Strategic Business Values of the Blockchain Technology Market to Assist Professionals: Deployment Perspective

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Abstract
It is difficult to transform a blockchain initiative from the feasibility stage to the fully commercialized the technology's products or services, especially considering the significant investment required and the lack of studies on the benefits and barriers from deployment perspective. Whereas some organizations have come up with their own solutions to moving beyond the feasibility stage, commercial applications do not yet exist and few organizations are willing to invest beyond the prototype phase and fill in the gap between the expected and actual business value of these types of projects. This study aims to develop a blockchain model using a survey to gather qualitative data on experts' opinions on the deployment of blockchain technology. Our model will measure how business professionals could take advantage of blockchain's disruptive technology to develop business opportunities. This study's contribution is to show blockchain technology's potential strategic business value. The findings from this exploration include the prospective for delivering comprehensions to businesses for different creating investment choices on the embracing of the blockchain technology.

Keywords:
Blockchain technology; business value; deployment opportunities, technical assessment.

I. INTRODUCTION

"Blockchain investing is the future: you can see real users, in real time. Traditional investors receive this information a few months later, buried in an earnings report (John Hargrave)." According to PwC (2020), blockchain will add $1.76trn in value to the global economy by 2030. It might change the game for those seeking to invest in this technology. However, opinions remain divided, where some experts believe blockchain offers strategic solutions for industries [1] and others see it as a fantasy.

Despite the BT's potential to support various types of businesses by enhancing efficiency and cutting billions of dollars in corporate expenditures, its commercial applications remain at the conceptualisation phase and lack of evidences for a practical use of the blockchain [2]–[5] where blockchain is struggling to arise from the pilot phase and many projects failed to obtain more funds [5]. Additionally, several organisations decline the adoption of the BT due to the uncertainty of BT benefits [6]. One of the main issues with blockchain is how it will add value to businesses that existed technologies cannot offer [2]. For this reason, significant investment is used as a criterion that shows the transformation of blockchain initiatives from the feasibility phase to commercialised products or services [7], [8]. The acceptance of the BT also has not perceived a rapid implementation as yet [9]. However, to invest in any technology, it is significant to study what value will add to the organisation. Realising blockchain's strategic business value and resolving the challenges associated with it are of major concerns for many professionals. Guidance is required for a variety of issues, including the challenges businesses face within a dynamic environment. Several researchers studied the behavioral intention of BT adoption [10]–[16]. Rare of the studies highlighted or pointed out to the business value from investment perspective.

Therefore, the success of blockchain depends on investors who comprehend the technology's potential in affecting their bottom lines [17] where the business communities' desire is to disrupt how they transact their value. Investments in blockchain can also be motivated through the knowledge of its technological attributes in terms of how they could significantly address different gaps within legacy technologies such as security, transparency, etc. [18]. The predicted global spending on BT solutions reaches up to $11.7 billion in 2022, and around 50% of the organisation across the globe where the BT is seen as a strategic business value [19]. Despite the positive predictions for BT and the fact its adoption has increased since 2018, investment has decreased in recent years [9]. Businesses are still unenthusiastic about investing in BT [20] and firms are still using regular databases [21]. This gap needs to be investigated from the investment perspective to shed the light on the reasons that make the technology at the conceptualisation phase and what tasks professionals should conduct to utilise the technology. Therefore, a research is needed to fill these gaps and provide evidence on the barriers and drivers of blockchain investment and implementation [22]. More investigation is needed on the role of certain stakeholders (e.g., investors, traders, miners, decentralized apps users, etc.) to understand the costs and benefits of technology acquisition [23].

The main questions are why a technology like blockchain, with so many promising solutions for business, is still at the

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pilot stage, and how business professionals can respond rapidly and effectively to take advantage of the opportunities this innovative disruptive technology could provide. We need to understand the underlying barriers to and drivers for investing in BT. Answering these questions will clarify why investors are still reluctant to consider a transformational and disruptive technology such as BT. Therefore, the development of the conceptual framework could answer these questions. The study contributes empirically to the body of knowledge and enhances other studies in the field of blockchain technology.

This study aims to increase the awareness of blockchain's potential to improve business processes. Our findings could also help develop strategies for investment and provide new business models that could attract and guide more investors. This paper provides a comprehensive literature review of BT for potential investors and entrepreneurs. Further, it will directly contribute to the background information academic researchers require to provide practical solutions to some important aspects of this novel technology. The developed framework serves as a comprehensive tool for practitioners who aspire to assess the BT. It could help enhance the decision-making process about investment, and avoid the threats of using BT. Moreover; the findings could support regulatory entities in forming satisfactory legal settings for the operation of the blockchain technology market. Additionally, the research builds a valuable reference for other business entities in the early stages of the BT initiatives and has a noteworthy effect for practitioners.

This paper is organised as follows. A discussion of the related studies on blockchain is open, particularly, in the investment of this technology. After that, the factors that hinder or attract BT investments are investigated and the reasons that investments are not placed to the extent that corresponds to the potential capabilities of this technology. This study then attempts to find out why there are no large investments in a disruptive technology that is capable of providing huge benefits to many industries, compared to the early stages of the internet, another earlier disruptive invention. Then, conclusions and recommendations.

II. RELATED STUDIES

A. *Blockchain technology: an overview*

Approximately 80% of the barriers to improving business performance can be removed by adopting technology that leads to new business models and improvements in business processes [24]. BT is an innovative, disruptive business-transformation technology and not an information technology.

Organizations could invest in BT after they assess whether blockchain's solutions would provide them with advantages over the legacy systems they presently use and help them significantly transform how they do business [22]. Adopting a disruptive technology involves undertaking disruptive adaptations [25]. It also involves considerable financial investment and modifications to current operations and business models [26]. Investing in the necessary hardware and software represents higher costs for organizations and their partners [27]. This is why some countries are moving toward blockchain technology through their established initiatives and strategies. For example, China intends to use BT to solve individual credit problems [28]. As per Kaplan and Orlikowski [29], when people were to articulate their thoughts, intentions, and plans around BT, this would encourage their investment efforts and support their future decision-making regarding the deployment of a blockchain.

Organizations are still facing barriers to understanding the tangible benefits of blockchain technology [30]. For managers to understand the benefits of BT in terms of how it could improve business and technological processes and the other opportunities it could provide, they need to understand how blockchains work [31]. Regional and cultural factors also affect the progress of BT in terms of its ability to provide enhanced solutions for certain problems [32].

Migration to BT requires significant investment, top management support, and collaborations at the international level to influence the technology's governance, standards, and security [33], [34]. This could be led by advanced countries that pose fewer barriers to BT adoption and whose social and economic systems provide motivation that would encourage the acceptance of the type of disruptive changes that are inherent in BT [33]. Several benefits are associated with the development of blockchain-based standards, such as ensuring the type of interoperability between blockchain systems that could reduce the potential for fragmentation in the business ecosystem. Other benefits include improving the understanding of this technology as well as addressing the security, privacy, and data governance surrounding it [35]. Figure 1 shows the status of organizational plans for adopting blockchain technology according to Gartner [36] that range from low to high. On the basis of the plan, 1% of companies are invested and deployed BT. While, 43% are no action plan yet. This is a major concern to investigate the significant discrepancy between them. Therefore, understanding the business value of BT is a means to show variances.

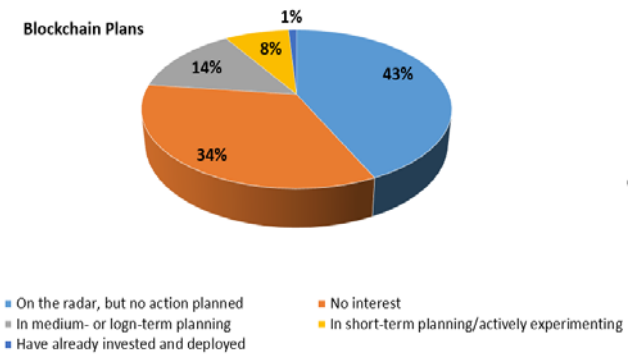

FIGURE 1. Blockchain plans (Source: Gartner [36])

B. Analysis of blockchain technology's business value

Blockchain technology offers real-world solutions and its commercialization is moving at a dramatic pace [37] as investors are being lured by the competitive advantages [31], [38]–[40] and huge profits it promises [41]. BT benefits can be classified as both technological and financial [42] and matching business requirements with BT solutions is a prerequisite to its adoption. In general, blockchain has significant benefits compared to existing systems, for example in lower costs, better identification control, fraud reduction, shorter settlement times, and new revenue opportunities [1]. China launched its national blockchain network to exploit features specifically designed to reduce the cost of performing blockchain-based business transaction, resulting in up to 80% in cost reductions in China [43]. For example, as of 2020 70% of financial services companies in China are presently using distributed ledger technology [44].

BT provides advantages to different stakeholders such as developers, entrepreneurs, and technology enthusiasts [42]. Several elements should be considered when investing in blockchain, including the problems it proposes to address, the solutions BT offers, and major concerns over investments decisions [45].

Public and private sector entities are keen to take advantage of BT capabilities all over the world. This is motivated by many benefits that can fit their requirements such as combinations of data and transactions offering traceability functionality over the network [46] that can be performed with a high level of accuracy to enhance a system's security [47]. Further, structure of BT is such that it is open to anyone on the network who would like to perform valid transactions [48]. BT removes intermediaries from the supply chain and this saves more money on transaction fees [49], [50].

Cryptocurrencies are attracting more investment through various funding models [51]. To facilitate seamless monetary transactions independent of trusted third parties, cryptocurrencies rely on blockchain technology. More and more distinct new forms may be created thanks to this exchange; these forms are all associated with various customer-to-customer interactions [52]. For example, Visa and MasterCard are transforming their current platforms to blockchain-based systems so they can continue to provide their services, more efficiently, in national and international markets [53]. BT can provide safe digital identities for transactions over tangible products, thereby rendering counterfeiting much harder. This feature represents a strategic level of investment for companies that engage in manufacturing or distributing products at risk of counterfeiting [54], thereby driving investments in BT's innovative applications across all industries [51].

BT has a wide range of stakeholders. Investors are individuals and institutions that fund and invest in projects; they can be classified into optimistic and pessimistic or skeptical investors. Institutional investors use systematic approach to obtain the information they need to make investment-related decisions [17]. Organizations should understand that BT could disrupt their commercial models [55]. Investors are interested in the demand side of the technology [56]. Some organizations began to run prototype blockchain-based projects to improve their image, attract investors and show competitors their capabilities [57].

Another positive impact of BT implementation is enhanced asset turnover and reduced sales expenses [58]. Low costs and better efficiency make BT a significant transformational model for all sorts of business operations [22], [49]. Blockchain can also provide risk management through procedures that protect individuals and organizations from uncertain losses or from becoming victims of other types of financial hazards such as credit risk [20].

Investing in BT results in significant improvements in business transaction processing [59], investment markets [60], marketing and advertising [61], real estate and urban planning [62], institutional governance [63], public services [64], tracking assets in supply chains [65], restricting censorship and online surveillance [20], preventing breaches in legal regulations [20], and addressing changes in capital markets [66]. In some developed countries the rate of BT adoption is low [67], while in others businesses and government are progressing toward fully integrating this technology. According to Deliotte [1], 2020 witnessed a 17% rise in blockchain incorporation in global production, compared to 2019. Several countries put blockchain in production, for example China with 59%, Ireland at 48%, UAE at 43%, and U.S. at 31%. Globally, blockchain is a top priority and companies are investing more in staffing and technologies related to bitcoin [68]. Certain blockchain applications are limited to certain industries . Deliotte [1] notes that blockchain's investment planning capability requires an invest of at least $5 million. Figure 2 shows the variety of areas where organizations of are investing in blockchain

and utilizing its use. For example, Ripple and R3 are blockchain-based systems that can be used to make payments globally, in real-time delivery, while lowering the cost of each transaction. This helps decision makers remain competitive [13] [20], [59] and attracts more investors to the blockchain technology [51].

Banks in some countries have been investing in blockchain (e.g., Germany, and Switzerland) as have several industries, the topmost of which are hospitality and tourism as of the year of 2017, representing 11% of total investment, followed by financial services with current investment of 9% and future expectation of 36% of total investment [69].

In the future, many companies may make blockchain an investment priority [70] to obtain the benefits the technology offers and this could positively drive up investment [18].On the other hand, investment costs could mean an uncertain future for BT due to the costs involved in integration, networking, and operations [20]. Real business transformations will only occur when giant tech corporations or governments embrace BT and offer it to others [48]. A recent report released by Deliotte [1] shows that nearly 53% of the study participant perceived that blockchain could become a critical priority for their organizations. Nevertheless, these are only survey results as there are no real case studies on investments in BT. However, a total of US$10 million in investment in BT is proposed for Luxembourg, Switzerland, and Germany, with shares of 43%, 33%, and 31%, respectively, by the end of 2021, the highest country-based potential investments in blockchain to date. The problem is that the business requirements are still not clear for investors.

In 2018, the total investment in blockchain technology, globally, reached $5.5 billion, while it dropped to $3 billion in 2019. Venture capitalists are the top investors in blockchain. In, 2015, they invested over $US500 billion in start-up companies [59]. According to IDC [71], in Europe, investment in BT increased by 60%, since with over $1 billion in spending forecast for 2020 representing a level of progress that could move BT from concept to implementation and production. This movement has mainly been a result of the Covid-19 pandemic and its effects on traditional technology projects. The pandemic has shown gaps in current systems that could be solved through blockchain-based solutions in a wide variety of areas. This could also be accelerated through public policies that assist in facilitating blockchain investment [72]. There have been numerous investment initiatives in around the world (e.g., Goldman Sachs) to reduce costs and avoid regulations at the national level [73]. Other enterprises implementing BT are Facebook, Google, Toyota, and the Alibaba group. This raises the question, why did this happen? Figure 2 shows investment in blockchain.

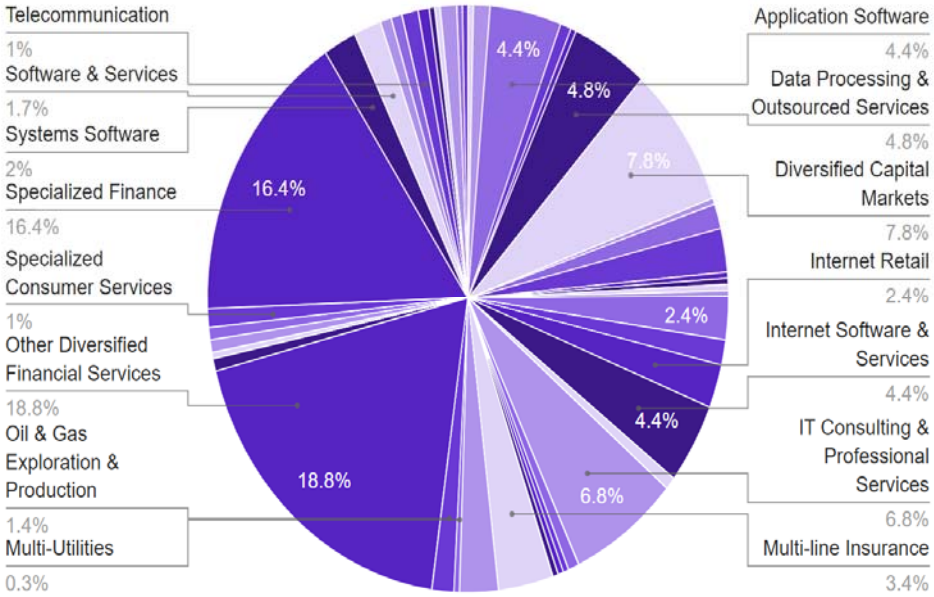

FIGURE 2. Investment in blockchain (Source: [74])

III. ISSUES FACING INVESTMENT IN BLOCKCHAIN TECHNOLOGY

A. Regulatory cluster

Those interested in investing in BT should wait for their governments to develop regulations for this technology. To date, there is no single regulatory doctrine that has garnered widespread endorsement [75]. For example, uncertain regulations have prevented banks in India from using cryptocurrency [76]. And even though the private sector has been driving the expansion of blockchain applications [77], the technology is still immature in terms of its criteria, rules, shared governance models, doable ecosystems [8] and value creation [78]. However, blockchain applications are obliged to comply with financial regulations and standards in some countries. For example, the United States is taking real action toward regulating the blockchain ecosystem [79]. Nevertheless, regulation is only at a starting point and its lack is a serious obstacle to implementing this technology [80].

One explanation is the complexity of regulatory regimes [81]. A comprehensive understanding of BT is required before launching associated regulatory measures [82]. Regulatory guidance engenders trust in a system and its place in the economy [83]. Creating trust will lead to successful adoption by businesses [84]. According to Axios and Lacity [7], [8], it is difficult to transform blockchain initiatives from feasibility to commercialized products or services, especially due to the need for significant investments in blockchain-based projects. Regulatory issues are also perceived as one of the highest barriers to BT adoption [1]. Companies fear the risks involved in implementing blockchain [34], specifically risk-averse companies that could face negative financial consequences from investing in this new technology [9].

The lack of BT legislation poses a barrier that could hinder investment [16]. In the blockchain era, to enhance investment opportunities, regulatory strategies are essential for the successful, safe, wide-spread implementation of this technology [79] [75]. Regulatory uncertainty, particularly with regulatory changes globally, makes it difficult for global partners to conduct negotiations around the use of BT [85]. Guo and Liang [86] indicated that regulatory issues around decentralized systems remain unresolved and there is a need to develop industry standards. It may be necessary to develop concessional policies for blockchain to provide incentives for entrepreneurial and innovative behaviors [72]. The debate about blockchain regulations (e.g., how personal data is stored and handled) [1]. In these cases, professionals should be aware of the trends in regulation for this technology [79]. For businesses to migrate to BT requires solving legal barriers to enhance the transformation process [18], [87]. Some blockchain operations might conflict with the regulatory requirements. For this reason, BT is perceived in a negative context because its integration may be used for unlawful activities (e.g., money laundering) [20].

B. Governance cluster

New governance mechanisms are needed, along with changes in organization processes [16]. Governance operates at the agent level to safeguard against bounded rationality and at the institutional level to safeguard against institutionalized injustice [88]. According to Yeoh [89], blockchain depends on collaborative governance to build trust and avoid the occurrence of any cybercrime activities. Trust is also an essential component for both the technology and the players in the market [16]. Governance can promote trust. Increased trust is a positive factor that improves business processes [90].

C. Organizational cluster

Blockchain enterprises continue to fail to achieve business value. This is because of the absence of knowledge about how BT can generate benefits for the relevant business models [8]. Society still does not understand what a blockchain is [22]. So creating awareness of blockchain is a much needed step to embrace the technology [38]. Additionally, investors still avoid investing as their business models require higher upfront investments in R&D and cash flow and commercial tractions occur only after early adopters have tested the technology [91].

Shifting to BT also requires solving cultural resistance to the transformation process [18]. Several factors negatively affect investment in blockchain, such as lack of in-house capability, insufficient funding, and lack of business priorities for this technology [1]. Hence, the low level of BT awareness as well as the lack of information on workable business uses prevent adoption [67]. Also, companies' lack of resources for technological investments is often a reason companies are slow to migrate towards BT investments [75].

According to Mori [92], organizational and business practices are also considered major barriers to adopting BT. Considering its current associated limitations, there is little encouragement to invest in BT. Solutions are required to encourage investment, such as cutting down operational costs and cycle times, mitigating the risks, and enhancing the potential for revenue earning; these are some of the major drivers for investing in BT [93].

D. Technical cluster

Inter-operability is essential to widespread BT adoption [94]. The integration of BT as a legacy technology is a complex process [81]. Scalability is also a technical issue in BT. This requires validation of the technology after complete implementation in real business use cases [95]. Information exchange, transactions classified under technical clusters, and shared

infrastructure [96] could influence adoption [97]. Addressing these factors will provide a clear picture for investors regarding the pros and cons of the technology. It might be that positive understandings could encourage investors, while negative understandings could discourage them. Moreover, technical factors represent the extent to which organizations will adopt blockchain in their business processes. Increased adoption will lead to more investments in this technology. Covering all of the required factors represents a roadmap for stakeholders (e.g., investors, business and government). A summary of the clusters are presented in figure 3.

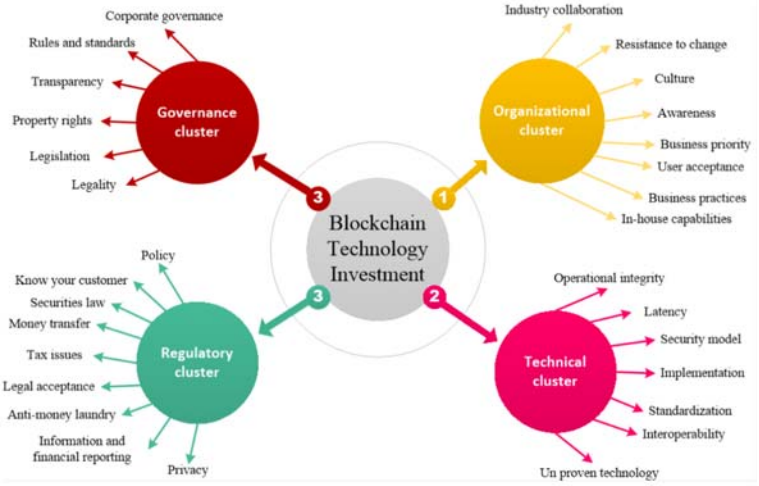

FIGURE 3. Summary of the clusters

IV. THEORETICAL INTERPRETATIONS BEHIND DISRUPTIVE TECHNOLOGY

When prospective investors look at a new technology, they consider its current and future investment performance [98]. Disruptive innovation theory is a suitable basis to use for interpreting BT's implementation [99]. And as there are a limited number of case studies on BT's application [100], the Theory of Planned Behavior offers investors guidance on the investing process for this novel technology.

Technology-organization-environment theory can also be used to interpret the potential costs and benefits of investing in BT [101]. Several scholars have studied the barriers and drivers of investing in BT. However, the objectives of these investigations have been limited to developing a framework for investors Table (1) summarizes the technical benefits of blockchain.

TABLE 1
BLOCKCHAIN TECHNOLOGY DRIVERS

Drivers	Explanation	**Source**
Disintermediation	No third party needed.	[102], [103]
Non-repudiation	Indicate the truthfulness.	[48], [104]
Automation	Computerize dealings among associates.	[48], [104]
Speed	Fast transactions with no system failure	[105]
Trust	Integrity and security of payment process.	[16]
Timestamps	Keeping historical records	[22], [105]
Immutability	Unable to change the transactions	[22], [105]
High level of security	High-level of protection from malware and hackers.	[106]
Transparency	Better credibility and real time. Real-time transparency of BT lets investors have better supervision over managers.	[90], [107]
Decentralization	No need for trusted third-party in a P2P network for authentication purposes	[108]

V. RESEARCH METHOD

The study provides guidance to help stakeholders (e.g., investors) make informed decisions on whether to invest in blockchain technology. The theory planned behavior explains the behavior of users [109]. Therefore, the theory is used to interpret the data that is collected from the experts in the field. A comprehensive literature review [110]with the systematic approach provides a clear picture about blockchain. This review also includes theoretical and empirical studies, both qualitative and quantitative, so as to shed light on all of the factors associated with the study's objectives. The research includes resources from grey literature (e.g., conferences, white papers, newspaper articles). Mendeley is used as a database reference management system.

The experts provide different perspectives on the BT and their predictions of the reasons that make the technology have further investments. Moreover, professionals should take advantage of the opportunities pertaining to this disruptive technology. Experts' perceptions is a common approach for studying forecasting technology's trends [111]. Several criteria are considered in selecting experts with the requisite level of understanding and engagement in BT, specifically the business transformation that is realizable through this technology, understanding the market (e.g., investment opportunities), having over five years of experience with BT, and having worked in top management in the field (e.g., strategic level decision making). This study also tackles diverse positions and backgrounds that could enrich the findings. Our study intends to answer how blockchain investment is defined within businesses and why it is relevant.

VI. DATA COLLECTION AND ANALYSIS

The research starts by exploring several databases to generate a resource set that is unique to the BT from an investment perspective: Web of Science, Sage, Scopus, MDPI, PubMed, Google Scholar, ProQuest, JSTOR, and EBSCOhost. The multidisciplinary nature of blockchain research was the motivation behind selection of the databases. Additionally, the reasons are varied from most trusted databases up to the data that includes many articles, which have not been indexed as yet, including more quality works, holistic cross and multidisciplinary nature of databases. The researcher also used the strings "blockchain," "technology," and "invest*," for search purposes. The study involved both theoretical and empirical research and extracted important constructs that can affect investment in blockchain. It is also important to gather experts' opinions on investing in blockchain. The researchers determined what constituted a suitable sample. The period that is used in searching for the literature was from 2015 to 2021. After that, they approached a wide range of business experts as the interview subjects via an email that consisted of a brief introduction to the research and a semi-structured questionnaire.

VII. RESEARCH DESIGN AND SAMPLING APPROACH

Blockchain technology's markets are expected to reach $67.4 by 2026 [112]. However, with the promising of the technology in the near future, there is a lack of a rising investment. The question is that "What are the reasons for that?", and "What should professionals do to respond to these changes?". This study aims to develop a framework that could be used as a roadmap for those who are interested in investing in BT. This roadmap will guide them in making efficient investments in BT while avoiding risks. To achieve this objective, a qualitative method was adopted in which field experts were interviewed and data was collected to strengthen the proposed model [113]. Suitable questions were posed such that the researcher gained an in-depth understanding of the status of BT investing while also obtaining answers to the research questions. Experts' thoughts are valuable for gaining insights into BT's actual usage as against its predicted use.

Presently the available evidence on the BT is inadequate for developing a framework to guide through the investment process. To overcome this gap in knowledge and to obtain a more complete understanding of the BT, different stakeholders in the business sector are asked to share their experiences and knowledge to provide a more comprehensive picture about investing in this technology [114], [115]. The number of respondents depended on the types of questions they were asked. The criterion was based on reaching the saturation point where it was determined that no new information went unnoticed [116]. The researchers could not identify the number of respondents beforehand. Thus, the saturation point was reached following completed interviews with twelve experts in the field. The researcher proposed interviewing additional three respondents to demonstrate that they could not provide any new information. The questions were organized before conducting these interviews and the focus was on investing in blockchain technology.

The researcher carried out scheduled interviews that lasted for one hour. The questionnaire was organized to discover the following: 1) the way experts define the investment factors in BT; 2) the way BT can revolutionize businesses; 3) the way blockchain's business value and models are affecting investors' decision making; and 4) the way respondents presented their opinions about BT when

asked and how this could improve investment perceptions regarding BT [114].

Semi-structured Zoom and Skype interviews using both open- and close-ended questions [114] are conducted by selected experts in business digitalisation. Selecting semi-structured interview serves the researcher and interviewees. The researcher can explore more information from interviewees, avoid interviewer bias, guide the interview, allow the researcher to acquire new ideas from the interviewees, and the elements of the framework can be explored [117]. Blockchain technology remains at the pilot and exploration stage. Therefore, conducting interviews with the experts in the field is a powerful method for gaining experts' perspective to achieve the research objectives [118]. The aim was to acquire an in-depth understanding about investing in blockchain technology. It was considered more appropriate to gain qualitative information for the study since few individuals possessed the required experience with BT.

The level of expertise is considered a way for improving the reliability of answering the survey questions [119]. The results show that the experts' opinions depended on the way they perceived the benefits of investing in blockchain technology. Their opinions were helpful in drawing a roadmap that could affect the decisions of interested investors.

Each interview began with enquiries about the expert's views on BT and the prospective benefits from investing in this technology. It was established that the experts were in agreement on the benefits of investing in this technology. One expert from the financial services sector indicated that *"Blockchain technology can help the entities that are accountable for handling, storing, and financing a database. The peer-to-peer architecture turns out to be commercially applicable due to blockchain's capability to reward members for their influence with "tokens" along with providing a stake in any forthcoming expansions in the value. Yet, the mindset moves vital and the commercial disruption is massive in such a model. The strategic value of blockchain is cost reduction."*

Why should businesses move to blockchain technology? Not every company needs blockchain but many businesses should consider it because of the numerous benefits it may bring. Companies that require large amounts of customer information where many intermediaries are involved or where complex accounting is required could benefit from blockchain. Another participant confirmed, *"the need for tracking goods can be efficiently assisted by blockchain without the need for a person to do the tracking. For example, in the healthcare industry blockchain is used to store patient records. The positive point for companies that invested early in blockchain is that they will have a competitive advantage over others."*

Companies face some difficulties when deciding which opportunities to follow. One participant stated that, "*[c]ompanies can limit their choices by capturing a controlled method using a lens of rational skepticism. The initial phase encompasses deciding the value at stake for the case of investing in BT for a specified use. Identifying precise problem areas will allow for a rough idea of the probable economic value as well as the limitations of using blockchain for business solutions. Generally, a corporation's business features along with its proficiency and competencies will also have an impact on this choice, as a business should recognize the distinctions between all of BT's mechanisms while selecting a suitable use that would produce concrete payoffs. If a particular use is viewed as potentially failing to achieve a minimal level of viability and possible returns, a business will not study the second stage of which blockchain strategy to embrace."* This is supported by Deliotte [1], who notes that as a measure of skepticism, 20 percent of respondents still believe that blockchain is overhyped.

One also requires an awareness about BT. One expert stated that, *"[a]wareness is required to look for any opportunity which could add value to the organization … The available information related to BT is still poor. Therefore, it's important to disseminate specialized knowledge about blockchain, in areas such as governance, risk, regulations, and the important role that the spread of knowledge contributes to dispelling misconceptions about blockchain and how it can contribute to the application of modern best practices."* More acceptance of blockchain means more investment in the technology.

VIII. DATA ANALYSIS

A. Constant comparative analysis

Iterative process is used for data collection, the literature review and the framework-based investment perspective. Responses are summarised based on the answer from the experts in the field. A systematic method is employed to identify the cluster and categories of the BT that could fulfill the research's objectives. For this reason, constant comparative and frequency-count analysis is used to investigate matches and variances between professional views on specific topics or issues [120], [121]. Additionally, it is an attempt to saturate where saturation searches for the instances that represent the category and continue searching and interviewing until a new information does not provide further insights into the category [122]. On the topic of cryptocurrency, one of the study's participants, a CEO and founder of a start-up tech company indicated, *"I don't think the technology is ready yet. I think all of the issues around scalability, security, and usability still have to be overcome if we want to go mainstream with this technology. There are a lot of projects whose concepts have never gone beyond that stage*

because really good case studies are lacking. *Actually, most of them do not move forward because of issues around scalability and usability. Those things have to be solved. More time is required for that because of the need of interoperability between public and private blockchains. I have to say that more work needs to be done before really going to mainstream with blockchain."* This will motivate more investment.

However, there was support from another participant who stated that *"Moving towards blockchain for commercial products is still difficult, specifically concerning companies that are required to drive the investment. Potential investment constraints exist in terms of justifying the value of blockchain to an organization. Further, organizations are scared of implanting the technology."* Concerns over "regulatory issues" is an aspect that was also widely discussed in the interviews.

B. Frequency-count analysis

Frequency count analysis was used to identify the categories and sub-categories obtained from the responses. This measurement technique involves calculating the number of times a specific topic is addressed in written information [123]. This process takes place during the coding analysis. Table 2 presents the interviewees' perspectives on the barriers and drivers that could lead to investments in BT. All of the participants agreed that itemizing these pros and cons would help professionals assess the potential strategic business value of investing in BT, and what should they do in order to increase the chance and respond rapidly to the value of technology. The coding process allows the researcher to count the repetition of factors from respondents. Drivers and barriers perceived an agreement from all respondents. Findings are supported by similar studies such as in [9], [23].

TABLE II
INTERVIEWEES' PERSPECTIVES ON THE BARRIERS AND DRIVERS TO THE INVESTMENTS IN THE BLOCKCHAIN TECHNOLOGY

Domain	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	Frequency
Drivers													
Disintermediation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
Automation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
Speed			✓	✓	✓	✓	✓	✓	✓				10
Trust	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
Timestamps	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
Immutability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
Transparency	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
High level of security	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
Barriers													
Privacy	✓	✓	✓	✓	✓	✓	✓	✓	✓				9
High initial cost	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		11
Latency		✓	✓	✓	✓	✓	✓	✓	✓				8
Governance standards		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10
Interoperability	✓	✓	✓	✓	✓	✓	✓	✓	✓				9
Scalability	✓	✓	✓	✓	✓	✓	✓	✓					8
User acceptance	✓	✓	✓	✓	✓	✓	✓	✓	✓				9
Legality of transaction	✓	✓	✓	✓	✓	✓	✓	✓	✓				9
Regulatory issues	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
Lack of industrial collaboration	✓	✓	✓	✓	✓	✓	✓	✓	✓				9
Low-level of awareness	✓	✓	✓	✓	✓	✓	✓	✓					8

Source: Interview results

IX. FINDINGS

A. Demographic information

The study's participants were selected using sampling approaches designed to acquire professionals with different types of knowledge and experience associated with BT. The selection process resulted in a total of 12 participants, 83% of whom were male. The survey respondents were employed mainly in financial services, health care, tourism, and tech start-ups. These people worked in different roles; some were CEOs, CIOs, and IT consultants and advisers, others were managers. Table 3 provides data on these participants' positions, employment type, years of experience and gender. Each participant had sufficient understanding of BT and understood its strategic value and challenges for businesses.

The purposive sample is employed to find out the experts who can achieve the study's objectives. Sections B and C answer the following research questions:

1) What are the reasons behind the slow moving of blockchain technology?

2)What business professionals should do for taking the advantages of technology.

TABLE III
PARTICIPANTS' CHARACTERISTICS

No.	Position	Organization type	Experience	Gender
T1	Portfolio manager	Financial services	7	M
T2	CEO	Financial services	15	M
T3	CIO	Financial services	10	M
T4	University professor	Academic	12	F
T5	IT directors	Healthcare	13	M
T6	Consultant	Tourism	8	M
T7	Sales manager	Real estate	6	F
T8	Analysts	National information center	9	M
T9	CEO and founder	Technology	5	M
T10	Co-founder	Technology	5	M
T11	IT Advisor	Telecommunication services	12	M
T12	IT Consultant	Telecommunication services	11	M

B. Participants' attitudes towards and perceptions about the business value of BT

Almost all of the participants agree with the business value of the BT. While all the twelve experts agreed that the BT can provide a competitive advantage to an organisation, there are also challenges that could slow or discourage investment. As one participant noted, *"The initial high cost, privacy, governance, and regulatory issues are major challenges that discourage the investor and slow down the investment process."* Experts agreed that investors are also reluctant to invest in the BT due to the lack of government's regulations. With regards to the privacy issue with blockchain in answering the question "Do you think that the lack of privacy in blockchain will affect investors' decisions?" The majority of respondents agreed that this issue is likely to be of concern to investors. This is confirmed by a university professor, who specified that, "Privacy issue could hinder and slow down the investment process in blockchain technology. Therefore, solving the lack of privacy of the technology will have more users who adopt it".

C. Increasing the level of investment in the Blockchain Technology

Blockchain is a new technology that every business professional requires to comprehend. Understanding the technology enhances the chances on how to respond and utilise the benefits of such disruptive technology. Therefore, certain factors should be addressed to build the response strategy toward the implementations' challenges. For instance, government legislation is an important factor that encourages investments in blockchain, as governments are looking to impose taxes on every business operation that takes place. The imposition of such legislation would more likely be the reason for using blockchain because it is a reference for any dispute. Reference to the strategic business value of the BT, all twelve experts agreed that minimising and resolving the barriers are associated with the BT's implementation such as privacy, high initial cost, latency, governance standards, interoperability, scalability, user acceptance, legality of transactions, regulatory issues, lack of industrial collaboration and low level of awareness could encourage more investment in this technology. The experts involved in the study perceived the barriers and drivers as well-matched with the findings in the literature. One participant stated that identifying BT's barriers and drivers could help professionals determine how to generate business value through the use of this new technology.

Another participant indicated, *"Despite the numerous studies that research blockchain and the current size of investments in the blockchain, there is still fear and reluctance among investors."* However, engendering trust in blockchain could increase investment and be a game changer for businesses that offer blockchain-based products or/and services. BT's many technical benefits could drive investment in a technology with the capability of revolutionizing the economy. The benefits could answer one research question: How would blockchain help me make more money in my traditional business? As one expert stated, *"We are moving into an era where every company will be able to become a digital products and services company. In this era, your data becomes currency, it is the fuel that drives innovative applications that are assembled from tokenized process components on a blockchain platform, where it is "who" is on that platform and what data they bring to a collaboration that defines which platform will have the "killer ecosystem" of data that will drive the most innovative apps. The unit of competition will become the ecosystem in the platform wars of the near future."* Another participant said, *"A new model of decentralized governance will be critically based around new forms of incentives as the marketplace protocol itself is monetized to drive helpful investment behavior. This is a key challenge we face."* Another expert also noted, *"Blockchain - it is all about trade, trust and ownership of digital assets - where a digital asset can be*

anything of value. I do think that new forms of decentralized governance give us new marketplace models where a shared view of data does not mean giving up marketplace power as before. I do see utility tokens as a useful marketplace currency and tool for governing behaviors, but I see it more as loyalty points' model with interoperability into fiat." Experts' opinions were negative regarding the impact of blockchain on increasing investment, especially with regard to how investors face obstacles. One expert noted that, *"[b]arriers such as regulations, governance, high cost, latency, awareness, scalability, interoperability, and lack of industry collaboration must be solved in order to attract more investment."* Overall, experts had positive views on BT's perceived drivers.

According to the driving factors of the BT that could encourage businesses to take advantages of this innovative technology, all twelve respondents agreed that the BT would play a powerful role for the advancement of their businesses. In general, the respondents perceived the drivers and barriers that aligned with the results from the previous studies. The respondents have also recommended that the BT might be adopted by the business once the organisation supports drivers and barriers. One respondent stated that, "The BT will affect all aspect of business process. For example, the benefits of security, immutability, and trust can affect businesses intention to move forward to invest in the businesses." The power of blockchain characteristics attracts more investors. Therefore, professionals should bring these benefits into the potential investor and remove the misunderstanding about the technology. The expected benefits of the BT could improve the level of investment in the blockchain technology. Based on these characteristics, the study answers the research questions, which are comprised of: (1) what professionals should do to respond to the rapid technology changes?, and (2) what are the reasons that slowdown the movement toward blockchain investments?

X. DISCUSSION

The study aims to develop a blockchain model through the use of a survey to gather qualitative data on experts' opinions on the blockchain technology investment and strategic business value of the technology. The study identifies four main clusters of the blockchain technology investment that might be touched by the technology. These are (a) regulatory cluster; (b) technical cluster; (c) organisational cluster and (d) governance cluster. The study objective is intented to investigate the BT investment to find out the reason that made the technology at the pilot stage and how business professionals will respond rapidly and effectively to take advantage of the opportunities of the innovative disruptive technology. To achieve that, a framework is developed to increase the investment level in the technology. The research results are discussed and interpreted with their theoretical background.

Based on the first objective, the interview with twelve respondents revealed that the blockchain technology has a business value that could attract further deployment. The agreement came from participants that the technology would have a powerful performance for businesses. The respondents list barriers and drivers of the blockchain technology. These characteristics are classified into both technical and non-technical factors such as immutability that could enhance security, transparency, traceability and privacy, and can speed up business procedures, and reduce the cost of business transactions.

On the other hand, objective 2 aims to explore what professionals should do to respond effectively to take advantage of this innovative disruptive technology. All participants agreed that the investment in the technology increases once they have a clear solution in solving the barriers of the BT. The findings of the research reinforce the expectations of the BT that could play in attracting further investments by utilising the benefits of the technology. The findings of the research show that the BT has the ability to attract more investments. However, solving barriers that are associated for the BT is the main motivation for further more deployments.

To move forward, professionals should take care of what problems the organisation faces by legacy systems. Following that, professionals should assess what risks are associated with implementing the blockchain, expected gain and the available human resources who have enough knowledge of the BT. Additionally, professionals should justify the deployment in the BT by defining returns on investment. Working toward blockchain is required to involve a variety of stakeholders internally and externally. To do so, an agreement is required to govern stakeholders in terms of standards for data and other aspects such as ownership and finance to guarantee funds. Agreement is required on the procedures and commitments before the investment. Key performance indicators must be employed to measure the progress. By considering drivers and barriers into consideration, professionals should evaluate the financial and technical ability to deliver the solution for selected use cases. Businesses should establish essential structural outlines, together with employed clusters along with the organisational rules, consequently progresses, suitable arrangements, combinations, creations, and ensuring that publicizing is maintained satisfactorily.

Opportunities in the business that is concerned on the promising transformation of the BT are extraordinary. However, enormous extents of uncertainty are real in a way to take advantage of the expected values of the innovative technology. The BT is still facing absences of governing misunderstanding, which hinders wide-ranging investment. The underlying technology has established

itself as a remarkable answer to a precise regular of complications and frequently permitting advancing of well-known marketplace actors. The developed framework provides businesses with a probable influence of the BT of investment.

The BT involves bringing together many parties. Where investments are considered for research purposes, adopting blockchain technology presents an investment/research opportunity. One expert from the financial sector noted that, *"I think the reason is that the proof of the concept of BT demonstrates that BT is not suited to the business requirements. Even if you have a message log, you still need a database. My own view is that, based on my understanding of the technologies of blockchain, it is a very limited form of technology which is unsuited to most business needs. There are few cases of its use where blockchain makes very good sense or is, potentially, the only good solution."* It is obvious that not anyone desires to proceeds with the danger of dealing with a technology that could not blow. As soon as a serious figure has linked, linkage possessions will boost in and fuel commercialisation, but until that time, progresses remain slow.

The lack of understanding of BT hinders its commercial uptake in business innovation. This study determined there are three core concerns for businesses: 1) the perceptions and attitudes of professionals; 2) the significance of BT; and 3) the barriers to and drivers for motivating investors. This study intended to come up with a framework for professionals to clarify the strategic business value of blockchain technology. It aims to determine why businesses are still reluctant to invest in BT and what level of investment is needed beyond the prototype phase. This is supported by [124] who finds that the BT benefits are acquired when there is a mass adoption of the technology by stakeholders. Exploring the barriers and drivers will answer these questions. A review of the interview sessions with the twelve participants shows that these experts perceived that BT would be important for many businesses. They also listed some of the drivers of BT, such as disintermediation, automation, speed, trust, timestamps, immutability, transparency, and high level of security, all of which could motivate and enhance the strategic value for businesses. Participants noted that the barriers need to be considered before moving to the implementation phase; these include privacy, high initial cost, latency, governance standards, inter-operability, scalability, user acceptance, legality of transactions, regulatory issues, lack of industry collaboration, and low level of awareness about BT. The researcher categorized these factors into barriers and drivers. The research magnifies on this point by articulating through each of the key themes to develop a comprehensive narrative on various possible BTs, including the forthcoming path of the investment in the technology. Meantime, debating drivers and barriers that could affect the investment [125]. The research affirms that the BT is expected to add a number of strategic business values and create extensive alterations for different businesses. Figure 4 presents a conceptual framework that could assist professionals to consider investing in the BT. The model divided into two criteria. Barriers count for 11 factors, and drivers count for 8 factors. These factors can be categorized into technological, organizational, and environmental dimension.

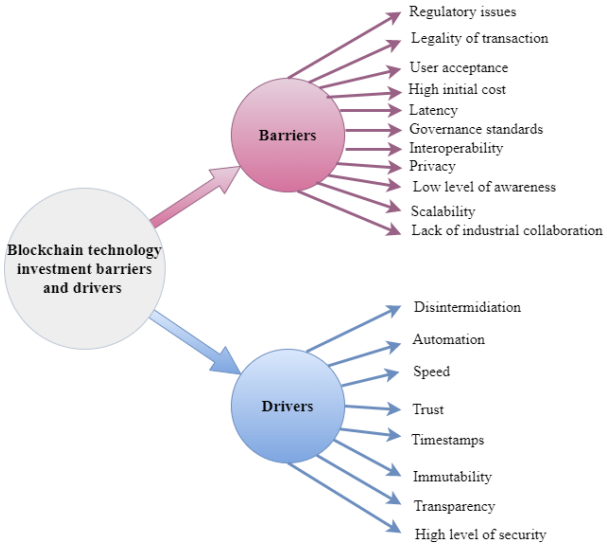

Figure 4. Blockchain technology: investment barriers and drivers

It is still too early to see BT in its mature ideation due to the volatility of currencies (e.g., of cryptocurrencies generally). This poses challenges for investors looking for actual vs perceived valuations of BT when they are making their decisions. Blockchain can used in different business/organizational segments as it has numerous applications. The role of organizations is to evaluate whether blockchain offers suitable solutions that meet their specific needs. A framework could be developed at any time during the blockchain journey. Such a framework should begin during the ideation phase and use-case selection and grow from there. The obtained results of the research support the scenario of [126] who assess the feasibility of BT for variety of industries. Also, support the scenario of [23] who investigated the challenges and implication of BT in the private and public sector and the expected value.

XI. CONCLUSION

This study provides a broad range of information to prospective investors in blockchain technology, providing all the appropriate indicators for every stakeholder, from researchers, to investors, governments and other entities who are interested in integrating this technology into their business or operations models. The framework proposed presents aspects that both drive and slow deployment of blockchain. This information was obtained from a survey of previous studies and data collected through interviews with experts in blockchain technology. Experts in the field of the BT and business digitalisation validate and verify the developed framework. The paper's model can form the basis of more-applied studies on the BT that uses different methodologies. The results will help policymakers, practitioners, and business management make a rationale deployment decision on this novel technology.

The study explores the barriers and drivers of the BT by using a qualitative based method. The framework contributes to interpreting the reasons that could hinder the BT and stating the tasks that should be performed by business professionals to effectively respond to take advantage of the innovative technology. However, the study might be done with different context as a future direction for the research.

The research outcomes deliver recommendations for stakeholders who are interested in adopting BT. The findings point to BT as having the potential to help businesses, organizations and government achieve technological, societal, and competitive advantages through the blockchain's transformative capabilities. Professionals can use the proposed framework as a reference point from the investment perspective in the BT. With the development of BT and the growing percentage of companies embracing this technology, cost-benefit issues will require a lot of attention. Considering the technology's prospective but unclear benefits and the extraordinary investment involved in its initial costs, companies are advised to carefully evaluate every prospect and challenge associated with this technology to ensure that they make careful and effective use of their assets. Understanding the factors affecting BT's diffusion is equally important for technology producers (e.g., software or hardware) and economists studying the technology's potential contributing factors for economic development. Based on the study findings, other researches are needed to differentiate between the permissioned and non-permissioned blockchain and how the value of each one can be obtained on the level of organisation. Additionally, how these types can be of benefit to the organisation and where they intersect. What other requirements are needed to implement the technology among organisations. Validating the proposed framework by using a quantitative method is a potential area for future study. Therefore, the future research is required to test the validity of the research framework. Due to the nature of the study that employed a qualitative method, a quantitative based method is required for generalisation purposes.

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