RIP2

BACHELOR OF BUSINESS ADMINISTRATION (BBA)

Blockchain Technology- Revamping SME Funding

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DECLARATION

We hereby declare that the matter included in this RIP2 report entitled "**Blockchain Technology- Revamping SME Funding** is the result of study and interviews carried out by our own. We further declare that this is our original work and has not been published anywhere before.

This Project has been carried out for the sole purpose of submission in partial fulfilment of Bachelor of Business Management (BBA) at S P Jain School of Global Management, Dubai (the Year 2017-2018).

The above is true to the best of my knowledge and understanding. We have read, understood and signed the code of Ethics.

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IN WITNESS THEREOF, Assignor has duly executed this agreement.

Date: 15/04/2018

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Research Proposal

How Blockchain Applications help Dubai's SMEs to Raise Fund?

Abstract

Purpose– This paper aims to determine key reasons hindering UAE's small-and-medium enterprises (SMEs) in financing and investigate the potentials of blockchain applications ameliorating this funding challenge.

Research Design–The conceptual framework proposed is based on qualitative and quantitative research methods. Specifically, in-depth interviews withSMEs, banks, and blockchain experts in the Emirate region were conducted and a globally online survey of 105 blockchain specialists was carried out. Statistical techniques(z-test and perception test) were employed to verify, validate, and test the reliability of the constructs and their indicators. To validate this framework, principal component analysis and empirical research were applied.

Findings – The proposed framework contains three main reasons affecting SMEs in UAEto obtain funds: banking reluctance, limitations of crowdfunding and entrepreneur credibility. Responding to these challenges, Blockchain-based Smart Contract and Initial Coin Offerings (ICOs) are suggested to address these issues. Through a research process, results from interviews and surveys confirmed three reasons. The framework achieved almost all possibilities of proposed solutions, except failure in connecting bankruptcy-rate reduction with the smart contract and copyright protection of ICO. Finally, legal challenges, ICOnot-being-listed risks, and low readiness to blockchain adoption were investigated; thus, outlining the ways forward. The examined framework has adequate levels of validity and reliability.

Research Limitations – The main limitation was that only a small sample of blockchain specialists was surveyed, and therefore there needs to be further research on a larger scale with advanced research approaches.

Report's Value – The findings of this research gives new insights into UAE's SME sector and provide technology suggestion to address its funding challenge. This research paper is primarily targeted at the SME sector, the Emirati Government as well as segmental-and-national policymakers in UAE. Furthermore, consultants, segment stakeholders, and students who are interested in SMEs and disruptive technologies will also find this paper useful.

Keywords Blockchain Technology, SME sector, Funding challenge, Smart Contract, ICO, UAE

1.0 Introduction

In this research paper, our primary goal is to highlight the important contribution of the SME sector in the UAE along with its serious funding challenge and propose Blockchain-based solutions to address this endless issue. While the SME sector plays a crucial role in economic development and employment creation in the UAE, they have been suffering a financial shortage for years, especially getting funds from external sources. For instance, bank lending to this very critical sector is abysmally low, specifically, the lending to the SME sector in UAE is just 3.85% when compared to twofold digit figures in the developed world (Baby & Joseph, 2016). Also, a majority of SMEs (80%) in UAE indicated personal money/savings as the primary source of finance for commencing their business operations (Dubai SME, 2016). This leads to an urgent consideration and efforts to address this market gap as SME directly impacts the Emirate economy. In other words, the SME sector cannot be underestimated in any circumstance and its sector's problems are required to address urgently.

In evaluating UAE developmental strategies, today, UAE is amongst the world's leading smart countries in its pioneering of innovative smart pilots with the overall strategic focus towards innovation and disruptive technology, remarkably, blockchain technology. Blockchain technology or distributed ledger technology (DLT) allows ones to connect and transact directly in the absence of third parties; thus, it is considered as the second far-reaching era since the Internet itself (Martin Hiesboeck, 2016) and promised to revolutionize and disrupt business models as well as transform industries in the upcoming years (Don Tapscott, 2016). In essence, the magnificence of Blockchain technology is its decentralization feature – where neither an individual nor an organization/governor has control over it, leading to the independence between data controlled and relevant parties, contributing to the prevention of data corruption or cost manipulation (Bettina Warburg, 2016). Thanks to its unique features, Blockchain technology assists users in reducing massive transactional costs and improving transparency and efficiency. Recognizing the potential impact of the blockchain technology, the UAE Government has established many institutions and agencies such as Smart Dubai and Global Blockchain Council to conduct research about Blockchain technology and its application to enhance the country's banking sector and governmental operation. Also, Dubai launched a citywide blockchain strategy in October 2016 intending to become the first blockchain-powered city by 2020.

While Blockchain emphasis was mainly placed on the banking sector and financial services, the Emirati government has missed out on connecting Blockchain technology with its country lifeblood-SME sector. By nature, Blockchain technology is 'disruptive' technology which is more likely to disrupt a small-foothold market, which appropriately fit in small-and-medium-sized segment (Christensen, Raynor, & McDonald, 2015). To put it another way, this type of technology has a slight impact on big industries such as manufacturing, transportation, or banking but a direct effect in the smaller-sized sector. Therefore, it is essential to go step-by-step, which is firstly put an evaluation on this small-in-size segment because of its importance in economic contribution (What Is Disruptive Innovation? 2015). Taken all together, this formulated a research statement "Blockchain technology and its application to the UAE's SMEs for raising funds".

The study of Blockchain technology and its contribution to SMEs' issues will perfectly fill the existing gap between people's understanding and solutions towards SMEs. The paper aims to map blockchain

technology nationally, explain its main characteristics and propose a conceptual framework, as well as highlight the areas that require further attention of policymakers. Besides, this study targets conducting the first- hand investigation into raising funds for UAE' SMEs by using blockchain technology. The objectives of this paper research are to:

1. Explore factors that hinder SMEs to capitalize on funds.
2. Identifythecompetitive advantages of adopting blockchain technologyforraising funds.
3. Propose recommendations to assist SMEs in financing equity.

2.0. Literature Review

2.1 SME Sector: Critical for the UAE Economy

2.1.1 The Dubai SME definition

Since SMEs are the anchor of the Emirati economy with a contribution to job creation, innovation, and value-added GDP, the launch of the SME definition in 2009 by Dubai SME was necessarily a first step towards the SME sector and Economic Development plan. The SME definition serves as a baseline for purposes of monitoring SME development, establishingguidelinesforresearch relating to SMEs and in essence enabling effective collaboration amongstakeholders.Theformulationof the SMEdefinitionincludesinputssuch as macroeconomicanalysis, typical SME landscape mapping, stakeholder assessment, data analysis, SMEsurvey, indicator fit assessment andstudyof international best practices. As a result, it comes to an outcome that SME is defined as any enterprise which qualifies the thresholds of employee headcount and turnover of its industry (Trading, Manufacturing, Services), hencetheclassificationofenterprisesize (Micro, Small, Medium) (figure 1). For SMEs, itshould be noted that a clear definition of what constitutes a small-and-medium will benefit them achieve SME-exclusive financial packages, focused programs and research studies, as well as favourable policies/subsidies offered by the Government, especiallyintermsoflendingassessment(MohammedBinRashidEstablishmentfor SME Development,2009).

SME DEFINITION FOR DUBAI

	TRADING		MANUFACTURING		SERVICES	
	Employees	Turnover	Employees	Turnover	Employees	Turnover
Micro	<=9	<=AED 9mn	<=20	<=AED 10mn	<=20	<=AED 10mn
Small	<=35	<=AED 50mn	<=100	<=AED 100mn	<=100	<=AED 100mn
Medium	<=75	<=AED 250mn	<=250	<=AED 250mn	<=250	<=AED 250mn

Figure 1: SME Definition for Dubai

(Dubai SME, 2017)

2.1.2 Market Size and Contribution to The Economy

According to The State of SMEs in Dubai, SMEs make up 95% of the enterprise population in Dubai. Remarkably, Micro firms constitute 72% of the overall business count in Dubai, while Small and Medium firms accounting for 18% and 5% respectively. Concerning a sector-wise split of the number of establishments, a majority of 57% is from the Trading sector, followed by the Services sector (35%), and the Manufacturing sector (8%).

SMEs have a striking footprint on the Emirati economy. According to UAE Ministry of Economy's database (2015), SMEs contribute almost 40% of the UAE's GDP account for 95% of the total enterprise population in the country and employ approximately 42% of the workforce. In this line, SMEs' revenues, productivity, sector-profitability and financial health are considered as one of the predominant indicators of how well the UAE economy is doing overall, indicated by Sami Dhaen Al Qamzi, Director General, Department of Economic Development-Dubai. Overall, the UAE-based SMEs not only secures a foothold in the market but also contributes to a sizable economic growth, innovation, and job creation, as well as helps to position the United Arab Emirates (UAE) as the most lucrative business market in the Arabian Gulf region

2.1.3 Level of Technology Adoption

It is undeniable that adoption of technology innovations is crucial to driving economic growth and productive nation. Globally, a study by Microsoft on 4,000 SMEs in five of the world's largest and most diverse economies (The United States, Germany, China, India and Brazil) stated that tech-savvy SME enterprises outperformed their counterparts who apply little technology in terms of innovation, job growth and increased revenues. In UAE, meanwhile, Dubai SMEs reported that although one-third of SMEs respondents have made a significant provision for IT expenses, the percentage of IT deployment was only 21%. In parallel with global trends, the government has been acknowledged the importance of adopting disruptive technology and set it as a goal for development (Chief executive officer, Dubai SME). In September 2017, the Emirati Government also launched the UAE Strategy for the Fourth Industrial Revolution to strengthen the UAE's position utilizing advancing innovation and future technologies. Besides, Dubai has taken initiatives when it comes to innovative technology embrace by committing to excellence and digital city transformation since 1999 (Smart Dubai, 2017). The city's technological journey will be completed in 2025 onwards until its goal of Smart-City fully achieves (figure 2)

Figure 2: Dubai Technological Journey

(Smart Dubai, 2017)

2.1.4 Financial Health of SME Sector

Sources of finance and its relevant challenges

Financial health is considered as one of the predominant indicators of how well an enterprise is doing overall, indicated by Sami Dhaen Al Qamzi (Director General of Department of Economic Development – Dubai). However, it is noticeable through financial sources that SMEs are struggling in accessing to finance, damaging the overall financial health of the SME sector in the UAE. Through multiple sources of funding, the fragile ecosystem of the SMEsectorisvisible:

80% of the survey respondents indicated personal savings as the primary source of finance for commencing their business operations (Dubai SMEs, 2016). The State of SMEs in Dubai also highlighted that businesses largely tend to re-invest their profits, retained earnings for business operations andexpansion.

Also, around 48% ofSMEs have obtained funding from multiple sources in the business system, such as angels, incubators/accelerators and VC funds, which indicated the emergence of investment syndication and pooling efforts among investors and industry players. However, for instance, angels in the region tend to appear "invisible"; thus, SMEs find it difficult in identifying these funding sources and have to rely on personal networksto seek angels.

There is a limitation in financing to external sources such as banks and government's support. Dubai SMEs stated that only 23% of the survey respondents indicated that they have accessed bankfinancein the last five years, compared to 25% of firms in the MENA region, 45% in South Asia, 57% in Eastern Europe (figure 3). This low access to banks' funding is caused by SMEs' inability to fulfil its strict lending policies. Regarding government's support, despite a comprehensive range of programs and initiatives have been implemented to enhance specific aspects of the SME sector, only 33% of SMEs canreceive fundingdue totheirlimited abilityto meettheeligibilitycriteria and grantrequirements.

Recently, crowdfunding was introduced by the Dubai International Financial Centre and its regulator, the Dubai International Financial Services Authority (DFSA) to revolutionize fund-raising issue forSMEsinDubaibutrespondentssurveyedrarelyadoptedit(DubaiSMEs,2016).

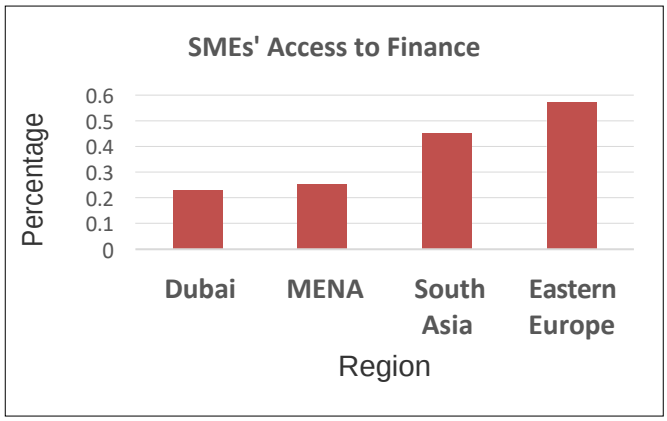


Figure 3: SME's Access to Finance (2016)

Besides, there are other two alarming points about SMEs' financial health worthy of notice. First, data from The State of SMEs also indicates that only 10% of SMEs in Dubai has accessed long-term financing for their business growth. Second, serviceenterprises arereportedtogainthelowestaccesstofinancedespiteits high contribution to value-add and employment whichhave been statedabove.

Altogether, thefinancialhealthof SMEsisaffected by limitedexternalsourcestofinance. SMEs iscurrently gaining fund mainly from internal sources rather than external ones such as banks, government or crowdfunding becauseoflacking qualifications to meettheirpoliciesandcriteria.

2.2 Blockchain Technology

2.2.1 Definitions & Characteristics

As an author of Blockchain Revolution (2016), Don & Alex Tapscott stated: "Blockchain is an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions but virtually everything of value." By design, blockchain is also explained as a decentralized or peer-to-peer technology with a miracle absence of third parties.

To understand why blockchain is suggested for security enhancement, time, cost and complexity reduction, an explanation of its operation and its relevant characteristics will be shown as follows.

As figure 3, when someone requests a transaction, firstly it will be encrypted by digital codes or technically known as encryption technology. Next, this encrypted data then will be distributed to a ledger, also known as a peer-to-peer network of computers. Then parties in this network will directly validate the transaction without a third party. Once the transaction is verified, this encrypted transaction will be combined with other encrypted transactions to create a new block and be added to a time-related chain, which gives the name to the whole system: blockchain.

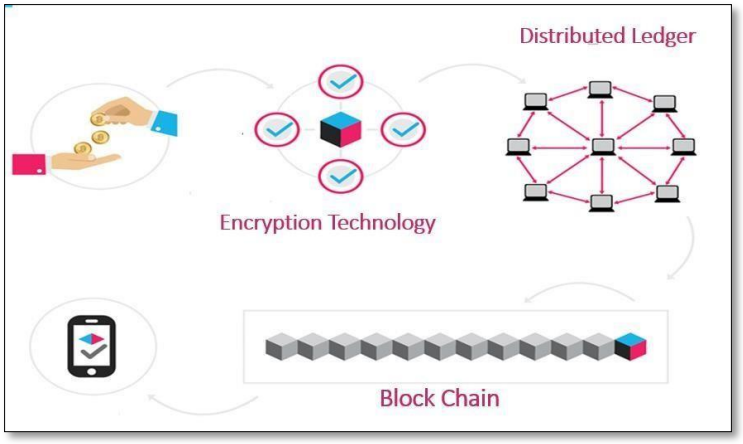


Figure 4: How Blockchain Works

Five basic characteristics are underlying the operation of this technology Invalid source specified.

1. Computational Logic

While the internet has a security problem that we all depend on the "username/password" system to protect our identity, blockchain security methods employ an encryption technology. The digital nature of this technique means that transactions on the blockchain can be warranted by computational logic.

2. Distributed Database

By decentralization technique, no single party can control or manipulate data or information. Each party can validate partners' transactions directly, without any middleman. For example, transactions are made in form of digitalized value (legal cryptocurrencies) directlyandsafelybetweenbothparties without going through a bank, a credit card company, PayPal or Western Union, social network, government or other middlemen (Realizing the Potentialof Blockchain, 2017). Thisleadstotheadvantages of time, cost and complexity caused by a transaction are completelyreduced.

3. Peer-to-Peer Network

Direct communication between peers rather than through a central node fully guarantees transparency. Each party on the blockchain network has access to the entire database and be able to store and forward information to eachother.

4. Transparency withPseudonymity

Each node or user has a unique 30-plus-character alphanumeric address to identify their transactions. They can choose to provide proof oftheir identity or remain anonymous. Additionally,each transaction is distributed to every party in the network. In other words, blockchain is public: anyone can view it at any time; no one can hide a transaction, and that makes blockchain more traceable than cash and other internet transactions (Tapscott & Tapscott, 2017). This maximizes transparency in transactions since avoidance of data manipulation from third parties and eliminates additional fees charged for auditing transactions as well as keepingfinancialrecords. In case users require privacy from their transaction, private blockchain can be used to secure sensitive information.

5. Incorruptibility of Records

Once a transaction is entered and updated on the database, its record is immutable because it is linked to other transaction records that came before it (figure 4). Various computational algorithms are deployed to make sure that the recording is permanent, chronologically ordered, and available to all parties on the network. Therefore, there would be no central database to hack or shut down, leading to the eternity of database availability.

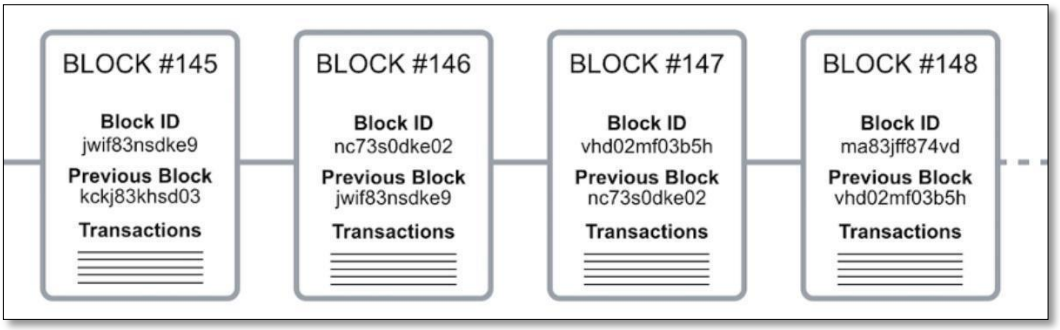


Figure 5: Incorruptible Blocks

2.2.2 Global Blockchain Technology

Market Shares by Region

Technavio's market analysis forecasted the global blockchain technology market to experience a steady growth at a CAGR of around 58.7%. Meanwhile, America was predicted to be the key contributor to the rising revenue of North America's market share in the coming years. The booming economies of Japan, China and India and their intention of digitalization also play an important role in the blockchain technology market. In developing regions of the Middle East and South America are also expected to help the market increase momentum, especially in the financial sector, according to Invalid source specified.

Figure 6: Blockchain Market Revenue by Region (US$ Mn)

Blockchain Market Forecast

Statista forecasted the market for blockchain technology worldwide to continuously grow and be able to reach **2.3** billion U.S dollars by 2021. By blockchain applications, smart contract and smart property were predicted to rapidly spread out. By industry market, potential areas for growth are finance, commerce, government and even healthcare.

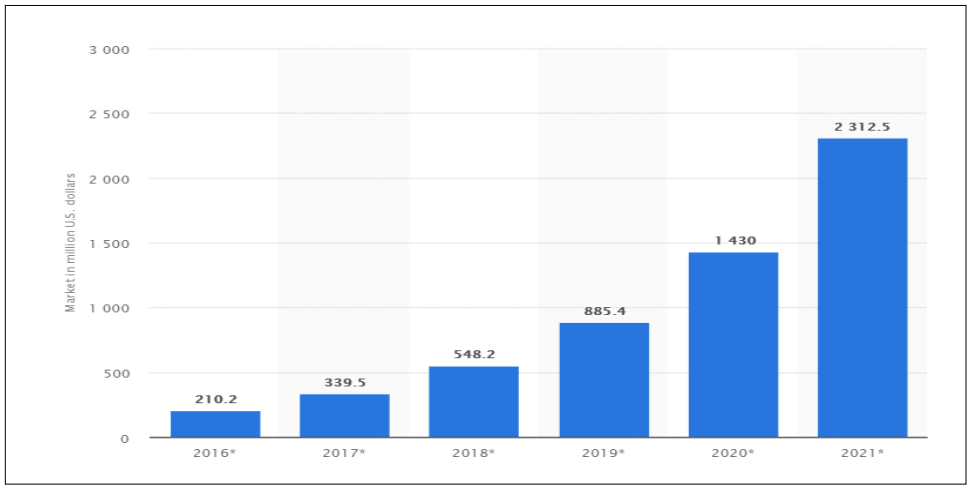


Figure 7: Blockchain technology market worldwide from 2016 to 2021 (in million U.S. dollars)

(Staples, 2017)

Key Trends

According to "Realizing the Potential of Blockchain" report conducted by The World Economic Forum in June 2017, the worldwide giants from JP Morgan to Microsoft implemented publicly open-sourcing software, the United Nations offered to aid in Jordan on the Ethereum blockchain, and China launched the Trusted Blockchain Open Lab. Additionally, IBM mentioned a project with keyplayers such as Wal-Mart, Nestle, Tyson Foods and Unilever to seek the blockchain-incorporated solution in August 2017. The world is ready for the fourth industrial revolution, which is characterized by a range of new disruptive technologies, according to Professor Klaus Schwab, Founder and Executive Chairman of the World Economic Forum.

SWOT Analysis for Blockchain Adoption

Strengths	Weaknesses
• More efficient, timesaving and cost-effective storage and operation. • Facilitating fast sharing of information with paperless processes. • Secure encryption and tamper-proof data storage. • Eliminating central authority which means reduce the risk of delay or manipulation.	• Blockchain does not provide an immediate out-of-the-box exit strategy. • Blockchain is mostly not modular. An old encryption module cannot easily be replaced. • The concept is not easy to grasp for a newcomer.

Opportunities	Threats
• Providing a platform for Big Data and analytic research. • Users have more control. • The world is becoming digitalized.	• Unwanted centralization: mining pools and large mining farms • Quantum computers (in the future) who have the ability to decrypt data. • There is always the possibility of mining attacks and cyber-attacks.

2.2.3 Blockchain in UAE

Key Trends

In parallel with global trends, UAE's Government has acknowledged the importance of blockchain adoption and take ini tiatives in order to achieve its goal as a Smart City. The adoption of blockchain technology applies by UAE to three main areas: the smart governance, smart economy, and smart people (i.e., local and international thought leadership (figure 8)

Figure 8: Three Pillars of The Blockchain Strategy

(Smart Dubai, 2017)

Started establishments of the Global Blockchain Council and The Dubai Blockchain Strategy, the government spent more provision on research about blockchain technology. Dubai Land Department became the world's first government entity to implement all transactions through Blockchain technology, setting the Emirates apart from competitors across the globe (Gulf News, 2017).

At the same time, the banking industry also made some significant moves to catch up with the trend. For instance, a joint project occurred between the UAE's central bank and the Saudi Arabian Monetary Authority (Sama) to

embrace blockchain technology along with digital currency in cross-border transactions. In addition, Dubai's largest bank, Emirates NBD, introduced blockchain technology into cheques as an aid to reduce fraud risks and increase ease of verification. In April, a partnership between government offices (Smart Dubai, The Dubai Future Foundation) and a FinTech consulting and development firm Avanza Solutions created the payments platform called Cipher. This payment platform will be rolled out in all Smart Dubai's 38 partner government entities, partner financial institutions and departments Invalid sourcespecified.

Waheedabbas reported that a Dubai blockchain-based realty trading platform has just been launched at the beginning of 2018:"Imagine being able to gain access to a country's property boom from anywhere in the world, without the need to get involved in local bureaucracy and processes, using straightforwardandtransparent transactionssecuredbyblockchainandsmartcontracts,"saidKhan.Alongwiththeportal'slaunch,Eternitywill also introduce the cryptocurrency token (ETY), which enables seamless transactions of a wide range of propertyassetswhilstalsoactingasamediumofexchangeand a store of value.

The adoptionofblockchaintechnologyperfectlyalignswiththe Emirati visionofembracingtechnology innovation to enable UAE's world-leading smart region.

2.3 Discussion in Framework: Blockchain Applications in solving SME's Funding Challenge

This section investigates into main obstacles faced by SME from obtaining adequate funding and linking with Blockchain-basedsolutions(i.e.,SmartContractandInitialCoinOffering). Theanalysisispresentedin a conceptual model shown below.

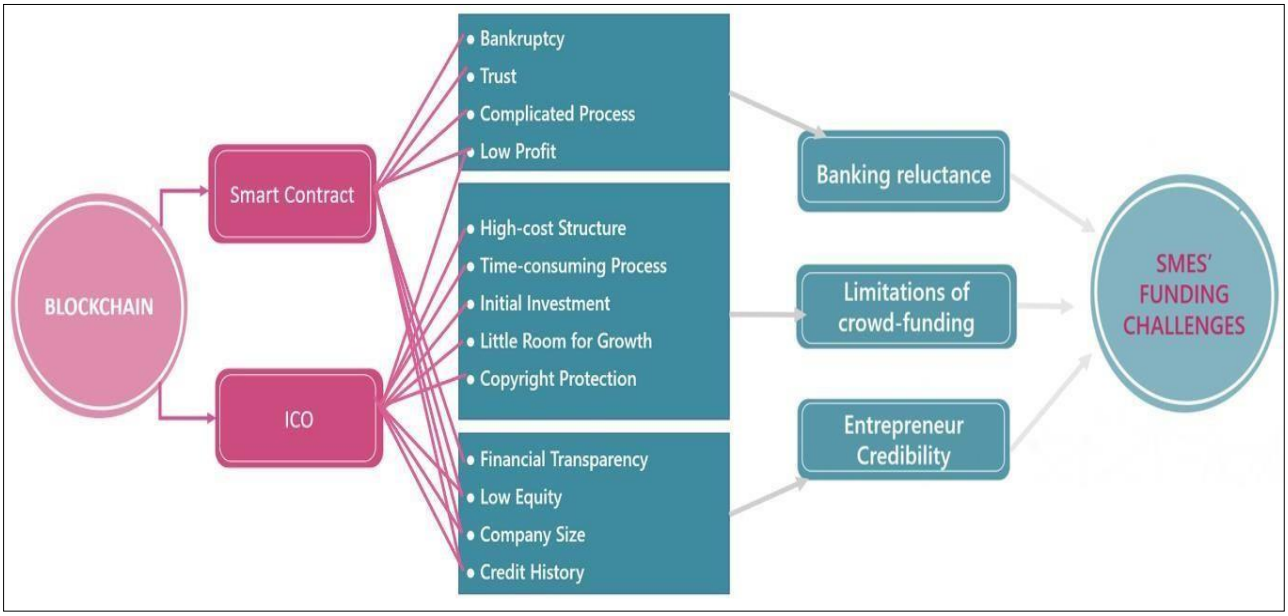


Figure 9: Conceptual Framework

2.3.1 Causes of SMEs' Funding Challenges

Though SME sector is critical for the economy of UAE, bank lending to support this segment is abysmally low: out of the total bank lending, the lending to SME in UAE is just 3.85% (Baby & Joseph, 2016). This situation intrigued us to investigate the key reasons behind this challenge. Below are the factors stated by banks regarding SME lending in the UAE.

Banking Reluctance

- Trust and Bankruptcy Rate

This is considered as the most key reason that significantly impacts the ability to secure a loan for SMEs. Banks are highly cautious in financing SMEs as they cannot easily "trust " the ability of SMEs to pay back. This was revealed by (Duggal, Kejriwal, Rasiwasia, Zhou, & Han, 2014), since the financial crisis in last decade and the subsequent credit crunch, UAE's banking has become extremely cautious in financing SMEs due to default risks as banks want to safeguard their interests and investments. Specifically, if SMEs mistakenly fail in meeting even one simple requirement, banks will hardly tolerate the "risky-defaulting" customers, which results in the rejection of a loan. Failing in bank's trust can demonstrate numerous behaviours: the absence of transparency financial documents, high credit-risk profiles, lack of collateral, or even segment-wise bias.

- Low Profitability

Profitability is the capacity of a business to earn a profit and measured with income and expense. For banking, profits can be obtained through the lending process by utilizing interest impeded when making a loan. In general, there a positive relationship between lending size and bank profitability: a larger loan portfolio generates the vast majority of net interest income. This concept applies to banks all over the world. As a matter of fact, SMEs are easily targeted for a loan rejection due to the need for profitability from the bank-demanded side.

- Limitations of Crowdfunding

Crowdfunding, which is relatively a new trend in alternative funding outside the banking system in the Middle East Region, also has significant drawbacks that will lag the Blockchain innovative solutions.

> *Crowdfunding is defined as a method of financing whereby small amounts of funds are raised from large numbers of individuals or legal entities to fund businesses, specific projects, individual consumption, or other needs* (Jenik, Lyman, & Nava, 2017). *It involves by passing traditional financial intermediaries and using online web-based platforms to connect users of funds with retail funders. Definitions of crowdfunding vary,*

but they often include the following key components: (i) raising funds in small amounts, (ii) from many to many, (iii) using digital technology.

- Initial Investment and High-Cost Structure

Entrepreneurs should be considerably aware of their initial investment in an exchange for a successful fundraising-crowdfunding campaign. In specific, IgnitionDeck indicated the overall upfront investment with an even simple campaign surprisingly and dramatically takes up to 21-25 per cent of the business's campaign return goals. For instance, there are numerous sizeable hidden costs involved in the real-world transactions that will hurt the companies' real profitability: process payment gateway fees, processing fees, content production along with copywriting costs, and website development fees associating with self-hosting costs such as domain registration, web hosting, plugins, and SSL Certificate fees, and the expense list is still going on. In this line, the crowdfunding alternative financing method should be re-evaluated for tight budget companies due to the ability to recoup these costs.

- Time-consuming Process

A lot of time and effort is required in the crowdfunding process: from promoting an idea through campaigns and promotions to getting approvals from public investors. Also, since currently crowdfunding is based on donors receiving rewards, the job of recording contributions and sending rewards is time-consuming. Besides, when a large number of investors become shareholders, the business will face even bigger administrative and accounting challenges –"this would require meticulous and laborious bookkeeping of all investments and shares in the business to determine the share of profits to which each investor is entitled to" (Sigar, 2012). Valanciene & Jegeleviciute (2013) emphasized that a large base of unsophisticated investors is a challenge not only to administrate but also to communicate.

- Little Room for Growth

There is considerably little room for SMEs in the Middle East region for growth and expansion due to some restricted regulations in oversea access as well as standardized scoring and disclosure in the regional place. Also, a specific problem for developing countries is represented by the fact that payment systems impact the choice of platform (Jenik, Lyman, & Nava, 2017). Most international crowdfunding platforms offer a limited number of payment options (e.g., a credit card, PayPal), hence excluding funders without access to these payment methods (World Bank 2015). Locally based platforms are likely to be better suited to engage in local payment methods, but they have a much smaller pool of potential contributors. Taken all together, this makes it harder for entrepreneurs to reach potential international funders and to build a global network.

Entrepreneur creditability

- Financial Transparency

One of the major factors that prevent SMEs from getting funds is informational asymmetries, which is

misleading in enterprise financing information. As indicated in the report (SME Financing- Avoiding Loan Rejection, 2014), SMEs were noticed to keep their financials intranspantly as the laws of UAE does not require corporations for financial statement. Additionally, prospective lenders or outside investors are not trained to analyze the financial statement of SMEs, leading to the inability to differentiate adequately between "high quality" and "low quality" companies and projects. In this case, lenders/investors are more likely to take "safe" action with "adverse selection", which rejects the project funding (Allen & Udell, 2007). Besides, due to high auditing fees from reputed audit firms, most SMEs in the region tend to ignore or neglect the provision of financial reports and business plans to external financiers (Issue in SME Financing, 2007).

- Business Size and Credit History

Investors are hesitant to fund enterprises which are relatively small-sized and sensitive to credit history. Company size constitutes one of the dominant factors that affect SMEs' possibility to get a bank loan. This is because small-size businesses usually have insufficient collateral and tangible assets to prove with lenders in case of default risk. The positive relationship between enterprise size and its acceptance of bank loan has further been proved by groundbreaking research conducted by (Zhao, Wu, & Chen, What Factors Affect Small and Medium-sized Enterprise's Ability to Borrow from Bank: Evidence from Chengdu City, Capital of South-Western China's Sichuan Province) in 2006.

The credit history is another important factor for investors/banks to take into consideration. To verify a business's creditworthiness, borrowers are considered by their credit rating where licensed financial institutions register every history, payment terms, payment schedules, and defaults of loans. The lower the rating, the higher the credit risk, which leads to higher interest rate impeded.

- Lack of Collateral

Collateral is an asset of the borrower that is required to transfer to the lender whenever the project revenues are not sufficient to repay the loan in full (Zhao, Wu, & Chen, 2006). Investors/banks, therefore, uses collateral as one of the assured guarantees to mitigate default risk. Following the recent report, UAE banks still prefer stringent collateral such as a certificate of land right of use and real estate, which makes SMEs more difficult in getting the funds (UAE Government, 2017).

2.3.2 Blockchain Applications in UAE's SME Sector: Selected Problem Solving

In this context, we tried to analyze the influence of blockchain on the SME sector in UAE where we believed that established enterprises incentivize the applications of blockchain bringing. This section aims to

widen current knowledge of the forward-thinking SMEs and raise awareness for traditional firms in order to sustain in the competitive market.

Smart Contract. Unliketraditionalwaysofraisingfund, blockchaintechnologyprovides SMEseffectivetools to not only reduces the cost but easily accesses a huge pool of funds. Smart contracts, for instance, based on blockchain could permit to perform some of these actions automatically, quickly and without any mistakes or fraud; guaranteethatfunds raisedbyinvestorswould be released tothe founderonlyif he/she reaches predetermined milestones, or that if the venture doesn't reach specific goals, the funds are returned (Lamarque, 2016). The keycharacteristicofsmartcontractsisthatexchanges' administrationcan be regulatedontheblockchain, rather thanthroughacentralizedauthority. Smartcontracts are digital assets, whose proprietorship is connected to the blockchain, and which can be exchanged through the blockchain. Smart contracts are the bedrock for exchangingrights orproprietorshipto specific resources (Chinaka, 2016).

Initial coin offerings (ICO-token sales) are also a new way for startups to raise funds—and for blockchain startups, perhaps the prevailing way (Chen, 2017). Like crowdfunding (Lambert & Belleflamme, 2014), ICOs bypass traditional intermediaries—such as venture capitalists and investment bankers—and raise funds directly from early investors. Unlike crowdfunding investments, blockchain tokens are scarce, global, liquid, and tradable, making them especially appealing to global investors (Massey, Dalal, & Dakshinamoorthy, 2017). In addition, raising funds by ICO brings enormous benefits for SMEs compared to Initial Public Offerings (IPO). By not listing security, companies, start-ups, oreven rawprojectscan attempt to gain funding in a way thatavoids thearduousandcostlyprocessof theIPOwhilealsonotdiminishingthefounders'stakesintheirbusinesses(Flood & Robb, 2017). Bank fees for IPO underwriting are set as a percentage of the total amount raised. 7% gross spread, the standard contract of 20% management fee, 20% underwriting fee, and 60% selling concession has become more common in recent years (Torstila, 2001). In these processes, the blockchain infrastructure would save a considerableamountoftime andtherefore,create asignificantcomparative benefitforusers.

In evaluating the Blockchain potentials as a way to raise funds, various advantages and opportunities have been identified and already proposed utilizing Blockchain-based Smart Contract and ICO in various problems and weaknesses that SMEs in UAE are struggling:

- Smart Contract can enhance business financial transparency and credibility as well as minimize process complication.
- ICO minimizes time-consuming process, expenses incurred in initial capital investment & borrowing process aswellasovercome"littleroomforgrowth" drawbacksofcrowdfundingfundingmethod.
- Both of these Blockchain-based solutions can be adopted by the various business without consideration of company backgrounds (i.e. firm size, credit history, profitability and sufficient equity)

(Realizing the Potential of Blockchain, 2017)

3.0 Research methodology

In order to divedeeperintothetopic and developathoroughunderstanding, weexplore all the facets of each problem by conducting descriptive and explanatory research respectively. Regarding data collection method, wetake advantageofbothqualitative andquantitativedatatominimizebiasesandensurebetter evaluation. In specific, at first, qualitative and quantitative data of blockchain application, SMEs' funding challenge and the potential relationship between them are gathered from secondary sources such as database ProQuest, Euromonitor and business reports. Additionally, the information will be also collected through an online survey and interviews. In these primary research, our main stakeholders are employees and executives from SMEs, relevant governmental agencies (e.g. Global Blockchain Council, Dubai SMEs). There will be an online survey to evaluate the relationship between ICO and Smart Contract and hinder factors of funding challenges. It will be sent out via personalized e-mails to blockchain specialists in various industries. The questionnaire will be created based on the literature reviews with a five-point numerical scale. Those exploratory findings then will lay a better groundwork for future researches as well as facilitate our upcoming interviews with executives from the governmentandrelated industries.

3.1 Quantitative Analysis

3.1.1 Survey Design

An online questionnaire to confirm sub-variables in the framework was distributed globally to the different blockchain community. The questionnaire was pre-tested by a blockchain specialist. From the specialist's feedback, thequestions then weremodifiedbefore being spreadout. Thefinalquestionnaire consistedof 16 main questions (two questions to self-evaluate smart contract and ICO knowledge, twelve questions to check the relationship of variables, and two questions to clarify their choices). There are other two questions to collect demographic data, such as occupation and management level. A five-point numerical scale was employed tomeasureresponses,with1 beingStronglydisagreedand5Stronglyagreeing.

3.1.2 Respondent Profiles

The survey participants were university students, participants in theblockchain community and professionals in different industries. The participants were from around the world with the condition of having certain knowledge and experience related to blockchain technology deployment. Out of a sample size of 250 potential respondents, only 105 usable responses were received, showing a response rate of 27.3%. The characteristics of the survey group are listed in the table below.

Table 1: Respondents across occupations, management level and knowledge about blockchain applications (n = 105)

Item	Measure	Percentage
Occupation	Management	15.2%
		18.3%

	Financial operations	
	Insurance	12.5%
	Government and public administration	9.6%
	Computer	14.4%
	Engineer	2.9%
	Social service	2.9%
	Education	2.9%
	Sales	2.9%
	Administrative Support	2.9%
	Production	1.9%
	Student	11.6%
	News anchor	1.0%
	Housemaker	1.0%
Management level	Junior Management	5.1%
	Admin	11.2%
	Support staff	5.1%
	Trained profession	15.2%
	Skilled labour	12.7%
	Consultant	6.3%
	Temporary employee	1.3%
		16.5%

	Researcher	
	Student	5.1%
	Self-employed	3.8%
	Upper management	3.8%
	Middle management	13.9%
Knowledge about ICO	Extremely limited	8.6%
	Somewhat limited	11.4%
	Adequate	22.9%
	Extensive	25.7%
	Excellent	31.4%
Knowledge of Smart Contract	Extremely limited	9.5%
	Somewhat limited	10.5%
	Adequate	19.0%
	Extensive	26.7%
	Excellent	34.3%
Total		100%

3.1.3 Analytical Tool

The collected analyzed software (i.e., independent data was using PHStat to evaluate samples t-test to examine whether Smart Contract and ICO can help SMEs overcome funding challenges. Rating scale from 1 to 5 followed by strongly disagree, disagree, undecided, agree and strongly agree respectively, we decided on point 4 as a benchmark with 95 per cent level of confidence.

We carry out a t-test statistical hypothesis test that unfolds in three steps: derive few hypotheses concerning the smart contract and ICO overcoming existent funding drawbacks; 2) collect data from online to test those hypotheses; and 3) based on the findings, propose and evaluate models.

A t-test is a statistical test which follows a normal distribution curve. Any statistical test is to measure statistically whether the null hypothesis or alternative is true. The same appliesto a t-test. It compares the

averages of the sample tell if there is a difference and also it shows us how big the difference is between two variables (Boneau, 1960). We choose the t-test as a statistic measure as the sample size was comparatively small compared to the population and the variance was notknown. By nature, a t-test was appliedsincethemain purposeistestingthe significanceoftwoproposedvariablesineachgroup.

Besides, we also used PERMAP 11.8a program (i.e., PERCEPTION test), which adopts conventional metric multidimensional scaling techniques. In particular, it uses pairwise numerical values to construct a map showing the relationship between variables (Heady & Lucas, 1997). Since our conceptual model has data involving two dimensions (Blockchain-solutions and problems), we, therefore, took advantage of this graphical method to extract the subtle relationships represented in a matrix of numbers. Besides, due to the complexdissimilaritiesof the proposed models, the method serves as a helping arm to support the main statistical technique; thus, both methodsstrengthenthereliabilityandvalidityofproposedsolutions.

3.2 Qualitative Research Method

3.2.1 Primary Qualitative Data Collection

In an attempt to prove our model, we have collected primary qualitative data by in-depth interviews to gain a deeperinsightintothe SMEsectorinUAE as well as Blockchain Technology anditsapplications. Also, this technique allows us to collect a wider range of qualitative elements. Seven respondents were conducted through face-to-face, phone, and Skype (Internet) interviews. After the interviews, we maintaineda folder of "field notes" and transcripts from recordingsto support thefollowingnextchapters.

Besides, it should be notedthatwe applythis research method for the "right-sided" theoretical framework, which ranges from underlying factors, served as independent variables (i.e. trust, low profitability, etc.) contributed to the three main reasons (banking reluctance, limitations of crowdfunding, and entrepreneur creditability) of fundingchallengesfor SMEsin Dubai. Thisallows us togaina comprehensiveunderstanding of SMEs's funding and financing challenges, and analyze how factors such as low profitability, lack of collateral, business size affect SMEs's ability to obtain a fund.

The respondents were chosen strictly based on our data collection's criteria:

- Respondentsare (i) fromdifferentsegmentsofthe SMEsectorand (ii) Bankingsectorin theUAEandhave a significant influence onthecompany's decisionsbeforeinterviewsconducted.
- Respondents are experts of Blockchain Technology, Smart Contract, ICO, and Crowdfunding attached to a Department or institution.

This enabled us to collect rich information and ensured the validity and reliability of the data collected.

3.2.2 Respondent Profiles

Table 2: Respondent Profiles

Respondent No.	Name	Gender	Organization	Role
R1	Vikram Pandya	Male	YES BANK	Strategic Advisor
R2	Nakul Berry	Male	Smart Dubai	Blockchain Specialist
R3	Thuan Lam	Male	KPMG U. S	Senior Associate Advisory & Risk Consultant
R4	Dr Dhrupad Mathur	Male	S P Jain School of Global Management	Deputy Director
R5	Zayd Maniar	Male	Crowe Horwath	International Liaison Advisor
R6	Ayman Itani	Male	TML-LLC	Business Growth Specialist
R7	Anand Sachdev	Male	Hello Mangoberry Ltd	Business Development Manager
R8	Balaji K P	Male	RAKBANK UAE	Relationship Officer

3.2.3 Analytical Tool

To analyze the results of findings from in-depth interviews, a non-qualitative deductive approach was used to evaluate all of the variables in the predetermined framework. Simultaneously, we conducted an in-depth interview analysis to explore new qualitative elements for our research.

4.0 Data Analysis & Findings

This section presents the findings of data collected and interpreted by a flowchart shown below. The flowchart presented two main themes, specifically Reasons for SME's Funding Challenges and Limitations of ICO, emerging from grouping the qualitative and quantitative elements. The information acquired confirmed all the factors (confirmation elements) obtained from the secondary research and elaborated some additional elements (expansionary elements) to strengthen our secondary research as well as developed awareness to encourage further research.

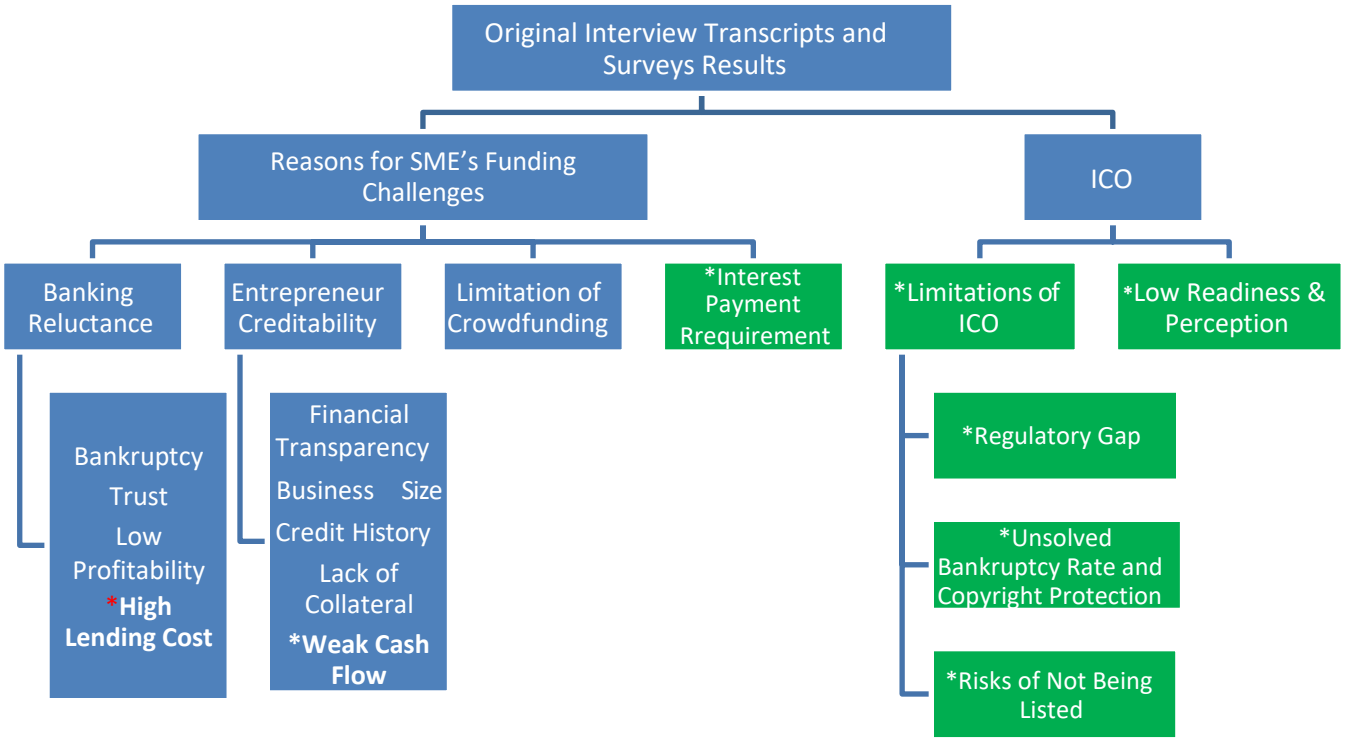


Figure 10: Result Findings

(*) Represents expansionary elements.

4.1 From Quantitative Research

Table 3: List of Hypotheses in This Study

Hypotheses (H)	Description
H1	Smart Contract can gain trust from users
H2	Smart Contract can enhance financial transparency
H3	Smart Contract can minimize the complexity of documental processing system
H4	Smart Contract estimates company's rate of bankruptcy
H5	ICO can overcome businesses' high-cost structure incurred
H6	ICO is time-efficient for the funding process
H7	ICO is beneficial for SMEs since widening project-development opportunities.
H8	ICO can protect a company's copyright
H9	Smart Contract & ICO are likely 'ignore' low profit-generating business
H10	Smart Contract & ICO are likely to be adopted for SME-fundraising regardless of business size
H11	Smart Contract & ICO can be used for SME-fundraising regardless of credit-history requirement.
H12	Smart Contract & ICO can be used for low-equity SMEs

4.1.1 Smart Contract

4.1.1.1 Trust & Financial Transparency

Trust and financial transparency are decisive factors in lending businesses. However, since small-sized businessesforcenturiesfinditextremelydifficultobtainingfundssincefailinginachievingoneoftheabove factors. Thanks to its outstanding characteristics, smart contract can be utilized in many segments, especially financial services. The consensus and mistrust between parties of business partners can be solved by the outstanding features of smart contract (Grybniak, 2017). The field of funding is another region where smart contractsworkextremelywell. Thefinancialindustryisdrivenbyinformation, andestimations areutilizedtodecide contract objective accomplishment. At the point when certain quantifiable objectives and breakthroughs are accomplished, the smart contract will permit foreordained conditions, thinking payment, expectations, and so forth, to execute (Brock, 2017). These terms are executed by preset rationale by building a blockchain to arrange comprising of PCs that utilization exceptional protocols to conduct upon the sequence of activities, the terms and requirement of the agreement/contract are executed by preset rationale, which allows users dispose of any outsiders, and the issues of counterparty trust can be comprehended substantially easier (Dikusar, 2017). For instance, if organization A offers shares or some other product like property, equipment, services to organization B and these parties don't believe eachother, theywill choose a subjective who can helpthemifthere shouldbeanoccurrenceofanydifficult circumstances. IforganizationAsends shares(throughthe codethey are encodedin) through blockchain stockpiling it is simply after organization B pays cash, that they will get the offers. It is feasible for you to write in the code as an exchange condition that the offers will be exchanged to the partiesafterthecashiskeptontherecord.Inthisway,initially, thecalculationchecksthebalanceand after that, the arrangement will be agreed upon, while information in the decentralized registry cannot be lost or cyber-attacked (Grybniak, 2017). Thisleadstothe statement thatusing smart contract is able to ensureacompany's financialtransparency as well as gaintrustfromlenders. Hypothesis H1 (t-value =2.35) and (μ= 4, $p< 0.05$) together with hypothesis H2 (t-value = 1.71) and (μ= 4, $p< 0.05$) was supported strongly, hence ultimately solving the problemsofsmallandmedium businessesin termsoftrust andfinancial transparency.

4.1.1.2 Complicated Process

Smart contracts can be utilized to enhance the information recording procedure and make it more exact and straightforward, therefore reduces audited costs. Smart contract also enhances the flow of consistent financial data and improves data integrity, which contributes to stabilizing the company's financial systems. Smart contracts permit rearranging your digital identity administration. You can store and control every one ofthe informationidentifiedwithyournotorietyandcomputerizedresourcesinsidetheblockchain

network and choose what parts of such information will be unveiled to a counterparty. Such usefulness gives enterprises the chance to know their clients and improve their satisfaction (Dikusar, 2017). Besides, thanks to automation in marking bargains and excluding human interaction in exchanges, everything is finished by the prescribed program codes (Grybniak, 2017). The smart contract could keep on tracking factors like arrival date and time, expenses appended for tolls and obligations paid, and some other alterationstotheagreement.A largegroupofinformationinputsimproveforcontractsandarenoissue for machines to process quickly. Rather than expensive suit to take care of issues, a smart contract stops execution — i.e. somebody does not get paid if pre-decided conditions are not met (Brock, 2017). For instance, the parties engaged with home loans and can be consequently associated with each other by a smartcontract. Smartcontractcanensurealowmistake, safety, andfrictionlessconnectionprocess, while interest payments and lien releasing after the loan is paid will also be automatically processed (Dikusar, 2017). They replace paper contract by having the capacity to self-execute and self-enforce. Self-execution is the reason we see solid advantages of smart contracts (Brock, 2017). This was strongly supported by hypothesis H3 (t-value =3.36) and (μ= 4, $p< 0.05$), leading to a conclusion that smart contractscan minimize the complexity of documental processing system.

4.1.1.3 Bankruptcy

Oneofthebiggest fearoflenders/ investorsaretheirborrowers'inabilitytopayoffdebtas wellas bankruptcy risk. Therefore, SMEs are easily rejected since investors are not likely to take any risk from small-sized business withhighprobabilityofdefault. This leadstothemotivationtoevaluatewhether smartcontractcaneliminatethe bankruptcyrateofsmall-and-medium-sizedbusinessornot(hypothesis 4). Witht-value=-7andtheP-valueis equal to 1 and greater than 0.05 (level of significance), we have rejected the ability of Smart Contract to reduce company's rateofbankruptcy.

4.1.2 Initial Coin Offering (ICO)

4.1.2.1 High-Cost Structure

Then, we have moved to ICO to examine its ability to reduce high-structure cost emerged when SMEs using traditional fundraising methods. Striking the optimized balance between investment performance and expenses incurred is one of the most important goals for investors in order to get a good return. Generally, all investments have fees associated with them- from portfolio management and operating fees to account maintenance, commissionsandtransactioncharges(Carson Institutional Alliance, 2015). Similarly, index funds or even crowdfunding, which may find attractive due to their low-cost structure, can prove detrimental to achieving investment goals due to their actual hidden costs incurred or in periods of negative returns. Entrepreneurs, thus, should choose an investment based not only on its expense ratio and but also on a low-cost impact to achieve investment goals.

ICOthatwesuggest bypassesallthedrawbacksofhigh-coststructureincurredininvestmentstrategy. With an ICO, the cost-per-exchange is minuscule. The expenses are for all intents and purposes free when the exchanges happenbetweeninvestors,extendingfromjust0.1to0.3per centwhentheyareexchangedon one of the unified

digital currency trades (Brock, 2017). Stock exchanges can be costly; with merchants chargingbetween$10 to $50 per transaction, and now and again upwards of 1 per cent of the acquired stock esteem is charged as commission. For exchanging more common stocks on an abroad trade, through local brokers, the expenses are significantly higher (Sireau, 2017). Conducting an IPO costs a couple of million dollars in addition to around 7% of the capital raised. This is not a down to earth choice for little organizations trying to raise humble sums (Conley, 2017). Exchange costs related to promoting and commitment settlements are essentially lower than with conventional raising money systems. Furthermore, ICOs offer liquidity upgrade of start-up back necessitiesthroughcryptoinvestors,overcoming raisingmoneychallengesforentrepreneurialactivities. ICOs allow crypto newcompanies, financial technologystart-upstoaccessmanypoolsoffinancialresources,bypassing bothbankingandnon-banking entities, and empower the offer of a stake in a crypto venture that expects to raise money at even a beginningperiodofdevelopment (A.Kaal & Dell'Erba, 2018). Hypothesis H5 (t-value = 2.63) and (μ= 4, p< 0.05) was supported strongly, hence ultimately solving the problems of small and medium businesses in terms of high-coststructure.

4.1.2.2 Time-consuming

We have also tested the connection between using ICO and its ability to reduce time-consuming fundraisingprocesses.Inbusiness,timeisrealmoneyandabusiness'smostpreciousresourceduetoan opportunity costconceptandthefactthattimeistheonlyoneresourcethatistrulyscarce (AllenS., 2017). In specific, a good investment requires balancing between investors' returns trading off with actual time consumption, leading to the fact that all time-consuming investments are required to be re-consider and eliminate whennecessary.

Ultimately, cryptocurrency offers 24/7 access to exchanging, as people can exchange freely when the trades never close. The customary markets are extremely constrained conversely. For instance, the London StockExchange Group only opens from 8:00 a.m. to 4:30 p.m. UTC, giving investors a constrained scope of time to alter their possessions.Bycontrast,thesettlementtimeswithdigitalcurrencyarequicker,with moves settled in minutes while common stock trades perform settlements in one to two business days. Digital currency's speed of executionisconsiderablymorelinedupwithportable driveninvestorswho expectquickness and thecapacity to respond rapidly (Sireau, 2017). Moreover, Initial Coin Offering requires fewer records and documentsthan any other public fundraising approach. Also, it doesn't fall under strict-law controls in most nations. This happens as a result of the decentralized approach and the distinctive businesstechniquesoftheventures (Iurina, 2017). Besides, our survey result hypothesis H6 (t- value =1.86) and (μ= 4, p< 0.05) was supported i.e. applying ICO forfundraisingwillsaveagreatamountof time forbusinesses.

4.1.2.3 Room for Growth

We also had the result of using ICO to open more room for SMEs to raise fund. An organization propelling an ICO will ordinarily take investors from any geographic area, giving them an enormous reach for raising funds. This is as opposedtoafirmpropellinganIPOonthe LSEGthatwillpullinspeculatorsfrom theUK(Sireau,2017).In

this way, tokens and ICOs can be advertised to an extensive, directed gathering of people with little exertion. Potential speculators can, along these lines, get some answers concerning a specific ICO through online advertisements, the organization's site, web-based social networking, and the sky is the limit from there (Dob, 2017). The other explanation behind the developing enthusiasm of venture investors in the ICO is the liquidity of the digital currencies, while quick liquidity to participate in new token offerings allows faster development, investors can also make benefits faster by easily withdrawing their money to invest in a new portfolio. To do this, they have to trade their token for Bitcoin or ethers on any exchange and after it will be effectively changed over into fiat monetary standards (Iurina, 2017). In addition, financial resources tend to be geologically gathered in budgetary centre points like Silicon Valley, New York City, and London. The ICO technique, for the most part, enables anybody in any geology to fund-raise. It additionally, for the most part, allows anybody to contribute (STELLAR DEVELOPMENT FOUNDATION & THE LUXEMBOURG HOUSE OF FINANCIAL TECHNOLOGY, 2017). More than that, while traditional funding reserves normally just permit a little gathering of world-class investors to put resources into profoundly creative undertakings for the most part obscure to the contributing open, ICOs give a considerably more comprehensive alternative for all investors (A.Kaal & Dell'Erba, 2018). , which additionally gives an organization the chance to converge with different firms and flags to the market that they are looking to grow, work with accomplices and raise their image profile worldwide. Hypothesis H7 (t-value = 1.71) and ($\mu = 4$, $p < 0.05$) was further supported i.e., utilizing ICO for fundraising will open a wide range of opportunity for SMEs.

4.1.2.4 Copyright Protection

After that, we have continued copyright protection and its relationship with ICO. One of the most common concerns for Internet-funding source is users' copyright protection. Copyright is a legal right created by the country's laws that grants the creator of an original work exclusive rights for its use and distribution (Tysver). However, crowdfunding cannot bypass this serious drawback of unprotected copyright in the presence. Specifically, the nature of crowdfunding is spreading business's proposed projects and asking Internet crowd for money support, which results in the likelihood of being stolen ideas and works, unprotected trademark as well as the copycat situation. Besides, the dynamic and unpredictable nature of technological innovation complicates lawmakers' efforts to write appropriate copyright laws, for current innovations and upcoming trends. Thus, the ambiguity and uncertainty in legal make it difficult for neither crowdfunding nor ICO users to protect their own business ideas and projects from competitors. To test the ability to overcome this disadvantage, we evaluate the hypothesis of the relationship between copyright protection's ability with ICO. With t-value=-15.89 and the P-value is equal to 1 and greater than 0.05 (level of significance), we conclude that ICO does not have functions on protecting the company's copyright

4.1.3 ICO & SMART CONTRACT

4.1.3.1 Low Profit

ICO, Smart Contract and their capacity to increase profit for companies and investors are also taken into consideration. When a company conducts an IPO, investors are offered company stock, regularly with a low

entry point. After the underlying sale, the offers of the firm are exchanged on a stock trade, for example, the London Stock Exchange Group (LSEG) or The New York Stock Exchange (NYSE). An ICO, in contrast, with the help of blockchain advancements and much general sense distinctive, includes issuing tokens that capacity as a sort of crowdfunding where a level of those tokens is given to investors in return for customary money or another outstanding cash, for example, Bitcoin (Sireau, 2017). Since January of this current year, new companies in four corners of the world have figured out how to raise over US$1.8 billion through Initial Coin Offerings (ICOs) (Dob, 2017). In the past, the bank is usually reluctant to lend SMEs money because of low profit. Since the rising fame of ICOs, the Venture Capital industry started to think about them as a productive speculation strategy. As per Coin Desk information, blockchain new companies have raised just shy of €1.5 billion through conventional investment firms (Iurina, 2017). In the second quarter of 2017, ICO issuances surpassed investment financing of new businesses for the principal time, with $210 million put resources into ICOs versus $180 million put into new companies through traditional investment stores (A.Kaal & Dell'Erba, 2018). With t-value= 1.84 and the P-value is equal to 0.0341 and less than 0.05 (level of significance), we conclude that ICO and Smart Contract bypass companies' background of low-profit generation.

4.1.3.2 Business Size

We have tested the size of businesses and their chances to successfully call for fund when utilizing ICO and Smart Contract. As mentioned in the previous section, business size also plays an important role in affecting SME's ability to get the fund. Specifically, smaller-sized firms, especially those with small proportion of tangible assets cannot possess sufficient collateral as banks/investors require and guarantors to protect against default risk (Zhao, Wu, & Chen, What Factors Affect Small and Medium-sized Enterprise's Ability to Borrow from Bank: Evidence from Chengdu City, Capital of South-Western China's Sichuan Province, 2006). Therefore, it is essential to evaluate whether these blockchain applications are able to overcome this challenge of SMEs.

Tight-budget enterprises are highly cautious in budgeting and business expenses, notably, compulsory legal processes or physical contracts are far more costly and complex than imagined, as stated: "Agreements are more complex than payments." Thanks to its unique consensus characteristic, the smart contract is an economical option used alike as physical contracts in all cases such as filing, verification, arbitration in legal support. Moreover, ICOs filled a void and empowered a democratization and consideration process that encouraged saving money disintermediation. Also, ICOs permit new businesses to raise support, bypassing both keeping money and non-managing an account element (e.g. VCs), and in addition their administrations as well as business size requirement (A.Kaal & Dell'Erba, 2018). In other words, it is all about the possibility of business processes but not about your business background. This was supported by hypothesis H10 (t- value = 1.66) and (μ= 4, $p < 0.05$) i.e., utilizing ICO and Smart Contract for SME-fundraising regardless of business size.

4.1.3.3 Credit History

ICO and Smart Contract are also tested for their usefulness in raising money for SMEs without looking at business credit history. As mentioned in the previous section, business's credit history plays a key role for firms to get funds from lenders and investors. The more defaults a company has made in the past, the less likely it is to get a loan, which threatens companies whose irregular payment history or having few issues on the default side. ICO and Smart Contract bypass this threat by the provision of

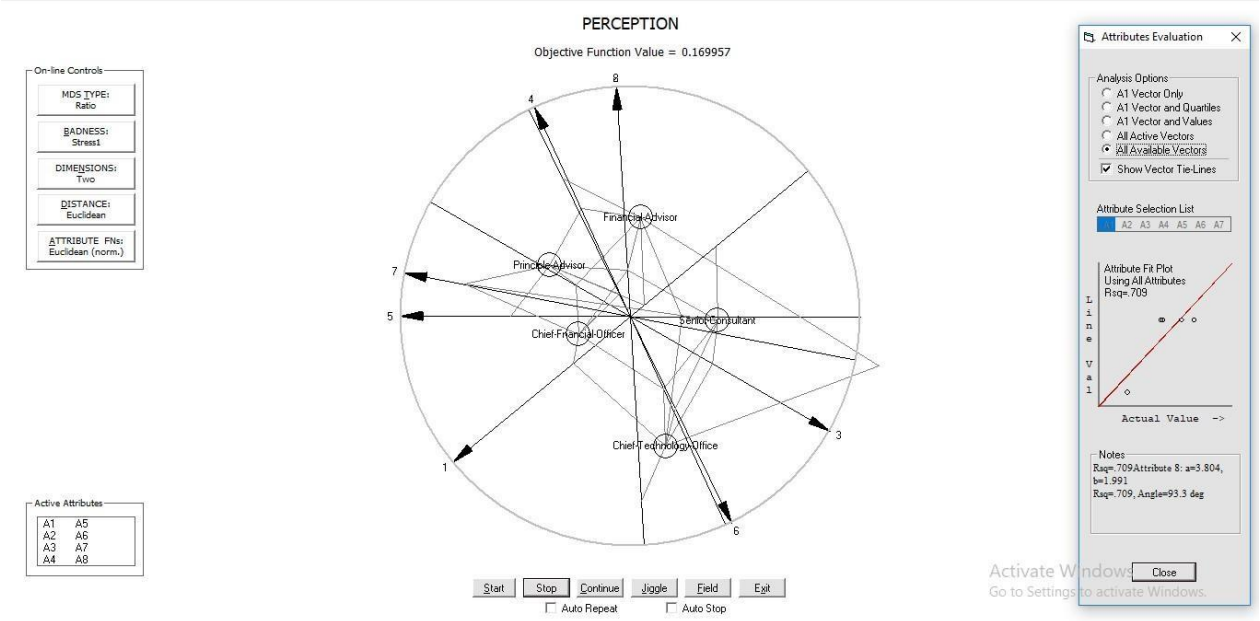
company-backgrounded elimination. Therefore, the company's biggest concern will no longer remain, widening the opportunities and chance of raising funds for small-and-medium-sized businesses. Hypothesis H11 was supported solidly (t-value =1.77) and (μ= 4, p< 0.05) i.e., using ICO and Smart Contract for SME- fundraising regardless of the credit-history requirement.

4.1.3.4 Low Equity

In addition, we have also tested ICO and Smart Contract in relation to the ability to raise fund forlow-equity SMEs. Overall, it is a necessity to test the correlation between Blockchain-based ICO & Smart Contract applicationsand low-equitybusinesses. Thelackofcollateralssignificantlyputathreatforsmall-sizedfirms to obtain funding from investors. Specifically, venture capital is one of the conventional approaches to finance a startup. Persuading an investor to put resources into an organization with an unproven track record and an inexperienced team can be hard. Regardless of whether entrepreneurs can convince investors, they will be probably demanded giving up a percentage of ownership of the company and even losing the control over numerous parts of company's strategies and directions (Conley, 2017). It may becomeaseriousproblemsince ICOpromoters, and their designers are not willing to sacrifice their equity which is usually low already in return for money raised. For these reasons, smart contract adoption and ICOs takeadvantageinthissituationbecauseinvestorrequirestoken notshare, and then founders do not havetogive uptheirequityortherighttocontrolthecompany.Thus,there would no longer a concerned issue for enterprises who lacks collaterals and assets. This was reflected by hypothesis H12 (t-value = 1.68) and (μ= 4, p< 0.05) i.e., possibility of adopting ICO and smart contract for low-equitySMEs.

4.1.3 Perception for ICO

Figure 11: Perception of ICO



Thestatisticsabovesummarizestheperceptionsofeverystakeholder,particularlyregardingthefactorswe foundto be mostcrucialfor fundraising challengesthatcan be solvedthanks to thepotentialpowersof ICO. We found thatChief FinancialOfficer andChief TechnologyOfficerbothregardedhigh-coststructure and companysize as the most likely to be eradicatedby ICO whileseniorconsultant andfinancial advisor have a completely opposing view. Also, allstakeholders except Chief Technology Officer consider thecredit history of a business as an easy factor that ICO can deal with. Furthermore, Senior Consultant and Financial Advisor have the same perception that low-profit factor is not likely to be solved, however, at the same time, it cannot be ignored as it is one of the fundamental reasons that Principal Advisor and Chief Financial Officer strongly believe that ICO can enhance. This result is very interesting and worthy to be taken into consideration carefully since Financial Advisor and Chief Financial Officer are expertsin making a decision related to money and profit but have an opposite point of views about this profit factor. Besides, little room for growth is also strongly agreed that can be fixed by Chief Technology and Senior Consultant while is not supported by Principal Advisor and Financial Advisor. In addition, copyright protection also strongly gains disagreement from most of the stakeholders, whereas the time-consuming process achieves a huge recognition as a factor thatcan be improved by applying ICO.

4.1.4 Perception for Smart Contract

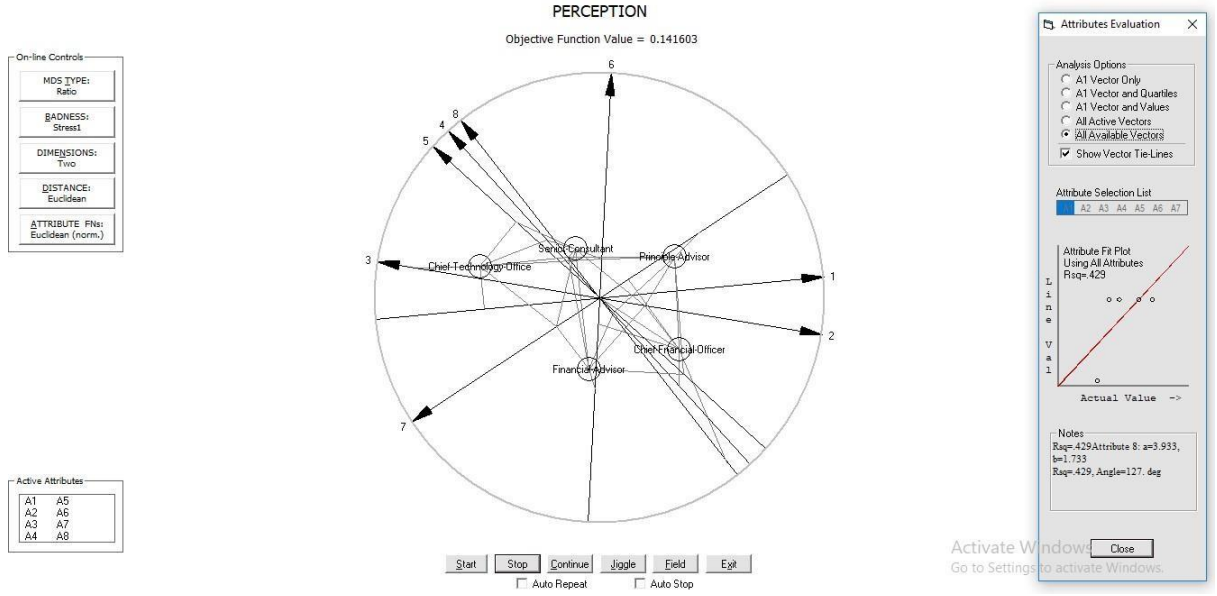


Figure 12: Perception of Smart Contract

The figureaboveoutlinestheperceptionsamongfivestakeholders, especiallyconcerningthevariables wediscovered duringtheprocessofcomprehendingmanypapertypesofresearch, textbooksandjournals in relation to dealing with SMEs funding problems with the help of Smart Contract. According to the pie chart, Chief Technology Officer and Senior Consultant had a strong agreement about Smart Contract's ability in terms of dealing with financialtransparencyandlowequityinbusiness, Financial Advisorand Chief Financial Officer gave very low credit forthesefactors. Regardingcredithistoryandcompanysizefactors, ChiefTechnologyOfficerfirmlybelievesthatby usingSmartContract,thesefactorscanbeeliminated,Chief Financial Officer, however, does not agree with the fact that Smart Contract can help SMEs raising fund regardless of their company size and credit histories. What is also interesting to note is that Chief Technology Officer and Principal Advisor feel the need and gravity of a smart contract for the solution of reducing complex document process and strengthening trust, Chief Financial Officer did not give much importance to this factor as they believed it would not be solved by utilizing Smart Contract. As we can see from the perception model, it's not difficult to realizethat while none of the

stakeholders has extremelysimilarperceptionsonallthefactors, theyallagreethat Bankruptcyistheleastlikelyto besolved by utilizing SmartContract.

4.2 From Qualitative Research: Data Analysis & Findings

4.2.1 Proved Evidence of Funding Gap

The respondents' confirmation was in good agreement with our findings in the literature review, which is the overall funding gap is evident. The results confirmed that a majority of SMEs-based respondents find it tough getting financing from banks and investors in the region. Through our respondents, there are various reasons contribute to an obstacle in obtaining funds, but mostly due to the bank's intolerance, and their lack of creditability. Among these factors provided by our conceptual framework, the respondents highlighted that insufficientcollateralandfinancialtransparencyarekeyreasonsthat affecttheirabilitytogetfunding. From a bank's perspective, (R7) confirmed that credit risks (bankruptcy-factor) and low profitability are dominant factors concerned by banks when lending SMEs. He commented that SMEs lending is considered as unsecured lendingin Dubaiand his bankplannedtoclose SMEs-lending Departmentattheend ofthis year. This result putsa threattoSMEsfundingchallengesandthusthrivesaneedforDubai small-and-medium enterprises to urgently take appropriate action and seek another alternative source of funding.

4.2.2 High Lending Cost

According to our respondents, banks in the UAE confront the challenge of the high cost of lending for SMEs; specifically, banks which are in the sector have to set up the complete organizational system and regulatory frameworkfor SMEsloaning. Forinstance, allofthebanksinvestinlendingprocessessuchasopening branches, hiring expertise such as Relationship Managers, Credit Analysts, as well as support and legal teams etc. This results inhigher cost of lending for the banks when compared to the relatively small lending size along with high default risks from SMEs (Baby & Joseph, 2016). On the other hand, this, in turn, makes an endless cycle, where higher costs of borrowinghinder SMEs from seeking bank finance.

4.2.3 Weak Cash Flow

The respondents broadened our current knowledge of another significant factor embedded in entrepreneur creditability, which is insufficient cash flow that makes them turned down for loans. On the one hand, lenders are highly concerned about the availability of their borrowers' cash flow to ensure their ability to cover payroll, inventory, and other operating expenses, as (R7) indicated. On the other hands, many SMEs-based enterprises struggle to liquidate enough cash flow in their accounts. (R6) commented on this factor: "We stilldon'thaveenoughcashfloweventhoughweareprofitablebecausewehaveto pay our suppliers and other third-parties before we received cash from our customers for our products." From the investors' perspective, SMEs'operatingcashmarginmanagementplaysakeyroleingainingtrustfor enterprises.

4.2.4 Interest Payment Requirement

In the literature review, we have investigated three important factors making SMEs difficult in funding: banking reluctance, entrepreneur creditability, and the drawbacks of the crowdfunding method. However, our respondents highlighted that interest rate is another important reason for their funding difficulty. The majority of our respondents revealed that they are charged with variable interest rates depend on their financial health and the amount of the loan given. In other words, this demonstrates that even SMEs are able to get loans, they are still charged with fluctuated interest rates and collateral requirements, especially with SMEs in service sectors since they have less or no collateral to guarantee. Also, our respondents felt unsecured by the upcoming rise in corporate loan interest rate announced by the UAE Central Bank, threatening their unaffordable loan payment. The interest expense can be re-emphasized by (R5)'s statement: "It's obvious that we have to pay loan interest from whomever we borrow, either bank or investors, do we have other ways to deal with this burden in the digital world you mentioned?"

4.2.5 Low Readiness and Perception

Unexpectedly, we found out an important conflicting element, which is a disparity between perception and actual action through interviews. Surprisingly, although most of our SMEs-background respondents acknowledged the importance of leveraging blockchain technology, especially ICO, to support their financing challenges, they still postponed adopting it. While the Blockchain phenomenon has become popular in the most of the Gulf and the world, equal numbers of respondents identified the absence of a clear vision and confidence in smart contract usage and ICO as a fundraising method. Respondent (R4) commented: "ICO is too new for us at the moment, probably we'll use it in the near future but this time we are not ready." The respondent also added his business plan to use crowdfunding for the next six months as it's trustworthy and popular in Dubai." (R5) and (R6) said that they would prefer traditional venture capital funding. In addition, (R4) further commented: "To be honest, blockchain technology is still beyond our perceptions. We have used physical contracts for years. It's too risky for us to use either ICO or smart contract since through these adoptions, our business model could be changed, and we are not sure about our ability to persuade clients. We will try our best to comprehend it and apply it to our business when it completely develops."

Further, one of the most remarkable finding to emerge from our primary research is the fact that the present ecosystem in UAE is not innovation-friendly. Through our respondents, we found out that since there are limited schemes to incentivize business in R&D along with high-cost business failure, enterprises in the region are sceptical and postpone when it comes to new disruptive technology implementation. This contributes to another reason SMEs' hesitancy in their initiative perception.

4.2.6 The ICO Regulatory Gap

Through our respondents, we explored that the majority of ICOs in the UAE remain unregulated and present as high-risk investments. (R1) also claimed: "Generally speaking, although there are huge potentials of ICO as a new disruptive way of raising finance on the other side, ICOs have their unique risks'. Therefore, they are still unregulated." In addition, (R3) stated: "Investors involved in ICO investments should be careful and seek

advice before making any decision as they are not protected by a regulatory framework in case of ICO collapse." At this point, Dubai authority (R2) also chose not to comment when it comes to an upcoming plan to develop a regulatory framework to mature ICO platform. The findings of ICO-regulated gap provide considerable insight into the expansionary qualitative element.

According to Jay Clayton, chairman of US Securities and Exchange Commission, he differentiates between ICO tokens and major cryptocurrencies such as Bitcoin and Ethereum and considers cryptocurrency as a security. On the other hand, J. Christopher Giancarlo, chairman of the US Commodities and Futures Trading Commission, raises the concerns about different ICO's regulations from state to state and consider it as a commodity and needed to be treated under US Commodities regulation (Young, 2018). Moreover, while governments in Asia have been amazingly proactive in sketching out how they will treat and regulate ICO and cryptocurrency as an asset, Europe authorities in contrast, according to the Financial Conduct Authority in the United Kingdom, in particular, label ICOs as the same characteristics as initial public offerings (IPO), as well as private placements of securities and crowd-sale (Katerina futur, 2018). In Middles East, The UAE's Securities and Commodities Authority (SCA) cautions investors to be watchful about dangers association with investment into all propelled, token-based fundraising activities or theories designs in the Emirates. Certain ICOs are not controlled and are in this way open to dangers of misrepresentation, and therefore are very hard to track and recuperate subsidizes in the situation of a collapse (Das, 2018). Taken all together as we can see, the confusion and uncertainty spread not only within the US – the largest ICO market or in UAE but around the world as well, which strongly and discourage companies, businesses and entrepreneurs from taking advantage of ICO for fundraising.

5.0. Managerial Implication

From a constructive viewpoint, our outcomes feature three significant implications for various stakeholders regarding ICO and Smart Contract.

The differences in evaluation and interests toward Smart Contract and ICO are evitable and have been further embellished by the perception test. From each stakeholder's perspective, their priorities are assigned for various applications of ICO and Smart Contract on different scales. Therefore, project makers and business leaders must understand stakeholder's point of views and their interests so that they can choose suitable approaches for different stakeholders.

Secondly, there are many confusions and discussions about how to regulate ICO and which categories it belongs to. Since different perspectives result in divergent regulatory standards for ICO that seriously prevents SMEs from adapting ICO. For that reason, it is urgent for UAE's government to take initiatives in fixing regulatory gaps to become the world first ICO hub and attract more startups and entrepreneurs around the world building and developing their business in UAE.

Finally, while policymakers and federal lawyer are in the process of architecting broad comprehensive regulations for ICO and Cryptocurrency, SME's sectors hould fully take advantage of this precious time to focus on learning, preparing knowledge and human resources in relation to ICO and Blockchain technology. Thus, when ICO and their regulation are thoroughly effective in place, small and

medium enterprises can stay ahead of this intense competition not only in the Middle East but outside the world as well.

6.0. Limitations and Future Scope

6.1 Limitations

With 105 respondents and 8 interviews, the data and information we collected probably do not fully reflect and examine the whole picture of the problems we are working on. In fact, not all people who participated in a blockchaincommunityandespeciallystudentshavea solidknowledgeofblockchain.Inaddition, UAEis considered as a small market for ICO and Smart Contract's developers, which creates many barriers for us to connect and interactwiththosewhounderstand Blockchainandareworkingondeveloping ICO and Smart Contract inthisfield. Regardinga globalscale, thesurveymainlyreachedoutto specialists from America, Germany, and India, while an investigation into the effectiveness of blockchain adoption in different regions is necessary to enhance the reliability of suggestions.

The rapid growth in technologies itself also a limitation of this paper research. Blockchain is becoming more prominent and gains contribution from developers all over the world. With the help of many dedicated communities, ICO and Smart Contract introduce new features in a different form and have been updated with different applications every single day, while this paper has a limited view and discussion on these features that are probably obsolete in the near future.

6.2 Future Scope

Future research should attempt to be conducted by specialists who have comprehensive knowledge and experiences about this technology so that the survey results less likely to be distorted. Furthermore, the research shouldbecarriedonalargerglobalscaleincludingavarietyofregionssuchasAsia,Europe and Australiato gainmore insights into how its effectiveness changes in different circumstances. The research paper should also be updated withthetrendsthatperiodictechnologyforumsdiscussing, hence proving a timely adoption of latest blockchain applications.

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