



Changing the Landscape of Accounting using Blockchain Technology

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ABSTRACT

Blockchain Technology or known as the Distributed Ledger Technology (DLT) is becoming the game changer in the business industry because of its disruptive and transformative ability. The study aimed to determine the factors that influence the professional accountants to accept to use blockchain technology. Data were from 30 professional accountants working in the Kingdom of Bahrain as respondents using descriptive method of research. They were chosen using a non-probabilistic sampling.

The study found out that professional accountants are slightly aware that blockchain technology is designed to be reliable since it relies on peer-to-peer network; immutable stored data; contained permanent and timely financial records and less effort to reconcile information from different computer systems. It was found out that the technology would likely impact to the accounting profession. Professional Accountants would probably use the Blockchain Technology in the business processes because of its perceived usefulness and technology task fit and might use on perceived ease of use.

The data implies that there is no significant relationship between the level of awareness of the blockchain technology and the level of likelihood that it will impact the accounting profession.

The study can conclude that the behavioral intention of the professional accountants to use because of its perceived usefulness, perceived ease of use and technology task fit. However, one of the platforms that need to address by the professional accountants is the acquisition of knowledge on blockchain technology through inclusion of the said technology on curriculum designing and continuing professional development programmes. There is a need for the creation of statutory legal framework to effectively operationalise the said technology.

Keywords-- Accounting Professionals, Blockchain Technology, Accounting Landscape, Financial Technology

Financial technology is a new and emerging technology that is characterized by bringing transformative and disruptive innovation for financial services. The innovativeness of the financial technology partners lead to the cusp of change from the traditional methodologies to automation in order to quickly address consumers' needs.

The blockchain, an underlying system behind Bitcoin, is the newest financial technology innovation. It successfully enables the function of Bitcoin to be used for remittance system (Folkinshteyn & Lennon, 2016), medium of exchange such as shares of stocks or real property titles and can be leveraged to improve other transactions' efficiency.

J. Staubus (2010) lays down major decision making criteria in creating the accounts for a firm, namely, relevance, reliability, bias, accuracy, comparability, intelligible, timeliness and the effects-via-third party. The extent of the criteria being fulfilled can be the basis for any decision related to accounting practices and the feasibility of any accounting changes. Some concepts or criteria were used by standard setting bodies in promulgating standards.

With this new development of digital currency, this study takes cognizant of its unprecedented characteristics that are impacting the financial and accounting sectors. According to the study conducted by Accenture in 2016, blockchain technology originally used for cryptocurrencies can be used for building consensus. Banks are exploring to apply blockchain technology as payments for capital market transactions. The blockchain-distributed ledger enable an open-source, decentralized, replicated, shared and cryptographically secure operations be validated by the players in the financial markets. This decentralized approach will remarkably change the power dynamics within the financial system. Smart contract, similar to business contract, is a digitalized business form of contract wherein people can be used for exchanges, such as goods, properties, shares without intermediaries such as brokers, underwriters and etc.

I. INTRODUCTION

In this aspect, blockchain can increase the efficiency of the trading, unnecessary interventions and improve regulation.

According to Deloitte Consulting (2016), Blockchain technology is considered as the game-changer in accounting. Management trusts its recordkeeping, but other users need the audited financial report for reliability purposes. The blockchain can be a source of trust, having secured records, traceable and having fully automated audit features, which can be of help in the accounting structure. It can be integrated in the traditional accounting procedure particularly with securing the record's integrity. Instead of having books of accounts, firms can directly record their transactions in joint register which are cryptographically sealed, thus, data falsification and concealment is impossible. Digitized paper records are time stamped and can hardly be modified.

State of Tennessee recently signed a bill legalizing the use of blockchain technology and smart contract in electronic business transactions. The law states "As introduced, recognizes the legal authority to use blockchain technology and smart contracts in conducting electronic transactions; protects ownership rights of certain information secured by blockchain technology." It also indicates that "no contract relating to a transaction shall be denied legal effect, validity, or enforceability solely because the contract contains a smart contract term."

With this new development of digital currency and the emerging technology, the study has sought answers to the following problems dealing with level of the awareness of the blockchain technology, level of likelihood of the impact of blockchain technology to the accounting profession and the level of behavior intention using blockchain technology by accounting professionals. Further, it takes cognizant of the characteristics of the blockchain technology that are impacting the financial and accounting sectors. There has a need to have an in-depth analysis its accounting and clear understanding of the blockchain technology.

The study aims to determine the factors that influence the professional accountants to accept to use blockchain technology. With this emerging and fast moving technology, this study aims to determine the level of awareness of the professional accountants on blockchain technology; the likelihood of the impact of the blockchain technology in the accounting profession; and the behavior intention to use. The readiness of the accountants to face the new challenges is vital in order to maintain their relevance in the business.

With the fast moving and changing business landscape, locally, regionally and globally, professional accountants and employers must be aware of the current technical skills and competencies needed to address the future skills. Conducting an assessment of the current state of their technical competencies on digital technologies can provide them opportunities for growth and to be still relevant in the accounting profession. Academic

institutions need to address the gaps of the graduates' required skills and competencies and the future needs of the companies. Professional Organization can specifically address the gaps between the needed professional competencies and technical skills particularly on digital technologies. This study can provide more information to the researchers as it examines the digital technology skills gap of the professional accountants. It will serve as a reference guide for faculty members, students and researchers to understand the impact of emerging digital technology and as added knowledge and as input for future researchers who will be embarking on similar study.

This study is limited to determining the level of awareness of the professional accountants working in the Kingdom of Bahrain regarding the blockchain technology and its prospective impact on the accounting profession.

II. REVIEW OF RELATED LITERATURE

Innovation is defined as "an idea, practice, or object that is perceived as new by an individual or another unit of adoption", while diffusion refers "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Roger, 2003). Innovation Diffusion Theory posited that "potential users make decisions to adopt or reject an innovation based on beliefs that they form about the innovation" (Karahanna, Straub, & Chervany, 1999). It attempts to demonstrate innovation decision process, determine the rate of adoption of the identified factors, and various types of adopters. It assists in determining the likelihood and adoption rate of an innovation (Chen, Gillenson, & Sherrell, 2002).

Technology acceptance model (TAM) is based on the theory of reasoned action (Davis, 1986 & 1989) which would like to determine the likelihood to accept the information technology. This would like to predict the acceptability of the tools and to determine the modifications needed to the system to it acceptable to the users. The acceptability of the information system, as suggested by the model, is determined by perceived usefulness and perceived ease of use. The perceived usefulness is determined by the degree to which the user believes that the system will help improve his performance. The perceived ease of use is defined as the degree to which the user believes that using the system is effortless. TAM basic framework only explains the influence the perceived usefulness and ease of use towards behavioral intention. Some researchers added additional external variables in order to adapt different culture or business scenarios. Behavior intention is an individual perception of he/she intends to use the technology and will to use it. This behavior is considered as the main factor of increase use of technology. Compatibility attribute defines as the "degree to which an innovation is perceived as

consistent with the existing values, past experiences, and needs of potential adopters". On the other hand, triability is the "degree to which an innovation may be experimented with on a limited basis", while complexity is on the "perceived difficulty to understand and use". The relative advantage measures the "degree in which an innovation is perceived as being better than the idea it superseded" which is identified as the best construct to predict adoption of an innovation. These attributes are used to explain the decision process on the adoption of the end-user to the new technologies and the decision-making process (Lee, Hsieh, & Hsu, 2011).

Goodhue (1997) states, that task-technology fit is the "degree to which a technology assists an individual in performing his or her tasks". Task-technology fit indicates that an individual wanting to use and takes advantage of a technology if it matches the job requirements (Lam, Cho, & Qu, (2007).

The technology change is eminent that has a significant impact not only in economic development of a country but also our readiness to face the consequences of the changes. Digital Darwinism (Solis, 2018) is a situation that society and technology evolves faster than the ability of the business or a person to adapt. Change may lead business growth or regression depending on the responses of the firm. Pressures come from globalization, rapid digital technologies, business complexity, management dynamics, increase in regulations and introduction of taxation. The impending emergence of new business models, payments and services will be vital for the professional accountants. Expert use of data analytics will allow a closer and better real-time reporting, raising prognostic analysis and better interconnectivity of both financial and non-financial information and performance (Borthick & Pennington, 2017).

Folkinshteyn & Lennon (2014) used Technology Acceptance Model to rigorously review and analyze the aspect of the acceptance of Bitcoin as currency and the blockchain as a financial technology. It was found out that there are significant benefits to some groups of users and risks and drawbacks in other circumstances. Bitcoin is considered to have significant positive factors such as the free open source, user's control over the transaction and efficient transactions. On other hand, security breaches and the required competent control were identified as the primary risks.

Blockchain technology applications, even at its early stage, show significant potential for growth particularly from the financial sector due to its robust and verifiable recordkeeping capability. According to Silinskyte, who studied the acceptance of the digital currency of Bitcoin using the Unified Theory of Acceptance and Use of Technology, found out that performance expectancy and effort expectancy are the factors that significantly influence the behavioural intention to use Bitcoin. The actual use of Bitcoin is

affected by facilitating conditions and behavioural intention. Performance expectancy is the degree to which individual believes that using the system will help him or her to attain gains in job performance, while the effort expectancy is the extent of convenience perceived for using the system.

Innovation Diffusion Theory identified five attributes for the diffusion of innovation; namely, observability, trialability, complexity, compatibility, and relative advantage. Observability attribute refers to the "degree to the results of an innovation are visible to others". The study explained that the higher degree, except for complexity, connotes that there is higher degree of adoption. For the complexity attribute, the lower degree means that adoption is faster. The study done by Lou & Li (2017), shows that blockchain technology has low degrees of compatibility and observability but identifies huge potential to use. This emerging technology is considered as potential disruptive technology.

Expectations on the level of competencies, skills and outlook of the professional accountants evolve based on the emerging needs of the business. Professional accountants need to look beyond the numbers rather than the historical data presented in the financial reports, assess and explain the numbers and provide insights to help the business achieve short-term goals and long-term objectives.

Professionals need to respond on the challenges and pressures brought by the changing business landscape. They have to continuously pursue professional development particularly in adapting the change in technology (Chen, Gillenson, & Sherrell, 2002), business processes, regulatory requirements and based on the demand of the employer.

III. METHODOLOGY

This study made use of the Descriptive Method of Research specifically the quantitative and qualitative techniques. Mixed methods were employed to gather and analyze data which are developed by mixed method theorists. The mixed methods approach provides the opportunity to examine respondents' views regarding the impact of the blockchain technology in the accounting profession and their level of awareness using a structured, written survey, and subsequent qualitative interviews to better understand the quantitative findings. The research covers the professional accountants working in the Kingdom of Bahrain. The data to be used in this study comes from survey questionnaire with a sample size of 30 using a non-probabilistic sampling. This sample size allows enough representation so if statistical significance is found. The survey instrument examines the level of awareness on blockchain technology; the level of likelihood that blockchain technology has impact on accounting profession and the effect of the perceived

usefulness, perceived to use; and technology fit task to behavior intention to use blockchain technology.

IV. FINDINGS AND ANALYSIS

The results of the study shows that majority of the respondents are professional accountants as indicated in the certification; Certified Public Accountants (70%), Certified Internal Auditors (6%), Certified Management Accountants (6%). Based on the results, majority of the respondents are competent on the field of accountancy. It shows that majority of the respondents are Bachelor's degree graduates, 64%, followed by master's degree holders, 23%, and the remaining are post-graduate degree holders. It also revealed that majority of the respondents are engaged in Accounting professions with, 30% in Audit and Assurance; 20% in Education; 17% in Taxation and the remaining are in Corporate Reporting, Financial Management and Governance, and Risks and Ethics. These professional accountants have competencies to assess the impact of the digital technologies on their field of specialization.

The study revealed that respondents are slightly aware (mean=2.554, std. dev. = 1.342) of the Blockchain Technology, which shows that respondents are aware that blockchain technology is designed to be reliable since it relies on peer-to-peer network; stored data which are immutable; contained permanent and timely financial records and less effort to reconcile information from different computer systems. However, since blockchain implementations, other than the bitcoin and other digital currencies, are still on early stages and commonly used by the industry, but professional accountants most likely they have understood the core concepts of the technology such as the peer-to-peer replication, messaging and data storage.

The results of the study posted that Blockchain Technology would likely has an impact to the accounting profession since the overall weighted mean of 4.057 and std. deviation of 0.615. It is perceived that Blockchain technology extremely likely will increase the operational efficiency of the business and many leading organizations consider digital transformation as a part of their strategic goals.

The study confirmed the unprecedented characteristics of the blockchain technology that are impacting the financial and accounting professions. Blockchain is considered as a new system of database management where records and authentications of data and transactions are maintained. In business processes, transactions have unique identifiers that capture the entire history of the transactions for validation purposes in real time and tamper-free which will reduce auditing costs and time, improves the level of trustworthiness of accounting information. Technology disruption is evolving due to employee and customer expectations, values and behavior.

The study examined the behavioral intention of the professional accountants to use Blockchain Technology and it was found that they would probably use it with mean of 3.500 and standard deviation of 0.793.

The study implies that even on early stage, Blockchain Technology application shows potential for growth particularly on financial sector due to its robust and verifiable recordkeeping capacity. It suggests affirmatively on the study conducted by Sliliskyte (2014) that performance expectancy and effort expectancy significantly influence the behavioral intention of the users. Further, the acceptance of the Blockchain technology in the business processes is influenced by the behavioral intention to use.

Many businesses such as pharmaceutical companies are now currently using blockchain technology in tracing their products given to patients. Logistics company such as DHL is exploring the use of the technology for potential improvement in transparency and traceability in its supply chains and automation of its commercial processes. Along with these trends, professional accountants should be well-adept with the new trends rather than focusing on crunching numbers presented in the financial reports, assess and explain the numbers and provide insights to help the business achieve short-term goals and long-term objectives, among others.

The study examined the effect of the perceived usefulness, perceived to use; and technology fit task to behavior intention to use Blockchain Technology using a 5-point Likert scale. It was found out that majority of the respondents would probably use the Blockchain Technology because of its perceived usefulness (mean= 3.600, std. dev.= 0.631), technology task fit (mean= 3.383, std. dev.= 0.659) and might use on perceived ease of use (mean= 3.600, std. dev.= 0.669).

The study used the technology acceptance model (TAM) using the perceived usefulness and perceived of use to assess the acceptability of the Blockchain Technology by the professional accountants. The study found out that respondents believed that the system will help them improve their performance. They would probably use the Blockchain technology as they it as the next-generation business process improvement software and it will lower the "cost of trust" particularly where business processes that occur between companies.

Based on the results of the study that respondents "might use" the technology can be deduced into determining the relative advantage of the technology such as the compatibility and triability attributes. Blockchain technology is still an emerging technology and its application, aside from cryptocurrency, is on early stages. Respondents perceived that business process that makes work more efficiently and effectively and transactions submitted to a public ledger do not need third party validation are still on experimentation stage. However, compatibility attribute of the technology is still consistent

that business processes need to adhere with new digital innovation.

The study confirmed the study of Goodhue that task-technology fit indicates that respondents wanting to use and takes advantage of a technology if it matches the job requirements. Respondents perceived that blockchain-based accounting will greatly reduced time and costs of performing auditing, greatly simplifies integrity verification procedures and enables a real-time fraud detection scheme.

The results of the study show that there is a no significant relationship between the level of awareness and the level of likelihood of the technology that will have impact on accounting profession since $r = 0.288$ $p = .122$ at .01 level of significance.

The study affirms on the concept of Digital Darwinism (2018) that society and technology evolve

faster than the ability of the business or person to adapt on it. Although, blockchain technology caught the attention of the professional accountants particularly on the digitalization of accounting system, use cases are still in infancy stage. Expert use of data analytics allow closer and better real-time reporting, raising prognostic analysis and better interconnectivity of both financial and non-financial information and performance. These emergence of the new business models pressures the accounting professionals to move fast to learn or adapt to these new technology. It is imperative for them to be aware of the uses of the blockchain technology not only on cryptocurrency but on other business processes and the likelihood of its impact to their profession. The readiness of the accountants on this aspect makes them maintain their relevance in their field of specialization.

Test of the Effects of the Factors on Behavioral Intention to Use Blockchain Technology

		Perceived Usefulness	Perceived Ease of Use	Technology Task Fit
Behavioral Intention	Pearson Correlation	.711**	.707**	.488**
	Sig. (2-tailed)	.000	.000	.006
	N	30	30	30

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Results of the study indicates that behavioral intention to use on perceived usefulness has significant correlation since $r = 0.711$, $p = 0.000$ at .01 level of significance. Perceived usefulness of the Blockchain technology or known as the Distributed Ledger Technology (DLT) has been into spotlight in the global financial industry. Many have been interested in this technology because of its disruptive and transformative ability. It is now viewed as enabler of safe storage of value, increase operational efficiency, reduce transaction costs and increase transparency among the industry players.

Results of the study indicates that behavioral intention to use has significant correlation with perceived ease of use since $r = 0.707$, $p = 0.006$ at .01 level of significance. The perceived ease of use is defined as the degree to which the users believes that using the system is effortless. The relative advantage attribute of this technology superseded what was initially envisioned, the cryptocurrency. However, the DLT is now experimented on other purposes such as in logistics and supply chain. Based on Deloitte study, the existence of the DLT is perceived to have an impact on financial audits and is perceived that auditors will become obsolete. However, on the same report, the financial data stored on the DLT, though considered as tamper-free or immutable, will not completely represents the financial statements, and

auditors still need to perform an assurance test beyond the blockchain (Deloitte, October 2017). These attributes explain the decision of the respondents that this technology will be beneficial to them in the future.

Results of the study indicates that behavioral intention to use has significant correlation on technology task fit with $r = 0.488$, $p = 0.000$ at .01 level of significance. Technology task fit is measured by the degree in which the technology assists an individual in performing his or her tasks. An indication that professional accountants want to use and take advantage of the technology if this matches their job requirement. The introduction of the DLT in the business processes, it is important that the DLT system can be integrated with the other systems. Further, it must be capable of interoperating with other systems and communicating with one other. Given the infancy of the technology and the complexity of the system, it is viewed to the game changer in the accounting profession. Professionals need to respond to the challenges and pressures of the new and emerging technology by continually pursuing professional development.

V. CONCLUSION & RECOMMENDATIONS

The blockchain is the newest financial technology that will be changing the landscape of the accounting

profession. Accounting professionals take cognizant that the unprecedented characteristics of the technology will impact the financial and accounting sectors.

With the innovative uses of blockchain technology, professional accountants should continually adept themselves with this emergent technology. Professional accounting organizations as part of their continuing professional development should provide a platform wherein their members gain knowledge on this emergent technology. The inclusion of the blockchain technology in the Accountancy programme curriculum designing must be considered to address the future needs. Academic programme that will provide trainings to the students and accounting professionals to develop their skills and competencies on how to use the DLT. Creation of statutory regulation model that will manage and assist this type of technology that have common platform. Financial and accounting regulatory bodies should conduct a thorough research to aid on the possible enactment of new accounting/auditing standards. For the possible commercialization of the blockchain technology or DLT, there must be an appropriate rules and regulations set by an international governing bodies.

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