

Blockchain Technology: Its Applicability, Challenges, and How these Challenges can be Handled in the Normal Accounting Cycle

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Abstract

The tremendous advances in digital technology continue to affect how people live nowadays. In the fields of education, business, medicine, and science, among others, the fast-paced modernization of different processes is tremendously evident by adopting the latest digital resources to add value in the provision of services. In the world of finance and accounting, the presence of cryptocurrencies, the prevalent use of electronic wallets, and blockchain technology (BCT) are indicative of the revolutionary impacts of digitization. BCT is a distributed ledger, which contains different potential benefits on the one hand and different potential challenges on the other. Potential benefits are in terms of security, digital identity, and cost savings. Meanwhile, potential challenges include its technicality, complicated features, and scalability. The potential benefits and challenges are worth noting to find out its applicability in the normal accounting cycle. Despite the available literature about the use of BCT, no study has been conducted yet on how it would be possibly applicable in the normal accounting cycle. The purpose of this paper is to give a general overview, based on a literature review, of the potential applicability of BCT in the normal accounting cycle. This study used the theory synthesis, a method that included an examination of 17 recent or current literature published from 2017 to 2021 about the BCT and its potential applicability in the accounting cycle, including its challenges and how these challenges can be handled. The potential benefits of BCT in terms of security, digital identity, and cost savings might be considered on its applicability in the normal accounting cycle. However, the potential challenges shall also be considered to have a holistic perspective on dealing with the subject matter.

Keywords: blockchain, blockchain technology, normal accounting cycle

INTRODUCTION

The latest technological advancements have contributed various changes in the way organizations do their businesses, especially in the midst of the present pandemic. For instance, in the field of education, teachers and students have been adopting the different modes of online teaching-learning modes like Google Classroom, Zoom, Cisco Webex, Google Meet, Skype, etc. (Mishra et al., 2020). In the world of accounting, Alsaqa et al. (2019) believed that the latest developments in digital technology would be an opportunity to improve the different accounting processes. Meanwhile, aside from the aforementioned platforms, the potential of using BCT has

become one of the major trends lately, as evidenced by several research studies. In the study of Bonson and Bednarova (2019), they cited that the Big Four accountancy firms have expressed their interest in BCT, which led them to launch different projects on the technology's potential in accounting. ICAEW (2018) stated that BCT has the potential to increase efficiency in the bookkeeping side of accounting.

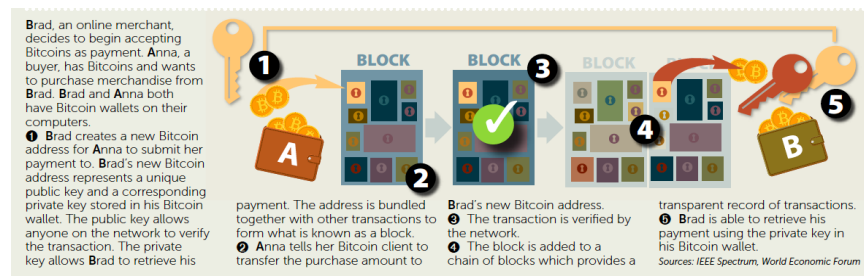
Smith and Castonguay (2020) believed that the use of BCT could have potentially positive implications on financial reporting. "Blockchain's functions of protecting data integrity, instant sharing of the necessary information, as well as programmable and automatic controls of processes, could facilitate the development of a new accounting ecosystem" (Dai & Vasarhelyi, 2017, p. 5). For hundreds of years, accounting ledgers have existed to track economic transactions. Even though new technologies such as Big Data and machine learning have begun to change the landscape of accounting, transaction records continue to be necessary (Coyne & McMickle, 2017).

The main motivation of this study is to discover how the BCT might be applicable in the normal accounting cycle, considering its benefits, challenges, and how these challenges can be overcome. Despite the available literature about the use of BCT, no study has been conducted yet on how it would be possibly applicable in the normal accounting cycle.

Blockchain Technology

Bonson and Bednarova (2019) defined blockchain as a distributed digital ledger. The term "distributed" pertains to a network of computers where transactions are being consummated. The users in those distributed computers are called nodes, as defined by Kokina et al. (2017). One transaction will require the approval of all the users or nodes in the network before a "block" can be formed (Kokina et al., 2017). A block represents an approved transaction with a security feature called hash, which is a long alphanumeric character. Liu et al. (2019) explained that with this kind of peer-to-peer network setup, all stakeholders like suppliers, customers, creditors, regulators, etc., would have the ability to share information on a real-time basis. In the study of Meth (2019), he explained that each block formed is interlinked with each other and can be retrieved without any difficulty. Figure 1 below shows a simple example of how blockchain works in a sale transaction:

Figure 1: How Blockchain Works



Source: *How Blockchain Works*, 2018

Potential Benefits of BCT

In discussions and in Figure 1, there are different potential benefits of BCT that are noteworthy. The first one is security. Conway and Byrne (2018) pointed out that there will be a rare chance for

the blockchain to be hacked because of its cryptographic hash feature. It will be very difficult for a potential hacker to attack the network as it would need to discover the alphanumeric coding of each block. Aslam et al. (2021) agreed that such a security feature of blockchain is an example of advanced technology development in modern times. The second one is digital identity. Conway and Byrne (2018) explained that the members of the blockchain network will no longer need to always identify the ones transacting at any given point in time. Unlike with banks and other regulatory offices, when a transaction occurs, a lot of verification shall be done first. In a blockchain, the digital identities of the users are already established. Further, another potential benefit would be cost savings. BCT, according to Conway and Byrne (2018), would save much time and energy on dealing with routine transactions. One of the features of BCT is the presence of smart contracts, which pertains to self-executing, pre-programmed criteria. Once a routine transaction is recognized, it will just automatically execute, thus saving time, cost, and energy.

Potential Challenges of BCT

Despite the enumerated potential benefits, there are also potential challenges to using BCT. As cited by Acikgoz and Apak (2019), blockchain faces different challenges despite its promising benefits. The first challenge is that the technology is complicated. Swan (2017) pointed out that even the basics of BCT are difficult to understand, conceptually and technically, and might be a challenge to the decision-making process. The second challenge is its technical aspects. No matter how promising the benefits are, there is still a chance that the network might be attacked by hackers. The third challenge is scalability. Swan (2017) explained that scalability is the ability to process voluminous transactions on a real-time basis. The fourth challenge is regulation. Swan (2017) pointed out that blockchain transactions involve money, and as of the moment, there are no available laws or even accounting standards being created or legislated to regulate the possible use of cryptocurrency and BCT as a whole.

Normal Accounting Cycle

It is noteworthy to be reminded that the focus of this study is to discover the applicability of BCT, with its challenges, and how those challenges can be handled in the normal accounting cycle. Ballada and Ballada (2021) defined the accounting cycle as “a series of sequential steps or procedures performed to accomplish the accounting process” (p. 119). The steps in the cycle and their aims follow:

1. *Identification of events to be recorded.* This aims to gather information about transactions or events generally through the source documents.
2. *Transactions are recorded in the journal.* This aims to record the economic impact of transactions on the firm in a journal, which is a form that facilitates transfer to the accounts.
3. *Journal entries are posted to the ledger.* This aims to transfer the information from the journal to the ledger for classification.
4. *Preparation of a trial balance.* This provides a listing to verify the equality of debits and credits in the ledger.
5. *Preparation of the worksheet, including adjusting entries.* This aids in the preparation of financial statements.

6. *Preparation of financial statements.* This provides useful information to decision-makers.
7. *Adjusting journal entries are journalized and posted.* This aims to record the accruals, expiration of deferrals, estimations, and other events from the worksheet.
8. *Closing journal entries are journalized and posted.* This closes temporary accounts and transfers profit to owner's equity.
9. *Preparation of a post-closing trial balance.* This checks the equality of debits and credits after the closing entries.
10. *Reversing journal entries are journalized and posted.* This simplifies the recording of certain regular transactions in the next accounting period.

In the foregoing steps enumerated, the definition of terms might be helpful to understand better the accounting cycle. Journalizing pertains to the "recording of business transactions chronologically in a journal, in terms of debits and credits" (Ballada and Ballada, 2021). This process marks the initial recording of transactions in the books of accounts. Meanwhile, posting refers to "the recording of business transactions from the journals to the ledgers." A ledger is a record that summarizes all the entries from the journals. In other words, journalizing precedes posting.

Despite the numerous studies about BCT and its potential advantages, no study has been conducted yet on its potential applicability in the normal accounting cycle. Thus, this paper aimed to provide general insights on how BCT may be used in the normal accounting cycle, considering its potential advantages and disadvantages. The typical accounting cycle involves the following steps (Ballada and Ballada, 2021): (1) identification of events to be recorded; (2) recording transactions in the journal; (3) posting journal entries to the general ledger; (4) preparation of a trial balance; (5) preparation of the worksheet including adjusting entries; (6) preparation of the financial statements; (7) journalizing and posting adjusting entries; (8) journalizing and posting closing entries (9) preparation of a post-closing trial balance; and (10) journalizing and posting closing entries.

This study was a theory synthesis, which included an examination of recent or current literature about the BCT and its potential applicability in the accounting cycle, including its challenges and these challenges can be handled. This type of review was chosen by the researcher as it is the most applicable at the time of the study, considering that blockchain is not yet fully adopted in the accounting process by organizations.

The following research questions were addressed by this study:

1. What are the features of BCT that may be applicable in the normal accounting cycle?
2. What are the potential benefits of BCT in accounting?
3. What are the potential challenges of BCT in accounting?
4. How can these challenges be handled?

This study might be helpful to the following: (1) accountants in public practice as this study might be helpful to make them aware of how BCT might be beneficial in the conduct of their

independent audits; (2) accountants in commerce and industry as this study might be helpful to make them aware on how blockchain may improve their current accounting processes; (3) accountants in the academe to make them aware on the BCT and possibly its incorporation in their students' accounting curricula; (4) accountants in the government to make them aware on how BCT may be adopted in the government accounting processes; (5) researchers as this paper may serve as a reference for further research considering its scope and limitations.

This research covers only the insights generated from the literature review on how BCT may be applicable in the normal accounting cycle represented by the ten steps enumerated above. Further research will be highly recommended to explore the potential adoption of BCT in other branches of accounting like audit, taxation, managerial accounting, and regulatory framework for business transactions.

METHODOLOGY

This study used the theory synthesis, a method that included an examination of 17 recent or current literature published from 2017 to 2021 about the BCT and its potential applicability in the accounting cycle including, its challenges and how these challenges can be handled. The analysis was done by synthesizing the different studies obtained from journals, textbooks, and other published materials pertaining to BCT. The BCT's benefits and challenges were the sole determinants used in this study to indicate its applicability in the normal accounting cycle.

RESULTS AND DISCUSSION

This section provides the results and discussion based on the theory synthesis as discussed in the literature review in the Introduction section. Results are presented according to the research questions.

BCT Features Applicable in the Normal Accounting Cycle

To answer Research Question No. 1, "What are the features of BCT that may be applicable in the normal accounting cycle?", three themes emerged: distributed ledger, security, and interconnection.

Distributed ledger

Bonson and Bednarova (2019) defined blockchain as a distributed digital ledger. The term "distributed" pertains to a network of computers where transactions are being consummated. The users in those distributed computers are called nodes, as defined by Kokina et al. (2017). One transaction will require the approval of all the users or nodes in the network before a "block" can be formed. Alsaqa et al. (2019) pointed out that having a distributed ledger system, parties in a particular transaction have access to a complete copy of the ledger, which promotes transparency and accessibility.

Security

In addition to the distributed ledger feature, BCT provides security mechanisms in handling financial transactions. A block represents an approved transaction with a security feature called hash, which is a long alphanumeric character. Liu et al. (2019) explained that with this kind of peer-to-peer network setup, all stakeholders like suppliers, customers, creditors, regulators, etc., would have the ability to share information on a real-time basis. Swan (2017) concluded that BCT, with its decentralized storage records protected by the cryptographic hashes, would make it difficult to potential hackers to attack the data.

Interconnection

Aside from the features of distributed ledger and security, BCT promotes interconnection. In the study of Meth (2019), he explained that each block formed is interlinked with each other and can be retrieved without any difficulty. This means that all the participants (nodes) in the blockchain network can easily communicate together on a real-time basis without the necessity of verifying their identities.

BCT Potential Benefits Applicable in the Normal Accounting Cycle

To answer Research Question No. 2, “What are the potential benefits of BCT in accounting?”, three themes emerged: cost savings, digital identity, and security, which are presented in Table 1.

Table 1: Applicability of BCT in the Normal Accounting Cycle

| Potential Benefits of BCT | Normal Accounting Cycle | Applicability of BCT in the Normal Accounting Cycle |
|--|--|--|
| Cost savings/digital identity/security | Step 1. Identification of events to be recorded | BCT has the ability to self-execute transactions thru pre-programmed smart contracts. (Conway & Byrne, 2018). Routine transactions like sales and purchases can be processed thru smart contracts. |
| Cost savings | Step 2. Transactions are recorded in the journal. | BCT can accommodate different transaction entries as it is conceptually a distributed ledger. (Bonson & Bednarova, 2019) |
| Cost savings | Step 3. Journal entries are posted to the ledger. | BCT can accommodate different transaction entries as it is conceptually a distributed ledger. (Bonson & Bednarova, 2019) |
| Cost savings | Step 4. Preparation of a trial balance. | The trial balance can be programmed after the results of the first three steps. |
| Cost savings | Step 5. Preparation of the worksheet, including adjusting entries. | The worksheet and adjusting entries can be done thru the smart contracts. |
| Cost savings | Step 6. Preparation of financial statements. | The formats of the complete set of financial statements, namely, the statement of financial position, the |

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|--------------|--|---|
| | | statement of comprehensive income, the statement of changes in equity, and the statements of cash flows, can be programmed. |
| Cost savings | Step 7. Adjusting journal entries are journalized and posted. | The adjusting entries can be done thru the smart contracts. |
| Cost savings | Step 8. Closing journal entries are journalized and posted. | The closing entries can be done thru the smart contracts. |
| Cost savings | Step 9. Preparation of a post-closing trial balance. | The post-closing trial balance can be generated after following the preceding step. |
| Cost savings | Step 10. Reversing journal entries are journalized and posted. | This will be an optional step. |

Source: Conway and Byrne (2018); Bonson and Bednarova (2019), Ballada and Ballada (2021)

BCT Potential Challenges Applicable in the Normal Accounting Cycle

To answer Research Question No. 3, “What are the potential challenges of BCT in accounting?”, four themes emerged: complicated technology, technical aspects, scalability, and regulation.

Complicated Technology

The first challenge is that the technology is complicated. Swan, 2017 pointed out that even the basics of BCT are difficult to understand, conceptually and technically, and might be a challenge to the decision-making process.

Technical Aspects

The second challenge is its technical aspects. No matter how promising the benefits are, there is still a chance that the network might be attacked by hackers. Swan (2017) argued that there seem to be unresolved technical issues on BCT.

Scalability

The third challenge is scalability. Swan (2017) explained that scalability is the ability to process voluminous transactions on a real-time basis.

Regulation

The fourth challenge is regulation. Swan, 2017 pointed out that blockchain transactions involve money, and as of the moment, there are no available laws or even accounting standards being created or legislated to regulate the possible use of cryptocurrency and BCT as a whole.

Handling the BCT Potential Challenges Applicable in the Normal Accounting Cycle

To answer Research Question No. 4, “What are the potential challenges of BCT in accounting?”, three themes emerged: training, engaging technical experts, technology development, and public consultation.

Training

One of the ways how to address the technicality of BCT is training. Accountants can undergo a series of training in order to get acquainted with the technology, especially its basic features that are necessary to their daily tasks. Conway and Byrne (2017), citing the study of Rooney et al. (2017), cited that accountants need to be well trained in order to deliver value to their respective organizations.

Engaging Technical Experts

With regard to the technical aspects, engaging technical experts would be recommendable to address those matters that are highly technical in nature. Bonson and Bednarova (2019) believed that a company might struggle to find a business partner with whom to share its decentralized architecture.

Technology Development

The scalability may be addressed by performing periodic and close maintenance of the whole system to preserve the integrity of records and to prevent it from being hacked. Swan (2017) cited that “the development of consensus algorithms that are scalable, efficient, and secure is a challenge for the long-term viability of BCT” (p. 10).

Public Consultation

Lastly, public consultation may be conducted in order to influence the legislators and standard-setters to come up with ideas on how to make the use of BCT legal and practicable. Bonson and Bednarova (2019) mentioned that one of the areas of challenge is the environmental context, which refers to the role of regulators in the adoption of BCT in the accounting ecosystem.

CONCLUSION

The different BCT features, namely, being a distributed ledger, its security, and interconnection capabilities, might be applicable in the normal accounting cycle. Its underlying ability to self-execute transactions thru smart contracts and to accommodate different transaction entries are just among the possible advantages that might be obtained when BCT is applied in the normal accounting cycle.

However, despite the potentiality of those features and benefits, there are also underlying challenges that need to be considered. BCT is a technical and complicated technology that needs special knowledge and skills to operate. The issues on its scalability to accommodate voluminous transactions in real-time. Moreover, there are not yet laws and regulations governing its use, which would pose challenges to its implementation.

The challenges above may be addressed by conducting training, engaging technical experts, developing BCT, and public consultations.

Lastly, further research is highly recommended to discover the applicability of BCT to the normal accounting cycle. One suggestion is to conduct pilot testing in a micro-entity to assess its applicability in handling small amounts of transactions. If it becomes applicable, then it may be applied to bigger categories of entities like small entities, medium-sized entities, and large and/or public interest entities.

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