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The use of blockchain technology in marketing: advantages and barriers

Pazarlamada blokzinciri teknolojisinin kullanımı: avantajlar ve engeller

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Blockchain technology becomes more and more important and offers great benefits to marketing. Blockchain technology fosters transparency, protects consumer data, increases trust, enables traceability of data, reduces transaction and investment costs, and provides personal products/services. However, there have been only a few implementations of blockchain technology in the field of marketing so far, because it is still not clear whether it will be the "next big thing" for companies' marketing departments or not. The objective of this study is to examine the potential advantages and barriers facing the implementation of blockchain technology in marketing. In this conceptual paper, it is asserted that blockchain technology can provide advantages to companies in their marketing activities, but also reveal the barriers during its adaptation. In this respect, this paper is expected to guide future research on the implementation of blockchain technology in marketing.

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ÖZET

Blockzinciri teknolojisi, pazarlamada gittikçe önem kazanmaktadır. Blockzinciri teknolojisi şeffaflığı teşvik etmekte, tüketici verilerini korumakta, güveni artırmakta, verilerin izlenebilirliğini sağlamakta, işlem ve yatırım maliyetlerini azaltmakta ve kişisel ürün/ hizmet sağlamaktadır. Blockzinciri teknolojinin, firmaların pazarlama bölümleri için "gelecek büyük şey" olup olmayacağı henüz kesin olmadığı için bugüne kadar pazarlama alanında sadece birkaç uygulaması gerçekleştirilmiştir. Araştırmanın amacı, blockzinciri teknolojisinin pazarlama alanında yaratacağı potansiyel avantajları ve engelleri ortaya çıkarmaktır. Bu kavramsal çalışma, blockzinciri teknolojisinin pazarlama faaliyetlerinde firmalara çok sayıda avantaj sağlayabileceği, ancak benimsenmesi sırasında engellerin yaşanabileceğini ileri sürmektedir. Bu yönden çalışmanın, blockzinciri teknolojisinin pazarlamada uygulanmasına ilişkin gelecekteki araştırmalara yön vermesi beklenmektedir.

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1. Introduction

The aim of companies is not only to carry out campaigns to reach the target numbers for their brands but also to cooperate with their customers to establish a stronger relationship and to expand their marketing activities (Santomier, 2008). Therefore, marketing activities focus on new communication ways to develop more effective and stronger customer relationships (Melewar et al., 2017). To achieve this goal, companies focus on advanced technologies dealing with big data to learn more about their target customers' needs (Stone and Woodcock, 2014). Currently, the internet is facing challenges such as trust, security, and privacy. As soon as someone carries out a financial transaction online, a digital trail is being left behind which contains important information like customers' purchasing habits, credit card information, and other crucial information no one should be able to access (Prabhaker, 2000). The lack of these privacy issues is getting worse (Bodoni, 2019). Eventually, consumers' doubts about online transactions will grow, disrupting the relationship between consumers and companies (Norman et al., 2016). These aspects emphasize the suitability of following the latest privacy regulations and technological innovations to ensure the safety of consumers at all times when moving online. In this way, blockchain technology is thought to create a tremendous improvement in many areas and therefore in marketing activities. With this new way of working, a more customer-specified targeting that aims to increase trust and customer loyalty can be guaranteed for the activities in the field of marketing. This research intends to show how blockchain technology can have a great impact on marketing activities.

Kotler et al. (2019) emphasized that digitalization is already changing marketing processes, therefore marketing and brand management need to be redesigned according to technological changes. Hence, Blockchain technology can help companies to customize their business activities and secure consumer PII (Personally Identifiable Information) to build trust between customers and companies. In 2008, after the digital cryptocurrency Bitcoin was created and experimentally activated by Satoshi Nakamoto, Bitcoin started to be bought and sold with currencies of different countries and no banks, government agencies, etc. were needed (Wang et al., 2020). Bitcoin Whitepaper is a digitally signed and electronic cash payment system that allows direct person-to-person online payments from one side to another without the need for a financial institution (Coin Update, 2019). Since the release of Bitcoin Whitepaper, blockchain technology has managed to attract a lot of attention from companies.

Blockchain technology has a strong encryption technique consisting of distributed data structures rather than a centralized data structure and works not only with blockchain-based currencies but also with all kinds of blockchain technology-related activities. Therefore, it is significant to understand the features of blockchain technology and how it can be used in marketing. Blockchain is used in different areas such as: health and pharmaceuticals; education; finance; agriculture and food; tourism; Internet of Things (IoT); energy sector; supply chain management. Other application areas of blockchain technology include advertising, title deed and marriage licenses, educational degrees, and birth certificates (Zheng et al., 2018; Antoniadis et al., 2019; Mengelkamp et al., 2018). Although companies can benefit from data storage with blockchain technology, the use of this technology is not common in marketing activities. This study has been determined that limited studies (Ertemel, 2018; Antoniadis et al., 2019; Brauer and Linnala Eriksson, 2020; Rejeb et al., 2020) have been investigated on the use of blockchain technologies in marketing activities. A few studies examined the barriers of the adaptation and implementation of blockchain technology in the sustainable supply chain (Kouhizadeh et al., 2021) and in various sectors and services (Biswasa and Guptai, 2019; Farooque et al., 2020). As indicated by Rejeb et al. (2020), this study explores the barriers to blockchain adaptation in marketing.

The research objective is to examine the potential advantages and barriers faced provided by the use of blockchain technology in marketing. The research questions are;

(i) *What are the advantages of blockchain technology for marketing activities?*

(ii) *What are the barriers of blockchain technology adaptation in marketing?*

In this context, firstly the definition of blockchain technology and its use in marketing activities are discussed in detail. Then, the potential effects and advantages in marketing are presented and the barriers to the use of blockchain technology in marketing. Finally, the conclusion of the study is given.

2. Literature Review

The composition of the two words in blockchain "block" which means collective operations and "chain" which represents cryptographically linked blocks (Maslova, 2018) was originally designed for the digital currency Bitcoin. Satoshi Nakamoto and his team introduced a huge database in 2008 in their technical work called "Bitcoin: A Peer-to-Peer Electronic Cash System" (Nakamoto and Bitcoin, 2008). The virtual currency Bitcoin can take precautions against manipulations of its internal and external users and has a strong encryption technique. This technique consists of distributed data structures rather than a central data structure and works not only with blockchain-based currencies but all kinds of blockchain technology-related activities (Hampton, 2016). Treiblmaier (2018) defines the blockchain as "a digital, decentralized and distributed ledger where transactions are recorded and added in chronological order to create permanent and tamper-proof records."

Blockchain technology is not controlled by a single authority. This technology is a distributed and decentralized ledger having multiple copies stored on multiple different computers in a network. Despite this fact, blockchain technology consists of the integration of multiple existing technologies (Lu, 2019). Blockchain technology deals with the storage of big data, its distribution, and a digital signature which creates a secure unchangeable set of data. The decentralization of the ledger includes that without following a consensus protocol no single entity is able to make changes to the ledger. Cryptographic hashing, peer-to-peer networks, incentives management, and public-key cryptography (Bits on Blocks, 2015) are therefore thought to transform companies' way of organizing, managing, and performing their day-to-day business. At the same time, blockchain represents the most highly secured decentralized and distributed ledger when dealing with bonds, deeds, music, art, money, even with votes and all kinds of assets (Forbes, 2020; Tapscott and Tapscott, 2016). With these features, blockchain technology is "like a giant spreadsheet for recording all assets" (Swan, 2015).

Blockchain technology can protect vast amounts of data gathered during interactions and transactions (Kumar et al., 2020). This can be done because, with blockchain technology, data is permanently sealed on a virtual page with a unique serial number after the data has been processed. These serial numbers of diverse sealed pages then have the power to represent the connections between the chains, thus the protected data of a

particular object can be tracked by its users, but no user has the power to change or delete operations past sealing.

As shown in Figure 1 below, in the simplified blockchain data structure, each block contains a summary of the block that preceded it. The figure examined that the blocks are linked together as a chain. While the data of the current block is being processed, all the data of the previous block is also processed. Therefore, users who want to change the data must change the data of all blocks forward whenever they want to change or destroy the data of any block. This means that it is almost impossible to perform such an operation on a very large data set. Therefore, this security element of blockchain technology is extremely powerful (Oh and Wallsten, 2018).

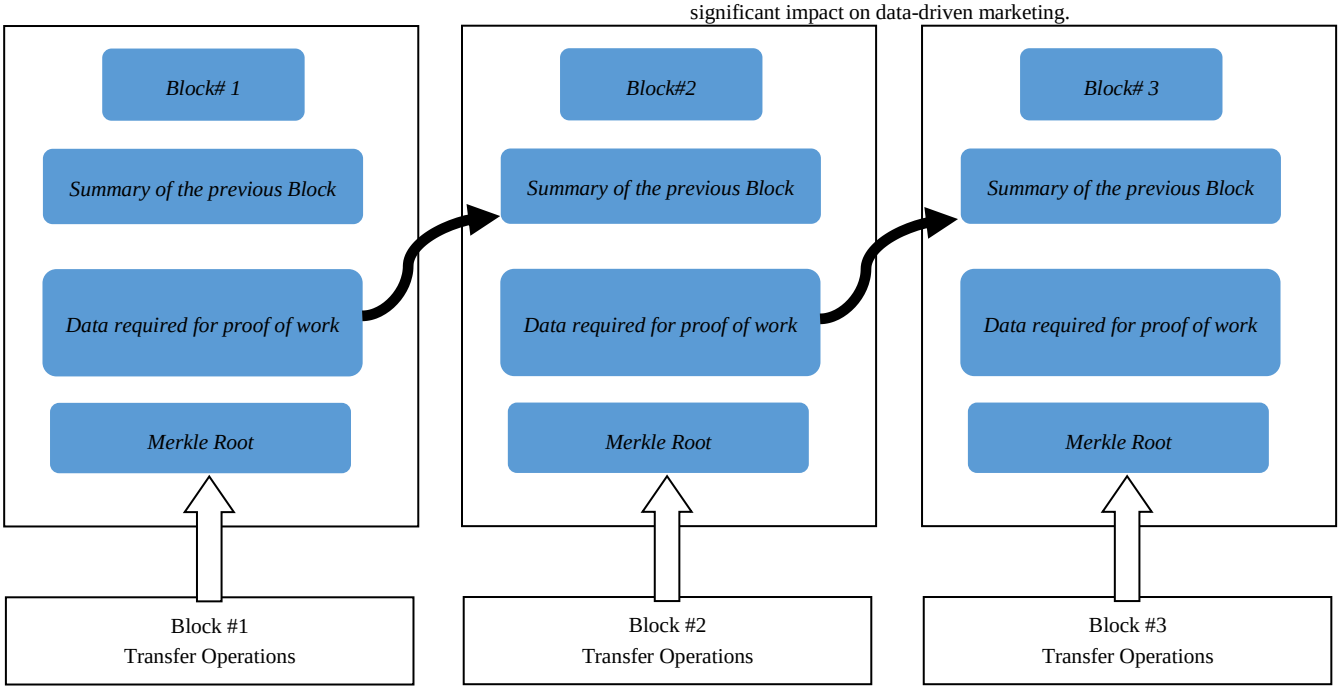

Figure 1. Simplified blockchain data structure

Source: Ayoade et al., 2018

After performing the sealing procedure with a certain serial number, the technology does not allow deletions or any other changes, because the pages are locked (chained) with a mathematical encryption system. When looking at this feature of the technology it is clear that trust is a very important issue because it is almost unlikely to delete or change data which was created in the past (Carson et al., 2018). Considering the features of being able to track and protect data, blockchain technology can be considered the most reliable and safe technology to store data (Mittal et al., 2019).

Blockchain technology has created an extremely secure data storage area to prevent data loss. This technology provides its participants a decentralized system that operates under the principles of traceability, transparency, and openness. It is remarkable that the blockchain technology works with large databases, ensuring that they can be accessed easily and transparently by all participants, and at the same time, it can protect all records, forever, with a strong chain structure (Beck and Müller-Bloch, 2017).

Blockchain technology will become increasingly important in many businesses. With the following five main features, blockchain technology can be applied in many different areas. These features are (Zheng et al., 2018): (i) The transparency of data records, (ii) autonomy and trust, (iii) unchangeability and anonymity, (iv)decentralization of operations, (v) endless access to open sources. With these features of blockchain technology, the verifiability and security of the system increases, the absence of intermediaries creates trust in the system and reduces transaction costs (Collomb and Sok, 2016).

Blockchain technology is an important development for marketing procedures (Gaiser and Linxweiler, 2017), this is because, blockchain technology will offer great benefits such as reliable performance measurement techniques in advertising campaigns and email marketing (Customer Think, 2020). By preventing ad fraud, offering transparency to customers and enabling engagement tracking, blockchain technology has a significant impact on data-driven marketing.

This is because blockchain technology can secure data and transactions of businesses, the government and people (Panetta, 2017). Blockchain technology protects customers' personal data and enables customers to track their requests and needs regarding brands, products and services more comprehensively. Once applied the technology is presumed to bring opportunities to marketing activities (Ertemel, 2018).

This part of the research will explain how companies manage their interactions with their customers and their daily business using blockchain technology in a rapidly digitalizing world (Aspasia and Qurania, 2014). Digital marketing activities help companies develop a unique marketing mix and therefore create a more competitive environment among companies. Reebok and Adidas have begun using applications based on blockchain technology for their operations to create effective solutions to their marketing techniques. Facebook for example uses blockchain technology to create its own cryptocurrency system for its social networking services (The Wall Street Journal, 2019).

To highlight the importance of applying blockchain technology in marketing, this research aims to explain the application of the technology in six marketing fields which raises awareness of the potential that the technology can offer to marketing activities. These are (Antoniadis et al., 2019): (i) marketing management; (ii) payment; (iii) reduction of transaction costs; (iv) traceability of the supply chain in supporting the brand image; (v) loyalty programs in CRM; (vi) digital marketing.

(i) Marketing Management

Blockchain technology can be used to gather information about target customers. This way better content for upcoming advertisement can be collected which is known as market data analysis. In order to generate more effective and efficient marketing and business processes, companies are making use of big data sets to find out about their consumers (Jia, 2019). The positive outcome of market data analysis based on blockchain technology is that customers are presented with an advertisement that assists to serve their real wants and needs (Blockchain Research Institute, 2020). This way, blockchain technology helps advertisers examine their advertisement campaigns and understands whether their target customers are being reached. Blockchain technology also allows advertisers to learn who opened their advertisements, provide more accurate conversion rates and obtain information about where their customers are geographically located. Blockchain provides advertisers with ways to audit and verify details of their advertising activities, because of its stability and transparency and provides its users with more insight and authority to detect fraudulent activities (Kshetri and Voas, 2019).

Nowadays, it is necessary to understand that companies use various dashboards to analyze large data sets to obtain a holistic result. Data sets are analyzed with long, complex, repetitive, time-consuming and costly procedures that do not guarantee an accurate, efficient and effective result. Adjust GmbH, a German company founded in 2012 in Berlin is able to prevent such an inefficient work process. The company is the industry leader in mobile fraud prevention and provides companies with high-graded analytics and prevention fraud solutions for mobile applications. The company provides blockchain-based Software as a Service (SaaS) to organizations and distributes them over the internet. The software collects data with the help of cloud computing and distributes it through Platforms as a Service (PaaS). This service reduces repetitive working procedures essentially for companies to find a holistic solution for marketing activities or other businesses, thereby reduces investments that make companies more competitive. Adjust GmbH, which offers this superior service to the industry, has established partnerships with major platforms such as Twitter, Google, Facebook, WeChat and Line. Adjust GmbH has implemented more than 25,000 applications and has opened offices in many countries to offer its services worldwide (Horizont, 2018).

(ii) Payment

The digital payment with its cryptocurrencies is based on blockchain technology and is used together with smart contracts. These contracts help reduce transaction costs between parties and ensure speed and security of transactions. Therefore, the blockchain technology used in transaction processes sends transaction data which is stored and encoded in a cryptographic block to sellers and buyers and can only be accessed by the seller and buyer with the help of smart contracts (Adiyanto and Febrianto, 2020).

The blockchain ledger is both a secure and fully transparent database (Forbes, 2020). Once an operation has been approved and entered into the blockchain ledger, it cannot be indiscriminately changed which emphasizes that all data is secured at all times. Thus, the security of increasing blockchain technology ensures smooth and reliable data exchange between all participants (Tapscott, 2018). Therefore, such contracts help secure suppliers' and buyers' data, support brand image and protect all participants from fraud. Using cryptocurrencies can therefore build trust between customers and companies and increase brand loyalty (Dujak and Sajter, 2019).

Blockchain technology can provide significant savings to the company in situations such as customer and supplier traceability, and fraud problems within the value chain. It is emphasized that cryptocurrencies within blockchain technology are especially useful for all areas where payment processes take place (Scherf and Becker, 2020). Therefore, while blockchain technology improves traditional media planning processes, it also creates transparency in financial transactions that are difficult to follow in the transaction procedures in industries such as marketing.

(iii) Reduction of Transaction Costs

Blockchain technology not only builds trust on the whole system and its outcome but also helps reduce transaction costs between parties, which is also called smart contracts. Usually, intermediaries (i.e. credit card companies) charge retailers +3% payment processing costs and other platforms charge listing fees or sales commissions. With the help of smart contracts, these forms of payment costs can be avoided and a reduction of transaction costs can be achieved (Scherf and Becker, 2020). This important feature comes with the introduction of Ethereum and describes the transaction of money between two parties within the blockchain which does not need intermediaries for its completion. Performing almost real-time transactions of digital assets and in diverse areas of economic activities and securing storage of data of the parties involved is making the whole process easier (Casino et al., 2019). This method reduces transaction costs and eliminates moral hazards in a trustworthy virtual environment (Yermack, 2017).

The security and automation of blockchain technology help speed up processes that would normally take longer because of the presence of several intermediary parties. Therefore, while enabling the safe transmission of data or value within a short time the technology can improve processes more efficiently and effectively. Thus, it can be said that blockchain technology is an efficient management tool for financial capital which, traces and decreases all costs involved in transactions. Using blockchain technology to reduce transaction costs without using 'middlemen' will also become common in smaller companies. Being able to communicate directly with customers and build trust will also help companies and their brands to compete (Kumar et al., 2020).

(iv) Traceability of the Supply Chain in Supporting the Brand Image

For monitoring supply chains, experts show that industries with complex supply chains, such as the automotive industry, are particularly suitable for blockchain technology applications. Experts also consider this technology to be suitable for tracking products such as medicine, food, clothing, and luxury items. Items that need to be tracked may also include halal, organic, and other certificates that the goods must have (Tan et al., 2020). Business practices such as verification of credibility claims or participation in corporate social responsibility (sustainability, ethics, fair trade, etc.) can also be tracked in this way and offer transparency to participants of blockchain technology (Treiblmaier, 2018). Therefore, with this technology, it can be monitored where the goods come from and how accurately they are handled, and it can be said that making this information transparent to customers creates trust in the goods and the brand image of the companies (Thyen, 2020). With the help of blockchain technology, the path of all products and their components can be tracked by the company and its customers in order to investigate their authenticity (Kumar et al., 2020). To ensure the prevention of corruption and fraud, stakeholders are able to follow all the supply chain steps; ensuring accountability, verifiability, integrity, and transparency. This could subsequently build trust in the company's brand, which is a powerful marketing strategy to gain

customer loyalty (Zheng et al., 2018). This positive outcome will also lead to Sustainable Development Goals (SDGs) in the field of agriculture and other fields of interest (Tripoli and Schmidhuber, 2018).

With the help of blockchain technology, companies are able to detect any kind of national and international neglection of regulations. The quality of products within the supply chain can be traced through Quick Response (QR) codes or Radio Frequency Identification (RFID) systems (Tripoli and Schmidhuber, 2018). This way, traceability through blockchain technology can be guaranteed at all times (Al-Jaroodi and Mohamed, 2019).

The traceability of supply chains was what motivated Walmart and Starbucks to begin using the technology for their supply chain network activities. Walmart and IBM partnered to trace some of their products back to their suppliers (Kamath, 2018) while Starbucks collaborated with Microsoft to use blockchain technology to track their coffee "from bean to the cup'' (Palmer, 2019). Therefore, blockchain can help to track across e-commerce which is a steadily growing market sector (Wang et al., 2020).

Alibaba for example developed a blockchain-based internal system to track products to guarantee authenticity through their supply chain. Other companies like BlockVerify and Everledger are using blockchain technology and IoT systems to ensure the traceability of their products to prevent the aforementioned fraud problems. Carrefour in Europe uses blockchain technology to track and ensure their free-range chickens. With the help of the technology, customers receive information about the name of the farmer, how each animal was brought up, the type of the feed which was used, treatments which were used, their quality labels and the location of the slaughter (Carrefour, 2018). Volkswagen and Renault are able to track information about their vehicles' engine usage, repair and maintenance history and their mileages with blockchain technology and make this information available, at all times, again through blockchain for buyers, manufacturers, insurance companies, dealers and other entities involved in the purchasing process (Lannquist, 2018). In most industries, the origin of products and their accuracy are important so that companies do not need to deal with fraud issues and scandals. Therefore, data tracking with the help of the blockchain technology application is especially important and extremely helpful to address such issues (Roepert, 2020).

(v) Loyalty Programs in CRM

A competitive market strives for brands to gain consumer loyalty towards their products and services. To achieve this, companies are forced to collect and store data of their customers mainly through loyalty programs (Cvitanović, 2018). Blockchain technology can help businesses to build up a new form of loyalty program where the program is designed, tracked and also communicated to the consumers. In the blockchain-based program, all members of the program (marketers, consumers, sales offices, etc.) are fully integrated and interlinked. Companies can use real-time blockchain-based loyalty program consumers' purchasing patterns, payment history, responses to promotions, etc. accessing information. It also helps companies create customized loyalty programs that are more effective. Furthermore, it gives customers the opportunity to trade loyalty points that contribute to higher customer satisfaction and greater contribution by working with this new type of blockchain-based loyalty program. With blockchain technology, the security of CRM's valuable customer data is always ensured and offers customers personalized loyalty rewards (Kumar et al., 2020). Thus, blockchain technology gives companies more detailed information about their customers and at the same time customers' power about the correct usage of their personal data. This way, blockchain technology guarantees a win-win situation for all participating parties (Brauer and Linnala Eriksson, 2020).

Using blockchain-based CRM technology helps companies like Big Bazaar, Central, Croma, D-Mart, Hypercity, Reliance Fresh, Airbnb, Dropbox, Westside and other companies such as Reebok and Adidas to offer discounts and coupons to their customers. Thus, companies are able to track their shopping activities and will know when their customers need to be rewarded. In such strategies, customers are informed about current and future offers. Therefore, the use of blockchain in retail stores is a secure and transparent technology to protect transactions, provide financial benefits to customers based on various shopping programs set by the retailers (BP and Das, 2019). Working with a blockchain-based loyalty program can also help companies reduce their administrative costs since data gained from the technology can be used in an efficient and effective way. This is more economical and less time-consuming and helps companies generate customized loyalty programs for each and every customer taking part in the program (Deloitte, 2016). In addition, in the near future, to make payments more secure cryptocurrencies will be used to protect both customers and companies from fraud (Scherf and Becker, 2020). This way, blockchain technology can create a more secure environment for both companies and customers; maintaining relationships build on trust (Zhang et al., 2017).

Loyalty program goals with a complex blockchain-based Customer Relationship Management (CRM) can bring a long-term profit to the marketing space. Also, since all activities carried out between sellers and buyers require security, accuracy, and trust, the use of blockchain technology in CRM can manage these activities more effectively and efficiently. Identifying and tracking product authenticity and system activities, and recording and storing data cryptographically to protect customer Personally Identifiable Information (PII). This relationship is based on trust between customers and sellers (Adiyanto and Febrianto, 2020).

Companies claim that the data of existing CRM systems are still filled in manually, and therefore there are always glitches in key data management. Therefore, implementing blockchain technology for CRM in companies would be a useful solution. It prevents current problems due to its' easy and secure use of customer data and ensures its correct use. Blockchain technology with its cryptocurrencies used along with smart contracts ensures speed and security of data management and creates trust between participating parties. Considering the benefits, in the future, this technology will be also very important for other areas of companies (Cmm360, 2020). With this great emphasis on the value of blockchain technology in CRM and its outcomes, it is expected that in the near future technology will be fully embedded in companies' sales and marketing strategies (Cmm360, 2020).

(vi) Digital Marketing

Digital twins are a virtual prototype of a physical object that creates real-time data and give a certain identity called unique digital twin to the object it represents which at the same time is resistant to manipulation (Stöcker et al., 2017). Thus, with the help of blockchain technology, a virtual identity that represents all the features of an object that exists physically in real life is revealed. With the help of the unique digital twin all users of the object can connect to its virtual identity, access all the information and make operations with them (Kritzinger et al., 2018). The technology can also increase consumers' confidence in the quality of the object since traceability of the physical objects is provided (Thyen, 2020). Furthermore, digital twins are the control mechanism of physical objects as they keep track of their work throughout their lifetime, thus ensuring the proper functioning of the physical objects in real life. In addition, before

any changes are made on the physical object, they are first tested on the digital twin as much as needed and then according to the results, performed on the physical object. Such applications would normally be very costly and difficult to implement in environments where a digital twin is not available but with the help of digital twins working cost-effectively, more easily, and less time-consuming, helps companies save important resources (Khajavi et al., 2019).

Digital twins are not only beneficial to companies' digital marketing but also to consumers. Stöcker et al. (2017) and Scherf and Becker (2020) were used in the preparation of Figure 2. Object marketing in this context refers to all activities related to the Digital Twin of a product in the consumer domain (Innogy Innovation Hub, 2017). As seen in Figure 2, after the product is purchased by a consumer they can connect to its' digital twin and access all information related to the product and interact with the organization or other users and add new information to the program. They can also give feedback to the organization, which means that consumers are able to express their experiences with the product through the digital twin. Companies can send new product or service information to the digital twin and respond quickly to the wants and needs of their consumers. Consumers can inform other participants about given information and gain their discounts or coupons offered by the organization for their recommendations or information-sharing regarding products (Tao, 2019; Stöcker et al., 2017). Putting all this information into consideration, the digital twin which is based on blockchain technology is a great tool which can be introduced as a communication tool that offers more convenient interaction between organizations and consumers (Xiang et al., 2019).

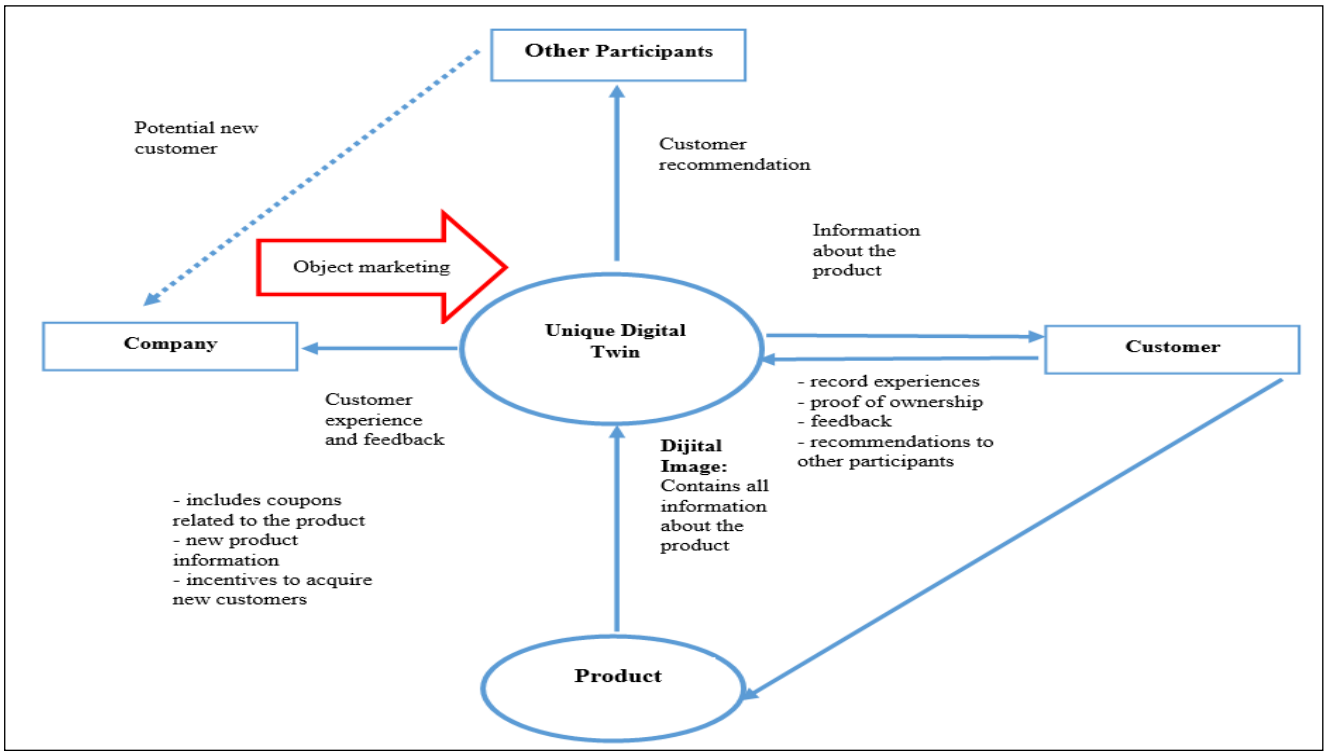

Figure 2. Object marketing via a digital twin
Source: Stöcker et al., 2017; Scherf and Becker, 2020

All in all, organizations can protect their consumers' data in the digital twin environment and include them in product development activities (Fang et al., 2019). The digital twin thus secures customer data and prevents it from being visible to organizations or other users. However, this data can be accessed if the customers allow them to share the data at their own request. Considering this information, the protection of the data is known to be safeguarded at all times and the communication between the organization and the customer is maintained through the digital twin by guaranteeing anonymity (Xiang et al., 2019).

Today, blockchain-based digital twins cannot be used by many companies due to a lack of infrastructure and high investment costs. The barrier to the use of blockchain technology by companies forces them to use traditional methods. However, today's blockchain-based digital twin studies will continue to reduce infrastructure shortcomings and will provide companies with a great competitive advantage in the future. According to marketing perspective experts' opinions, blockchain technology can be used in different areas of marketing, showing that it can offer potential solutions for various difficulties and problems detected in marketing. However, it is emphasized that the application areas of technology should be addressed according to the sector in which marketing works (Thyen, 2020).

3. The Potential Advantages of Blockchain Technology for Marketing Activities

Blockchain technology can provide companies with a competitive advantage related to their marketing activities (Gartner Glossary, 2020). The most important benefits of blockchain technology are transparency in marketing operations; protection of consumer data, increased sense of trust; verified origin and traceability of data, lower transaction costs; personal product/ service presentation and reduction of investment costs.

Transparency in Marketing Operations- Blockchain technology gives high importance to transparency in marketing operations. All users have encrypted IDs (Identification Number) within the blockchain and are able to examine and analyze all information they need whenever they want. Blockchain technology ensures its users to remain anonymous at any time (Xiang et al., 2019). The transparency, as result of the function of the technology, can be created for any type of data transaction. At the same

time, the transparency dimension has become increasingly important in order to strengthen the relationship between the consumer and the company. Therefore, companies aim to ensure transparency in business activities such as in supply chain activities, the verification of a company's donations for a social project, or the actual number of female employees working in the company. The transparent provision and visualization of this information, for example in form of a mobile application, enables consumers to experience the company or a brand in a completely new way. This way, a new form of digital experience and a positive contribution to the relationship between companies and consumers based on trust can be created (Francisco and Swanson, 2018). Blockchain technology can guarantee data transparency and security, compliance with laws and regulations to prevent corruption, counterfeit products and fraud (Zhao et al., 2019).

Protection of Consumer Data- While researching the developments in marketing, it turns out that blockchain-based applications can protect consumer data. In this context, however, it is problematic to assess the fear of consumers that company activities could violate their privacy. Thus, privacy issues such as transaction anonymity and confidentiality are very challenging issues companies are dealing with (Compeau and Higgins, 1995). With the help of blockchain technology, e-commerce activities can become safer since consumers have the possibility to act anonymously and have control and possession over their personal data. Thus, the technology has a positive impact on the privacy problem, because blockchain technology enables consumers to encrypt their PII and therefore gain control over their information in the digital environment (Kosba et al., 2016). However, this control of consumers brings new challenges to companies. In this case, the company must be able to provide the customer with a value-added experience so that the customer is ready to share data with the company (Scherf and Becker, 2020; Thyen, 2020).

Increased Sense of Trust- Blockchain technology is thought to create trust and transparency in marketing. Ertemel (2018) argues that trust issues are particularly evident in e-commerce. Due to the limited trust that exists in these online environments, online businesses cannot perform the amount of business they would like to. These trust issues may be related to parameters such as not knowing who the counterparty is, uncertainties regarding the journey of the asset through the supply chain, reliability of brand promises, and not knowing what will happen when things go wrong (Ertemel, 2018).

Technological infrastructure and the trust factor are vital in e-commerce related Business to Consumer (B2C) relationships (Lee and Turban, 2001). As the Edelman Trust Barometer (2018), there is a significant decrease in consumer confidence. The success of a company can be measured by how reliable it is seen by its consumers (Tapscott and Tapscott, 2016). Accordingly, with its highly cryptographic structure, blockchain technology can build trust and increase the success factor of companies by acting with integrity and honesty (Chapron, 2017). It can be said that the most important benefit blockchain technology provides consumers is the sense of trust arising from the transparency and accuracy of the information given. However, consumers are able to keep their private information under control, thereby eliminating the fear of being captured by third parties. With this technology, consumers can protect their privacy and strengthen their confidence in the technology. Thus, the use of blockchain technology from a marketing perspective creates company and brand trust (Tapscott and Tapscott, 2017). Since consumers share their information with companies voluntarily, companies can offer special offers to consumers and personalize products and service campaigns (Fang et al., 2019).

Verified Origin and Traceability of Data- The significant advantage for companies for using blockchain technology is the verified origin and traceability of data as well as the protection against manipulation and hostile attacks (Lu and Xu, 2017). It is clear that there are advantages for both companies and consumers when using blockchain technology, but the implementation of this new technology in the culture of a company requires adaptation for both companies and consumers. This feature provides advantages to both companies and consumers and improves their marketing activities in terms of product reliability, especially by tracing expensive goods throughout the supply chain (Schwerin, 2018).

Lower Transaction Costs- Blockchain technology is an advantage for companies to reduce transaction costs, especially by closing brokers. By enabling P2P transactions without financial institutions lower transaction costs arise and transparency problems can be prevented and a move away from the old to the new systems while creating a new form of economy can be generated (Scherf and Becker, 2020). Secure payments with the technology provide significant financial support to companies and consumers and strengthen their trust (Scherf and Becker, 2020). A good example of this could be the OpenBazaar platform, which uses Bitcoin for consumers and companies to carry out their transactions with one another using P2P, without transactional costs or fees and without storing their data. As a result, blockchain technology in marketing helps to carry out activities with transparency of information, privacy, verified origin and traceability of data and lower transaction costs. In general, it can provide consumers with a unique experience by providing confidence in the digital world. Blockchain technology shows clear solutions to problems that companies face. However, possible problems and barriers that may arise from the use of technology should not be ignored (Scherf and Becker, 2020).

Reduction of Investment Costs- Implementing blockchain technology in the company creates investment costs. These costs may be quite high at the beginning, but the cost of not creating transparency and trust is much higher than the start-up costs of the implementation. Therefore, companies should make an investment in blockchain technology considering this situation. Hence, blockchain technology must be considered by companies to adapt to new business model changes in order to stay competitive (Scherf and Becker, 2020).

4. The Barriers of Blockchain Technology Adaptation in Marketing Activities

The use of blockchain technology in marketing activities has increased consumer confidence in the product and brand value. It also improved the interactions and communication between companies and their consumers (Vovchenko, 2017). It is particularly beneficial for brands that want to take advantage of blockchain-based information transparency while creating customer value (Kouhizadeh and Sarkis, 2018). However, there are some barriers that may arise from blockchain technology adaptation in marketing. Processing and storing information in the blockchain is expensive and compared to single-source operations the processes are complex for companies and their network partners (Baldimtsi et al., 2017; Smith, 2017). In addition, the lack of a proper management structure makes adopting of blockchain technology in marketing activities challenging as well.

Lack of knowledge about blockchain technology- Companies are lack of knowledge and insufficient technical expertise about blockchain technology. Therefore, it is extremely important that companies familiarize themselves with the technology and its usage (Iansiti and Lakhani, 2017; Niranjanamurthy, 2019). There is also a lack of knowledge about what information is important to provide when educating employees regarding

this technology (Scherf and Becker, 2020). For this reason, it is important that senior management fully supports the new investment, so that blockchain technology can be successfully implemented and accepted within the company (Mengelkamp, 2018).

Scalability- There is a scalability problem of blockchain technology, which makes transactions of large amounts of blocks quite difficult because it still is a relatively new technology. Therefore, it might not be implemented in companies at a large scale for several years (Ertemel, 2018). In order for blockchain technology to be implemented efficiently, improvements in storage management such as advanced cloud computing infrastructure are needed.

High cost- Blockchain technology is an expensive tool to set up. Currently, only large companies are able to apply this technology in their business processes which keep smaller companies from being competitive (Rejeb et al., 2020). Installation costs are thought to decrease as blockchain technology infrastructure becomes widespread; making it more cost-effective to apply in smaller companies. Field tests found out that companies have to invest between 100,000 Euros and 200,000 Euros to be able to use blockchain technology, which for some companies can be quite a big investment (Tian, 2016).

Lack of information sharing- Companies are reluctant and fearful to share information because companies understand information as a competitive advantage. Additionally, companies are concerned about privacy issues. On the other hand, blockchain technology works based on information sharing. It is a problem that companies are uncertain how much and what kind of information will be shared within the system. Companies are willing to share information only when they know that their private information has not been shared (Wang et al., 2020).

Lack of customer awareness about Blockchain Technologies– Consumers can make more informed decisions by making use of technology's advantages, by accessing the product's supply chain information such as the origin of the product, which makes it easier for them to evaluate its sustainability (Steiner et al., 2016). However, the lack of knowledge and unwillingness of consumers to learn about the sustainability and origin of the products creates a barrier for companies to view blockchain as a necessity. Therefore, customers' lack of awareness and knowledge about sustainability is a barrier to implement blockchain technology into their activities (Hughes et al., 2019).

Lack of trust among companies- The shift from middlemen to fully transparent processes with the help of blockchain technology is still a relatively new way of sharing data. There are more companies that are skeptical and fearful than companies being enthusiastic about the technology's features (Scherf and Becker, 2020). This is considered a barrier in the implementation of blockchain technology in companies. Despite the interest in technology and its application, there may be real implementation difficulties and resistance due to flexibility in information sharing (Casado-Vara et al., 2018). Therefore, the lack of trust for blockchain technology among companies makes the implementation of blockchain technology in companies with transparent data sharing very difficult (Rejeb et al., 2020).

Lack of technological infrastructure- To implement blockchain technology, a digital infrastructure, adequate computing power, and other available technological resources and equipment is required (Valache, 2019). Blockchain networks require large amounts of computing power to validate transactions by solving complex problems that increase costs exponentially. These costs must be reduced to make the technology acceptable (Zhao, 2019).

It is also assumed that blockchain technology can only be applied by completely restructuring previous systems, which can be very challenging due to the high implementation costs, the absence of a qualified workforce to adopt such technology and fear of losing important data (Yaqoob et al., 2020). On the other hand, some experts argue that the provision of a suitable blockchain technology environment does not pose major barriers for companies. Retrofitting, that is, applying new technology to an existing system makes the job of applying a new technology relatively easy (Scherf and Becker, 2020).

5. Conclusion and Future Research

New trustworthy technologies are constantly shaping the way companies are doing business. In this respect, companies blockchain-based data mining techniques make it more effective and efficient for companies to analyze big data sets in order to customize their day-to-day businesses and thus, be more successful and be able to penetrate new markets (Johnston, 2014).

This study emphasizes the possibilities blockchain technology can offer companies to develop a unique marketing mix and thus create a more competitive environment and create effective, targeted solutions to marketing techniques. In addition, this study discussed blockchain technology transparency, consumer data protection and trust, and highlighted that the technology can provide solutions in different marketing areas without any problems. This way, blockchain technology will have an impact on business models by helping build trust between parties involved in processes. By offering safe platforms that help authenticate goods and validate transmissions without using intermediary parties it will also improve operational efficiency and help decrease operational costs (Kavoura et al., 2019). Blockchain technology will be used to gather information of target customers, without breaking their privacy, to create a customized content for their upcoming advertisement which combines their customers' most relevant features to have a more effective impact on them. The positive outcome is that companies come up with the most efficient and effective advertisement which increases companies' revenues and thus, customers are more presented with an advertisement that assists to serve their real wants and needs. Blockchain technology is especially useful for all areas where payment processes (smart contracts) take place. This guarantees significant savings to the company in situations such as customer and supplier traceability and fraud problems within the value chain. It also helps with reducing transactional costs between parties and eliminates moral challenges in a virtual environment. These benefits build trust which also helps companies and their brands' competitiveness.

In sectors with complex supply chains, such as medication, food, clothing and luxury items, blockchain technology is important for tracking goods. With this technology, it can be traced where the goods come from and how accurate they are dealt with. Making this information transparent to customers builds trust in the goods and the companies brand image. In CRM blockchain technology helps companies with offering loyalty programs to their customers because they are able to track their shopping activities and will know when their customers need to be rewarded.

With the help of the blockchain-based unique digital twin in digital marketing all users of the product can connect to its virtual identity and access all the information and make operations with them. Blockchain technology can also provide consumers' confidence in the quality of the product since traceability of the physical product is provided. The use of

digital twins is both cost-effective and easy, but also less time-consuming and therefore helps companies save time and money. It is not only beneficial to the company's digital marketing but also for the consumers. Consumers can connect to the digital twin and accesses all the information related to the product and interacts with the organization or other users and add new information to the program. Therefore, it appears that digital twin is going to succeed as a communication tool that offers more convenient interaction between organizations and consumers. Considering this information, data protection is ensured at all times and the communication between the organization and the customer is maintained through the digital twin by guaranteeing anonymity.

Although blockchain technology offers lots of benefits to all participants, only a few applications have been carried out in different sectors to date. In the future, it is expected that application in areas of the technology will develop and will become inevitable in marketing activities. Blockchain technology is in demand from many companies and in marketing activities to take advantage of its advantages such as higher customer satisfaction and product and cost benefits (Thyen, 2020).

Whether blockchain technology will be the "next big thing" (Norton, 2016) or not is still uncertain. With the impact of first field studies, pilot projects and some initial developments, it is undeniable that blockchain technology has the potential to provide transformative innovation in the world market. Most experts are optimistic and believe in the applicability of blockchain technology and some experts even see blockchain technology as a new additional digital revolution (Scherf and Becker, 2020). With investments in blockchain technology by large companies like Walmart, IBM, and some financial service companies the technologies success becomes more likely (Tapscott and Tapscott, 2017).

With the ongoing digitalization, the importance of the implementation of blockchain technology is increasing rapidly through automated processes and machines that are able to communicate with each other through "digital handshakes" effortlessly. Experts also think that future marketing activities can be handled with artificial intelligence within blockchain technology and thus contribute to the advancement of marketing activities (Project Provenance Ltd., 2019).

This study will contribute to further research in the areas of marketing management, payment processes, reduction of transaction costs, traceability of the supply chain in supporting the brand image, loyalty programs in CRM, and digital marketing where companies can learn from companies' blockchain implementations and experiences and help develop blockchain-based activities in the marketing area. Other areas such as; Artificial Intelligence (AI), enterprise resource planning (ERP), e-Procurement systems, electronic data interchange (EDI), CRM, RFID and collaborative planning forecasting and replenishment (CPFR) can be further research areas to implement blockchain technology.

Yazar Katkı Oranı Beyanı

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Çatışma Beyanı

Çalışmada yazarlar arasında çıkar çatışması yoktur.

Destek Beyanı

Bu çalışma için herhangi bir kurumdan destek alınmamıştır.

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