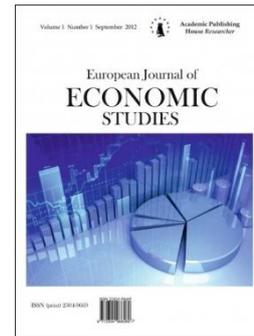


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Impact of Blockchain Technology on the Payment Management Systems – What Future Holds?

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Abstract

Due to its possibly disruptive effect on business model (BMs), blockchain innovation has started an lively discussion among researchers.

Delphi study sets out to explore the impact of blockchain in payments, which represents a major cornerstone of banking and the cradle of this technology. The outcomes, grouped around four areas thoughts, demonstrate that blockchain allows the offering of new services and renders some of the current ones obsolete. This consequently impacts the financial structure of firms in the payments industry and further generates great potential for new BMs while making some existing ones obsolete. Eventually, new players, which are better ready to use the potential of blockchain, will give a strong motivation to this improvement. This discoveries contribute to the literature by giving new bits of knowledge about the effect of innovative advances on BMs and have further practical implications by presenting a better understanding of future BMs in payments.

Keywords: blockchain innovation, financial structure, payments industry, Delphi study, credit card transactions, bitcoin exchange

1. Introduction

This research investigates the feasibility, challenges, benefits and risks of blockchain technology in the payments, which are based on the application of the blockchain to formal and non-formal credentials.

Technological changes represent new challenges and generate further opportunities for companys. In particular, innovative technologies have the potential to modify the equilibrium among the companys in an industry. Leading companys consistently fail to stay at the top of their industry when the technological discontinuities occur. The effects of technological changw on the global economic structure are creating large transformations in the way companies and nations organize production, trade goods, invest capital, and develop new products and processes.

Today, firms depend on virtualizing their business by enhancing some new technology or platforms. Virtualization technology is potentially the absolute most importantl issue in IT and has started a top to bottom overhaul of the computing industry.

Virtualization can simplify IT tasks and enable IT associations to react quicker to changing business demands.

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With regards to business achievement, many companies are resolute that the way they used the internet played a crucial part in that achievement. At the point when the internet is used effectively as a business asset, it can make easier your organization's daily tasks. It can also help to make customer communication easier, as well as being a fantastic resource for increasing your client base. Social media makes marketing and networking simple.

The approach of computers and mobiles have changed the way in which we work, as well as how we deal with our financial aspects and payments. The ever changing and evolving technologies have also led to the introduction of newer services, such as e-commerce that has led to the demand for quicker payment systems.

Given the pace of progress – and clients' expanding appetites for expanded speed and convenience, digital payments will realize a radical change in the payments sector. In any case, despite increased adoption of digital payments, cash would still remain as a primary form of payment for many, especially for low-value exchanges and certain demographic groups.

Blockchain has been initially launched as a way to the payment exchanges dependent on cryptography to give an alternative mechanism to the trust between two executing parties. Blockchain is an innovation to make and maintain a cryptographically secure, shared, and distributed ledger (a database) for transactions. Blockchain brings trust, responsibility, and transparency to digital transactions.

2. Literature review

Mike Faden states that though few blockchain-based payment services are yet available, expected to change in 2017 as the investment that has poured into exploration of blockchain's potential by banks, financial-technology startups and other companies yields fruit. According to a survey of 200 global banks published by the IBM Institute for Business Value and The Economist Intelligence Unit, 15 percent of banks expect to introduce full-scale commercial blockchain solutions in 2017, with "mass adopters" rapidly following suit – bringing the total to 65 percent of banks by 2020 (just three years). This post offers a roundup of many live and near-live blockchain payment processing solutions and trade finance deployments. He also states that „live“ blockchain deployments promise to accelerate payment processing and trade finance (Faden, 2016).

Blockchain innovation guarantees to ensure quick, secure, low-cost international payment processing services (and other exchanges) using encrypted distributed that give trusted real-time verification of transactions without the need for intermediaries, for example, reporter banks and clearing houses. Blockchain technology was at first used to help the digital currency Bitcoin, but is presently being investigated for a wide assortment of uses that don't include bitcoin (Faden, 2016).

Satoshi Nakamoto, the inventor of bitcoin, titled his original white paper on the subject "A Peer-to-Peer Electronic Cash System." This description touches on the core differences between bitcoin and credit card transactions. Blystone Dan said that he helped understand bitcoin better and his research talks about bitcoin transactions regarding and their difference from credit card transactions (Blystone, 2018).

Bitcoin payments are comparable to wire transfers or cash transactions, where payment is "pushed" directly starting with one party to next, without through influencing financial organization. Payment processing is executed through a private system of PCs, and every exchange is recorded in a blockchain, which is public. Bitcoin is based on shared innovation and depends on the blockchain and the cryptography securing it, with no outsider oversight.

Dan Blystone also discusses about credit card transactions entail the buyer effectively authorizing the seller to "pull" a payment from their account, passing through several financial intermediaries in the process. For example, a typical Visa transaction involves four parties: the merchant, the acquirer (the financial institution that enables payments to the merchant), the issuer (the card holder's bank), and the individual cardholder (Blystone, 2018).

When making a bitcoin exchange, it isn't so important to give individual identification information, such as, your name and address. Bitcoin transactions are made utilizing an anonymous alphanumeric location that changes with every transaction and a private key. Payments can likewise be made on cell phones by using quick reaction (QR) codes.

While credit cards are stored physically in a wallet, bitcoin transactions are sent to and from electronic wallets, which can be stored on your computer, smartphone, or in the cloud.

Bitcoin exchanges are irreversible and can be discounted by the receiving party – a key distinction from credit card transactions that can be canceled. This implies there are no charge-backs for vendors when taking payment via bitcoin. A charge-back is the demand by a credit-card provider for a retailer to cover the loss on a fraudulent or disputed transaction (Blystone, 2018).

Moghe Sarthak explains how blockchain can disrupt the card payments industry, and why it hasn't already.

Blockchain is a buzzword that is beginning to lose its buzz. The word is thrown around continually, and often individuals have little idea what it implies. But the technology does have value, and it doesn't just have to be an esoteric term. Instead, the blockchain has the capability to disrupt and change a number of industries (Moghe, 2018).

The card payments industry is one of them. While the card payments may be suitable for customer the merchants have been basis the bill for this suitability, with the high processing fees charged by the card processing intermediaries. Since blockchain innovation depends on the core principle of "decentralization," it gives a chance to achievement the various "middlemen fees" with an alternative low-fee digital payments network. And, besides convenience, merchants can share these savings in processing fees with their shoppers to elevate their experience to a whole new level. Let's look at how blockchain can help improve the card payments industry, and, if it's so great, why it hasn't already (Moghe, 2018).

Samantha Radocchia explains why it will be so important going forward with blockchain payment process:

A crypto payment system introduces greater liquidity into markets.

Connecting a supply chain or retail platform to a payment processor gives a different means of transacting and making payments—opening up a new sources of liquidity for the businesses involved.

Streamlined payment improves efficiency and automation.

The cryptographic seals we use look fairly simple, but they require a number of different parts. One company creates the antenna, and another builds the chip that turns it into the NFC inlay. A third vendor places all of it in a tamper-proof sticker. Now, our team isn't ordering vast quantities, and none of these vendors are located exceptionally far from each other. But the task of filling out orders and completing them is incredibly time-consuming.

Procedures like this can take months relying upon what kind of item the organization is dealing with. While a large number of these frameworks could turn out to be increasingly productive by digitizing and robotizing the stream of information and data, it's insufficient. Digital documents aren't significant in the event that they're being sent to someone with a blockchain-based payment processor.

And as more companies adopt crypto and blockchain technology, exchanging that value is going to become much more important (Radocchia, 2018).

A point-to-point transaction can reduce costs for companies

A blockchain payment processor takes the cargo off individual firms by offering a single solution for everyone in a supply chain or industry. Allowing companies to process transactions automatically and avoid or significantly lower transfer fees is a huge leap forward in efficiency and cost savings (Radocchia, 2018).

3. Research method

I have relied on this topic so this work will help someone who will in the future also rely on the same and who will interest blockchain technology and its benefits and application.

I decided to dedicate myself to this topic because it may not yet be so widespread and but it is important in the business world. I was based on certain relevant seminar papers, and on some articles where a group of researchers and authors discuss the benefits of blockchain technology and its use.

Research is motivated by the debate on the influence of blockchain technology and the growing body of literature on cryptocurrencies, combined with the necessity to assess how this would impact BMs in the payments industry

Research gives a high-level technical overview of blockchain innovation. It looks at different classes of implementation approaches. It examines the components of blockchain technology.

Experts (D. Yada, P. Mell, R. Nik. and K. Scarfone) give details on how blockchain innovation was extended out past attestable exchanges to include attestable application forms known as smart contracts. It also touches on some of the limitations and misconceptions surrounding the innovation. Also researches (Grech, Camilleri, 2017) presents several areas that organizations should consider when investigating blockchain technology. It is intended to help readers to understand the impact of blockchain technology on business models in the payments system. In Bitcoin, and comparable systems, the exchange of digital information that represents electronic cash happens in a distributed system. Bitcoin clients can digitally sign and transfer their rights to that data to another user and the Bitcoin blockchain records this transfer publicly, allowing all participants of the network to independently verify the validity of the transactions.

The analysis is based on a Delphi study conducted among experts (F. Holotiuk, F. Pisani., J. Moormna) from the payments industry knowledgeable of the blockchain technology. Given the lack of existing research and the exploratory nature of its study, open qualitative interviews would have been an option. However, the industry still shows a high degree of uncertainty on the study's topic. Furthermore, based on its industry insight, specific expertise could clearly be located. This advised a multi-stage study in a more formalized and group-oriented approach. Therefore, the Delphi approach was the method of choice. The Delphi method was developed in the 1950s and has become a common tool for measuring and aiding forecasting and decision-making. It is especially appropriate for exploratory theory building on interdisciplinary issues, which often involves new or future trends. Hence, the method is highly recognized in research concerning technology forecasting and has been used extensively in IS research to identify and rank key issues for management action.

The Delphi technique takes into consideration the dialog of a perplexing issue through an organized correspondence process. Dakey and Helmer characterize Delphi as a technique that endeavors to get the most solid accord of a gathering of mysterious specialists. Four particular attributes are introduced by von der Gracht: anonymity, iteration, controlled feedback, and statistical group response.

As for research point and as proposed by Murry and Hammons that picked a 3-round technique. In such manner, we pursue Fan and Cheng, who recommend three adjusts as being adequate to achieve accord and borne as a top priority time limitations which may impact the strategy. Cycle one (R1) planned to infer specialists' experiences and feelings. In cycle two (R2) specialists assessed the consequences of R1. Cycle three (R3) requested that specialists reexamine the outcomes in light of the gathering input.

Experts (F. Holotiuk, F. Pisan, J. Moormann) inform us that new service blockchain technology is going to allow the link between contracts and transactions. Blockchain technology is powering our future.

In 2008, the blockchain thought was combined with a few different technologies and computing ideas to make modern cryptocurrencies: electronic cash ensured through cryptographic systems instead of a central repository or authority. This technology became widely known in 2009 with the launch of the Bitcoin network, the first of many modern cryptocurrencies.

Identifying the Panel of Experts

The most critical model while choosing specialists is the individual ability on the issue under investigation. As needs be, chose qualified specialists relying upon their work involvement in installments as well as blockchain innovation, their expert position, and the job and foundation of the organization they work with. A key prerequisite for specialists to be chosen is an intensive understanding of blockchain innovation to evaluate its suggestions on installments. Also, a profound comprehension of installments was expected to evaluate industry-explicit ramifications for BMs. For the identification and validation of experts, used web search, talks with practitioners, and databases of professional networks. Hence, the Delphi panel was composed to be a representative mix of experts and included 45 panelists: 16 (35 %) from consulting, 11 (24 %) from fintechs, 6 (13 %) from banks, 4 (9 %) from academia, 3 (7) from public institutions, 3 (7 %) from payment service providers, and 2 (4 %) technology providers.

4. Analysis

Because of the iterative and multi-organize nature of Delphi examines, information gathering and butt-centric ysis are introduced together. In R1, conveyed 45 messages to the specialists where

they freely give thoughts, contemplations, and assessments on the improvement of blockchain innovation. As per Linstone and Turoff, structured R1 with an open-end organize, recommending beginning stages around BMs. This was done to elicit individual perspectives, judgments, and opinions from each panelist. In order to de-velop a general framework in the direction of this research question, the starting points were created by the researchers as suggested by Schmidt. Hence, to stimulate an-swers in R1, broad questions were provided where panelist could deliver their input (Holotiuk et al., 2017).

Recieved a 38 reactions. For less demanding perusing and examination the reactions were col-lected in one archive bringing about 20,000 expressions of subjective information. So as to distil the most pertinent articulations, the info was coded by three free scientists with a mediator planning the coding exercises. First, the researchers went through all answers and developed their own code list. Second, the moderator guided the discus-sion among the researchers to generate one code list which reflected all relevant input. Finally, the researchers translated all codes into better readable and easily understand-able statements. As an example, the code “new business models” was translated to “With the blockchain technology new business models in payments will develop”.

In R1, an initial set of 45 statements was produced describing the implications of block-chain technology in payments. Examined and talked about those explanations which are important for BM inquire about in connection to blockchain innovation. The scientists distinguished 17 out of the 45 proclamations as being applicable to the targets of this examination. The statement selection was based on the following criteria: threats and opportunities for existing BMs, need for revising current BMs, implications for designing new BMs, and new service offerings in the industry with substantial potential for new BMs (Holotiuk et al., 2017).

For the consequent assessment of the announcements in R2 and R3, needed to consider that the master board comprises of professionals with restricted time just as rela-tively low efficient comprehension. Hence, to better facilitate the evaluation, the state-ments were presented through the use of an online tool (Qualtrics) with a strong focus on intuitive readability. In R2, exclusively considered the 38 panelists who com-pleted R1. These experts were presented with the statements generated in R1 and asked to provide an evaluation of each statement on a six-point Likert scale ranging from “Strongly agree” to “Strongly disagree”. Six were picked to support clear choices toward assentation or difference and yet to offer enough operation tions for a separated assessment. Toward the finish of R2, the assessment of every announcement was gotten from 36 out of the 38 specialists. [Holotiuk.F, Pisani.F,Moormann.J 2017]

This gathering of 36 specialists was additionally considered in R3, where the indistinguishable articulations from R2 were displayed to the specialists, alongside the gathering's reactions from R2 joined with every specialist's own assessment. Exclusively graphical portrayals of the assessments were appeared. This methodology surpasses the standard Delphi strategy, yet guarantees the right elucidation. At last, specialists were approached to give their individual assessments in light of the gathering assessments in R2. Altogether, 34 reactions were gathered from R3 (Table 1).

Table 1. Response rates within the Delphi panel

<i>Round 1</i>		<i>Round 2</i>		<i>Round 3</i>	
Sent out	Complete responses	Sent out	Complete responses	Sent out	Complete responses
45	38 (84.4%)	38	36 (94.7%)	36	34 (94.4%)

After finishing R3 checked group stability. Across all statements, the average for agreement was 87 % and only 13 % for disagreement. Also compared two statistical measures, variance and variation, of R2 and R3 to determine if consensus was achieved. The average variance was reduced from 1.23 in R2 to 0.96 in R3. Furthermore, the average variation decreased from 47 % in R2 to 43 % in R3. Finally, selected those statements of the initial 17 with the highest con-sensus values. (Holotiuk et al., 2017).

5. Results

The ten articulations are the aftereffect of the Delphi technique and best condense the implications of blockchain innovation on BMs in the installments business dependent on the master board. Figure 1 illustrates how the ten statements are synthesized into four areas of thoughts: Blockchain-enabled services as a first cluster indicate how new services around peer-to-peer (P2P) and direct transactions, cross-border and cross-currency transactions, as well as the connection between contracts and transactions are being introduced. At the same time some existing services are rendered obsolete. This adjustment in administrations causes an adjustment in the money related structure of firms in the installments business. As a result, there is an incredible potential for new BMs in the market while some current ones wind up out of date. A strong impulse to new BMs is given by new players like fintechs, which are better able to leverage the potential of blockchain technology. Details on the opinions of the panelists are provided in the following (Holotiuk et al., 2017).

4 Areas of Thoughts	10 Statements	
Blockchain-enabled services	New services with blockchain technology	Obsolete services with blockchain technology
	P2P and direct transactions	Cross-border and cross-currency
Changed Financial Structure	Connection between contract and transaction	
	Changed income structure	Cost reduction
Potential for BMs	New business models in payments	Obsolete business models in payments
New Market Players	Fintechs developing blockchain technology	

Fig. 1. Implications of Blockchain technology for BMs in the payments industry

There are a strong consensus around the impact on payment services due to the introduction of blockchain, and we argue that there are direct implications at the BM level as the design of BMs involves the definition of services a firm delivers. From one viewpoint, specialists stretch that the advancement of blockchain innovation enables new administration contributions to be conveyed to the market. In more detail, specialists mention three administration regions, which assume a noteworthy job in the further advancement. These ser-indecencies are molding the advancement of BMs and are heralds of the change to come in installments: Blockchain innovation is relied upon to make coordinate exchanges possible with no outsider going about as "trust specialist". Hence, "transaction can be executed peer-to-peer" directly between two contractual parties (peers). P2P transactions can occur between identified parties such as firms or customers; but also between uni-identified parties like machines (cars etc.) or even unbanked customers (F. Holotiuk, F. Pisani, J. Moormann, 2017).

Blockchain innovation will make these installments "quicker and less expensive", for example quicker by giving a strong, regular framework crosswise over outskirts for exchanges, and less expensive by expelling costly middle people, in this way defeating to-day's "absence of trust". On the off chance that blockchain innovation permits simple universal exchanges dependent on advanced monetary standards, money trade will dissolve as an administration and evacuate expensive cash trade workplaces. Moreover, because of the comprehensive idea of the technology, worldwide and permissionless availability, current high charges for settlements by outsiders will blur and dissolve the particular BMs as people can partake directly in settlements abroad. These upgrades will be the absolute "greatest effects" of blockchain innovation. A completely new service blockchain technology will allow is the connection between contracts and transactions. Hence, the technology can be used to keep records of "contracts of purchase and passing of property" in addition to the actual transaction. Thereby, contracts of purchase can be directly linked to payment transactions, which is referred to as smart contracts. As a result, blockchain technology can be used as a "proof of ownership" as well as a proof of payment. The development of smart contracts will allow the "automated execution of transactions". Hence, smart contracts prove to be a critical cornerstone in the current advancements around the internet of things. Finally, the connection between contracts and transactions allows 'programmable' money flows and automation of transactions, which leads to decentralized autonomous organizations, where

business rules are coded in the organization and executed automatically under certain conditions (Holotiuk et al., 2017).

Expanding on the blockchain-empowered administrations and the changed monetary structure, solid impacts on BMs are perceptible and assume a noteworthy job while examining blockchain innovation. In any case, the recognition is twofold edged. From one perspective, we see a solid accord that new BMs as to installments will develop. For instance, specialists stretch the significance of information by fundamental "information investigation and further information related administrations". This is as per the pattern in our exploration, that installments related BMs will possibly endure if new administrations are included like "installments expanding ser- indecencies and items" and hence BMs are improved. Just the formation of "significant worth included administration", supplementing current BMs, will enable monetary organizations to keep their client base stable. For example, panelists point out that future BMs will no longer build on account service fees but "hosting and data security fees" and will be able to "monetize interfaces", not just services.

Finally, the described changes and implications give rise to new market players. As new players, and particularly fintechs, enter the market, new BMs are expected. Following the panelists, fintechs will play an important role in the context of blockchain technology application in payments. Panelists see fintechs as an "enabler for market infrastructure" and as "specialized providers from outside with a catalytic role" (Holotiuk, F., Pisani, F., Moormann, J. 2017).

Discoveries demonstrate that changes because of the presentation of blockchain are reflected in new administrations just as new income structures and in the long run new BMs (Holotiuk et al., 2017).

6. Conclusion

Blockchain is another innovation with possibly problematic power, which yields impacts for various enterprises. First applications came up in the money related administrations area with bitcoins, which puts the installment business at the focal point of developments around blockchain innovation. It is the first of its sort to assemble a high number of specialists and gain a superior comprehension of the suggestions on BMs in the installments business. In there try to outlines the changes due to blockchain technology, which are clustered in four areas of thoughts. First, new services are introduced, which foster P2P transactions, cross-border and cross-currency transactions, as well as the connection between contracts and transactions and, therefore, make current services obsolete. As a result, the monetary structures of existing BM will change. Third, these progressions will be reflected in the advancement of new BMs, making some current BMs outdated. Finally, these progressions make a potential for fintechs to enter the market by utilizing blockchain innovation. Abridged, explore gives bits of knowledge into how changes in installments, due to blockchain innovation, advance and in what headings organizations need to think to update their BMs. Research contributes to BM literature by analyzing the impact of new technologies. Furthermore, the findings yield new research avenues, which are promising to further explore the topic of blockchain. At last, the platitude "one mystery to keeping up a prosperous business is perceiving when it needs a major change" could demonstrate right by and by with BMs in installments (Holotiuk et al., 2017).

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