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Auctioning Using Blockchain Advantage Analysis

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***Abstract*— The paper reviews the various benefits of blockchain on auctioning. Blockchain is probably the most thrilling technological innovation after the Internet. The use of blockchain on auctions has been relatively recent. However, its positive influences on auctioning cannot be understated. The literatures on blockchain in the field of technology were extensively retrieved and carefully studied through Google search on the internet in order to identify various advantages of blockchain on auctioning. In the first sections of the text, the author describes auctioning; and the traditional auction was looked into. Additionally, the text progresses by exploring the benefits of blockchain; the three categories of blockchain; how the blockchain works in auctions and related works on the study. It is hoped that this study will inform auctioneers and the industries at large of the incredible benefits and solutions blockchain proffers to the world of auctioning.**

***Index Terms*— Blockchain, Auction, Advantages of Blockchain, Technology.**

I. INTRODUCTION

The role blockchain plays in the auction lately cannot be underestimated. This is likely because it offers many incredible benefits, including transparency, security, cost savings, social responsibility, marketing strategies and more.

Blockchain is a relatively new topic for literature. Most industries are not even aware of its existence. Research shows that only 41 applicable studies were published on the blockchain, and all of these publications were produced after 2012. The three most significant countries highlighted in these publications are: Germany, Switzerland and the United States (U.S) [1].

Studies shows that from the very beginning, progressive organizations explored the thoroughness of blockchain without wavering; for indeed, their value as the only source of truth was obvious. The blockchain so quickly established its value that the pace of its acceptance was surprisingly expected [2].

The motivation for this study is to contribute to the literature on the blockchain, as well as identify the positive influence of blockchain on auction. This paper analyzes the different benefits of blockchain in the world of auctions.

The paper will penetrate into the following headings in a chronological manner: (i) Auctions (ii) The Blockchain (iii) benefits of blockchain (iv) Why is blockchain preferred in auctioning? (v) How blockchain works in auctioning? (vi)The three categories of blockchain (vii) Related works (viii) Conclusion and (ix) References.

II. AUCTIONS

Auction is the process of buying and selling goods or services, accepting bids, and then selling products to the highest bidder. The open ascending auction may be the most common form of an auction that is being used. Participants openly bid against each other and each subsequent offer must be higher than the previous bid.The auctioneer can announce prices, bidders may call out their bids for themselves (or ask a representative to do so on their behalf), or bids can be sent electronically with the highest bid presented publicly [3].

In a Dutch auction, the auctioneer starts with a high selling price for a number of similar items; the price is reduced as long as the participant is not willing to accept the price of the auctioneer for a certain amount of goods in the party or until the seller's price is reached. While auctions are more related to public imagination with the sale of antiques, paintings, rare collectibles, and expensive wines, auctions include goods, radio spectrum, used cars and livestock [3].

Online auctions have played an important role in the global economy by transferring billions of dollars in exchange for goods and services over the past few decades [4].

III. THE BLOCKCHAIN

Blockchain is a decentralized (distributed) digital book that tracks all transactions through a peer-to-peer network. This is a list of records stored securely in a series of interconnected and ever-wider systems that makes the blockchain technology resistant because the network has no one point of vulnerability, and each "block" is linked only to blocks. The preceding digital signature is preceded, which means that it is not possible to modify the record without changing the previous records in the chain, making the information inviolable [5] -[6] –[7].

Blockchain contains new and previous information blocks. The data cannot be edited or modified, so everything that is entered is permanent. This creates a completely transparent system that allows all parties to see the records of that particular operation.A key invention in blockchain technology is that it allows a participant to transfer funds over the Internet without the need for a centralized third party.

The data structure used in the blockchain was first proposed for time-stamping the creation of intellectual property, aiming to use cryptography to protect the property rights of creators [8] –[9]. Block chain technology has attracted the attention of the world after the popularity of Bitcoin, the "cryptocurrency". Bitcoin is a product created in the original blockchain system invented by an unknown person using the pseudonym "Satoshi Nakamoto", which released a technical document in 2008 and confirmed the first Bitcoin entry in the Bitcoin blockchain system in 2009. During 2017, Bitcoin brought a blockchain headed by global technology and finance debates, due to its phenomenal currency-denominated exchange rate (Bitcoin reached the

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highest exchange rate of 19,783.06 USD for the first currency in 2017) [5].

IV. BENEFITSOF BLOCK CHAIN

The advantages of blockchain technology will be highlighted in the details below:

i. Transparency: This is no doubt the most significant benefit of the blockchain technology, and almost every other advantage of the blockchain points back to this feature. Buying a product online is synonymous to being in the dark. You have to trust your partners to get the best products at the lowest price. Unfortunately, most times, this trust falls from one side to the other as a result of finance and logistics.

Blockchain comes along with information from all your partners to better understand what is happening at each stage of the process. All partners can enter their data and data stored in several public blocks. This eliminates the "problem of confidence" in the supply chain. Each partner can see the data entering the business and logistics of this product [10].

ii. Cost reduction: One of the main concerns of e-commerce relates to all intermediaries in the supply chain. There are too many hands in the pot that seek to reduce profits. This increase costs for traders and customers, making it difficult to compete in an aggressive market. However, with the blockchain's increased transparency, the price may fall. Blockchain shows exactly what partners are doing, what and where their costs come from. This eliminates ghost partners who are taking part in their money without providing value. Blockchain can also help you discover delays in a process that can be corrected to optimize processes and costs [10].

iii. Social responsibility: for a socially responsible company, it is pertinent to be transparent at all times; this advertently helps boosts its integrity. As the supply chain is more transparent, it will be more aligned with your social missions. Transparency of the blockchain can help to prove the credibility and legitimacy of your businesss. You and your customers can see all the information about people who produce the product. It can provide information on environmental processes, laborlaws, and other social factors [10].

iv. Marketing: Blockchain also comes in very handy when marketing. Giving customers access to the blockchain information strengthens their level of trust because customers are becoming weary of the lack of transparency of online companies. In addition, loyalty programs where people get either cash or points in their digital wallet, delivered promptly by blockchain can be hosted in your company. The same applies to referral programs because the new customer and the referring customer receive a reward from their business directly in their digital wallet [10].

v.Security: Even if the blockchain is publicly visible, it is embedded in cryptography, which is one of the safest forms of encryption. This means that hackers cannot enter, edit or modify data, which further increases the reliability and security of your database. Even if someone could hack the system, blockchain would store all the changes, old and new, so that their source information could easily be saved [10].

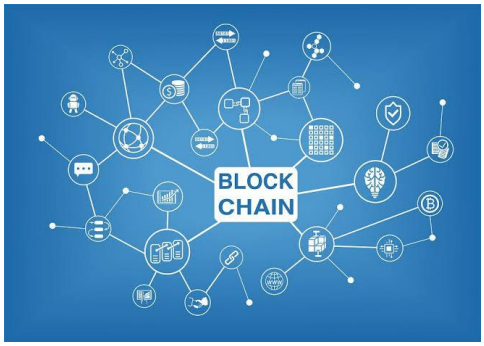

Figure 1: The advantages of blockchain technology. Retrievedfromhttp://www.google.com/search?q=advantages of blockchain technology (last accessed on 23 April 2019)

V. WHY IS BLOCKCHAINPREFERRED IN THE AUCTIONINGWORLD?

"The decision to use blockchain technology was never made because blockchain was 'so popular'. We chose to use blockchain technology because the blockchain is, indeed, perfectly relevant to our project as it answers some security requirements that traditional auctions cannot currently guarantee. Decentralization which is an intrinsic part of blockchain can solve several issues inherent to traditional auctions…" [11].

A problem inherent in the traditional auctions is highlighted below:

Lack of transparency: Bidders have no way to guarantee the origin, authenticity, and legitimacy of a larger offer. However, with the blockchain, the bidding history can be monitored and checked. Current auctions are not open due to their centralization. Bidders must use the organizer platform. This is not the case with the auctionity, because it can only be used if it is needed for your blockchain layer. Interoperability is the key. And that is what the auctionity brings.

Thus, the auctionity blockchain was created to tackle issues relating to security properties[11]. Some of these issueswill be looked into below:

i. The highest priceavails itself: The- highest- price wins the property ensures that the one that has submitted the highest bid wins the auction [11].

ii.Non-Repudiation: Blockchain technology guarantees the invariability of each record. Therefore, if it is possible for a winner to win without presenting a winning bid, he might try to prove he did not present a winning bid, even if he got legitimate. In order to guarantee irrevocability, the bidder who has made the offer should not be able to argue that he has done so [11].

iii.No cancellation: As in an auction in English, all bids are taken into account for the final result; the property of the undisclosed auctioneer assumes that the amount of the profit is correct. As a result, the bidder who delivers the last accepted bid must win the bid. However, if there is a chance that he will not win when his bid is accepted, it would mean that someone, an intruder or a tenderer could cancel the offer even after it has been accepted [11].

VI. HOW BLOCKCHAIN WORKS IN AUCTIONING?

A. Real-time Auctions

At a bidding auction, if the offer is made in the last remaining hour, the auction is extended by one hour. This anti-cutoff system is a good solution for allowing other people to bid, while at the same time allowing Ethereum (ETH) blockchain time to receive and validate the transaction, which may take several minutes. But if there are many other bids on time, the auction will be extended each time. This can be acceptable if it happens only once or twice, however, this cannot be a long-term solution.To remain consistent with real-time live auctions (that is, those made by an auctioneer), blockchain offers a technical consensus mechanism, ensuring that each offer has the highest value in one second.

B. Payment Guarantee: why the ETH deposit is key.

In an auction, the payment guarantee requires you to deposit on the livenet before any bid.

The payment guarantee makes transactions more reliable between the seller and the buyer. In fact, sometimes after the end of the auction, the winning bidder refuses to pay or buy its price, which means that the seller and the bidder have lost their time and money. However, when an auctioneer has assigned an auction, the object must be paid. There should be no way to avoid this. Blockchain can guarantee payment for the seller [11].

C. Delivery guarantee

At the end of the payment guarantee, the blockchain has another interesting feature which helps in order to overcome the problems of the delivery process. Auctionity blockchain can guarantee the delivery of any product token. This feature functions in a similar manner to the payment guarantee, guaranteeing the bidders to get the product they won at the auction. To ensure delivery, the seller will have to transfer the relevant crypto asset – a non-fungible token (NFT) into a smart deposit agreement before the auction begins. The assets will be locked in the Smart Deposit Agreement before the auction commences. The asset will be locked on the Smart Deposit Agreement until auction expires, it will then be transferred to the successful bidder [11].

Figure 2: How the auction works using blockchain technology. Retrieved fromhttp://medium.com/auctionity/decentralizing-ascending-auctions-on-blockchain-dffab74446c1 (last accessed on 23 April 2019)

VII. THE THREE CATEGORIES OF BLOCKCHAIN

There are currently three blockchain categories. Each is discussed below.

i. Public Blockchains: All participants can access the database, store the copy and modify it by enabling them to access computing power. Bitcoin is, for example, a public blockchain [12] –[13].

ii. The federated Blockchains: They are open to the public, but not all data is available to all participants. User rights are different and blocks are checked according to predefined rules. The federated block chains are, therefore "partially decentralized". A good example is an R3 consortium, which gathers 70 of the world's largest financial institutions for testing technology with a semi-private block-chain.

iii. Private Blockchains: The central authority manages the right to access or modify a database. The system can easily be integrated with information systems and offers an added benefit of an encrypted audit trail. In private block chains, networks do not have to encourage miners to use their computer power to execute algorithms for validation. For example, CrédistMutuelArkéa chose a private blockchain to share the data of his clients among the group's entities [12] –[13].

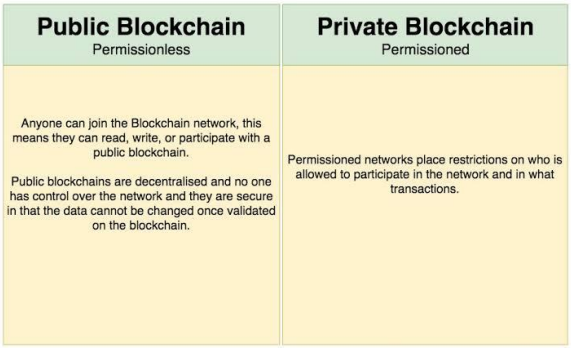

Figure 3: Public and private blockchain. Retrieved from http://www.google.com/search?q=privatebbloc j+chain+images&tbm= (last accessed on 24 April 2019)

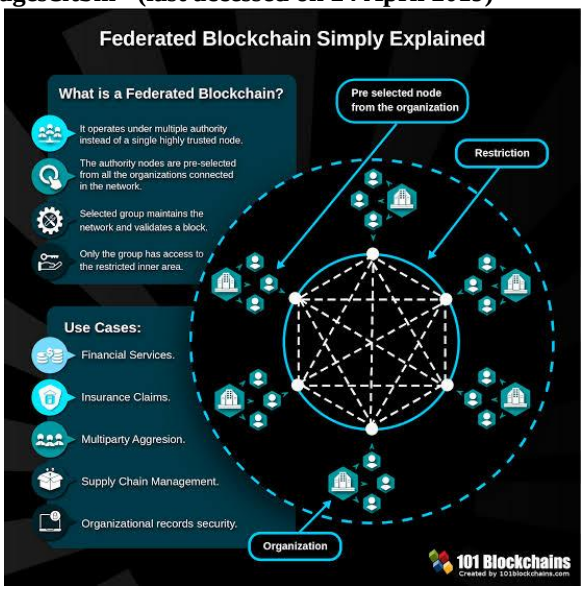

Figure 4: The federated blockchain. Retrieved from http://www.google.com/search?q=the+c0nsortium+block+chain (last accessed on 24 April 2019)

VIII. RELATED WORKS

Allen addresses the lack of articles dealing with the implications for entrepreneurs in the application of the blockchain when describing the commercial aspects of the new cryptographic economy "While the underlying technical invention of blockchain has been available since 2009, applicable entrepreneurial opportunities remain nascent" [14]. "The entrepreneurial problem of the blockchain is a development problem - analogous to that in new development economics - requiring non-price coordination over the complementarity of applications and opportunities". His views are shared by Davidson *et al.*, which is in line with potentially disruptive capabilities of the blockchain, but also the underlying challenges of entrepreneurs in the area of the blockchain [15].

According to Ko, the Hong Kong Financial Secretary Paul Chan expressed the following: "For the long-term sustainability of our financial industry, we should also pay attention to the development of the relevant formats, protocol as well as platforms of the blockchain." [16] – [17]. However, Lam also mentions that Hong Kong Monetary Authority is actively behind the development of blockchain, working in proof of concept projects with local banks to gain a better understanding of the technology and materialize pilot programs in those areas [17] – [18].

In furtherance, Susskind gives various instances of how a blockchain based voting system can comply with the Help America Vote Act (HAVA) and the Voting's Right Act. Blockchain voting system can, through end-to-end encryption, preserve the anonymity of voters. The system can also be a program that avoids voter mistakes in the voting process that could potentially prevent voting. The system would facilitate the voting process for people with disabilities because they would not have to leave their homes to vote, which could increase the rate of fluctuation of this population. Votes can also be audited without revealing the identity of a particular voter, which increases transparency. This voting system does not need (at least in the near future) to be the only voting method. Traditional methods can still be used to help people who do not have the necessary technical skills or who may not have an internet service or device that they can work with [16] –[19].

To improve transparency in its finance, the government could also benefit from the blockchain. Alboaie analyzes several dimensions that affect the blockchain. Topological dimensions establish three types of possible networks, centralized, decentralized and distributed [16] –[20]. In addition, as already mentioned, there are three types of blockchains, public blocks such as Bitcoin and Ethereum, both private block chains, such as Hyperledger (open source project of the Linux Foundation) and hybrid block chains. With something like HyperLeader, an open source platform, the government could accelerate and test the technology. Alboaie highlights the potential benefits of tracking online transactions almost in real time. This can be especially useful if the data is updated (with appropriate software development) on the same day. These data could have huge potential for government accounting. Coyne concludes in his article that the blockchain solves what is called the Byzantine generals problem2. The problem and the solution are poorly related to the issues of financial reporting. Although, some parts still work for accounting purposes [21] Coyne also reports that one of the 4 major accounting companies will say that the blockchain will cut office costs [16]. Coyne points out that interesting future research should explore how to find better ways to exploit the public blockchain and private blockchain.

Also, it was discovered that the block chain could also be beneficial to copyright. Ensign mentions the potential ability to link an intelligent contract to a work (in digital form) and make it function as a form of a digital watermark. Additionally, you can prove that the job is a copy or not. This could be very useful for the music and film industry in the fight against piracy [22].

IX. CONCLUSION

The auctioneers chose blockchain technology because it is thought to be able to improve ascending auctions, giving more value to crypto-collectible transactions in a decentralized way [11].

There is no doubt that the blockchain is gradually gaining momentum in industries, especially at auctions. Blockchain technology has immensely contributed to the positive development of auctions. Thanks to the use of the blockchain, there is an improved operating system in the world of auctions. Some of these improvements include transparency, security, traceability, process integrity, and more.

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