج التالية:

- تحتاج المؤسسات المنظمة والقطاع المصرفي إلى مزيد من المعرفة لبدء التكنولوجيا في فلسطين بالإضافة الى ان البنية التحتية بحاجة الى تطوير للتواكب مع تكنولوجيا سلسلة الكتل
- تقوم الجهات المشرفة على القطاع المالي بتكليف استراتيجية حذرة للغاية فيما يتعلق باستخدام التكنولوجيا.
- الجهات المشرفة على القطاع المالي ستضطر لاستخدام تكنولوجيا البلوكتشين عندما تعتمد المنظمات الدولية الأخرى مثل شركة SWIFT أو المانحين
- يتعين على الجامعات، كجزء من النظام البيئي، البدء في تقديم الدورة التدريبية المتعلقة بتكنولوجيا سلسلة الكتل لبناء القدرات البشرية اللازمة لتلبية الطلب المحتمل الهائل على هذه الكفاءات.

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## List of Abbreviations

ABC	Agricultural Bank of China
ACAD	Asala for Credit and Development
API	Applying Programming Interface
ASIC	Application-Specific Integrated Circuit
BC	Bank of China
BFT	Byzantine Fault Tolerance
BOP	Bank of Palestine
BTC	Bitcoin
CCB	China Construction Bank
DAO	Decentralized Autonomous Organization
DDoS	Distributed Denial of Service
DPOS	Delegated Proof of Stake
DVP	Delivery Versus Payment
ECC	Elliptic Curve Cryptography
ECDSA	Elliptic Curve Digital Signature
ETH	Ethereum
EU	European Union
FATF	Financial Action Task Force
FinCEN	Financial Crimes Enforcement Network
FPGA	Field Programmable Gate Array
FX	Foreign Exchange
GDP	Gross Domestic Product
GUI	Graphic User Interface
HSBC	Hongkong and Shanghai Banking Corporation
ICBC	Industrial and Commercial Bank
ICO	Initial Coin Offering
ICT	Information and Communications Technology
IoT	Internet of Things
KYC	Know Your Customer
LTC	Litecoin
MPC	Multiparty Computation
NASDAQ	National Association of Securities Dealers Automated Quotations
NAT	Network Address Aranslation
OECD	Organization for Economic Co-operation and Development
P2P	Peer to Peer

PA	Palestinian Authority
PBFT	Practical Byzantine Fault Tolerance
PBS	Public Broadcasting Service
PCMA	Palestine Capital Market Authority
PEX	Palestine Stock Exchange
PMA	Palestinian Monetary Authority
PoA	Proof-of-Authority
PoS	Proof-of-Stake
POs	postal operators
PoW	Proof-of-Work
ROI	Return on investment
SHA	Secure Hash Algorithms
SWIFT	Society for Worldwide Interbank Financial Telecommunications
TCP/IP	Transmission Control Protocol/Internet Protocol
TH/s	Trillion Hashes per Second
UBS	United Bank of Switzerland
UNIX	Universal Network Information Exchange

# 1 Introduction

This chapter discusses a brief background about Blockchain then approach Fintech technology that used in financial services. Also, argue the research questions and thesis structure of this research.

## 1.1 Background

Humanity experienced several revolutions; the most recent revaluation is information technology. As a result of these developments, the need for information technology has increased, as it has opened up prospects for new areas. Especially its remarkable growth in the trade sector. One of these developments was the Internet's appearance in 1991, as it created new businesses and industries that did not exist.

Blockchain technology has created enormous competition in trade and business, especially in the financial banking markets. It has diverse and attractive banking and financial markets; it works as decentralized networks that do not need a central server. But technology is still fresh. This technology became known in 2008 when an individual or group conceived it of founders under the name Satoshi Nakamoto in a paper entitled "Bitcoin: a peer-to-peer electronic cash system "(Nakamoto, 2009). Blockchain has been used as a core component of the bitcoin cryptocurrency. In 2014, Blockchain became a term referring to the distributed database (Kariappa, 2015).

In 2017, Blockchain was considered a significant technology because of its ability to create economic and social systems, but it takes years to implement them in economic and social infrastructure systems. The adoption process will not be quick; it will be steady and sequential, as waves of technological and social change continue to gain momentum (Iansiti & Lakhani, 2017).

The proportion of Blockchain users worldwide is growing by the day. Global spending for Blockchain use during 2018 was 1.5 billion, and by 2023, it is expected to reach 15.9 billion, as many industries have started to benefit from Blockchain technology and cryptocurrency. The financial sector is one of the fastest investments for Blockchain (Liu, 13 March 2020). Blockchain technology in the banking sector saves around \$8-12 billion annually and accounts for 30-70% of the banking operations cost (Almal news, 2019) and 60% of the market value during 2018(Liu, 13 March 2020).

The Palestinian financial sector is one of the most critical and influential sectors in modern economies, as it plays an essential role in the economic development of the

State. Therefore, it must keep pace with the dramatic and rapid developments and changes in the technology sector. So far, Blockchain technology has not received the effectiveness and responsiveness of its application in Palestine, especially from the financial sector, despite the benefits that can be achieved. Some researchers report that Blockchain technology can revolutionize the financial sector, and some jobs will disappear, such as intermediaries. At the same time, technology will lead to new employment (Murray, 2016).

So based on this background, this research is explorative to investigate the basic concept of Blockchain technology. It will also study the impact of Blockchain on the banking sector, changes in the current business model, and whether it will disrupt the banking sector in Palestine.

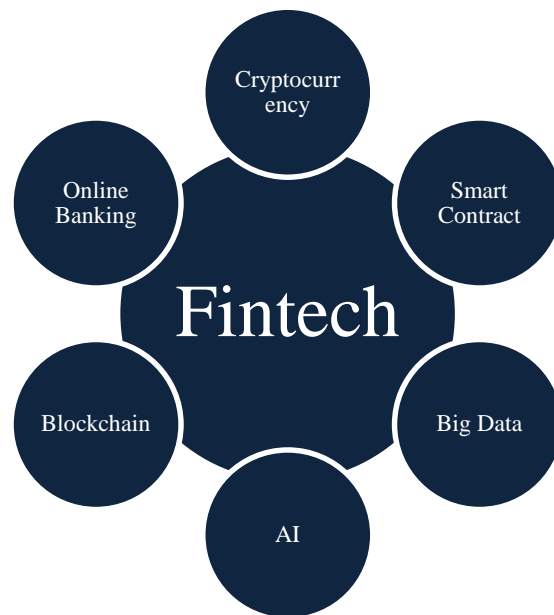
## **1.2 Fintech and Blockchain**

Fintech is of high strategic importance to companies providing financial services. For instance, in banks, IT costs account for 15-20% of all costs and are the second most significant cost factor after labor costs (Gopalan et al., 2012). With 4.7-9.4 percent, banks traditionally have the highest IT investments in all industries, while insurers invest 3.3 percent and airlines support 2.6 of their IT revenues.

The use of IT has a long history in the financial services industry, as the strategic importance of IT in financial services is high, with early adopters being banks, insurance companies, and other financial intermediaries (Lamberti and Buger 2008). The introduction of the engine teller machine (ATM) in Arlington/Ohio in 1959 (the first ATM in Europe was launched by Barclays Bank in London in 1967), the transition from physical to electronic NASDAQ trading in 1971, the introduction of home banking through Citibank and Chase Manhattan in 1981, the launch of the first internet banking facilities by Stanford Credit Union in 1994, and the introduction of home banking through Citibank and Chase Manhattan in 1981.

In a May 2017 own-initiative resolution, Fintech invited Parliament to take more action in Fintech industries and has many technologies that contribute to Fintech, such as cryptocurrency, smart contracts, artificial intelligence, and machine learning, big data, and data analytics, automation of robotic processes, Blockchain, crowdfunding platforms, mobile payments, robo-advisors, insurrect, and reteach (Members' Research Service, 2019).

Figure 1: Fintech Technologies



Source: (Own representation by Members' Research Service, 2019)

### 1.3 Research Questions

This thesis aims to know to what extent Blockchain technology will disrupt the banking industry in Palestine. Also, what is the current situation of local banks in using Blockchain technology? In addition to the changes that needed to be implemented and how long it takes to be well known and circulated in the Palestinian banking sector, it could be applied.

The questions, which will be answered in this thesis, are as follows:

#### **Main Question:**

- To what extent will Blockchain technology disrupt the banking industry in Palestine?

#### **Secondary Questions:**

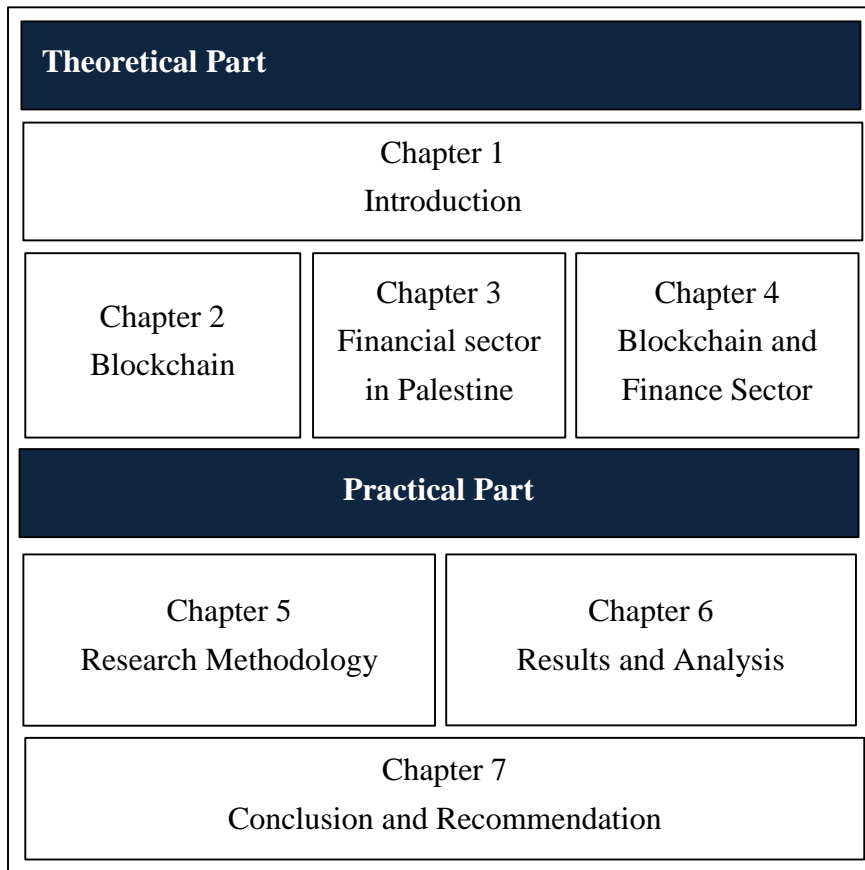
- What are the effects and changes that Blockchain technology will play in the current business model?
- What are the challenges of using Blockchain technology in banking systems?
- What are the required infrastructure requirements in banking in Palestine to apply Blockchain?



## 1.4 Thesis Structure

For the structure of this research, Figure 2 Explain the main chapters in this research

Figure 2: Thesis Structure



(Source: Own Representation)

Blockchain technology is a recent innovation that opens up great opportunities and many new business models. In this research, Blockchain technology is explored for the banking sector. Chapter 2 defines Blockchain technology, presents the technology history, architecture, types, layers, features, challenges, and previous studies. Chapter 3 handles the financial and non-financial sectors, including the banking sectors in Palestine. In Chapter 4, both Blockchains and the finance industry were connected. Further, in Chapter 5 the research methodology is introduced and explained. In the practical work, mixed research was used, where qualitative research and quantitative research was implemented in this thesis. The empirical research's main focus was on qualitative research and expert interviews in banking and Blockchains. Then in Chapter 6, the primary analysis and results are presented. In the analysis, the 17 interviews from the main stakeholders of the banking and Blockchain ecosystem in Palestine in which the results are presented, and Blockchain technology's impact on the banking sector are analyzed.

Additionally, the challenges and obstacles of implementing the Blockchain technology in the banking sector are also handled. In Chapter 7, a summary and conclusion of all results. Implications and recommendations are given. The results would be beneficial for the banking sector and all the official regulatory institutions.

## 2 Blockchains

This chapter indicates the main concepts and aspects of Blockchain in this comprise seven sections elucidating the definition of Blockchain from various authors' points of view and provide the reader with the history of Blockchain. Also, it explains Blockchain components and the main consensus algorithm used to authenticate Blockchain, and how Blockchain works. Also, it discusses the types of Blockchain. Finally, describing the feature and challenges of Blockchain.

### 2.1 Definitions of Blockchain

This section focuses on the main concept of Blockchain-based on various implementations for technology by presenting different definitions. Satoshi Nakamoto, a pseudonym person or persons (Collier, 2015) 2008, was the first one who invented Blockchain to perform it as a public transaction ledger of cryptocurrency bitcoin (Staff, 2016). He additionally arranged the primary Blockchain information. Also, he unravels the double-spending trouble for digital currency employing a peer-to-peer network (Staff, 2016). Also, Nakamoto is the founder of bitcoin and was active in developing it until December 2010 (Wallace, 2011). Table one provides various key references and definitions for Blockchain technology.

By looking at most of the articles that related to Blockchain technology, the majority of the researchers have used the concept Ledger for the Blockchain, for example; Public ledger by Gatteschiet al., 2018, distributed ledger by Walport 2016 and RomiKher & Siri Terjesen& Chen Liu (2019) and Soonduck Yoo (2017) and Christian Catalini & Joshua S. Gans (2016), shared ledger by OECD Blockchain Primer. At the same time, the minority have used the concepts list of blocks by Gupta & Sadeghiand, a distributed database by Yvonne Lootsma (2017), data collection by Zhang (2019). In this thesis, the researcher uses the term Blockchain and Blockchain technology or Blockchains as synonyms.

Table 1: Various Definitions of Blockchain

Definition	Author/Researcher
"A Blockchain is a linear collection of data elements called a block, where all blocks are linked to form a chain and secured using cryptography, and newly generated blocks are continuously chained to the Blockchain in an untrusted environment. To date, there is still a lack of formal definitions on the Blockchain that can be accepted by both academia and industry."	(Zhang 2019)

Definition	Author/Researcher
"Blockchain is "an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way."	(Kheret al., 2019)
"A Blockchain is a linked list of immutable tamper-proof blocks, which is stored at each participating node. Each block records a set of transactions and the associated metadata. Blockchain transactions act on the identical ledger data stored at each node".	(Gupta & Sadeghi, 2019)
"A Blockchain is a public ledger distributed over a network, recording transactions (messages sent from one network node to another) executed among network participants. Before insertion, each transaction is verified by network nodes according to a majority consensus mechanism. The recorded information cannot be changed/erased and, at whatever time, the history of each transaction can be recreated."	(Gatteschiet et al., 2018)
"Blockchain is a disruptive technology underpinning Bitcoin, a digital currency that was introduced to the world by Nakamoto (2008)"	(Seuren, 2018)
"A Blockchain is a shared ledger of transactions between parties in a network, not controlled by a single central authority."	(OECD Blockchain Primer 2018)
"Blockchain (originally developed for mining bitcoin) is described as a distributed database, meaning that data is stored on the Blockchain network and can be accessed by computers that are connected to it."	(Lootsma, 2017)
"A Blockchain is a distributed ledger technique in which all the members participate in the network share transaction information between the parties."	(SoonduckYoo, 2017)
"A Blockchain is a way of creating a robust, secure, transparent distributed ledger."	(Davidson et al., 2016)
"Blockchain is a distributed ledger recording technology."	(Walport 2016)
"'Blockchain' – a distributed, public transaction ledger – could be used by any participant in the network to verify and settle transactions in the cryptocurrency cheaply."	(Catalini & Gans, 2016)
In 2008, Satoshi Nakamoto ( person or group of people ) conceptualized Blockchain for the first time In his first article, Nakamoto defines an "electronic coin as a chain of digital signatures, a peer-to-peer network using proof-of-work to record a public history of transactions that quickly becomes computationally impractical for an attacker to change if honest nodes control a majority of CPU power."	(Satoshi Nakamoto, 2008)

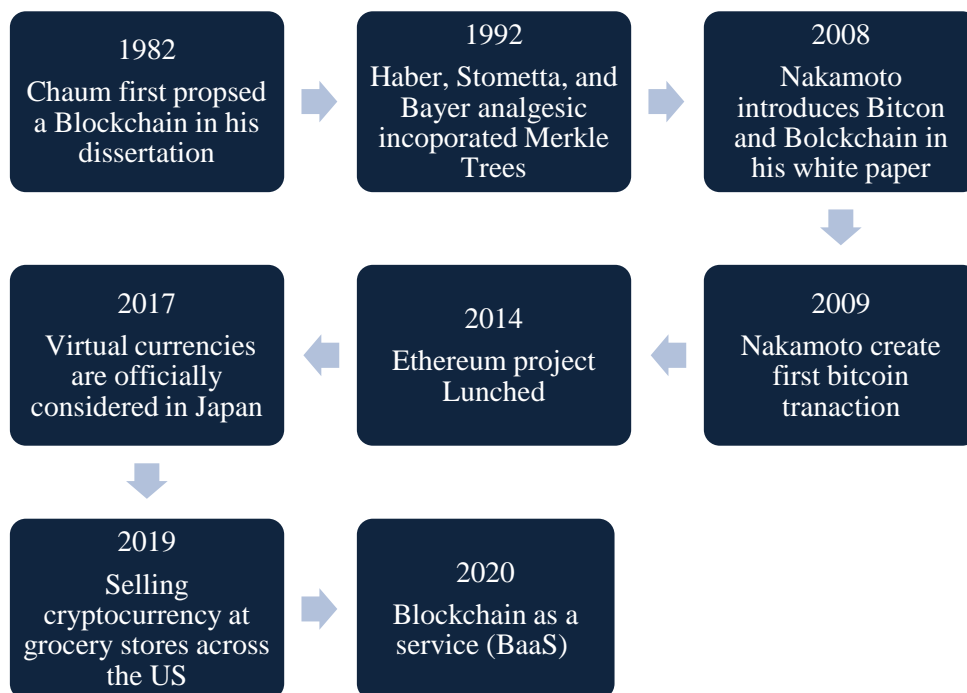
(Own representation adapted Sconduck, 2017; Davidson et al., 2016; Satoshi Nakamoto; Zhang 2019; Walport 2016; Gatteschi et al.,2018; Gatteschiet al.,2018; OECD Blockchain Primer; RomiKher & Siri

Terjesen & Chen Liu 2019; Yvonne Lootsma 2017; SoonduckYoo 2017; Sinclair Davidson & Primavera De Filippi& Jason Potts 2016; FLORIS F. SEUREN 2018; Christian Catalini & Joshua S. Gans 2016)

## 2.2 History of Blockchain

People believe that the 2008 circulation of Satoshi Nakamoto “Bitcoin” white paper and in 2009 the launch of the Bitcoin Blockchain (Nakamoto, 2009), Wallace 2011 introduced the technology of Blockchain. Bitcoin takes root in much earlier work. Nakamoto 2009 Bitcoin white paper has eight footnotes in total. Three of those eight footnotes are to the creation of Stuart Haber and Scott Stornetta, who developed the time-stamping structure we now call Blockchain twenty years before Nakamoto paper (Haber & Stornetta, 1991a; Bayer, Haber & Stornetta 1993; Haber &Stornetta 1997), Haber and Stornetta's central concern— trust in data in the digital age—particularly informs applications of Blockchain in the arts. See Figure 3.

Figure 3: Blockchain History



(Source: Own representation)

And in Table two, there are details about the history of the Blockchain

Table 2: History of Blockchain

Year	Event	Author/ Researcher
1982	The first one who proposed Blockchain-like protocol in 1982 is cryptographer David Chaum first submitted the	(Sherman et al.,2019;

Year	Event	Author/ Researcher
	dissertation "Computer Systems Established, Maintained, and Trusted by Mutually Suspicious Groups."	Whitaker, 2019)
1991	W. Scott Stornetta and Stuart Haber are the first to work uneasy on a cryptographically secured chain of blocks whereby nobody may tamper with timestamps of documents. Also, Haber and Stornetta write in their 1991 paper, one of the attractive features of digital time-stamping is organizing the importance of intelligent estate without publishing its contents	(Goyal, 2018; Lumi Blockchain wallet, 2018; Whitaker, 2019)
1992	Stornetta, Bayer, and Haber's residence united Merkle trees to the planning, which enhanced its efficacy by authorizing many document certificates to be compiled into one block.	(Bayer & Stornetta, 1993)
1998	Nick Szabo introduced bit gold as a mechanism for a decentralized digital currency chain.	(Kim, 2016)
2000	Stefan Konst published his theory of cryptographically secure chains and concepts for implementation.	(Soni, 2020)
31 October 2008	Satoshi Nakamoto brings up Blockchain and Bitcoin in a white paper.	(Nakamoto, 2008; Soni, 2020)
2009	Satoshi Nakamoto created the first bitcoin transaction – the 'Genesis Block.' The first transactions were between Hal Finney and Satoshi Nakamoto. Moreover, bitcointalk user dwdollar establishing the first bitcoin exchange and the Bitcoin Market.	(Whitaker, 2019; Grant Thornton, 2017)
22 May 2010	The first investment used by Bitcoins is two pizzas were bought for 10,000 bitcoins (\$25 at the time, approx. \$46million in Nov '17)	(Whitaker, 2019)
February 2011	Bitcoin exchange value attains equality with the US dollar	(Grant Thornton, 2017)
2013	Reaching \$1bn on the Market capitalization 25,000 bitcoin was the first significant virtual currency theft taken from Bitcoin Forum founder's wallet VitalikButerin introduces Ethereum and wise contracts throughout a written white paper. China's central bank bars money financially from dealing with bitcoin.	(Grant Thornton, 2017; Soni, 2020)

Year	Event	Author/ Researcher
February 2014	In February 2014, HMRC <sup>1</sup> within the United Kingdom distinguished bitcoin as personal money: VAT will not be charged with bitcoin mining or exchange. Bitcoin exchange Mt. Gox is hacked  The Ethereum Project is launched via crowdfunding as the first smart contract.	(Grant Thornton, 2017; Whitaker, 2019)
2015	NASDAQ begins a Blockchain trial. Blockchain technical company R3 is supported by a pool of economic establishments and Barclays, Credit Suisse, anarchist Sachs, JP Morgan, and RBS. And the Linux Foundation established the Hyperledger Project in December 2015	(Grant Thornton, 2017)
May 2016	The DAO (Decentralized Autonomous Organization) sets a crowdfunding record by raising more than \$150million investment (11.5million ethers). The DAO loses a third of its ethers – approx. \$50million – in a vulnerability attack.	(Grant Thornton, 2017)
January 2017	Seven central European banks announced a digital Trade Chain to produce a trade finance platform through Blockchain.	(Grant Thornton, 2017)
April 2017	Virtual currencies are officially considered in Japan. Also, the Bitcoin exchange Bithumb is hacked. And 16.5millions of bitcoin in circulation.	(Grant Thornton, 2017)
January 2018	Switzerland accepted tax payments in bitcoin Bitcoin's 10th birthday	(Grant Thornton, 2017; ConsenSys, 2019)
January 2019	Selling cryptocurrency at grocery stores across the US in Coinstar machines	(ConsenSys, 2019)
2020	Blockchain as a service (BaaS) by big tech companies	(Global economy, 2021, January 12)

(Own representation adapted from Grant Thornton International Ltd, 2017)

Blockchain's first introduction was in 1982, by Cryptographer David Chaum initially planned a Blockchain-like protocol in his 1982 treatise. After that, in 1991, Stuart Haber and Scott Stornetta described cryptographically secure as a chain of blocks. In

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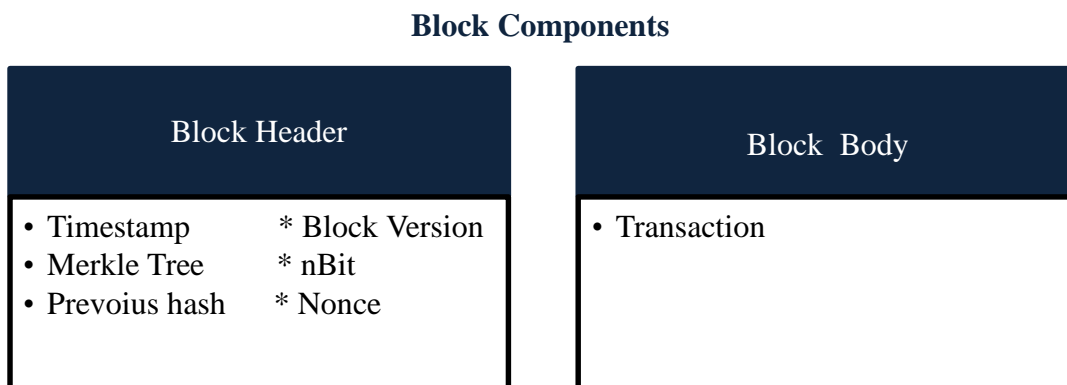
<sup>1</sup> Her Majesty's Revenue and Customs: the British government department responsible for taxation

1992 Haber, Stornetta, and Bayer analgesic incorporated Merkle trees into the planning. In 1998 Szabo introduced a decentralized digital currency chain. In 2000 Konst published his theory of cryptographically secure chains and concepts for implementation. In 2008 Satoshi Nakamoto introduced bitcoin and Blockchain in an exceedingly white paper. In 2009, the dwdollar established the first bitcoin transaction and exchange. In 2011 Bitcoin exchanges reached equality with the US dollar. In 2013 VitalikButerin introduces Ethereum and sensible contracts during a written white paper. In 2015 NASDAQ began a Blockchain trial. In 2016 decentralized Autonomous organizations (DAO) set a crowdfunding record. In 2017 seven major European banks announced Digital Trade Chain, a partnership to supply a trade finance platform via Blockchain. Finally, in 2019 Selling cryptocurrency at grocery stores across the US in Coinstar machines.

## 2.3 Blockchain Component

Blockchain is a set of blocks connected to every different, and therefore the individual blocks are composed of many elements. Roughly these are often differentiated into the header of the block and his body. See Figure 4.

Figure 4: Block Components



(Source: Own representation data collect from Zheng et al., 2018; Liang, 2020)

### 2.3.1 Block Header

- Block version number.
- Timestamp: is to record when a block is created (Zheng et al., 2018).
- Merkle tree: The Merkle tree is a binary tree with every leaf node tagged with the hash of one transaction kept within the block body, and also the non-leaf nodes tagged with the chain of its minor knot. Merkle root, i.e., the basis hash of a Merkle tree, is employed to reduce the efforts to verify the transactions in a block. Since a slight difference in one transaction will produce a completely



different, for example, the origin hash of a Merkle tree, it will be created easy to assess the transactions in a block (Liang, 2020; Zheng et al., 2018).

- Nonce: a random 32-bit number that typically starts with 0 and will increase for each hash calculating and is utilized in the creation and verification of a block and only used once (Liang, 2020; Zheng et al., 2018). Miners modify the nonce's worth to search out a hash below the present problem target (Naumann, 2018).
- NBits - the encoded form of the target threshold and current difficulty of the block.
- Previous block header hash Function. To create a hash for every block, the Blockchain uses Elliptic curve cryptography (ECC) and SHA-256 hashing to offer a robust cryptographic manifestation for data authentication and sincerity (Antonopoulos, 2014). Hashing is a methodology of applying a cryptographic hash to data, which calculates a comparative output for an input of nearly any size (e.g., a file, text, or image). It allows people to require input data independently. Hash that data, and put forward a similar result, proving no modification within the data. Any change will result in the information will be on a separate output digest (hash) (Yaga, 2019).

These essential security properties for cryptographic hash functions:

1. They reimage resistant. This suggests that they are one-way; it's computationally impractical to calculate the correct input value by giving some output value (Yaga, 2019).
2. The second pre-image is resistant. This implies one cannot heed an input that hashes to a particular output. Cryptographic hash functions are designed to give specific information. It is computationally unworkable to find a second input that creates a similar result. The only approach obtainable is to scour the input area; however, this is often computationally unworkable to do with any chance of success (Yaga, 2019).
3. They collision-resistant. This suggests that one cannot realize two inputs that hash to the same output. Plenty specifically, it is computationally impractical to seek any two inputs that turn out identical digest (Yaga, 2019).

This is wherever Transaction per Second (TPS), quantifiability of the Cryptocurrency, steps in acting as a crucial indicator for the processing power and a measurable and

comparable index. TPS's critical determinants for a particular Cryptocurrency are block time, block size, and one transaction's standard size. The block and block time (the time is taken to acknowledge a new block to the chain). Together, this assistance is included in the theoretical derivation of the TPS limit as per the following equation:

$$\text{TPS} = (\text{Block size} \times \text{Average Size}) / \text{Block time}$$

A specific cryptographic hash used in many Blockchain implementations is an associate output size of 256 bits (SHA-256) and the Secure Hash Algorithm (SHA). This decree hardware, making it fast to calculate (Yaga, 2019).

### 2.3.2 Block Body

The block body contains the list of valid and authentic transactions submitted to the Blockchain network (Yaga, 2019). Validity and genuineness are ensured by checking that the act is correctly formatted and the suppliers of digital assets in every action have each cryptographically signed the transaction. This verifies that the digital assets suppliers had access to the private key, which will quit the offered digital assets. The other full nodes will check the validity of all transactions throughout a published block and may not accept a block if it contains invalid transactions (Yaga, 2019). The block transaction number depends on the block size. The block user, called Miner, uses a cryptography mechanism to check each transaction's validation and authentication (Explained in section 2.4) (Zheng et al., 2018).

## 2.4 Consensus Algorithm

As a distinctive feature, the need for a trusted third party to verify the transactions is replaced by Blockchain. Before a block is enclosed into the Blockchain, an agreement is reached between the nodes. An according rule is utilized to manage the creation of a block to resist malicious attacks. There are fully used agreement algorithms, like Proof of Work (PoW) and Proof of Stake (PoS), to adapt to the Blockchain of varied types and, therefore, the performance wants in many applications (Liang, 2020). Table three explained the comparison between these algorithms.

Table 3: Comparison of Consensus Algorithms

	POW	POS	DPOS	PBFT
<b>Energy Consumption</b>	High	Low	Very Low	Very Low
<b>Transaction per second</b>	7-30	25-2500	25-2500	100-2500
<b>Transaction Fees</b>	High	Low	Low	Very Low
<b>Structure</b>	Decentralized	Centralized	Centralized	Decentralized
<b>Example</b>	Bitcoin	Dash	Bitshares	Stellar

(Source: Own representation)

### **2.4.1 Proof of Work (PoW)**

PoW could be an agreement strategy utilized in the Bitcoin network; someone should be selected to record the transactions throughout a decentralized network. A node must publish a block of transactions. Work of labor ought to be done to prove that the node cannot attack the network. Generally, the result means computer calculations. In PoW, each node is calculating a hash value of the block header. The block header contains a time being, and miners modify it to get different hash values (Zheng et al., 2017; Liang, 2020).

In the decentralized network, valid blocks can be generated simultaneously once multiple nodes realize the excellent time being nearly at constant time. As a result, branches could also be generated. In POW protocol, a chain that becomes longer after that is judged because of the authentic one. Miners keep mining their blocks till an extended branch is found (Zheng et al., 2017).

### **2.4.2 Proof of Stack (PoS)**

PoS is another agreement algorithm, with the target to scale back the intensive computation within the PoW algorithm. PoS is first employed in Peer coin. The proper to publish a replacement block remains granted by permitting nodes to vie to resolve a mathematical problem as in PoW, i.e., to seek out a valid nonce. However, the distinction lies within determining the matter, which is reciprocally proportional to the tokens and the holding time of those tokens that a node has. Specifically, with additional tokens and a long time of holding the tokens, the problem of mining for a node reduces. Further, the problem-solving method is eliminated within the latter PoS algorithms, and the block creator is elective based on the stakes the nodes hold (Liang, 2020).

Miners in PoS got to prove the ownership of the amount of currency. It is believed that individuals with additional currencies would be less likely to attack the network. The selection supported account balance is sort of unfair due to the one richest person is absolute to be dominant within the network. As a result, several solutions are projected with a choice of the stake size to make your mind up to forge a consequent block. In particular, Blackcoin uses the organization to predict consequent generators. It uses a formula that appears for rock bottom to hash the size together with the scale of the stake (Zheng et al., 2017).

### **2.4.3 Practical Byzantine Fault Tolerance (PBFT)**

PBFT could be a sensible voting-based algorithmic program that enables a consortium of nodes to achieve agreement while not the idea of synchronization among them. With a Byzantine Fault Tolerance (BFT), nodes can reach an agreement even once there are some faulty nodes. There are two sorts of nodes within the PBFT algorithm

and the primary nodes and backup nodes. One node within the network, acting as a client, asks the first node, and the primary node decides the execution order of the request and so broadcasts it to any or all the other backup nodes. Once receiving the request, the backup nodes check the request's authentication, decide whether or not to execute the request, and send replies to the clients. PBFT eliminates the many computations as in PoW to elect a node to publish a new block. However, the benefit comes by requiring a high level of trust between the nodes to resist the Sybil attacks where a brutal party can turn out many nodes to bias the agreement. Thus, PBFT algorithmic programs are typically employed in consortium Blockchain networks, e.g., Hyperledger material (Liang, 2020).

Hyperledger material utilizes the PBFT as its algorithmic agreement program since PBFT might handle up to  $1/3$  malicious replicas. The brand-new block is decided during a round. In every round, a primary would be hand-picked in keeping with some rules. And it's liable for ordering the transaction. The entire method may well be divided into three phases: pre-prepared, ready, and committed. In every part, a node would enter the next part if it is received votes from over  $2/3$  of all nodes. Therefore, PBFT phase that each node is thought to the network (Zheng et al., 2017).

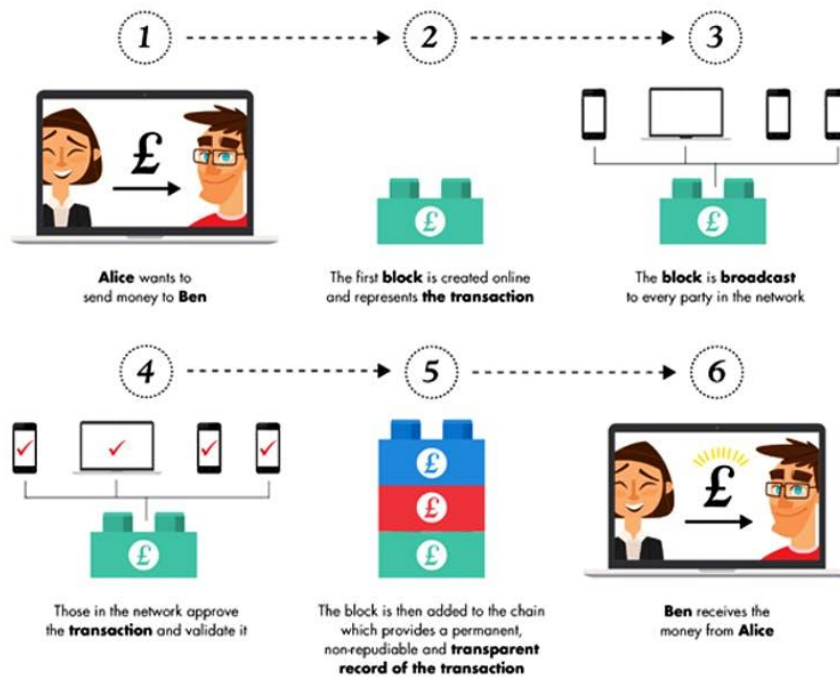
#### **2.4.4 Delegated Proof of Stake (DPOS)**

DPOS (Delegated proof of stake). The backbone of Bit shares, also the key distinction between PoS and DPOS, is that PoS is directly democratic, while DPOS is representative democratic, between PoS and DPOS. Stakeholders choose their delegates to come back with blocks and confirm them. The block can be easily verified with considerably fewer nodes to verify the block, resulting in short confirmation of transactions. In the meantime, network parameters such as block size and block period can be adjusted (Zheng et al., 2017).

### **2.5 How Does Blockchain Work**

In this section, the researcher will explain how Blockchain works. Figure 5 illustrates the process for convert money from Alice to Ben.

Figure 5: How Does Blockchain Work



(Source: Shah & Jani, 2018; Lush, 2017)

Let us consider that there are miners in our Blockchain. Who are on a distributed, decentralized network? The Blockchain technology in the bitcoin framework will be implemented by this Blockchain example (Shah & Jani, 2018).

- Alice wants to send money to Ben.
- It represents the transaction as a block.
- This block is then broadcast to any network member (miners).
- In this example, in our network, miners will act as evaluators. This authorizes the legitimacy of the transaction.
- This transaction-containing block is then added to the Blockchain.
- Ben received money from Alice.

In step four, which is known as a distributed consensus? The miners execute cryptographic algorithms. This can evaluate and verify the history of the individual Blockchain. If it proves the history and the hash values are valid and true, the transaction will be accepted (Shah & Jani, 2018).

The data will be unaccepted, and it will not add to the Blockchain miners, for some reason, cannot confirm the Blockchain information (Shah & Jani, 2018).

Each block is like a page in a book with its contents. The header is the previous block's hash value and the material that is the bitcoin transaction itself. So, block 2 includes the Block 1 hash value that is called the genesis block and Block 3 contains the hash value of Block 2, and Block N contains the hash value of Block N-1. Block N does not contain the hash value of another block and creates an unspendable subsidy. Moreover, the new blocks are added to the Blockchain and connected to the older

blocks. This chain is continually modified so that it remains the same for every block. The presence of this hash value is what makes it secure, powerful, and free of harm to this decentralized, transparent process in the Blockchain (Shah & Jani, 2018; Crosby et al., 2016).

When the latest block in the longest valid change is verified, the validates and the generators are added to the Blockchain. It's important to know. Blockchain length is not the number of blocks but the blocks' combined difficulty (Shah & Jani, 2018)

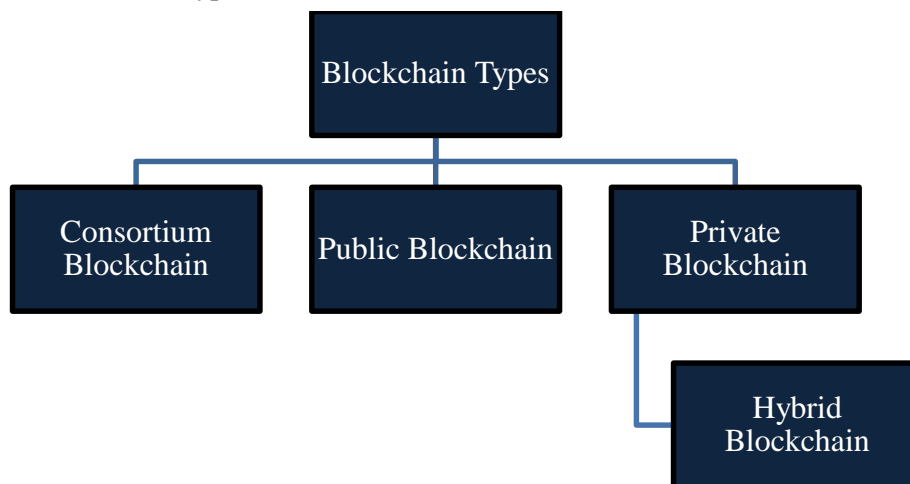
It is said that a Blockchain is valid if (Shah & Jani, 2018):

- The blocks are all true in the Blockchain.
- The transactions included in the blocks are all legitimate.
- The Blockchain begins with the block of genesis.

## 2.6 Type of Blockchain

In this section, the researcher will view the main four types of Blockchain networks - consortium Blockchains, private Blockchains, public Blockchains, and hybrid Blockchain. Figure 6 below views the main Blockchain types.

Figure 6: Blockchain Types



(Source: Own representation by Liang, 2020; Lin & Liao, 2017)

- Public Blockchain is intended for all the nodes inside the network to be open and verifiable. In particular, all nodes can verify transactions inside a public Blockchain network, protect the Blockchain's local duplicate and publish an alternative block into the Blockchain. Public Blockchains are distributed by assigning the authority to keep a ledger to any or all the nodes. In anonymous commercialism, such a Blockchain is commonly employed. However, the process suffers from the low speed of validation processing and requires a certain degree of computation to ensure that an impartial block is created. Bitcoin is one of the most common cryptocurrency enabled by public

Blockchain (Liang, 2020; Lin & Liao, 2017). Example: Bitcoin, Ethereum, Litecoin

- A single entity usually maintains a private Blockchain. The authorization nodes are given the privileges to access the Blockchain and validate the transactions through a central controller. An authorized network is built so that only the authorized nodes can access the Blockchain's protected transactions or participate in operations to publish new blocks. The privacy of the dealings is greatly improved during this process, and thus the decentralization of transaction validation authority is below the company's management. The computation-intensive agreement algorithm is not mandatory with a high degree of confidence between the nodes within the authorized network (Liang, 2020). The Multichain and Hyperledger projects are examples of private Blockchains. (Fabric, Sawtooth), Corda (Team, 2020).
- The Blockchain Consortium is similar to a personal Blockchain because they are each maintained in a much-authorized network. The difference is that there are several entities in the association Blockchain to exchange the right access and verify the transactions. They will also work together by sterilizing the agreement's algorithm that supports the degree of trust between them (Liang, 2020). Other researchers call it Federated Blockchain. Examples of Blockchain investment groups are Energy Web Base, R3 (Team, 2020).
- Hybrid Blockchain: A hybrid Blockchain may be a combination of a Blockchain that is private and public. It uses each kind of Blockchain feature where, in addition to a public permission-less system, you can have a private permission-based system. Users can monitor who gets access to the information stored inside the Blockchain in such a hybrid network. Only a particular portion of Blockchain information or records is often allowed to go public, keeping the remainder confidential within the private network. The hybrid system of Blockchain is flexible so that users will simply be part of a private Blockchain with multiple public Blockchains. A transaction during a private network of a hybrid Blockchain is typically verified among that network. However, users may also release it within the public Blockchain to get verified. The public Blockchains increase the hashing and involve a lot of nodes for verification. This enhances the safety and transparency of the Blockchain network. An example of a hybrid Blockchain is Dragonchai (Team, 2020).

## 2.7 Feature of Blockchain

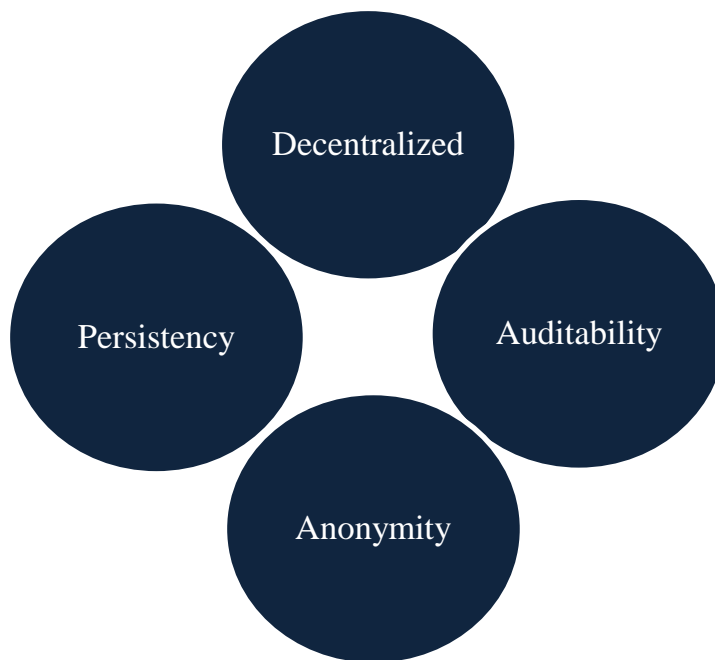
The Blockchain process concentrates on four main features, which are Decentralized, Persistency, Auditability, and Anonymity (Lin& Liao, 2017).

Figure 7: Feature of Blockchain

(Source: Own representation by Lin & Liao, 2017)

### **Decentralized**

In typical centralized act systems, each act should be valid through the



authentic central agency (e.g., the central bank), inevitably resulting in the price, and additionally, and the performance bottlenecks at the central servers. Otherwise, a bunch of actions among the Blockchain network will be conducted between any pair of peers (P2P), whereas not the authentication by the central agency. Throughout this way, Blockchain can significantly cut back the server costs (including the event's price and operation cost) and mitigate the performance bottlenecks at the central server (Lin& Liao, 2017).

### **Persistency**

Since every transaction spreading across the network has to be confirmed and recorded in blocks distributed within the whole network, it's hard to tamper. Also, every broadcasted block will be valid by different nodes, and transactions are going to be checked. Thus, any falsification is going to be detected.



### **Auditability**

Since every one of the Blockchain transactions is reliable and recorded with a timestamp, users will verify and trace the last records by accessing any node within the extended network. In the Bitcoin Blockchain, every group action is often traced to previous transactions frequently. It enhances the traceability and transparency of the information maintained within the Blockchain (Lin& Liao, 2017).

### **Anonymity**

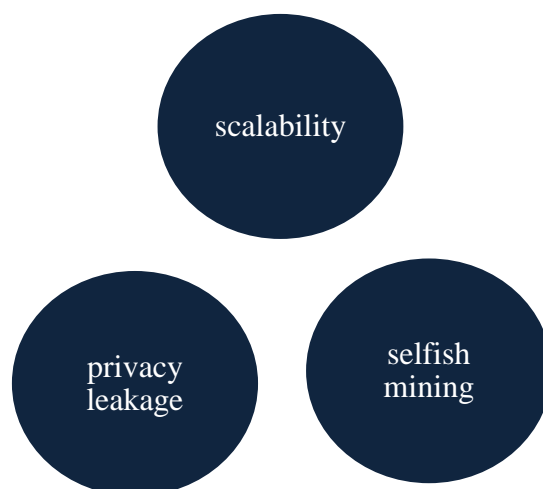
Each user will move with the Blockchain network with a produced address. Further, a user can generate many locations to prevent identity revelation. There's not any central party keeping users' non-public info. This mechanism protects a specific quantity of privacy on the transactions surrounded within the Blockchain. Blockchain can not guarantee the proper privacy preservation thanks to the intrinsic constraint (Lin & Liao, 2017).

## **2.8 Challenges of Blockchain Technology**

Challenges and up to date advances as rising technology, the challenges that Blockchain is facing summarized in three typical challenges: selfish mining Scalability, privacy leakage, and selfish mining as follows below See Figure 8 (Zheng et al., 2018):

Figure 8: Challenges of Blockchain

(Source: Own representation by Zheng et al., 2018)



### **2.8.1 Scalability**

With the number of transactions increasing, the Bitcoin Blockchain has surpassed a hundred GB storage, so the Blockchain becomes significant. All transactions ought to be compelled to be kept for verification of the dealings. Besides, the first restriction of block size, and so the live accustomed generation of a novel block (Meva, 2018). Bitcoin Blockchain will completely process nearly seven transactions per second that cannot fulfill the necessity of processing ample transactions throughout a quantity fashion (Atlam& Wills, 2019; Zheng et al., 2018). Meanwhile, as a result of the power of blocks is extremely little, different very small transactions may well be postponed since miners like high transaction fees. However, propagation speed and end in Blockchain branches could be correct by large block sizes. Therefore, the measurability problem is complex. Their unit of actions resolves the measurability disadvantage of the Blockchain, which might be classified into a pair of varieties (Zheng et al., 2018).

### **2.8.2 Privacy Leakage**

The Blockchain is believed to be safe as users do not build real identity. They only build transactions with generated addresses. In the case of data outpouring, users generate addresses. However, it is shown in Meiklejohn et al. (2013) and Kosba et al. (2016) that the values of all transactions and balances for each public key are publicly visible. So Blockchain cannot guarantee transactional privacy.

A recent study (Barcelo, 2014) has shown that Bitcoin transactions are connected to reveal user's data. Moreover, Biryukov et al. (2014) gave away to link user pseudonyms to IP addresses even once users are behind network address translation (NAT) or firewalls. In Biryukov et al. (2014), each client is notable by a group of nodes. However, this needs to understand the origin of dealing, and this set is learned. Multiple methods are scheduled to improve the obscurity of the Blockchain (Zheng et al., 2018).

### **2.8.3 Selfish mining**

It is a significant challenge in Blockchains. Even though a tiny part of hashing power is employed, a block is vulnerable to cheating. So, the miner keeps the mined block with no broadcasting on the network and can produce a private branch that will be broadcasted when meeting specific needs (Meva, 2018). Because of this, legitimate miners will waste resources and time. Also, the personal chain will be mined by selfish miners (Meva, 2018).

## **3 Financial Sectors in Palestine**

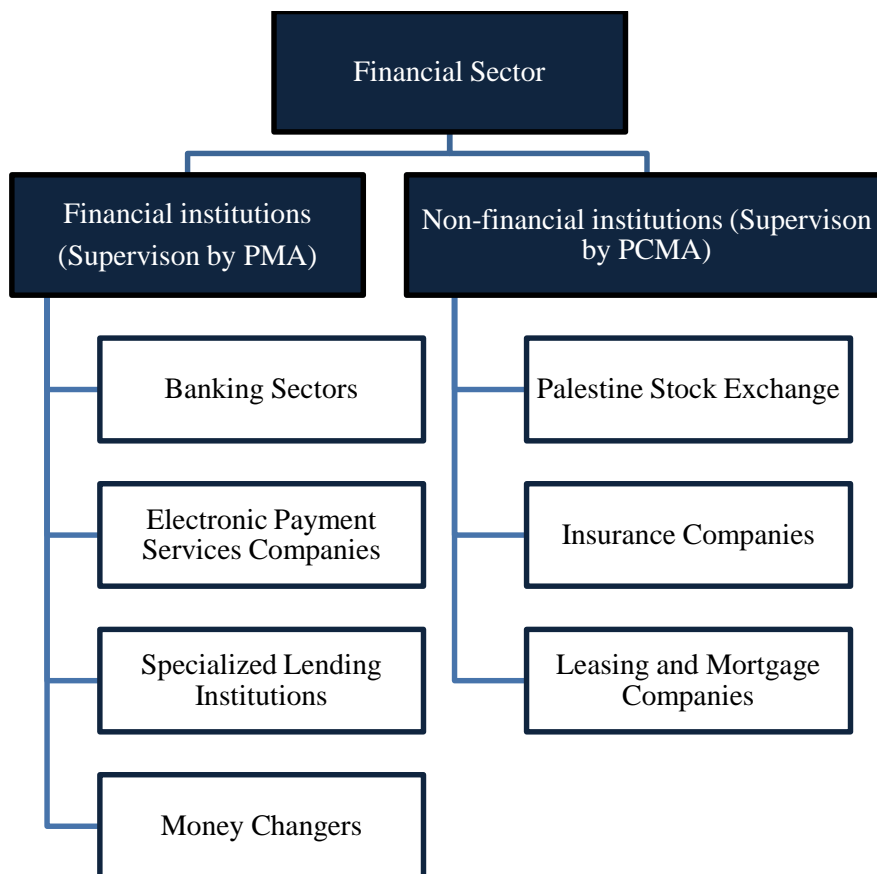
### **3.1 Introduction**

Around 15 years ago, after 1993-1994, with the Oslo Agreement's signing in 1993 and the Paris Protocol in 1994, the structured finance sector appeared in the West Bank and Gaza Strip (United Nations, 2019). Despite the challenging environment, the Palestinians have succeeded in creating a financial sector comprising most of the expected sub-sectors: banks, securities markets, insurance companies, payment systems, housing finance companies, microfinance institutions, and financial leasing companies (United Nation, 2019). Two main institutions for the regulation and supervision of the financial sector have been set up by the Palestinian Authority (PA): the Palestinian Monetary Authority for the banking sector (as well as the payment system, micro-finance institutions, and money changers) and the Authority for the Capital Market for the Non-Banking Sector (securities market, financial leasing, mortgage finance companies, pension funds, and insurance companies) (United Nations, 2019; PMA annual report, 2020).

### **3.2 Financial Sectors**

The financial sector in Palestine is constructed of Non-financial institutions and banking financial institutions (PMA, 2021). As for financial institutions, these are supervised by Palestine Monetary Authority (PMA) and have direct control on (1. Banking sector, 2. Money changers, 3. Specialized lending institutions, 4. Electronic payment services companies). Nonfinancial institutions are supervised by Palestine Capital Market Authority (PCMA) and have direct control (1. The Palestine Stock Exchange, 2. Insurance companies, 3. Leasing and mortgage companies). In Figure 9, the researcher will view both financial and non-financial institutions. In this research, the researcher will focus on financial institutions.

Figure 9: Financial Sector

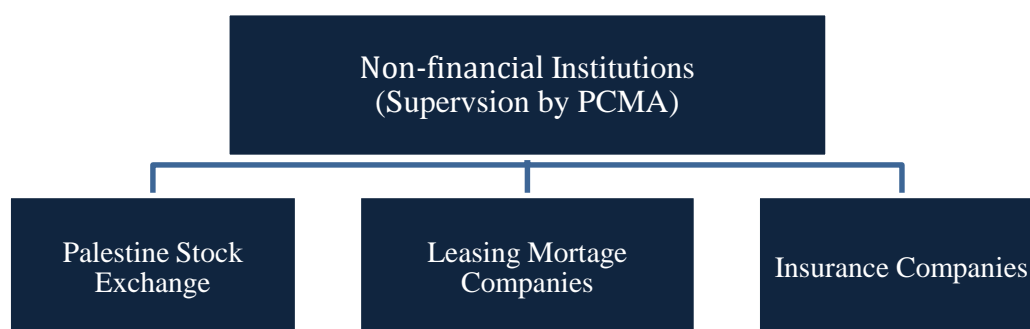


(Source: Own representation data collection from PMA Annual report, 2020)

### 3.2.1 Non-Financial Institutions

Non-financial institutions are moderate by Palestine Capital Market Authority (PCMA) and have main. Three institutions, See Figure 10.

Figure 10: Non-Financial Institutions

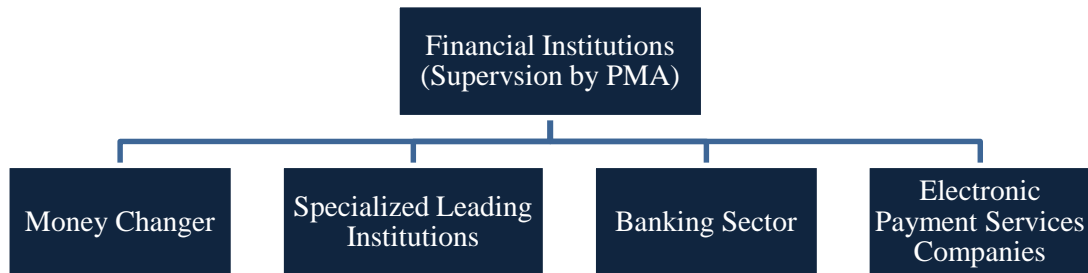


(Source: Own representation by PMA annual report, 2020; Palestine Capital Market Authority, 2021)

### 3.2.2 Financial Institutions

Financial institutions are supervised by Palestine Monetary Authority (PMA) and have direct control on (1. banks, 2. money changers, 3. specialized lending institutions, 4. electronic payment services companies) (PMA annual report, 2020).

Figure 11: Financial Institutions



(Source: Own representation by PMA Annual report, 2020)

#### 3.2.1.0 Palestine Monetary Authority (PMA)

The Palestinian Monetary Authority (PMA) is an autonomous public agency responsible for formulating and enforcing monetary and banking policies to preserve market stability and low inflation, foster financial stability, safeguard the banking sector, and promote sustainable domestic economic development. PMA aims to accomplish these objectives through:

- Development and implementation of monetary policy to ensure low inflation and price stability.
- Effective and transparent regulation and oversight of Palestinian banks, specialized credit institutions, money changers, and payment system companies.
- Supervision of modern, efficient payment systems for development, implementation, and operation.

#### 3.2.1.1 Money Changers

A money changer is an individual who exchanges the coins or currency of a country for that of another. (Xon, n.d.) By the end of 2019, there have been 270 money changers licensed by the PMA, 207 in West Bank, and 43 in Gaza Strip with 68 branches (PMA, 2019). The working capital of exchange at the end of 2019 was 70.1\$ million.

#### 3.2.1.2 Specialized Lending Institutions

Most non-profit organizations are specialist lending institutions working in Palestine. (Tourism Intelligence International, 2014). The number of specialized lending institutions licensed by the PMA in 2019 reached eight institutions: ACAD Finance, Allbdaa Microfinance, and Asala for Credit and Development Company, Vitas Palestine, Palestine for Credit and Development Company (FATEN), and Reef Finance. These institutions run via a network of branches and offices with 100 in 2019 with 910 workers. (PMA, 2019)

### **3.2.1.3 Electronic Payment Services Companies**

Palestine Monetary Authority issued instructions today. On April 28, 2020, to operate and provide electronic payment services, including e-wallets and prepaid cards (PMA, 2020 April 28).

Electronic payment processing tools will be offered by payment service companies authorized by the Palestine Monetary Authority to enable subscribers to complete their financial transactions, such as depositing and withdrawing money at any time, transferring money to anyone in Palestine, shopping, paying for purchases, and paying bills. This will be done through these companies' authorized agents spread across the governorates, cities, and country villages. Any citizen can benefit from the services provided by payment services companies without requiring a bank account, with easy and quick procedures where the citizen can subscribe electronically to the service and then visit one of the company's agents only once to complete the registration and data verification process (PMA, 2020 April 28).

### **3.2.1.4 Banking Sector**

The list of banks operating in Palestine includes 14 banks, of which seven are Palestinian banks and the rest are foreign banks (PMA Annual Report, 2020). There is an excellent opportunity for growth and expansion in the banking sector inside Palestine, where there are currently 395 branches and offices that provide their services to the 5 million citizens in Palestine (PMA Annual Report, 2020). Without considering the size of the population growth in Palestine, there is a need to double the number of bank branches operating in Palestine to reach the international standard. The Bank of Palestine looks at this relative decrease in the number of banking branches as an opportunity to expand its business scope, provide high-quality services and products, and achieve sustainability in the growth of financial inclusions (BOP Annual Report, 2019). Table four views the number of banks locally, foreign.

Table 4: Breakdown of Banks in Palestine by Ownership, December 2018

Authorized banks	Number of Banks
Locally Owned	7
Foreign-Owned	7
<b>TOTAL</b>	<b>14</b>

(Source: Association of Banks in Palestine, 2018)

As national public companies, Palestinian banks work, while Arab and international banks register as foreign firms. The PMA oversees all commercial banks. Until the adoption of Banking Law No. 2 of 2002, which regulates the development, management, and capital needs of banks in Palestine, banks in Palestine were subject to Jordanian law (Research and Monetary Policy Department, 2018).

Table 5: Main Banks in Palestine

Bank Name	Bank Type	Public or Private	Listing Market	# of Branches	No. Employees	Website
<b>Local Banks</b>						
<b>Bank of Palestine</b>	Commercial	Private	Palestine	72	2276	<a href="https://bankofpalestine.com/ar/home">https://bankofpalestine.com/ar/home</a>
<b>The National Bank</b>	Commercial	Private	Palestine	26	1292	<a href="https://www.tnb.ps">https://www.tnb.ps</a>
<b>Al-Quds Bank</b>	Commercial	Private	Palestine	40	772	<a href="https://www.qudsbank.ps">https://www.qudsbank.ps</a>
<b>Palestine Islamic Bank</b>	Islamic	Private	Palestine	43	700	<a href="https://aib.ps">https://aib.ps</a>
<b>Arab Islamic Bank</b>	Islamic	Private	Jordan	22	539	<a href="https://islamicbank.ps/">https://islamicbank.ps/</a>
<b>Palestine Investment Bank</b>	Commercial	Private	Palestine	18	269	<a href="https://www.pibbank.com/ar/">https://www.pibbank.com/ar/</a>
<b>Safa Bank</b>	Islamic	Private	Palestine	6	109	<a href="https://www.safabank.ps">https://www.safabank.ps</a>
<b>Foreign Banks</b>						
<b>Arab Bank</b>	Commercial	Private	Jordan	31	912	<a href="https://www.arabbank.ps/ar">https://www.arabbank.ps/ar</a>
<b>Cairo Amman Bank</b>	Commercial	Private	Jordan	21	507	<a href="https://www.cab.ps/ar">https://www.cab.ps/ar</a>
<b>The Housing Bank of Trade and Finance</b>	Commercial	Private	Jordan	15	275	<a href="https://www.hbtf.ps/ar/PL">https://www.hbtf.ps/ar/PL</a>

Bank Name	Bank Type	Public or Private	Listing Market	# of Branch	No. Employee	Website
<b>Bank of Jordan</b>	Commercial	Private	Jordan	36	338	<a href="https://bankofjordan.com/ar">https://bankofjordan.com/ar</a>
<b>Jordan Ahli Bank</b>	Commercial	Private	Jordan	9	189	<a href="https://ahli.com/ar/">https://ahli.com/ar/</a>
<b>Jordan Commercial Bank</b>	Commercial	Private	Jordan	5	122	<a href="https://www.jcbank.com.jo/ar">https://www.jcbank.com.jo/ar</a>
<b>Egyptian Arab Land Bank</b>	Commercial	Public	Egypt	7	157	<a href="https://www.aqaribank.jo">https://www.aqaribank.jo</a>

(Own representation, collected from Association of Banks in Palestine, 2018)

The financial data for banking sectors at the end of 2019 show that total assets increased by 11.2 percent, to \$ 17.9 billion. The credit portfolio also increased by 7.2 percent, to approximately \$ 9.0 billion, accounting for 50.4 percent of the banking sector's total assets. This is a sign of greater activation of the role of financial intermediation between the domestic economy's surplus and deficit divisions, creating further funding opportunities and contributing to economic growth. However, the growing public confidence was reflected in a clear increase in the volume of deposits, which reached \$ 13.4 billion, up 9.5 percent from 2018. Their investment indicators shifted inward rather than outward (PMA Annual Report, 2020).

### 3.3. ICSFC

ICSFC Jordanian Company that provided software for Blockchain for the banking sector. ICS Financial Systems (ICSFS) is a leading provider of modular, core banking systems. ICSFS's success can be attributed to our turnkey offering, ICS BANKS that serves and supports customers across the globe. ICS BANKS is a fully integrated universal banking application that deploys a solution and a range of professional services to automate and streamline banking services.

ICSFS provides business and technology solutions for financial institutions in countries across the world, helping financial clients select and implement the best tools to achieve their business needs and to integrate services and e-commerce features fully into their operations – crucial given the speed and flexibility of response required by the Internet and mobile-enabled e-commerce business models.



ICSFS caters to the needs of modern financial institutions. ICS BANKS is packaged as one complete solution to provide a complete integrated, parameterized, flexible, and scalable end-to-end solution covering all banking activities.

Today, ICSFS's success is largely attributed to its understanding of markets by working closely with its customers, advising them to adopt the international banking standards while addressing their local requirements.

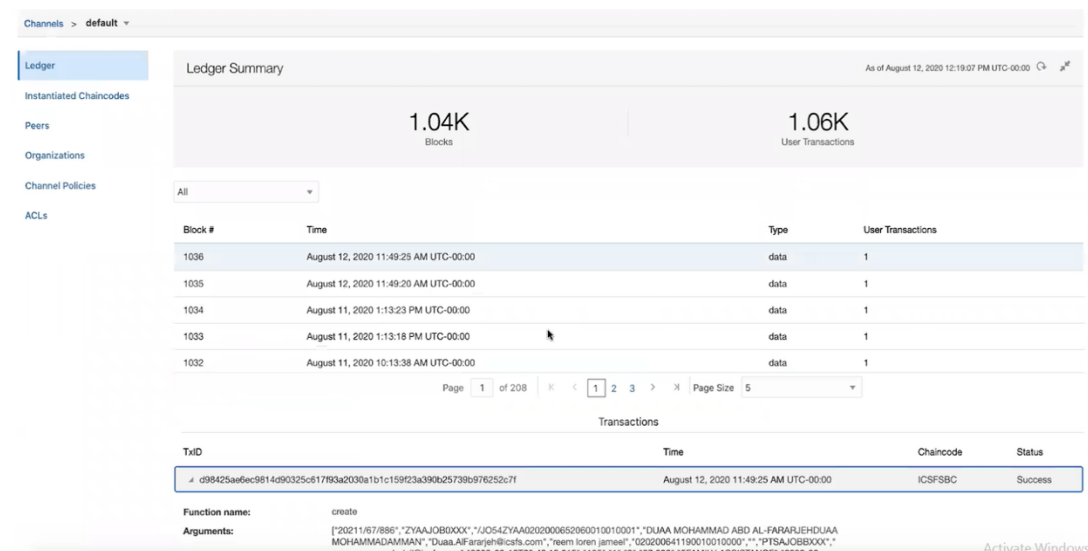
ICSFS operates in environments accredited by ISO-9001-2015, based on industry standards. Our platform is developed to address today's banking and finance industry's information processing and management challenges.

According to my interview with the Co-founder for IFSCS company. He summarizes the benefits of using Blockchain in the banking sector:

- Cost Reduction (No intermediaries)
- 80% reduction of transaction fees
- Lower transaction fees
- Real-time payment (Faster) from 2 days to few seconds
- Customer will be able to track payments
- End to End Payments tracking
- Notification for the customer for status

In Figure 12, the researcher views a list of blocks to transfer money between two persons.

Figure 12: Screenshot (List of Blocks)



(Source: IFSCS Company)

In Figure 13, views block details

Figure 13: Block Details

Txid	Time	Chaincode	Status
d98425ae6ec9814d90325c617f93a2030a1b1c159f23a390b25739b976252c7f	August 12, 2020 11:49:25 AM UTC-00:00	ICFSBC	Success
<b>Function name:</b> create <b>Arguments:</b> ["20211/67/886"; "ZYAAJOBXXX"; "/JOS4ZYAA0202000652060010010001"; "DUAA MOHAMMAD ABD AL-FARARJEHDUAA MOHAMMADAMMAN"; "Duaa.AIFararjeh@icfs.com"; "reem loren jameel"; "020200641190010010000"; "; "PTSAJOBXXX"; "amman reem.abulail@icfs.com"; "2020-08-12T02:48:15.015"; "105"; "1"; "2"; "27.606"; "SFAMILY ASSISTANCE"; "2020-08-12T14:48:22.067"; "9"; "update"; "1"; "105"] <b>Validation Results:</b> VALID <b>Response:</b> 200 <b>Initiator:</b> BCICFS: _defaultuser <b>Endorser:</b> BCICFS: peer0-2, BCICFS: peer0-1			

(Source: IFSCS Company)

Figure 14 explain the form for the end-user to transfer money

Figure 14: Blockchain form to Transfer Money

Block Chain Transfer

PREPARE

REVIEW AND CONFIRM

SENT

Fields marked with \* are required.

**From account \***

**Beneficiary Country \***

**Bank Subsidiaries \***

**Account number / IBAN \***

**Amount \***

**Charge type \***

**Beneficiary Name \***

**Beneficiary Address**

**COUNTRY**

(Source: IFSCS Company)

## **4 Blockchain and Finance Industry (Banks)**

The thesis clarified the Blockchain's key concepts and its most inventive implementations so far. However, this thesis aims to provide related insight into how the financial sector can be changed socially and redefined by this modern and unquiet technology. This chapter is therefore intended to introduce attainable technology applications within the banking world. Since the Blockchain has only recently gained interest, the quantity of analysis within the financial sector on the Blockchain results is banned. For this reason, during this thesis, several conclusions were established during this chapter.

### **4.1 Blockchain in the Financial Sector**

Modern electronic payment systems have trusty, central third parties to method payments firmly. The pressure to cut back these transaction prices lead banks to accept claims on one another. This innovation created trading many conveniences as merchants may currently despite notes directly into their bank from alternative banks, eliminating the burden of converting the currency into gold to transfer the funds. However, when accepting the note from a separate bank, the payee's bank sweet-faced a brand-new downside within which it was presently exposed to the bank of the payer until settlement in gold can be organized. Wherever the acceptance of notes is limited to a small range of banks, this could be handled bilaterally. As the range of banks multiplied within the system, interbank payments became cumbersome, multiplying banks' incentives to create an efficient system (Yoo, 2017).

Recent innovations have seen the rise of digital currencies such as Bitcoin, which combines new currencies with sub-urbanized payment structures. Although the financial Blockchain has received significant attention largely based on financial case analysis of digital currencies, a crucial breakthrough could be the distributed ledger underlying their payment mechanisms as money orders bank deposits. These days most financial assets exist as solely digital documents. This opens up the possibility that the national economy would usually be reworked a lot by distributed ledgers. The distributed ledger, which is implemented as a Blockchain, is divided into closed and private, close, public, and open and public ledgers that look at the involvement and restriction of the ledger's ownership. Non-permissions mean that they are available to all. Allowable could be a structure within which solely approved persons will participate. The personal ledger jointly restricts the ledger's ownership to a limited number of owners, although everyone can keep the general public ledger (2017, Yoo).

A closed distributed ledger is used in the financial sector, such as interbank transfers and international financial transactions. Since the essence of finance, reliability, stability, and power are priorities, the most common are Blockchains supporting a closed distributed ledger, where only approved workers can participate. The closed kind incorporates an agreement, a system that guarantees the integrity of community operations. Only a limited number of particular teams are involved in compensating for the problems of transparency. Next, it's about ensuring technological advancement and standardization. Due to the scarcity of the latest standard methodology resulting from technological growth, the open type is difficult to normalize. Still, the closed type is easy to agree and settle among participants for technical standards. Second, power and freedom will do this sort of thing. There is no clear power or dependency agency interference in the open category, but the power structure is lower than the closed type in the agreement structure. Thirdly, in the case of the closed form, the group action is often modified. AN open kind cannot change the group action recorded within the computer program and may solely be corrected by reverse commercialism. However, the closed kind is often changed by mutual agreement. In this respect, the financial sector adopts a closed distributed ledger (Yoo, 2017).

## **4.2 Blockchain's Impact on Financial Services**

Back-office management of transactions is the environment where many see Blockchain 1stever-changing the current financial services. When a financial institution offers a syndicated loan or by-product, the transaction documentation is timely and requires onerous back-office procedures. These procedures reportedly discuss contracts with different related attorneys and make contact between the parties to complete the transaction. On average, the settlement of a syndicated loan exchange would take twenty days. Those back-end exercises are expensive for financial establishments. This is often in distinction to the front-end systems' financial establishments, wherever millions are spent to realize a nanosecond of competitive advantage.

Additionally, financial establishments, because of restrictive necessities like Dodd-Frank, handling larger necessities for transparency, reporting, and knowledge dissemination. To answer these problems, they need a technical breakthrough. The innovation that can bypass these financial transactions may be Blockchain. They estimate that Blockchain will save a minimum of \$20 billion annually in the settlement, administrative, and cross-border payment rates for financial establishments.

Given this ability to turn back-end systems, Blockchain is used by many businesses and organizations aiming to be the one to fix these problems. R3, a Blockchain start-up, offers a Blockchain as a Service (BaaS) that already includes members such as Barclays, BMO money cluster, Credit Switzerland, Commonwealth Bank of Australia, HSBC, Natixis, Royal Bank of a European nation, TD Bank, UBS, UniCredit, and the metropolis of Wells, as an example. R3 hopes to conduct cash transactions in the private network of the world immediately. Banks can simulate the exchange values of money transactions through assets on the distributed ledger, Blockchain protocols of victimization. As another example, a bitcoin revolving credit has been developed by Coinbase, a serious business addressing bitcoin transactions. Victimization of the Blockchain protocols, the revolving credit is going to it is the key step in the cryptography of transactions directly to a Blockchain, eliminating most back-end costs. Goldman Sachs is also investing in the financial internet start-up Circle, which it hopes will offer an improved back-end system supported by Blockchain. This method ought to offer larger, simple Use of online and in-person purchases, combined with improved customer protection and privacy. They are collectively in the process of developing a digital currency for their needs. UBS is exploiting its London-based Level39 to demand that Blockchain be used to boost its money service desires. Sand Hill Road, Many Blockchain projects are devoted to the benefits of Blockchain, a start-up dedicated to transitioning into the modern Wall Street. The primary money service built using a Blockchain system is possibly Ripple. It provides a way to make complicated and easier cross-border payments that are formless and use a distributed global network approach. Therefore, for each settlement, money establishments currently have time delivery with certainty, contributing to any dealings' total bottom price. These are simply some numerous corporations concerned with creating changes to the money market mistreatment of Blockchain. Venture capitalists have thirstily endowed over five hundred billion in over a hundred start-ups over the past year, and this year's expectations are much higher. Blockchain will only extend and reform the financial system.

Several companies are building on the Blockchain at the organizational level. NASDAQ partners with non-public companies such as Chain to use Blockchain to issue and move the equity securities of tightly regulated firms to the exchange's non-public marketplace. They are arranging for Blockchain to exchange this paper certificates system, with a price reduction and a speed gain to get the initial public offering. From these actions, there will be some helpful effects. The efforts of these companies to stay successful must be pursued by CFOs and financial executives.

## **4.3 Application of Blockchain in Finance**

### **4.3.1 Financial Services**

A major impact on traditional financial and business services has been the emergence of Blockchain systems such as Bitcoin (Nakamoto, 2008; Hyperledger, 2015). Peters et al. The Blockchain has been discussed as having the potential to disrupt the banking world (Peters and Panayi, 2015). Blockchain can be applied to many fields, including financial asset clearing and settlement, etc. Moreover, in his articles, Morini showed that real business cases, such as financial derivatives collateralization, can exploit Blockchain to reduce costs and risks. In the eyes of major tech firms, Blockchain has also received considerable attention: IBM and Microsoft Azure are planning to include Blockchain-as-a-Service (Morini, 2016).

### **4.3.2 Enterprise Transformation**

Blockchain can help traditional organizations complete the business transition smoothly and the evolution of financial and business services. Consider the postal operators, for example (POs). Since traditional postal operators (POs) function as a simple intermediary between merchants and customers, with new financial and non-financial services, Blockchain and cryptocurrency will allow POs to expand their simple roles. Jaag and Bach discussed possibilities for POs to build Blockchain and argued that each PO should issue its post coin, a kind of Bitcoin colored coin. Because the public sees the POs as a trusted authority, post coins can prevail quickly (Jaag et al., 2016). Blockchain will make it easier for traditional organizations to complete the business transformation swimmingly, in addition to the evolution of financial and business services. Blockchain will make it easier for traditional organizations to complete the business transformation swimmingly.

### **4.3.3 P2P Financial Market**

Through a stable and efficient strategy, Blockchain can also promote the construction of the P2P financial market. To shape a P2P financial MPC (Multiparty Computation) market (Noyes, 2016), Noyes explored ways to combine peer-to-peer structures and multiparty computation protocols. The Blockchain-based MPC market allows process tasks to be discharged into a network of anonymous peer-processors.

### **4.3.4 Risk Management**

In financial technology (Fintech), the risk management system plays a major role and will currently be combined with Blockchain to perform better. Pilkington provided a risk-management system in which Blockchain is used within the Luxembourg state of affairs to study investment risk (Pilkington, 2016). Via chains of custodians who

appear to face the risk of these defaults, investors hold securities. Investments and collateral can be easily calculated with the Blockchain's help rather than surfing in the long term. Michele and Heyde indicated that a replacement system with a Blockchain would reduce the risk of custody and achieve a constant transactional security degree (Heyde, 2016). The rational Blockchain-based contract enables the Decentralized Autonomous Organizations (DAO) to communicate in business-work partnerships. An extremely reliable DAO-GaaS conflict model (Norta et al., 2015) has been planned to safeguard business-semantics-induced consistency law.

#### **4.4 Evidence from the European Banking Industry**

Before going into details with the foremost evidence from the western banking industry, it's vital to fret the role that geographical areas play in promoting Blockchain (and the most important in general Fintech) startup and company developments (Rega et al., 2014).

While discussing Blockchain technology developments and implementations, geographical variations typically arise because of the level of investments (and, by consequence, the number of users and developers) who disagree a great deal between the different regions. During this sense, the United States of America market was the pioneer for Blockchain-based startups largely as a result of the primary developments of such technology (cryptocurrency in most of the cases) came from that region (the renowned example of bitcoin as a response to the 2008 financial crisis(Rega et al., 2014).

However, the competitive advantage regarding investments and setting that the American landscape had within the first years has been recently reduced by the rise of Chinese Fintech firms, even due to a definite set of laws that created the proper scheme to permit Blockchain-based startups to grow with no legal restrictions.

This section will specialize in the western space of the globe, attempting to explain the state of Blockchain implementations within the European and American banking system. Most cases on this analysis can focus on the area unit: We Trade first successful Blockchain-based transaction, Santander new Blockchain-based payment system (One Pay), the IBM Blockchain platform Batavia, the BBVA, and Indra new Blockchain-supported Company loan (Rega et al., 2014).

#### **4.4.1 We. Trade**

Initially named Digital Trade Chain, We. Trade may be a Blockchain-based trade platform born in 2017 from a syndicate of 9 Banks (Deutsche Bank, Rabobank, HSBC, Natixis, Nordea, KBC, Santander, Societe Generale, and UniCredit) whose primary objective was to achieve this goal were supplied a lot of straightforward cross-border trade. The benefits of employing us. Trade platform for a firm is enormous:

- It offers a sturdy KYC interface (with identification of unknown counterparts) because the platform users provide their knowledge, so we tend to trade.
- A true-time settlement occurs because of the unique platform that each of the parties concerned within the trade. Real-time settlements will cut back delaying, and also the price related to the management of the invoices.
- Because of the intelligent contract primarily based system, the delivery versus payment (DVP) or alternative standard settlement practices mechanically triggered.
- Continuous track and trace of the products bought/sold that tracked on the Blockchain; we tend to. Trade is not solely a platform to subsume financial tasks. However, it's additional, just like one online search area where corporations will manage all their trade processes from the start to manage all their trade processes in a rapid and automatic means. We. Trade was designed on the IBM Blockchain platform and, up to date, has with success completed seven trade transactions across five countries (Rega et al., 2014).

#### **4.4.2 One Pay**

Based on Ripple's xCurrent distributed ledger technology, One Pay FX is an application that permits Santander's customers to method real-time (same day) international payments in numerous currencies. The advantages arising from the utilization of one Pay are not solely the reduction of prices and magnified speed, however additionally the chance for the purchasers to grasp the precise quantity which will be received within the destination currency (so exchange rates and group action fee) before they create the transfer (Rega et al., 2014).

The benefits that One Pay provides to Santeder's customers are mainly three:

- The chance to possess one and clear summary of the dealings, as well as exchange rates, prices, and bank fees
- A delivery time quote for improved transparency
- A receipt of payment for complete certainty



According to the Santander cluster president, Ana Botín, 50% of the bank's overall international transactions can be coated by One Pay (TEAM RIPPLE, 2018). Moreover, the number of nations during which this service is accessible (Spain, UK, Brazil, and Poland) are going to be enlarged because of the quality and also the variety of services (the objective is to succeed in intraday dealings even for cross border payments) (Rega et al., 2014).

#### **4.4.3 Batavia**

Batavia is a world trade finance platform developed by five banks (UBS, Bank of the urban center, CaixaBank, and Commerzbank) on the IBM Blockchain platform. This platform, developed by IBM (which is additionally a part of Hyperledger, a UNIX systems foundation project) and this allows all banks to permit all the elements concerned in trade to possess a complete summary continuously over documentation, KYC, track of the orders, and security of payments. In step with IBM9, the typical quantity of time to deal with a trade (end to finish process) is seven days. This is because of the number of documents that each of the parties concerned ought to receive (regulators too, the waiting time for payments, and the receipt of invoices. With Batavia, now it will be reduced to one hour. This tremendous improvement is because of the one distributed ledger that the platform shares with the parties concerned and the intelligent payments (triggered by sensible contracts) that come about once the products are shipped (Rega et al., 2014).

This approach to trading merchandise and services will bring variant advantages not solely to the banking system (with fewer paper documents, therefore, the certainty of payment dates) to the trading chain as a full (Rega et al., 2014). To sum up, the most advantages that Batavia guarantees to its customers are the following:

- Elimination of invoices and waiting time for payments, as these actions are performed on the Blockchain and triggered automatically.
- One online tool wherever all the parties will read wherever the products are, where they are.
- Elimination of uncertainty. In terms of shipping and payments, the Batavia platform was with success tested an epitome. Currently, the pool is specializing in a production-ready answer to sell within the market.

#### **4.4.4 Considerations**

An extensive range of interest sustains the efforts to develop Blockchain resolution within the world. It is interesting to note that banks do not operate by themselves almost all the days but rather attempt to act in the cluster (consortia) and share investments and data. This is often a key point: with Blockchain, however, a lot of generally with Fintech innovations, banks are forced to open themselves due to the

added within the method is higher if the network over which the Blockchain works is massive. In this sense, money intermediaries will provide expertise in collaboration instead of competition, whereas developing such solutions (Rega et al., 2014).

To create standards (that rely on the project's success), banks ought to produce giant consortia and embody an extensive range of users to succeed in the most comprehensive range of consumers doable. The trend in Europe and the North American nation looks to give place to the present reasonable collaboration. Such platforms' 1st results are giving credits to the current model (Rega et al., 2014).

## **4.5 Evidence from the Chinese Banking Industry**

### **An outline of the Development of Blockchain Technology in China:**

In February 2016, the People's Bank of China determined to issue "digital currency," supported the analysis of the event trend of the world Blockchain and China's Blockchain and application trend. In Gregorian calendar month 2016, the Chinese Government and also the enterprise's connected block chain together publicized The report on the event of the Blockchain in China and Application Development of the Ministry of Industry and information, supported the analysis and judgment on the event trend of the world Blockchain, and also the current state of affairs and direction of the event of the Blockchain and application in China and relevant suggestions regarding round the support policy, the technological breakthrough and also the platform construction and even the application demonstration. The info Blockchain has been written into the 13th Five-Year plan by the State Council. Meanwhile, in 2017, the encrypted digital currency market's total asset is hyperbolic by 30 % (Rega et al., 2014).

However, to guard off the speculators and stop criminal mistreatment of the Blockchain, the China Banking restrictive Commission and also the China Securities restrictive Commission have determined to forbid ICO (Initial Coin Offering) to stop it from inflicting confusion within the investment market. However, it conjointly ends up in the outflow of skills and related funds (Rega et al., 2014).

According to the "The Analysis Report on Blockchain trade of China in 2018", China has entered from Blockchain a 2.0 technology to Blockchain 3.0 technology<sup>10</sup>, that involves three industries, as well as the underlying technology and infrastructure, general application and technology extension, vertical trade application then on and involves quite ten vertical sectors. According to incomplete statistics, there quite 47 enterprises within the vertical industries application, as well as 24 enterprises in

money field, 14 in digital currency field, 4 in offer chain management, 2 in the Internet of Things, 3 in energy service, 5 in the medical field, 5 in legal assistance, 13 in cultural recreation, and 4 in the social field(Rega et al., 2014).

Besides, the three recent web corporations, Alibaba, Tencent, and Baidu, have created an outsized quantity of efforts in learning the event and application of Blockchains. For instance, in Apr 2017, Alibaba originated the primary Blockchain industrial zone termed Blockchain depression in the city headquarters. In the Gregorian calendar month 2018, IPRdaily, the media of intellectual property, issued The Rankings of Patent in international Blockchain Enterprises of 2017, within which Alibaba has 49 patents and ranks No. One within the international Internet corporations. In November 2017, at Tencent's international partnership conference, the finance-level answer of Tencent cloud formally was issued by the BaaS (Blockchain as a service). The answer that relies on recent financial Cloud and integrates payment, social network, the media network, credit platform and different advanced sources in sectors can give safe, reliable, and versatile Blockchain service for financial purchasers within the fields of intelligent contracts, mutual insurance, giant knowledge group action, and group action, provide chain and also the management of provide chain, cross-border payment/liquidation/audit. Beneath the state of affairs provides a secure, reliable, and versatile Blockchain service for financial users. In the Gregorian calendar month 12, 2018, Baidu launched the open platform of BaaS (Blockchain as a Service), named “Baidu Trust,” which has the best options of “openness” and “customization” (Rega et al., 2014).

Also, it's worthy of specializing in the perspective of the state-owned banks headed by the People’s Bank of China to the Blockchain (Rega et al., 2014)

#### **4.5.1 The People’s Bank of China (Central bank)**

In 2016, the block-chain analysis institute was formally established in the center printing zone and commenced to review digital currency and Blockchain. Up to now, supported Blockchain of digital bills platform, the Center Bank has with success dispensed experimental production within the price ticket exchange and declared the Blockchain Registration Open Platform (BRPOP) successful institution in March 2018. Therefore, the analysis cooperation in connected fields with Tencent and IBM has been achieved (Rega et al., 2014).

#### **4.5.2 Industrial and Commercial Bank (ICBC)**

The Industrial and Commercial Bank of China (ICBC) unveiled a white paper on Blockchain technology applications in finance, the first of its kind in the banking sector. In the case of ICBC, which set up a special Blockchain research team in 2016,

the bank said it had explored in recent years the integration of Blockchain technology into artificial intelligence (AI), big data, 5G. In the middle of the fight against the coronavirus epidemic and a simultaneous push for work resumption, the bank also launched Blockchain-based services to track fund flows. According to ICBC, the services are now up and running on the Red Cross Society of the Guangxi Branch of China and the Zhuhai Charity Federation and will be offered gradually to domestic colonies and charity institutions (Global Times, 2020).

#### **4.5.3 Agricultural Bank of China (ABC)**

The Agricultural Bank of China (ABC), one of the world's largest banks with total assets, completed the issuance of a loan worth \$300,000 by using a Blockchain system as it tested the technology for the first time. Blockchain is deployed to facilitate the process through various node partners such as other commercial banks, the People's Bank of China provincial branch, and the Land Bank of China (Coinwire, 2020).

The bank said that the tamper-proof Blockchain could streamline the manual process of loan approval by having a distributed ledger to keep parties updated with browser data and their collateral, eliminating the double-spending problem in which borrowers using the same piece of land as collateral apply for loans from different banks (Coinwire, 2020).

#### **4.5.4 Bank of China (BC)**

In Jan 2017, the Bank of China launched the primary Blockchain electronic wallet (BOCwallet) APP, consisting of 32 numbers and English letters and may bind the charge card numbers. In August of a similar year, the Bank of China, SWIFT organization, and therefore, the international banks joined the SWIFT GPI Blockchain proof of the idea (POC) to promote finance applying within the SWIFT GPI project. Meanwhile, the Bank of China also actively cooperated with Alibaba, Tencent, and different leading enterprises in the net. It can still perform in-depth analysis on electronic note cases, financial transactions, and Blockchain (Rega et al., 2014).

#### **4.5.5 China Construction Bank (CCB)**

Compared to different banks, China Construction Bank features a wider vary of analysis areas, involving insurance, international resolution, foreign trade credit, commerce, and finance et al. And with the openness and promotion of “The Insurance Platform of Blockchain” in Hongkong, it provided service for retails and business banking service through the cooperation with IBMT in September 2017. At an equivalent time, it's the initial completion of the “Fablock Eco” that clients and factoring commercial banks and others will directly participate. And through the Blockchain, the cross-bank and cross-border domestic L / C and international factoring applications have been completed. The additive business quantity has

accumulated to 1600 million yuan, covering 20 domestic and foreign establishments (Rega et al., 2014).

## 5 Research Methodology

The author elaborates on the research methodology conducted in this research. First, the researcher describes the analysis methodology, data, and information acquisition, information analysis and presents an outline with reflections upon the method. Mixed-methods research is used in this research; it was qualitative and quantitative data collection. See Figure 15.

Figure 15: Methodology Design



(Source: Own representation)

### 5.1 Research Design

This exploratory research has two goals. The first part explains and explores the Blockchain concept; this part of the research is a descriptive approach. It studies Blockchain technology regarding the concept and the mechanism of action in addition to many characteristics. Write more points that you handled in the theory part. The second part is the practical approach that focuses on the effect of Blockchain on the Palestinian banking sector, where it was adopted. The practical approach consists of the Quantitative approach (Questionnaire) for the banking industry in Palestine and the Expert Interview (Qualitative approach) for the banking industry and its ecosystem. The researcher used both interviews and questionnaires. Based on the interview, some information was missing from the interviewees, so the questionnaire referenced the information that the interview or the bank intends to be authorized. The second reason is that some banks want to provide us with statistical and technological data.

The questionnaire consists of 21 questions. Two are closed questions (yes and no questions), 19 are open questions. All the questionnaire's open questions were mainly focusing on the following: information about the interviewees, information about the bank, Blockchain technology in Palestine, Blockchain technology, and the ecosystem. The bank's questions focused on the bank's infrastructure, business model, advantages, disadvantages, bank's plans, and if it can be applied in banks. The

questions about Blockchain technology in Palestine were focused on the obstacles in Palestine, banks that have implemented it, and the bank's perspective about Blockchain technology during the next five years. The questions about Blockchain, in general, focused on the international companies that started applying Blockchain technology like Amazon and Visa. The questions about the ecosystem described the current system and how it will be after five years.

The research aims to highlight the potential role that Blockchain technology can play in the Palestinian banking sector. To do so, I used expert interviews and a questionnaire. The population is the sample for the quantitative approach since it is small and manageable, namely the 13 Palestinian banks and The Palestinian Monetary Authority. Geographically the banks are distributed among all the country's governorates, but the central administration exists in Ramallah for all of them.

The interviews were with 13 banks (one bank abstain for interview meeting and full questionnaire). 12 Banks (nine face to face and two through zoom). Three meeting interviews were with the Palestinian Monetary Authority (one face to face and two through zoom). Two startup companies were through zoom. The interviewee's gender consists of 2 females and 16 males. Most of them are directors and members of the bank's information technology department. Moreover, their work experience in the banking sector ranged between 15-30 years of experience, and most of them their degree is a master. The interview duration is about 30-1:75 minutes according to their possibility of applying Blockchain technology in the bank and if it includes their strategic plans or not.

Table 6: Type of Interviews

Type of Interview	Number
Face to face	11
Zoom interviews	8

(Source: Own representation)

## 5.2 Data Collection

What involves qualitative case study - By combining data sources and methods, data will be gathered in many different ways. This means that a phenomenon will not only examine multiple lenses via one lens. For example, interviews, documentation, direct observations, physical artifacts, and participant observations may well be sources of knowledge. However, the collection of overwhelming amounts of data is a risk because it would become too difficult to organize and manage (Baxter and Jack, 2008).

For this research, interviews are the methodology for the data assortment, as they help to understand people's opinions on the matter and therefore answer the research questions. Semi-structured interviews are used as the main methodology for data assortment during this study. Additional broad information can be extracted from individuals who work in the department and are associated with Blockchain technology.

Essentially, an interview is a conversation between 2 people, and the amount of data generated will be considered depending on the duration. Semi-structured interviews consist of a transparent. However, the interviewee's list of questions that must be clear, placement, phrasing, and structure is adjustable (Draper and Swift, 2011), which is advantageous for this research in comparison to structured interviews (short answers) and the unstructured interviews (open questions and discussions) (Draper and Swift, 2011).

### 5.3 Data Analysis

The underlying basis is that to perform high standard qualitative analysis. The researcher should be ready to perceive the collected data. The thematic analysis used in this study is the fundamental method for qualitative analysis, according to Braun and Clarke (2006). Leininger (1985) states that the area unit of themes discovered by combining parts or particles of concepts or experiences is typically meaningless once checked out separately.

### 5.4 Population and Sample

The population covered most banking industry in Palestine, which are 13 banks. In addition to some related industries that may use Blockchains like PMA and IT's companies.

Table seven lists the banks, interviewees, positions, date, and the duration of each interview.

Table 7: The List of Banks

#	Bank Name	Interviewees	Position	Duration (hh:mm)	Date	Media
1	Bank of Palestine	Mr. Hassan Afifi	Director of Operations and Information Technology	01:12	14-06-2020	Zoom meeting



#	Bank Name	Interviewees	Position	Duration (hh:mm)	Date	Media
2	The National Bank	Mr. Basem Naser	Manager of Banking Operations/System Development	00:40	05-08-2020	Face to Face
3	Al-Quds Bank	Mr. Alaa Al-Titi	Director of Information Technology Department	01:05	11-05-2020	Zoom meeting
4	Arab Islamic Bank	Mr. Mustafa Abu Khaizran,	Director of the Networks and Systems Department	01:01	11-06-2020	Face to face
5	Palestinian Islamic Bank	Mrs. Shireen Yaseen	Deputy Director of Information Technology	01:15	11-08-2020	Face to face
6	Palestine Investment Bank	Mr. Abed Al-Raheem	Director of the Information Systems Department	00:40	15-06-2020	Face to face
7	Safa Bank	Mr. Ahmad Jaber	Security Supervisor	01:08	29-06-2020	Face to face
8	Arab Bank	<b>Abstain</b>				
9	Cairo Amman Bank	Mr. Jamal Okal	E-channel section supervisor	00:30	15-06-2020	Face to face
10	The Housing Bank of Trade	Mr. Ishaq Sarhan	Director of the Systems Department	00:30	03-06-2020	Face to face

#	Bank Name	Interviewees	Position	Duration (hh:mm)	Date	Media
	and Finance					
11	Bank of Jordan	Mr. Shadi Samara	IT Manager	00:30	24-06-2020	Face to face
12	Jordan Ahli Bank	Mrs. Iman Hannoun	Director of the Electronic Channels and Telephone Services Division	00:23	08-06-2020	Face to face
13	Egyptian Arab Land Bank	Mr. Abed Hijazi	Head on Information Technology Department	00:52	01-08-2020	Zoom
14	IFSCS	Mr. Raed Mikkawi	Co-founder CS Financial Systems	00:37	15-08-2020	Zoom
15	PMA	Mr. Hatem Hamdallah	Payment Systems Manager	1:10	20-06-2020	Zoom
16	PMA	Mr. Anwar Al-Rimawi	An employee in the Information Technology Department	00:33	03-05-2020	Zoom
17	PMA	Mr. Fares Al-Hindi	Deputy Director of Information Technology	00:46	15-10-2019	Face to Face
18	Piti	Mr. Mahmoud Al-Betawi	Chairman of the Fintech	00:53	06-05-2020	Zoom

#	Bank Name	Interviewees	Position	Duration (hh:mm)	Date	Media
			Committee in Piti Co-founder ASD			

(Source: Own representation)

## 6 Results and Analysis

This chapter analyzes the interviews using thematic analysis to answer the main question for this thesis. The researcher will analyze 17 expert interviews in addition to the questionnaire to see the technological situation of banks in Palestine in terms of the infrastructure, business model, the advantages and disadvantages of the banking sector, the obstacles that they will face to apply this technology in Palestine, the readiness of banks to implement them and what their plans, if any Teams specializing in this technology, and finally obtaining the answer to the main question of the study, will Blockchain technology disrupt the banking industry? In the sense of how Blockchain technology will disrupt the local banking industry.

### 6.1 Thematic Analysis Phases

#### Phase 1: Familiarizing yourself with your data

During the first phase, the researcher starts to familiarize data. And listen to audio recording and transcript for interviews and taking notes

Figure 16: Sample of Interview

Blockchain technology relies on The Palestinian Monetary Authority. The Palestinian Banks cannot use this technology without reference Palestinian Monetary Authority which must be the first one to legalize using it or not because there are many restrictions in Palestine and the occupation impact. The technology will be discussed during the coming period. Still, it needs intensive requirements to launch it in terms of infrastructure and procedures in the country and require expertise and high financial costs.

Bank A has not applied this technology even now because of its lack of widespread in the banking sector and the absence of legislation governing this technology to be properly and properly exploited.

However, since any data that can be traded can be used as Blockchain technology and under strict confidentiality, some banking works can be employed through this technology or any other business if international or local legislation is governing

it. There is a risk about currency and investment in the cryptocurrency field because there is nothing that protects the value of this currency. Still, it is surprising that China uses it and all its dealings in Bitcoin. There are big fears regarding money laundering. Also, its value can change any time if I have a balance in the Bitcoin, and it suddenly decreases. How will I maintain my financial situation and the conditions of customers?

It is currently possible to provide electronic banking services with a more widespread, accepted and reliable party from our customers without going to such technologies now under the above reasons.

(Source: Own representation form of data collection)

### Phase 2: Generating initial codes

At this stage, the researcher initially generates codes, the data must be systematically coded, and the largest number of possible symbols and topics collected. After that, the researcher collects the data the continues the same symbols together.

Figure 17: A Sample of Generating Codes from the Interview

Data	Codes (Initial)
<p>Blockchain technology relies on The <b>Palestinian Monetary Authority</b>. The Palestinian Banks cannot use this technology without reference Palestinian Monetary Authority which must be the <b>first one to legalize using it</b> or not because there are <b>many restrictions</b> in Palestine and the <b>occupation impact</b>. The technology will be discussed during the coming period. Still, it needs <b>intensive requirements</b> to launch it in terms of <b>infrastructure</b> and procedures in the country and <b>require expertise and high financial costs</b>.</p> <p>We have not applied this technology even now because of <b>its lack of widespread in the banking sector</b> and the <b>absence of legislation governing</b> this technology to be properly and properly exploited.</p> <p>However, since any data that can be traded can be used as Blockchain technology and under <b>strict confidentiality</b>, some banking works can be employed through this technology or any other business if international or local legislation is governing it. There is a risk about currency and investment in the cryptocurrency field because there is nothing that protects the value of this currency. Still, it is surprising that China uses it and</p>	<p>Regulator</p> <p>Legalize</p> <p>Restrictions</p> <p>Occupation</p> <p>Requirement</p> <p>Infrastructure</p> <p>Expertise</p> <p>High cost</p> <p>Lake</p> <p>widespread</p> <p>Legislation</p>

<p>all its dealings in Bitcoin. There are big fears regarding money laundering. Its value can change any time if I have a balance in the Bitcoin, and it suddenly decreases, how I will maintain my financial situation and the conditions of customers.</p> <p>It is currently possible to provide electronic banking services with a more <b>widespread</b>, accepted and reliable party from our customers <b>without having to go</b> to such technologies now under the above reasons.</p>	Risk
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(Source: Own representation form of data collection)

### Phase 3: Searching for a Theme

At this point, after generate a long list of different codes. This stage is focused on the broader level of themes and involves sorting the different codes into potential themes.

Figure 18: Codes and Themes

	Codes	Codes Coding	Theme	Description
1	<ul style="list-style-type: none"> <li>* No knowledge about Blockchain</li> <li>* Included in future strategic plans</li> <li>* Included in the Vision</li> <li>* knowledge about Blockchain</li> </ul>	<ul style="list-style-type: none"> <li>No awareness (0)</li> <li>Awareness (1)</li> <li>Vision (2)</li> <li>Strategy (3)</li> </ul>	<ul style="list-style-type: none"> <li>Top Management</li> <li>commitment</li> <li>Readiness</li> </ul>	How much they are involved and have the vision and the strategy for the BC technology
2	<ul style="list-style-type: none"> <li>* Current employees with BC experience</li> <li>* Training for employees on BC</li> <li>* Hiring employees are specialized in BC</li> </ul>	<ul style="list-style-type: none"> <li>Training for Blockchain (1)</li> <li>Hiring potential for IT specialist in BC (2)</li> <li>Availability of IT specialist (3)</li> </ul>	<ul style="list-style-type: none"> <li>Human Capital</li> <li>Readiness</li> </ul>	Readiness for human capital to start Blockchain
3	<ul style="list-style-type: none"> <li>* Inclination for investment in BC technology</li> </ul>	<ul style="list-style-type: none"> <li>Not Ready to invest (1)</li> <li>To some extent, wants to invest (2)</li> <li>Ready to invest (3)</li> </ul>	<ul style="list-style-type: none"> <li>Investment</li> <li>Readiness</li> </ul>	The bank's readiness to acquire the technical requirement in Blockchain
	<ul style="list-style-type: none"> <li>* Technical requirement for banks to applying Blockchain</li> </ul>	<ul style="list-style-type: none"> <li>Software (1)</li> <li>Hardware (2)</li> <li>Open-source (3)</li> </ul>	<ul style="list-style-type: none"> <li>Technical</li> <li>Readiness</li> </ul>	Technical requirements

Codes	Codes Coding	Theme	Description
			to applying BC
4	<ul style="list-style-type: none"> <li>* High cost to change current banking systems</li> <li>* regulation approval to start working on Blockchain</li> <li>* high quality and fast internet</li> </ul>	Internet availability (1) Internet technology 3G (2) Regulation (3) High cost for upgrading available infrastructure (4)	Infrastructure readiness  What are the main challenges for infrastructure in banking
5	<ul style="list-style-type: none"> <li>* Do not have a partner</li> <li>* SWIFT</li> <li>* Other banks applying Blockchain</li> </ul>	No partner motivator (0) Partner motivator (1)	Partners with BC technology  Partner for bank applying BC
6	<ul style="list-style-type: none"> <li>* Lack of experience in Blockchain technology</li> <li>* Lack of research in Blockchain in Palestine</li> <li>* Political situation</li> </ul>	Experience (1) Research (2) Political situation (3)	Challenges and Limitations  Challenges and limitations for applying Blockchain in banking
7	<ul style="list-style-type: none"> <li>* Faster transactions</li> <li>* Lower fees transaction</li> <li>* Better tracking</li> <li>* More security</li> </ul>	Faster transactions (1) Lower fees transaction (2) Better tracking (3) More security (4)	Benefits for the bank  Challenges and added value for applying Blockchain in banking
8	<ul style="list-style-type: none"> <li>* Customer in applying the new technology.</li> <li>* Bank does not realize this effect (not important)</li> <li>* Bank consider it somehow</li> <li>* Bank sees it as a great advantage</li> </ul>	Not important (0) somehow important (1) Great advantage (2)	Customer Experience (UX) as seen from the bank  How important is customer experience for the banks?
9	<ul style="list-style-type: none"> <li>* Regulation restriction</li> <li>* PMA very conservative</li> <li>* Avoid the high risk of money loss</li> </ul>	No Regulations (0) lack regulations (1) regulations are very conservative in BC (2)	Regulations readiness  Regulators restriction for apply BC in Bank

Codes	Codes Coding	Theme	Description
<b>10</b> * Money transfer * Smart contracts * Cryptocurrency * Swift * No use case possible	No use case possible (1) Money transfer (2) Smart contracts (3) A cryptocurrency (4) Swift (5)	Use cases	In which department can applying Blockchain in banks
<b>11</b> * Using of Blockchain in current banks system	No (0) Yes (1)	Already using Blockchain technology	Using Blockchain Technology
<b>12</b> * Ecosystem is not there to support * very few initiatives, if any, exist that implement Blockchains * Ecosystem has to be created to support the stakeholders	Not Ready (0) somehow ready (1) ready (2)	Ecosystem readiness	Is ecosystem ready for applying Blockchain
<b>13</b> * I do not see any potential for BC technology to be implemented in the coming years * BCs will be part of the banking system in the few coming years * It is already there, and we have to deal with it	Above ten years (0) 5-10 years (1) 1-5 years (2) Less than one years (3)	The potential use of BCs in local banks	After how many year banks can start working on Blockchain

(Source: Own representation from data collection)

#### Phase 4: Banks Rating

In this section, the researcher will evaluate banks according to our interview with each bank and the questionnaire they fill, see Table eight. That view the scale for banks that using criteria or ready to use these.

Table 8: The Evaluation of the Banks' Themes

	Theme/ Criteria	Level of scale		BOP	TNB	Ahli	Housing	Arab Islamic	Palestine Islamic	EA LB	Jord an	Safa	AL- Qud s	Inv est me nt	Ca rio	
1	Top Management Readiness	No awareness	+0			✓	✓	✓	✓	✓	✓	✓			✓	
		Awareness	+1	✓	✓									✓		
		Vision	+2	✓	✓										✓	
		Strategy	+3													
2	Human Capital Readiness	No training and specialized	+0	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
		Training for Blockchain	+1													
		Hiring potential for IT specialist in BC	+2													



	Theme/ Criteria	Level of scale		BOP	TNB	Ahli	Housing	Arab Islamic	Palestine Islamic	EA LB	Jordan	Safa	AL- Quds	Investment	Carrio	
		Availability of IT specialist	+3										✓			
3	Benefits for the bank (This scale level is added)	Faster transactions	+1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		Lower fees transaction	+2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		Better tracing	+3													
		More security	+4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	Initiate Using of Blockchain	No	0	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
		Yes	1										✓			
5	Years needed to start using Blockchain in banking	Above ten years	1													
		5-10 years	2	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	
		1-5 years	3													

	Theme/ Criteria	Level of scale		BOP	TNB	Ahli	Housing	Arab Islamic	Palestine Islamic	EA LB	Jord an	Safa	AL- Quds	Inv est me nt	Ca rio
		Less than one years	4		✓								✓		
6	Use cases (This scale level is added)	No use case possible	+0												
		Money transfer	+1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Smart contracts	+2												
		Cryptocurr ency	+3												
		Swift	+4												
7	Customer Experience (UX) as seen from the bank	Not important	0												
		May important	1												
		Great advantage	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

	Theme/ Criteria	Level of scale		BOP	TNB	Ahli	Housing	Arab Islamic	Palestine Islamic	EA LB	Jordan	Safa	AL- Quds	Investment	Carrio	
8	Investment Readiness	Not ready to invest	0			✓	✓	✓	✓	✓	✓	✓			✓	
		To some extent wants to invest	1	✓	✓									✓	✓	
		Ready to invest	2													
9	Technical Readiness	Software	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		Hardware	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Open- source	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
11	Partners with BC technology	No partner motivator	0	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
		partner Motivator	1											✓		

	Theme/ Criteria	Level of scale		BOP	TNB	Ahli	Housing	Arab Islamic	Palestine Islamic	EA LB	Jordan	Safa	AL- Quds	Investment	Carrio	
11	Regulations readiness	No Regulations	0													
		lack regulations	1													
		regulations are very conservative in BC	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
12	Ecosystem Readiness	Not Ready	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		somehow ready	1													
		ready	2													

(Source: Own representation from data collection)

+ number adds up

In this section, the researcher will evaluate banks according to numerical scale to see banks' readiness to implement Blockchain, see Table nine. That view the scale for banks that using criteria or ready to use these.

Table 9: Numerical Scale

	Theme/ Criteria	Level of scale		BOP	TNB	Ahli	Housing	Arab Islamic	Palestine Islamic	EA LB	Jord an	Safa	Qu ds	Inve st ment	C ari o
1	Top Managemen t Readiness	No awareness	+ 0			0	0	0	0	0	0	0			0
		Awareness	+ 1	1	1									1	
		Vision	+ 2	2	2									2	
		Strategy	+ 3												
2	Human Capital Readiness	No training and specialized	+ 0	0	0	0	0	0	0	0	0	0		0	0
		Training for Blockchain	+ 1												
		Hiring potential for IT specialist in BC	+ 2												
		Availability of IT specialist	+ 3										3		

	Theme/ Criteria	Level of scale		BOP	TNB	Ahli	Housing	Arab Islamic	Palestine Islamic	EA LB	Jordan	Safa	Qu ds	Inve st ment	C ari o	
3	Benefits for the bank  (This scale level is added)	Faster transactions	+ 1	1	1	1	1	1	1	1	1	1	1	1	1	
		Lower fees transaction	+ 2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Better tracing	+ 3													
		More security	+ 4	4	4	4	4	4	4	4	4	4	4	4	4	4
4	Initiate Using of Blockchain	No	0	0	0	0	0	0	0	0	0	0		0	0	
		Yes	1										1			
5	Years needed to start using Blockchain in banking	Above ten years	1													
		5-10 years	2	2		2	2	2	2	2	2	2		2	2	
		1-5 years	3													
		Less than one years	4		4								4			
6	Use cases (This scale	No use case possible	0 +													

	Theme/ Criteria	Level of scale		BOP	TNB	Ahli	Housing	Arab Islamic	Palestine Islamic	EA LB	Jord an	Safa	Qu ds	Inve st ment	C ari o
	level is added)	Money transfer	+ 1	1	1	1	1	1	1	1	1	1	1	1	1
		Smart contracts	+ 2												
		Cryptocurre ncy	+ 3												
		Swift	+ 4												
7	Customer Experience (UX) as seen from the bank	Not important	0												
		May important	1												
		Great advantage	2	2	2	2	2	2	2	2	2	2	2	2	2
8	Investment Readiness	Not ready to invest	0			0	0	0	0	0	0				0
		To some extent wants to invest	1	1	1								1	1	

	Theme/ Criteria	Level of scale		BOP	TNB	Ahli	Housing	Arab Islamic	Palestine Islamic	EA LB	Jordan	Safa	Qu ds	Inve st ment	C ari o	
		Ready to invest	2													
9	Technical Readiness	Software	1	1	1	1	1	1	1	1	1	1	1	1	1	
		Hardware	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Open source	3	3	3	3	3	3	3	3	3	3	3	3	3	3
11	Partners with BC technology	No partner motivator	0	0	0	0	0	0	0	0	0	0		0	0	
		partner Motivator	1											1		
11	Regulations readiness	No Regulations	0													
		lack regulations	1													
		regulations are very conservativ e in BC	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12		Not Ready	0	0	0	0	0	0	0	0	0	0	0	0	0	



Theme/ Criteria	Level of scale		BOP	TNB	Ahli	Housing	Arab Islamic	Palestine Islamic	EA LB	Jord an	Safa	Qu ds	Inve st ment	C ari o
Ecosystem Readiness	somehow ready	1												
	ready	2												
<b>Total</b>			<b>24</b>	<b>26</b>	20	20	20	20	20	20	20	28	24	20

(Source: Own representation from data collection)

### Phase 5: Producing the report

Based on expert interviews to answer the research questions and to measure the readiness of banks to start implementing Blockchain technology, the researcher used thematic analysis for interviews, a 12 theme was used for analysis, and results as follows:

#### Vertical analysis

- Bank Al-Quds get the highest rating of 28 points, according to our analysis. The National Bank scores the second rating of 26 points, Bank of Palestine and the Investment Bank rank on the third rating with 24 points. These banks can adapt easier to Blockchain technology. However, they have to work on developing the technology. The rest eight banks achieved 20 points rating, which indicates that these banks did not yet invest in the Blockchain technology and are expected to have more difficulty adapting to the technology at this time.
- Knowledge from Blockchain technology senior management that most banks did not include the strategic plan and the Blockchain technology vision as a small category. (The top management of the eight banks did not reflect any inclusion for the technology at the awareness level, in their vision, as well as in their strategic plans).

- As for Human Capability, most banks do not have Blockchain personnel or trained personnel. Only Al-Quds Bank has trained their Software employees(Eleven banks did not train their employees).
- All banks are aware of the importance of Blockchain technology as the transaction is faster, less cost per transaction, and safer.
- All Palestinian banks do not use Blockchain technology. The only bank that is currently using Blockchain technology is Al-Quds Bank.
- Most Palestinian banks experts prospected that the bank sector in Palestine could apply Blockchain technology after 5-10 years. In contrast, The National Bank and Al-Quds Bank are capable of using the technology in less than five years.
- All the banks think we can use Blockchain technology in the remittance system.
- All banks need technical changes in the current system to apply technology (software and hardware). (All banks need technique requirement (software and hardware)
- All banks reported that the only major project to initiate technology was the Monetary Authority. (All banks address that there is a restriction from regulatory)
- All banks reported that there was no current Ecosystem for Blockchain technology in Palestine.
- Ten from banks expects that 5-10 years needed to initiate Blockchain
- All banks address that Blockchain will provide a great customer experience
- All banks have the same threat and challenges for implementing Blockchain in Palestine base on Palestine situation and capability

### Horizontal analysis

- Blockchain not included in Strategic plan for banks in the next five years
- Regulator conservative in using Blockchain
- The ecosystem not ready yet to start to implement Blockchain technology
- The experiences, political situation are challenges that face banking for implementing Blockchain
- High-cost infrastructure requirement to adapted Blockchain

### Threats for applying Blockchain

All banks have the main threats and challenges to applying Blockchain. The main factor is infrastructure and other challenges like a lack of expertise, researcher, and Political satiation. Table 10 view the scale for each bank for these threats and challenges.

Table 10: Threats and Challenge

	Theme/ Criteria	Level of scale		BOP	TNB	Ahli	Housing	Arab Islamic	Palestine Islamic	EALB	Jordan	Safa	Quds	Investment
1	Infrastructure Readiness	Internet availability	- 1								✓			

		Internet technology 3G	- 2							✓			
		Regulation	- 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		High cost for infrastructure	- 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	Challenges and Limitations	Experience	- 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Research	- 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Political satiation	- 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

## **6.2 Ethical Considerations**

To effectively address ethical considerations in this thesis, the researcher must be mindful of all the research activities and tell interviewees about the nature and purpose of the thesis to ask for permission before recording interviews. Besides, share a high-level description of the research subject. The information would be used only for scientific research purposes, and that the privacy of the information would be preserved. The interviewees must be provided with advanced knowledge.

Also, they have the right not to answer any question they don't want to answer. They must make the data collection process ethical. They can withdraw from the interviews and choose not to respond to specific questions. The research explained the type of information and guaranteed that the data would not be exchanged in any way.

## **6.3 Validity and Reliability**

Cross-checking can achieve validity in qualitative research (Cohen et al., 2007). Qualitative validity of study means that research is accurate and reliable (Johnson & Christensen, 2009).

Significant quantities of text are covered for quality analysis. Therefore, validity cannot be measured in qualitative research based on quantitative principles used in quantitative research. Other approaches for validating qualitative research can instead be pursued. The triangulation procedure is one of the most important methods for obtaining qualitative research validity, according to Hair, Money, Samouel & Page (2011). In qualitative studies, it is possible to adopt four forms of triangulation (Denzin, 1978; Patton, 1999):

- Triangulation analysis involving several researchers examining and interpreting the collected data.
- Data triangulation involving the compilation and comparison of data from different sources of data.
- Method of triangulation, which includes various forms of analysis and comparison of the results.
- Triangulation theory requires analyzing and recognizing data using various theories.

In this research, the researcher followed a data triangulation approach to validate the research findings; by cross-checking the collected data with relevant literature findings.

## 6.4 Will Blockchain Disrupt the Banking Industry

This research's main objective was to To what extent will Blockchain technology disrupt the banking industry in Palestine? According to previous literature on Blockchain technology was consulted, interviewing and analysis conducted to answer this question.

The world of banking, as we know for many years, is in a fundamental transformation process, triggered by new technologies. The most important is the Blockchain that is said to change the way financial transactions are handled today fundamentally. It is forecasted that this technology will have significant consequences on how traditional banks do business in the future, enabling new business models, deliver unique value propositions and solve longstanding challenges, with the well-needed transparency and security in transactions that nowadays involve multiple parties and large amounts of data.

Though this technology is currently still at a nascent stage, Blockchain is proclaimed to be a game-changing, disruptive innovation that holds the capability of completely shaking up the landscape of banking in the coming years. Others even claim that blockchain will make banks (entirely) obsolete.

In Palestine, the minority of banks cannot apply Blockchain technology, and it would disrupt the banking sector, and the majority was with Blockchain technology in the banking sector. But to continue to evolve with Blockchain technology, the banking sector must keep pace with developments and make necessary changes in the current business model. The banking sector must operate in an integrated manner to achieve the goals and benefits of Blockchain technology.

## 6.5 Plans for Implement Blockchain in Palestine

Figure 19: Plans for Blockchain



(Source: Own representation from data collection)

Despite the rise in popularity of Blockchain technology compared to the last decade, there is still a gap in knowledge about its potential technologies, applications, the challenges it faces, and the way forward for many Governments, intergovernmental organizations, and actors in the supply chain. To use this technology to develop government institutions and achieve policy objectives. The Government and international organizations need to build their capacity to support these technologies' development and application in several areas.

### **Phase one: Raising Awareness**

The public sector should continue to improve its understanding of how these technologies can enhance transparency and efficiency and help achieve its policy objectives. Building this knowledge base will enable governments' commitment to develop, use, and promote this technology. Besides, introducing technical and management courses on Blockchain technology and introducing Masters' level programs at the universities and colleges. Banks can support this idea by offering funds to universities to encourage the introduction of Blockchain technology programs and courses at different academic levels. Also, promoting conferences, Expo tech, and various activities on the topic of Blockchain in which international and local experts on this topic are invited.

### **Phase two: Private and Public Cooperation**

The private and public sectors should work hand in hand together to be able to initiate the technology in the country.

The private sector should support different funds and investments in both the private and public sectors to initiate common projects between the sectors.

The private sector should take the initiative to pull the technology to the public and governmental sectors by taking real initiatives and investing in promoting the different use cases in the non-financial sector. This will help make the technology more familiar to the different stakeholders, for example, by funding startups based on this technology. On the other hand, the public sector should develop and implement Blockchain to ensure their inclusion and access for small and medium enterprises (SME). This means that the government sector should contribute to the technical dialogue on research and development with the private sector.

### **Phase three: Blockchain technology use cases in other areas**

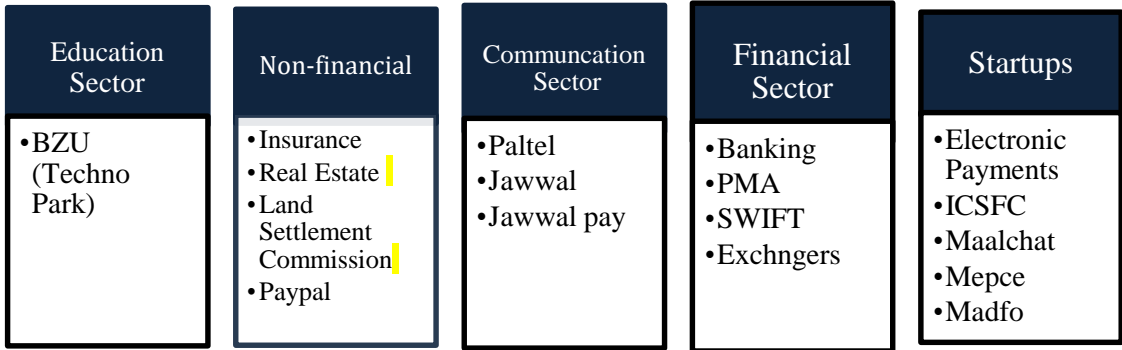
The use of Blockchain technology is not limited to financial services but can also be adopted in the management system. Many banks and stakeholders are unaware of these uses. It is possible to adopt it through banks as a method of keeping records and information rather than a paper-based filing system. A talk application using blockchain technology can be designed and adopted between banks and the monetary authority. It is considered a means of preserving correspondence while sending it from the sender to the user.

**Phase four: Promote the Ecosystem for Blockchain in Palestine**

After analysis, there is a lot of areas in Palestine that can benefit from Blockchain technology. For example, the education sector, communication sector, Startups, IT-companies, financial sector, and non-financial sector. Figure 20 views these sectors and institutions.

In Palestine, there’s a lot of potential for Blockchain, but the ecosystem in Palestine still not mature enough and needs a lot of initiatives to promote Blockchain technology.

Figure 20: Blockchain Ecosystem



(Source: Own representation from data collection)

**6.6 Summary of Results**

- Based on previous literature reviews, interviews, and questionnaires that the researcher has made, the banking sector and regulators in Palestine cannot apply Blockchain technology because they do not know the technology. As well as the absence of specialized experts in this field.
- Banks’ technological infrastructure is not ready or suitable to initiate yet.



- Currently, banks do not use Blockchain technology and do not include it in their strategic plans for the upcoming years. Because the banking industry regulators must begin these steps, if all banks did not condense this technology's work, the benefits will not be as needed.
- According to the interviews' analysis, a few banks will be disrupted by Blockchain, so a proportion of the banks will be outside the banking sector if applied technology. Another most significant percentage will support the banking sector and open the way to mechanisms for action and new benefits for the banking sector.
- The regulator and banking sector will be forced (push strategic) to use Blockchain technology by international organizations such as SWIFT and donors.
- One of the most critical obstacles facing the application of technology in Palestine is the Israeli occupation. Suppose we have adopted the technology for our external business, it depends on the occupation's internet.
- The strategic plan for the 2-5 upcoming years did not include the application of Blockchain technology.
- The shift to financial technology will limit the available problems as not having national currency, the cost of using foreign exchange, and geographical lack of communication between cities and provincial (PMA [zoom-interview], 2020).
- The Monetary Authority has launched its financial inclusion strategy along with its development strategy Payment methods. It is currently working on launching the financial technology strategy (PMA [zoom-interview], 2020).
- The possible department that can implement the technology is the remittance system, as it is the most prevalent in most of the previous experiences of banks
- The monetary authority should give permissions in the next five years and allow banks to use Blockchain technology.
- The primary promoter for starting Blockchain technology in the banking sector is the Palestinian Monetary Authority, the primary regulator and legislator of technology startups.

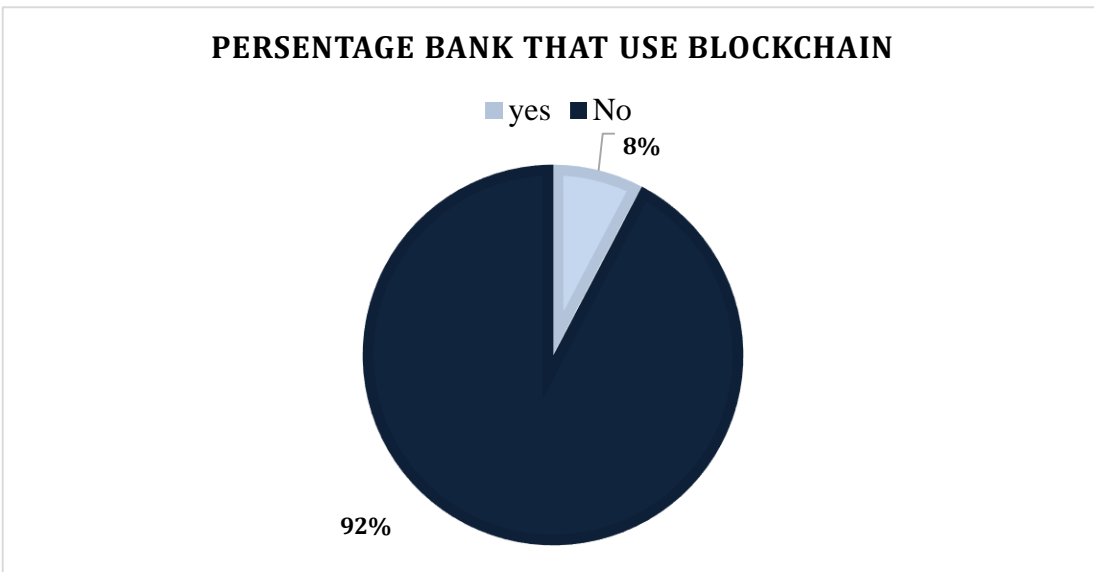
- There is no particular ecosystem of Blockchain technology in the banking sector.
- The only bank that has applied Blockchain technology is Al-Quds bank, the first experience in Palestine. And used it in the remittance system and took permission from the Monetary Authority in 2019 with an 8% percentage to other local banks.

Figure 21: Percentage Bank that Uses Blockchain

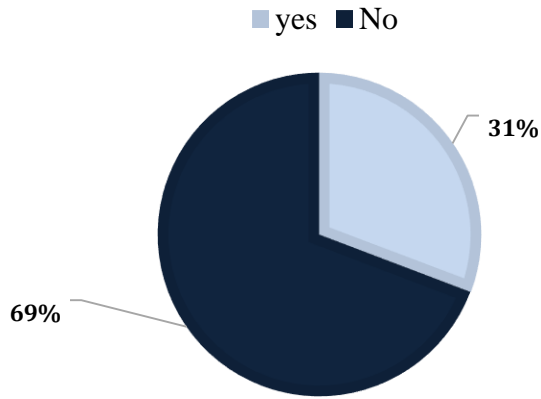
(Source: Own representation)

- The result shows the percentage of banks that included apply Blockchain in their strategic planes with parentage 31%.

Figure 22: Percentage of the Bank that Included Blockchain in the Strategic Plan



**PERCENTAGE OF BANK THAT INCLUDED  
BLOCKCHAIN IN STRATEGIC PLAN**

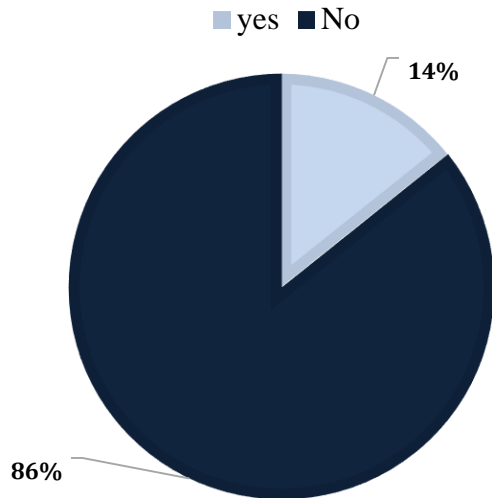


(Source: Own representation)

The result shows the percentage of banks that identify that Blockchain will disrupt the banking industry with a 14% percentage.

Figure 23: Will Blockchain Disrupted the Bank Industry

**WILL BLOCKCHAIN DISRUPTED BANK INDUSTRY**



(Source: Own representation)

## **7 Conclusion and Recommendation**

Technology sector development is still at an early stage, especially in the financial sector. Blockchain technology is among these recent technology trends. Blockchain is a distributed ledger that allows for secure processing and immutable recording of transactions in the network without a trusted third party.

This research tries to answer whether Blockchain technology and the change in banks' business models will disrupt them. Besides, this research's main objectives are to explore Blockchain technology theoretically and investigate the tremendous expected impact of Blockchain technology on the banking sector and the changes in the current business model. In doing so, the local ecosystem of the Blockchain in Palestine is explored. The main focus of the local Blockchain ecosystem concentrated on the financial banking sector and its regulatory institutions.

As for the main question in this thesis which is “To what extent will Blockchain technology disrupt the banking industry in Palestine?” my research shows that Blockchain technology will disrupt the banks in the current business model without any changes or development and get out of the banking industry. While banks that make changes in the business model to adopt Blockchain technology will stay in the banking industry and continue to benefit from Blockchain technology.

### **7.1 Blockchain Use Cases Implementation in Palestine**

Al-Quds Bank is considered one of the pioneering experiments in Blockchain technology, as it is considered the first experience in the banking sector. Al-Quds Bank obtained a license from the Palestinian Monetary Authority in 2019. It was approved in the financial transfer system in cooperation with the Jordan Code Bank.

They turned to Blockchain technology because it is faster and more secure. It is also considered a quantum leap. By the year 2025, the technology will be widespread in the world (Al-Quds bank [Zoom Interview], 2020).

The infrastructure of the Blockchain took 3-4 months from the date of obtaining a license from the Monetary Authority, where a dispatch was built with a raised Blockchain and was taken Training courses for employees to work on the software

## 7.2 Recommendation

- The regulator for banks in Palestine can create a Blockchain network to the interconnection between Banks where we can create them to store the clients' data on them and be open by all banks and by these steps can create a database for the customer (KYC).
- The regulator can create a chatting system using Blockchain to the connection between banks
- Adopt a Private Block during our translations with the banking sector where transactions are only accessible to the person who had validity.
- Blockchain can be used in the banking sector to create a unified database Government to share Government and banking sector (KYC) (Investment bank [Questionnaire], 2020)
- As part of the Blockchain ecosystem, universities have to promote and start introducing Blockchain technology-related courses to build the human capacities needed to meet these competencies' substantial potential demand.

## 7.3 Study Limitation

- Although the research has managed to accomplish its objectives, yet several limitations and shortcomings were unavoidable.
- There is no comprehensive and complete case study on Blockchain technology applied in the banking sectors in every detail.
- The population sample is small, with 13 banks in Palestine.
- We tried to communicate with international banks, but they did not cooperate with us. Some local banks in Palestine are not bargaining and do not want to disclose Blockchain technology information. Some of them abstain from doing the interview and filling out the questionnaire.

## **7.4 Future Research**

Similar to all studies, this research has limitations, which, however, provides opportunities for future studies:

- There's a lot of potentials to start Blockchain in Palestine
- Create a business model framework for Blockchain in Palestine

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## Appendix1



السلطة النقدية  
مملكة العربية السعودية

### اعلان صادر عن سلطة النقد بشأن التعامل بالعملات الافتراضية

يهدف الحفاظ على نظام مالي مستقر ومتين وحرصاً من سلطة النقد على الحفاظ على أموال المواطنين، فإنها تحذر المواطنين من التعامل بما يسمى العملات الافتراضية بكافة أشكالها وخصوصاً الـ Bitcoin، وذلك لما تحمله هذه العملات من مخاطر مرتفعة جداً كونها غير مضمونة من قبل أية جهة كانت وهي عالية التذبذب الأمر الذي قد يلحق خسائر مالية فادحة بالمتعاملين بها. إضافة الى أن كافة الجهات والأطراف التي تقدم وتتعامل بهذه العملات غير خاضعة أو مرخصة من قبل أي جهة رقابية.

وعليه فإن سلطة النقد تدعو المواطنين لعدم التعامل بهذه العملات سواء بهدف الاستثمار أو الادخار أو التبادل التجاري أو غيرها من المعاملات المالية، وذلك حماية لهم من التعرض لأية خسائر أو مخاطر مالية.

[www.pma.ps](http://www.pma.ps)

## Appendix 2

### Blockchain Questionnaire

تم عمل هذا الاستبيان لاستكمال متطلبات التخرج لرسالة الماجستير تحت عنوان "Will Blockchain disrupt banking?"

"Industry  
شكرا لحسن تعاونكم

\* Required

Identification of personality; Name, the bank's name, job title, and experience

\* تعريف عن الشخصية; الاسم, اسم البنك, المسمى الوظيفي, الخبرة

Your answer

هل تُستخدم تقنية البلوكتشين في النظام البنكي الحالي؟  
Do Blockchain technology use in the current banking system? \*  
في النظام البنكي الحالي؟

Yes

NO

هل يوجد خطط مستقبلية لتطبيق تقنية البلوكتشين في النظام البنكي؟  
Are there any future plans to implement blockchain technology in the banking system? \*

Yes

NO

إذا كانت الاجابه على السؤال السابق نعم. هل يمكن شرح ما هي هذه الخطط؟  
If the answer in the previous question yes, Can you explain more about this plan?

Your answer

What are the advantages of using blockchain technology in the banking system?

\* ما هي ايجابيات استخدام تقنية البلوكتشين في النظام البنكي؟

Your answer

What is the added value from using Blockchain technology in banking system?

\* القيمة المضافة من استخدام تقنية البلوكتشين في النظام البنكي؟

Your answer

Which bank's internal departments will be affected by using Blockchain technology?

\* اي الادارات الداخلية للبنك التي ستتأثر عن استخدام تقنية البلوكتشين؟

Your answer

What are the disadvantages of using blockchain technology in the banking system?

\* ما هي السلبيات من استخدام تقنية البلوكتشين في النظام البنكي الحالي؟

Your answer

What are the obstacles to applying blockchain technology in Palestine?

\* معوقات تطبيق تقنية البلوكتشين في فلسطين؟

Your answer

What are the reasons for delaying using blockchain technology compared to countries that started using it? ما هي اسباب تأخيرنا لاستخدام تقنية البلوكتشين مقارنة بدول العالم التي بدأت باستخدامها؟ \*

Your answer

What are the core changes that will happen in the business model in the current banking system? ما هي التغيرات التي ستحدث على نموذج العمل الحالي للنظام البنكي؟ \*

Your answer

What is the infrastructure that needs to be modified in the current banking system to implement blockchain technology? And how much time does it need? ما البنية التحتية التي يجب تعديلها في النظام البنكي الحالي لتطبيق تقنية البلوكتشين؟ وكم تحتاج من الوقت؟ \*

Your answer

Many international foreign banks have begun applying blockchain technology in their interactions, so what is the position of Palestinian banks on these developments? العديد من البنوك العالمية بدأت بتطبيق تقنية البلوكتشين في تعاملتها، ما هو موقف البنوك الفلسطينية من هذه التطورات؟ \*

Your answer



Amazon works toward buying aetherium, in addition, Visa International Company works on issuing Visa Card for digital currencies. What do you think as a Bank about it and are there any plans regarding it? تعمل شركة امازون العالمية على التوجه للشراء باستخدام الايثيريوم، و شركة فيزا العالمية تعمل على إصدار بطاقة فيزا للعملات الرقمية. ما رأيك كبنك في ذلك؟ هل هناك خطط متعلقة بالموضوع؟ \*

Your answer

---

A Palestinian bank has begun to implement Blockchain technology in the remittance system and has got a license from the Monetary Authority regarding this? What do you think and do you have any future plans? بدأ أحد البنوك الفلسطينية في تطبيق تقنية البلوكتشين في نظام الحوالات وحصل على ترخيص من سلطة النقد بخصوص ذلك؟ ما رأيك في ذلك و هل يوجد خطط مستقبلية؟ \*

Your answer

---

According to your personal opinion, what is Palestine's position from applying blockchain technology during the next five years? حسب رأيك الشخصي ما هو وضع فلسطين من تطبيق تقنية البلوكتشين خلال الخمس سنوات القادمة؟ \*

Your answer

---

Will Blockchain technology disrupt banking industry? هل تقنية البلوكتشين ستؤدي إلى إضراب في القطاع المصرفي؟ \*

Your answer

---

اسماء أشخاص خبراء في تقنية Blockchain technology experts in Palestine \* البلوكتشاين في فلسطين؟

Your answer

ما هو النظام الايكولوجي الحالي? What is the current Ecosystem in Palestine for blockchain? \* في فلسطين لتقنية البلوكتشاين؟

Your answer

كيف سيكون النظام الايكولوجي في 5 سنوات القادمة? How will the Ecosystem in Palestine be after 5 years? \* فلسطين خلال 5 سنوات القادمة؟

Your answer

اي ملاحظات اخرى حول الموضوع Other Notes Related to topic

Your answer

Submit

## Appendix 3



### Bank of Palestine

#### Vision

We aim to become valued and distinguished money and banking establishment on each the native and regional

#### Mission

We aim to become a valued and distinguished money and banking establishment on each the native and

#### About Bank

- The Bank of Palestine is accountable for international financial innovation and observation innovation
- 
- Control programs have been developed to monitor the Power Card system
- The Digital Signage system has been implemented where the content of the display screens in the branches is remotely controlled by a central system, where 13 screens have been installed in the branches so far.
- 
- The Information Technology Department purchased a new package of IP Address to achieve the work of banking systems such as Internet banking, Mobile banking from the alternative site in line with the bank's plan and the requirements of the Monetary Authority
- 
- The Information Technology Department has obtain the International Payment Card Industry (PCI) for the second time, in line with each of the requirements of the Visa International Company and increase the security and protection of all electronic payment cards for each of the bank's customers



## The National Bank

### Vision

**Maintain our prominent position in the financial sector in Palestine, growing in a prudent and profitable way.**

### Mission

**Continuing our promise of commitment being the national difference for Palestinians, seeking a sound,**

### About Bank

- TNB is that the second largest Palestinian banking group and the quickest growing within the country. The national bank is one amongst the country's most trustworthy suppliers of comprehensive monetary services for the corporate, retail, investment and microfinance sectors.
- Automated teller machine without a card, which is the first of its kind in Palestine, which enables our customers to benefit from automated teller services without the need to carry an ATM card? This service basically solves the problem of customers getting the card, or their need to use an automated teller (ATM) in an emergency manner.
- The Signature Visa card is the perfect companion for your travel through exclusive benefits and rewards for cardholders, in addition to presenting you as privileged customers in the places where the card is used.



## The Quds Bank

### Vision

To be an exceptional financial institution that offers

### Mission

To utilize Palestinian capital within the development and growth of the financial system, and supply innovative financial solutions that add price to all or any the country's sectors and enrich the lives of our customers.

### Core Value

To implement the best standards of skilled commitment, yet because the best banking practices of transparency, fairness and sensible governance.

### About Bank

- Al-Quds Bank started its march in 1995
- has developed its business and adopted a strategy that adds the best personal banking services with developed investment solutions practically designed to protect, preserve, and develop wealth.
- Al-Quds Bank propose Silver, Titanium, World and world Elite Mastercard credit cards that advantage the slogan "Your Partner". The cards were designed with the comfort of clients in mind, offering them flexibility in paying for purchases and the freedom to withdraw money inside and outside the country.
- The bank expanded its network of agents for quick transfers to include Western Union, making it the biggest network in Palestine.



## Arab Islamic Bank

### Vision

The Palestinian Bank is the leader in Islamic financial activities and services, investing with a sophisticated technological perspective that meets the needs and requirements of customers and stakeholders.

### Mission

Discrimination in the target markets by providing comprehensive, qualitative and modern banking solutions in accordance with the provisions of Islamic law, and moving forward in meeting the financial needs of all segments of the local community in order to achieve the principle of sharing in the winnings.

### About Bank

- The Palestine Islamic Bank Public Shareholding Company was established in 1995
- The bank won international prizes , such as the “most innovative digital bank” award for the year 2019 from Finance International magazine
- Award for “Best Islamic Bank in Palestine” from EMEA magazine Finance for the same year.



## Palestine Investment Bank

### Vision

To be a modern, developed bank that provides outstanding banking services with high efficiency by reaching customers in efficient and effective ways inside and outside Palestine

### Mission

Providing comprehensive and competitive banking solutions for all sectors, adding significant value to our customers, contributing to their development and meeting their ambitions, work with them in the concept of partnership to reach their highest successes, and contribute effectively to the efforts of economic

### About Bank

- PIB started operations throughout March 1995.
- PIB developing new product for the Palestinian banking market; enhancing our money position by dominant risk factors
- PIB developing human resources and effectively introducing trendy technology for the continuation of distinctiveness in performance; and increasing competency in addressing our business in absolute transparency.



## Palestine Islamic Bank

### **Vision**

The Palestinian leader Bank in Islamic financial activities, services, and investment with an advanced technological perspective that meets the needs and requirements of customers and stakeholders.”

### **Mission**

Excellence in the target markets by providing comprehensive, qualitative and modern banking solutions in accordance with the provisions of Islamic law, and moving forward in meeting the financial needs of all segments of the local community in order to achieve the principle of sharing

### About Bank

- One of the banks that working on strategy for digital transformation
- it has adopted a project to modernize its main banking system to meet the current and future needs of customers and supervisory authorities in line with its endeavors to move from product focus to customer focus.
- The bank has chosen Temenos International products for its new banking system.





**Cairo Amman  
Bank**

**Vision** "Preferred bank of choice"

**Mission** "Provide pioneering banking services"

#### **About the bank**

- CAB takes pride in being the first bank within the world to introduce the iris print as a method of identification permitting customers to access their bank accounts and doing away with the ATM cards and therefore the pass (secret) variety. Thus, the system acknowledges the client and permits him to access his account and complete his banking dealings either at the service counter or at the ATM at the branches.
- CAB responds to its customers' instant desires by providing personal loans supporting the transfer of the borrower's pay to CAB. It additionally provides investment services, credit cards, and bank transfers, mistreatment of its outstanding integrated network of branches in Jordan and Palestine.
- CAB provides its customers with a large variety of varied, innovative banking services that suit all client classes and meet all their banking, financial, and investment necessities.



Housing  
Bank

**Vision**

**Housing Bank is the preferred bank for clients.**

**Mission**

**Providing innovative, high quality banking services to clients in the individual, institutional, and corporate sectors that meet their needs and exceed their expectations, also keep pace with developments in the financial and banking markets.**

**About Bank**

- During 2019, the HBTF has dole out a widespread method of exchanging ATMs networks. As the old ATMs were exchange with modern sophisticated ATMs that simulate the electronic banking leap that the bank is keen to stay abreast with.
- The bank wants to replace the plastic cards by launching Virtual Prepaid Cards.
- Launching transferring credit card “You are a winner with a Housing Bank Card”. Those cards enable customers of other banks to replace their credit cards with one of the Housing Bank credit cards free of interest on the transferred balance.
- Launching the installment service with 0% interest rate when using credit cards under the headline “There is a Solution for Each Problem” aimed at encouraging credit card holders to use these cards to purchase their needs from merchants participating in the purchases installment program.
- Launching Credit Card Overriding Service up to 10% of the available ceiling value on the card, enabling customers to cover their emergency expenses if the entire ceiling is utilized.



## Egyptian Arab Land Bank

**Vision** Leading the banking sector with the best innovative financial products and services to change the lives of the people having them through our superior quality and friendly business consultants.

**Mission** To be as the oldest bank in the region that is constantly majoring development through innovative financial solutions to positively alteration the lives of our clients, partners, shareholders, employees and enrich the communities where it operates.

### About the bank

- The Egyptian Arab Land Bank has been aimed to enhance the Egyptian economy since it was first founded.
- The bank has launched its top priority of being a part of the Egyptian agriculture sector development by providing the owners of agricultural lands with loans to increase their lands productivity.
- The Egyptian Arab Land Bank has opened a branch in Palestine as a response to the troubles in the region during the first half of the 20th century and as a part of our aims to serve Arabs.



## Safa Bank

### Vision

The first customer destination for distinguished banking solutions.

### Mission

Providing modern banking products and services based on Islamic law to meet the expectations of all partners.

### About Bank

- Build a solid client base.
- Provide competitive banking services and products.
- Develop the efficiency and effectiveness of the bank's performance.
- Develop partnerships and promote social responsibility.
- Develop a bank wallet with attractive returns

ahli | الأهلي

Ahli Bank

**Vision**

A financial institution specialized in providing excellent services through creativity, efficiency and focus on

**Mission**

We are committed to building a prosperous society and economy that achieves financial inclusion, serving

### About Bank

#### Future Plan 2020:

- Expansion and spread by opening new branches.
- Achieve financial goals.
- Continuing the approach of developing new products and services that will be launched during the year.
- Raise operational efficiency.
- Spreading and strengthening the concept of corporate culture and common prosperity among the company's employees and continuing with the training approach and raising Competencies.
- Business development and creation of innovative technological solutions.
- Continuing to raise the readiness of the company's infrastructure by updating methodologies and work procedures and protecting the security of the company.



# Bank of Jordan

## Vision

**To be a pioneering bank that excels in providing products and services, offers comprehensive financial solutions and acquires an advanced position in the Arab**

## Mission

**To build close relations with our clients, optimize the returns to shareholders and contribute to developing the society by providing comprehensive financial solutions through high-quality and efficient service channels and modern business environment that comprise an**

## About Bank

In 2019, Several projects and action plans including the Enterprise Content Management (ECM), the Enterprise Risk Management (ERM), the Managed Security Services (MSS), and the Customer Experience (CX) were executed under the strategic plan.

In 2019 there's other projects for improving the credit process and business intelligence reporting were also carried out. Furthermore, enhancements were introduced to BOJ Mobile and the updated version of the app was launched in Palestine.



البنك العربي  
ARAB BANK

## Arab Bank

### About Bank

- Arab Bank's Corporate and Institutional Banking (CIB) division manages the group's corporate and institutional client base.
- Arab Bank's Corporate and Institutional Banking (CIB) division will continue to develop its product and service offerings across the Arab Bank network. As part of its digital transformation program,
- CIB will introduce innovative products and services to provide clients with value-added digital solutions that help them to manage their business operations and transactional banking requirements.
- Consumer Banking will continue its work to introduce a new set of banking services and products on its digital channels. Electronic digital account opening service will be introduced in countries where regulations allow.

