

Article

Stick or Twist—The Rise of Blockchain Applications in Marketing Management

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Abstract: The adoption of blockchain technology by companies can change the way they interact with stakeholders, redefining communication strategies and other marketing processes. In this study, we investigated the relevance of blockchain applications for marketing management from the perspective of marketing-related professionals. Answers about blockchain technology application in the marketing arena were collected from the social platform Quora. The data were analyzed through text mining and Spearman's correlation coefficient to assess the degree of association, inherent intensity, and the association significance between the variables payments, supply chain, loyalty programs, digital marketing, credential management, and marketing management, using Quora-specific metrics, namely, upvotes, shares, and views. The results posit blockchain technology as being an asset for marketing, with greater relevance in supply chain and internal management among marketing operations. Professionals will be able to potentially improve internal management systems and marketing campaigns, which will enhance companies' competitive advantage.

Keywords: blockchain; marketing; Quora; text mining; Spearman's correlation



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1. Introduction

Companies are compelled to adopt a robust technological infrastructure that addresses existing security flaws and increases consumer confidence in the marketing environment [1]. To achieve a competitive advantage, technologies have played a relevant role in continuously offering new products, services, quality, and data protection, making the production process more agile and cost-effective [2]. Thus, new technologies can make a paramount change in the marketing arena [3–5].

An accentuated mistrust in companies' transparency was potentiated by the 2008 global financial crisis, one of the first applications of Distributed Reason Technology (DLT) that paved the way for blockchain technology [6,7]. By unveiling the potential for financial companies in 2015 [8], blockchain has gained widespread relevance, resulting in an increasing number of applications in diverse sectors, including insurance, logistics, and health [4].

Blockchain technology is characterized as a distributed network of transactional data records protected from tampering [7,9]. It consists of a network of cryptographically protected blocks, where each block contains information about the individual and personal digital transactions performed by each intervenient [4,10]. Each block contains a timestamp and a link to a previous block, which allows the information on the network to be

permanent and tamper-proof block-to-block, improving strategic brand management and consumer–company relationship quality. The main properties of blockchain technology, based on its distributed and decentralized data storage, provide transparency, privacy, immutability, and security, making it a reliable technology. These characteristics are critical for information protection in every market sector [11,12]. Among the many advantages, this technology can reduce operational and financial costs, while increasing profit margins in the distribution chain management. At the same time, by mitigating fraud, it raises brand image and consumer confidence [13]. The technological breakthrough, the intermediaries disappearance, and intrinsic characteristics of blockchain have demonstrated the feasibility to protect consumer privacy and increase marketing security [4,14].

Blockchain technology can help in the fight against the widespread phenomenon of fraud, creating a healthier marketing space for any involved stakeholder and thus strengthening the relationship between brands and consumers [12].

The blockchain technology topic is awakening among academics, with multiple conceptual publications on the subject. Treiblmaier and Önder [15] studied four theoretical approaches (Agent Theory, Transaction Cost Theory, Resource- and Capability-based Views, Actor Network Theory) to foster blockchain implications within the tourism industry. Rejeb et al. [16] highlighted six future avenues in marketing benefiting from blockchain technology. Manski [17] aimed to understand the countervailing tendencies of blockchain and the contingencies that influence their development. However, few empirical studies have been conducted. Dierksmeier and Seele [18] applied a survey to understand the impact of blockchain technology on financial transactions. To the best of our knowledge, no empirical study has yet been conducted on the topic in the marketing context.

According to Antoniadis et al. [19], supply chain management, payments and transactions, loyalty programs, digital marketing, reviews and credential management, and internal marketing management were identified as major applications benefiting from blockchain. Grounded in these authors' conceptual work, our study aims to test whether these potential applications of blockchain in marketing are posited as relevant according to marketing-related professionals. We propose an analysis of all given answers in Quora regarding blockchain technology and marketing. The data were analyzed through text mining and Spearman's correlation coefficient to identify the most relevant contributions of blockchain to marketing. This research is of importance to academics and practitioners, as it will allow the identification of the most relevant blockchain applications able to promote companies' competitive advantage [20,21].

This research is structured as follows: (1) theoretical background for hypotheses formulation; (2) methodology procedures; (3) results and discussion; and (4) conclusions, theoretical/practical implications, limitations, and recommendations for future research.

2. Theoretical Background

Given the nature of blockchain technology, its benefits for marketing are unquestionable [16]. The technological features inherent to this technology suggest the start of a new era for marketing [5,22]. One of the most relevant features is based on peer-to-peer communication. This feature mitigates the use of intermediaries, leading to an efficient process. Moreover, immutability and shared data records disable the possibility of changing or duplicating information, enhancing access to high-quality and transparent data. These features will foster a private, trustworthy, transparent, and secure environment.

According to the American Marketing Association (AMA) [23], marketing is *“the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large”*. This definition implies that marketing is an activity that influences companies' overall environment, benefiting numerous stakeholders. Within this environment are payments and transactions [24]. Payment and transaction systems influence clients' behavioral intentions, attitudes, satisfaction, perceptions, and perceived risk [25–27].

The marketing discipline includes distribution chain management since the supply chain connects the producers and their clients. It comprises legal transactions, information provision, ancillary services, and physical logistics. It can influence clients' trust, brand perception and expectations, purchase intentions, and willingness to pay a premium price [28,29].

Moreover, loyalty programs can influence the brands' perception of value, satisfaction, and loyalty and encourage clients to shop more frequently [30–32], also shaping clients' brand preference and decision making.

Credential management also plays a relevant role in marketing, as it influences trust, protection, security, and enhances transparency, reducing bureaucracy, corruption, and fraud [33–35]. These features will influence client information exchanges and relationship quality between actors [36].

Internal marketing management aims to improve internal service quality, practices, human resources management, service marketing, and internal suppliers, or to change management practices [37]. It may also lead to effectiveness, trust, and automation, contributing to superior performance and better results [38]. Following the conceptual work of Antoniadis et al. [19], we aimed to investigate the relevance of blockchain to marketing and marketing management.

2.1. Payments and Transactions (B2B and B2C)

In the context of blockchain technology, the meaning conferred to payment differs from the traditional banking system. In each decentralized transaction, the created block will be validated and accepted by the parties without intermediaries. Considering the transaction verifiable and trustworthy, the block is added to the chain, completing the transaction process [39].

With the implementation of blockchain technology and the emergence of smart contracts, the essential characteristics of decentralization and disintermediation arise, accelerating the process towards ubiquitous trade [40]. A smart contract is a software program that stores rules and policies for negotiating terms and actions between parties. It automatically verifies if the contractual terms have been fulfilled and executes the transactions [41,42]. The execution of an intelligent contract is activated by the common understanding of the network's various actors. This determines the transaction users' certification and approval, the permissions they are entitled to, and whether those or others are required access to its implementation [43]. This is a process of sharing network data between the distribution chain participants, and a continuous improvement of this process [44].

Retailers and online services have been encouraged to accept payments through digital methods, regardless of the currency value [6,45]. For example, Microsoft has adopted blockchain technology to pay for various services, including Xbox Live and Skype [46]. These applications can be used to conduct transactions with both customers (B2C) and suppliers (B2B) to ensure higher speed and security in transactions, creating trust between all participating parties [47].

Transactions contain hash sets with public key stamps of all parties involved, cryptographically signed by the sender [18,48]. Considering the information used for the transaction as true and specific to it, this information cannot be modified or duplicated, rendering blockchain one of the most secure and reliable infrastructures [41,49]. Through blockchain, transactions cannot be intercepted, prohibited, or modified, in a distribution and decentralized way, defining a solid economic system free of weaknesses and characterized by transparency and anonymity [50].

This emerging technology enables customers to track the origin and changes in the transaction process, removing all potential risks of trust breach with customers, thus increasing transparency and providing security [51]. Thus, we defined the following hypothesis for our study:

Hypothesis 1: *Blockchain technology has a positive impact on payments and transactions.*

2.2. Distribution Chain Management

The organizations that are able to efficiently manage the distribution chain benefit from creating efficient relationships between suppliers and their customers, creating a competitive advantage [6,16,52].

Product traceability is becoming an increasingly essential and differential requirement in many distribution chain industries [43]. This process allows access to information about the product's itinerary, content, collection dates, origin, and destination [53]. For example, the brand Carrefour adopted blockchain technology to control its distribution network and manage the entire production process [54].

The transaction cost theory explores the ideal structure for companies in minimizing the total cost under exogenous conditions concerning the nature of transactions [5,41]. For example, in the case of acquisitions based on information technology (IT), compared to traditional acquisitions, which involve only exchanges of goods or services, the former induce more uncertainty, requiring more evidence and validation by the parties that constitute the transaction, generating extra costs to mitigate this uncertainty throughout the procurement process [55].

Trust between distribution chain partners is an essential factor in business-to-business information-sharing networks, where the traditional distribution networks are seen as vulnerable to information assurance problems and security threats [56]. The feasibility of designing collaborative business processes based on blockchain shows that applying blockchain technology is effective in overcoming collaboration and trust problems in the distribution chain networks [7]. This can lead to beneficial effects on the performance of distribution chain networks by providing an effective solution to balance information asymmetries between partners [51,57].

Decentralization is an essential property of blockchain technology, controlling any information tampering and increasing its veracity [58]. The notion of protecting and securing distribution chain management details through blockchain has captured the interest of the industry [59], leading to perspectives that encompass transaction confidence in the security and privacy threats that companies face in the digital media value chain [7].

Blockchain is also expected to go through disruptive developments that lead to entirely new and unexplored possibilities in distribution chain management [60,61]. In this sense, it deals with the absolute excellence of business processes and represents a new form of business management and relationship with the other distribution chain members [51]. From the supplier to the consumer, it improves their confidence in transactions and adds value to all stakeholders [52]. Thus, we proposed the following hypothesis:

Hypothesis 2: *Blockchain technology has a positive impact on distribution chain management.*

2.3. Loyalty Programs

Loyalty programs can significantly benefit brands, generating ever-increasing sales and profits [62]. As such, brands strive to ensure that consumers remain faithful to their products and services [7]. Companies have systematically collected and maintained data about their customers, mainly through loyalty program cards. The data collected from these consumers include personal information, purchasing patterns, transaction details, and favorite sales channels. The list of purchased products, complaints, and behavioral and financial information helps companies to predict future purchases, thus helping managers to plan the production, manage orders, purchases, sales volume, revenue, and profit forecast [1].

Brand strategies have undergone significant transformations with Internet implementation [7], for example, building customer relationships, enabling interactivity, and providing more personalized offers [63]. With blockchain technology, loyalty programs can be revolutionized through using models based on customers' rewards after carrying out a transaction, capturing attention, and encouraging them to connect with the brand [5,45].

Several companies already use blockchain for this purpose, such as Cathay Pacific and Air Asia [62,64], which have transformed their air miles benefit scheme. The blockchain platform automates data filling procedures, enabling a transparent transaction history between the airline and partners, improving business efficiency, and minimizing BackOffice administration [65]. Companies can offer a better experience to customers by combining blockchain and gamification.

Through the implementation of a trustable system that allows a closer relationship between companies and customers, they maintain contact with users through social applications, based on rewards, increasing customers loyalty [66], thus leading us to the third hypothesis:

Hypothesis 3: *Blockchain technology has a positive impact on loyalty programs.*

2.4. Digital Marketing

Implementing new IT helps restructure business processes, facilitate changes, and establish innovative methods to link a company to customers and suppliers [67]. These new technologies have brought new marketing terms and tactics, demonstrating that a traditional marketing plan can evolve into an e-marketing plan [68].

Through the blockchain distributed data storage network, it is possible to protect consumers' privacy by preventing it from being tampered [67]. The available data will be more authentic, reliable, secure, and effective in creating solutions that prevent data falsification [69].

Blockchain technology helps in creating a permanent data record that can be made publicly available, increasing data transparency. Moreover, is critical in improving operations and information using social media. For example, *Sola* is a social media platform supported by blockchain technology, advocating freedom of information and facilitating information sharing [70,71]. Based on its characteristics of decentralization and distributed storage, it helps to solve the problem of data collection associated with traditional social media platforms, keeping information safer, preventing its falsification, and maintaining consumer confidence [12].

Digital advertising has become a vital force for virtual and real economies [68]. The proliferation of fraudulent advertisements in the digital world has brought a negative experience for some Internet users [72]. These problems reflect the lack of an effective supervisory mechanism in the digital advertising market and the outdated operating mechanism. It is thus essential to establish an effective self-management system when supervision is weak to regain the confidence of users [13].

Most websites rely on click-through rates to earn ad revenue. According to the properties of blockchain technology based on decentralization, high reliability, security, anonymity, and traceability, it is possible to respond to the needs that the digital advertising market presents in fighting information fraud and insecurity felt by users [5,68].

In the electronic world, implementing a certified email service is also essential to solve the problem of the exchange of correspondences with the acknowledgment of receipt [73]. By implementing a solution based on blockchain technology, it is possible to overcome this problem based on email certification without using intermediaries, meeting the necessary security [73].

The blocks include information about their creation date, allowing it to track transaction information, such as messages with a stamp included. Through timestamp systems, the authority has a central role in determining the information that can be given and its traceability throughout the process, preventing the immutability of information on the network and keeping it accurate [74]. Implementing blockchain technology makes it possible to fulfill security requirements through disintermediation. Furthermore, it also certifies that email protocols meet key veracity, punctuality, and confidentiality requirements [73].

Customer relationships are changing, and companies can take advantage of IT attributes with blockchain technology to build and improve long-term customer relationships,

protecting and maintaining users' credentials and trust [72]. Facing this scenario, the following hypothesis was formulated:

Hypothesis 4: *Blockchain technology has a positive impact on managing digital marketing.*

2.5. Reviews and Management of Credentials

The conflict between the growing public awareness of data protection and the inability to obtain data ownership has led to a profound social discussion [75]. In competitive markets exposed to growing developments, a well-defined brand identity represents a differentiating asset for organizations to improve their performance and market positioning with the support of their target audience [76].

Credential certification is currently used worldwide to validate digital certificates following the standard used. The certification steps are performed to evaluate the certificate and determine if they are vulnerable to tampering attacks. Through the authentication of the issuing institution, an analysis is carried out of the issuer's profile, comparing their information with the data included in the issued certificate [77].

Blockchain thus provides a new direction for protecting data, maximizing consumer relations with the brand and transmitting confidence in any sector [64,78]. The ability to enable decentralized transactions, where no entity controls network data and only transaction participants can validate the recorded data according to a mutual agreement, conveys maximum security and trust to users [79].

In the case of *Health Wizz*, it is possible to test whether blockchain technology allows patients to aggregate, organize, share, give, and trade their medical records [80,81]. The idea is to allow users to control their health data as quickly as they control their online bank accounts, enable better communication between health organizations and caregivers, and contribute to a better standard of care. Thus, public and private blockchain network chains emerge, and their difference is proven by their extension of decentralized networks or guarantee anonymity [6,47].

In the private or closed blockchain, there are no required cryptographic incentives or proof of work. There is no anonymity [43]. For example, entities produce and distribute products in the distribution chain network, but access is restricted to the chosen network [82]. In this case, there will be functions that provide certificates to network actors in the distribution chain and maintain the private network [13]. Alternatively, on public or open blockchain, to maintain users' trust and their anonymous profile, cryptographic methods are applied to allow them to enter the network and record their transactions [47].

Blockchain's architecture helps systems reduce corruption, fraud, and bureaucracy in their ecosystems [34,35]. This facilitates efficient and immutable transactions between entities without intermediaries, eliminating spending situations and duplicate transactions while ensuring anonymity and security [47,83].

Based on this information, we have defined the following hypothesis for our study:

Hypothesis 5: *Blockchain technology has a positive impact on credential reviews and management.*

2.6. Internal Management of Marketing

As companies grow and stakeholders observe their development, they recognize that blockchain provides effective solutions to business problems [19]. Characterized as a decentralized, immutable, and transparent network, blockchain is an innovation for the internal management of marketing. Marketeers can build user profiles directly from customers and obtain all the information needed to create a competitive marketing strategy. Customers are not only those who pay for the goods or services but are also those who pay their time and attention to advertising campaigns. All the aspects mentioned help improve the internal marketing management [84].

Within the internal marketing, crowdsourcing has emerged as a new computing paradigm aiming to attract users to perform tasks presented by companies in the labor

market [85]. Companies create incentive mechanisms such as the monetary base or reputation [6,86]. Blockchain technology permits creating profiles for working candidates with their skills to facilitate the recruitment process. Based on a transparent and reliable collaborative data system, blockchain technology increases trust among stakeholders without the need for third parties and the veracity of shared information [87].

The use of process engineering principles is recognized as one of the primary mechanisms to increase organizations' excellence, productivity, and quality. With necessary standards and techniques for IT business environments, these are recommended to be implemented, managed, and executed within companies [88]. Blockchain was built to operate without a central authority, with a secure history for exchanging data using a timestamp to verify each exchange [89]. As such, companies can improve their execution and management systems, redesign processes, and evolve and adapt business processes, thus increasing the impact and internal improvements associated with the implementation of this technology in new business models [90].

Considering the importance of blockchain for internal marketing, we formulated the following hypothesis:

Hypothesis 6: *Blockchain technology positively impacts the internal marketing management.*

3. Methodology

Data were collected from the social platform Quora, in which answers to questions on the application of blockchain in the marketing sector were selected. The sample consisted of marketing-related professionals who use the Quora social platform to discuss the topic of this research.

The Quora social platform is a Q&A-based website/application developed, organized, and edited by its user community [91]. On this social platform, users ask for helpful information about an area of interest, and there is a set of associated responses related to that area. The questions and answers on Quora are authentic and original. The positive link between questions and answers is strengthened by the statistics of user approval voting, views, and sharing the information provided. The questions are posed by different people from different countries, cultures, and life experiences [92].

Thus, marketing-related professionals have taken advantage of this platform to clarify their doubts and collect information on various topics, including blockchain technology, particularly questions about its implementation and added value for marketing [93].

3.1. Data Collection

To select the questions that addressed the application of blockchain technology in marketing, we applied a query using Boolean operators. Boolean operators enable the creation of a search string with multiple terms by adding the operators "AND", "OR", and "NOT", among others, leading to a more detailed, sophisticated, and specific query, reducing the noise of the outcome [94]. The selected terms were based on prior literature, following Antoniadis et al. [19]:

"marketing" OR "payment" OR "supply chain" OR "loyalty programs" OR "reviews and credential management" AND "Blockchain".

The application of the query returned 61 relevant questions. Since the questions are related to a marketing subject and blockchain, respondents were considered for the sample. From each response, the following variables were collected: date, gender, professional experience, upvotes, shares, views, and text (see Table 1). In total, 229 answers were collected.

Table 1. Collected variables.

Variable	Description
Date	Date the answer was published
Gender	Gender (male or female)
Professional experience	User professional experience
Upvotes	Number of upvotes
Shares	Number of shares
Views	Number of views
Text	Reply text

3.2. Data Analysis

The first step upon data collection consisted of analyzing the answers through the text mining technique. Researchers widely use this method to identify and extract knowledge from a large set of documents [95]. The text, with its unstructured nature, has been analyzed and modified to a structured format [94,96].

To conduct the analysis by text mining, the stop-words, punctuation, and adverbs were eliminated from the 229 answers. The uppercase letters were converted to lowercase, and the stemming technique was applied, reducing the words to their root to obtain a common term (e.g., “payment” and “paying” were reduced to “pay”). This process was carried out in the software “R” through the package “tm”. After this treatment, the terms related to the constructs of the model of Antoniadis et al. [19] were grouped, creating a dictionary. Three blockchain and marketing experts read 10% randomly selected comments from the total (23) to identify words used in the comments related to each of the identified constructs. Then, to eliminate subjectivity, all three experts validated each of the terms. Only terms on which all three experts agreed were included. Through a final discussion, we reached the final dictionary (Table 2). The words associated with the six applications of blockchain technology in marketing identified by Antoniadis et al. [19] were employed as the constructs of the present study.

Table 2. Designation constructs and sample of associated terms.

Constructs	Associated Terms
Payments	pay, money, transfer, bank
Supply Chain	inventory, shipment, proof, distributor
Loyalty Programs	loyal, confident, reward, relationship
Digital Marketing	advertising, social media, online, google
Credential Management	anonym, record keep, security, confidential
Marketing Management	management, strategy, competitors, success

Finally, a statistical analysis was performed in the SPSS (Statistical Package for the Social Sciences) to study the association between the variables. The variables were analyzed based on their frequency of terms defined in the dictionary observed in the answers. Thus, the result from applying text mining is a table with the occurring frequencies for each construct. Since each construct is translated into a numeric value, correlations between constructs can be directly computed. The numbers of upvotes, shares, and views were accounted to evaluate the association between the variables through Spearman’s correlation coefficient analysis [97].

4. Results and Discussion

The research sample is composed of 140 males, 60 females, and 29 individuals without gender disclosure. Their professional experience is characterized in Table 3.

Before proceeding with the correlation analysis between variables, the Kolmogorov–Smirnov normality test was undertaken for the number of upvotes, shares, and views normality (see Table 4). According to the Standard Values for Normality Test Analysis, if the p -value > 0.05 , the variables follow a normal distribution [98].

Table 3. Professional experience.

Professional Experience	Frequency
Blockchain Specialist	15
CEO	52
Digital Marketing Specialist	30
Management Consultant	9
Marketing Specialist	10
Other Business-Related Activities	41
N/A	72
Total	229

Table 4. Kolmogorov–Smirnov normality test.

Variable	Kolmogorov–Smirnov Normality Test Statistics
Upvotes	0.462 ***
Shares	0.506 ***
Views	0.389 ***

*** $p < 0.001$.

Thus, we can infer that the variables upvotes, shares, and views do not follow a normal distribution, as the null hypothesis of normality distribution was rejected for all three variables. In this sense, we proceeded with the analysis of Spearman’s correlation coefficient between the variables [97] (see Table 5). The Spearman’s correlation analysis is a nonparametric measure of a monotonic, but not necessarily linear, association between two variables [99].

Table 5. Spearman correlation coefficient test.

Spearman’s Rho	Upvotes	Shares	Views
Payments	0.158 *	0.124	0.152 *
Supply Chain	0.170 **	0.229 ***	0.195 **
Loyalty Programs	0.092	0.072	0.177 **
Digital Marketing	0.124	0.107	0.138 *
Credential Management	0.137 *	0.219 ***	0.135 *
Marketing Management	0.169 *	0.234 ***	0.120

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Following our results, the variables payments vs. upvotes ($r_s(229) = 0.158, p < 0.05$) and payments vs. views ($r_s(229) = 0.152, p < 0.05$) present a significant positive, but weak, correlation between the variables. Thus, the implementation of blockchain technology is relevant for payments and transactions, confirming Hypothesis 1. With the implementation of blockchain technology, applications have been used to conduct transactions with both customers (B2C) and suppliers (B2B) [47]. Using this technology, information cannot be changed or duplicated, ensuring trust, velocity, and security in the transaction process. Pertaining to other digital transfers, blockchain technology will be traduced into safer and more reliable procedures, thus providing secure and accurate guarantees to the supplier [47].

The variables supply chain vs. upvotes ($r_s(229) = 0.170, p < 0.01$), supply chain vs. shares ($r_s(229) = 0.229, p < 0.001$), and supply chain vs. views ($r_s(229) = 0.195, p < 0.01$) have a positive, but weak, significant correlation, confirming that the implementation of blockchain technology benefits the distribution chain management, validating Hypothesis 2. The efficient and strategic management of a distribution chain and the relationship between suppliers and customers is a way to create a competitive advantage [7,52]. Implementing innovative technologies such as blockchain can lead to fruitful relationships among supply chain intervenients by lowering the risk through transaction verification [7]. This perspective aligns with the transaction cost theory that explains how the ideal structure can minimize transaction costs [100]. With the results obtained and based on the transaction cost theory, our study suggests that blockchain technology effectively overcomes collaboration problems and trust issues in the distribution chain networks. Its decentralization feature controls information tampering, increasing its veracity by guaranteeing the transaction details [101]. Following this rationale and these study results, implementing blockchain technology in distribution chain networks has a significant impact on marketing, increasing users' confidence in sharing their information.

As for loyalty programs vs. views ($r_s(229) = 0.177, p < 0.001$) we can again verify a weak, positive, but significant correlation. This result confirms that the implementation of blockchain technology positively impacts loyalty programs, confirming Hypothesis 3. Loyalty programs generate sales and profits and have the advantage of leading to customer loyalty [62]. Hence, brands have interest in having a loyalty program to meet customers' expectations and increase loyalty to the brand [16]. Through the customers' data, such as transaction details and favorite products and channels, companies can predict future purchases and identify different types of consumers. Moreover, brands can develop effective customer relationships [63]. Blockchain technology allows collecting accurate information about customers [102] who own their personal information and control it. This process increases transparency between the company and the customers, leading to an unquestioning relationship.

Therefore, implementing blockchain technology has a positive and significant impact on marketing loyalty programs, preserving and building trust relationships with consumers and captivating them to stay true to brands.

Concerning the digital marketing vs. views ($r_s(229) = 0.138, p < 0.05$), we found a positive and significant correlation but still weak. In such a way, we can see that the implementation of blockchain technology positively impacts marketing in the digital setting, confirming Hypothesis 4. Blockchain technology is a powerful ally for companies and consumers in the digital setting by maintaining information transparency. Since digital personal information remains with the consumer, personal data are considered safe, and companies will only use data shared directly by the consumer. This becomes a challenge for companies. However, customers' trust increases in the digital environment [67]. Notwithstanding, companies will access accurate and reliable data [69]. In this trusting environment, companies can take full advantage to create and build long-lasting relationships [62].

At the same time, we can conclude that the variables credential management vs. upvotes ($r_s(229) = 0.137, p < 0.05$), credential management vs. shares ($r_s(229) = 0.219, p < 0.001$), and credential management vs. views ($r_s(229) = 0.135, p < 0.05$) present a weak, positive, significant correlation. Thus, we can acknowledge that the implementation of blockchain technology positively impacts the review and management of credentials, validating Hypothesis 5. Credential certification is used to validate digital certificates that determine their vulnerability to tampering attacks [77]. Multiple advantages emerge from the blockchain's architecture. This technology severely reduces corruption, fraud, and bureaucracy [34,35]. The blockchain guarantees certification validation, leading to process efficiency [103]. Furthermore, the immutable transactions between entities remove any middlemen and duplicated transactions. Simultaneously, they ensure anonymity and security [47].

The analyses of marketing management vs. upvotes ($r_s(229) = 0.169, p < 0.05$) and marketing management vs. shares ($r_s(229) = 0.234, p < 0.001$) present a positive, weak, significant correlation. In this way, we can demonstrate that the implementation of blockchain technology positively impacts the internal management of marketing, confirming Hypothesis 6, in concordance with Stallone et al. [5]. The technology characteristics provide multiple competitive advantages due to the effectiveness, speed, and security of internal processes [11,12]. The technology permits process automation, such as sales management and real-time monitoring. The process is fully trustworthy and reliable due to the transparency, privacy, and security due to immutable information, and timestamps to verify every exchange [19]. The automation process can lead to internal improvements and process efficiency, leading to cost reductions and fraud prevention. Therefore, implementing blockchain technology has a positive and significant impact on internal marketing management. Companies recognize that the significant role that blockchain implementation plays in the internal management processes will affect the company's ability to stand out from competitors, contributing to better marketing performance and better business results [1].

Considering the results of the variables payments vs. shares, loyalty programs vs. upvotes, loyalty programs vs. shares, digital marketing vs. upvotes, digital marketing vs. shares, and marketing management vs. views, as we can verify through the significance analysis test (Table 5), the variables do not present statistically significant levels to perform correlation analysis. We could not draw conclusions regarding the correlation analysis between these variables [104].

Comparing all the values of the correlations of the variables based on Table 5, we can conclude that the variables supply chain and marketing management are the most significant and researched by the marketing-related professionals on the Quora social platform.

Furthermore, the correlation analysis between supply chain vs. upvotes ($r_s(229) = 0.170, p < 0.01$), supply chain vs. shares ($r_s(229) = 0.229, p < 0.001$), and supply chain vs. views ($r_s(229) = 0.195, p < 0.01$) support Hypothesis 2. With the implementation of blockchain technology in the internal processes of companies, it is possible to acquire advantages with solutions for the reduction of risk and the verification of true transactions. Blockchain technology helps overcome trust issues in the distribution chain networks [7,59]. Thus, for marketing-related professionals, blockchain technology has a positive impact on the distribution chain management.

As for the analysis concerning marketing management vs. upvotes ($r_s(229) = 0.169, p < 0.05$) and marketing management vs. shares ($r_s(229) = 0.234, p < 0.001$), and following Hypothesis 6, we can verify that with companies' growth and development, blockchain technology provides essential solutions to business problems. Following up on customer needs effectively, quickly, and safely helps to improve advertising programs. It is possible to improve efficiency and information transparency, prevent fraud, and improve the consumer's final experience [68]. Thus, we can verify that blockchain technology positively impacts the internal management of marketing.

5. Conclusions

The main goal of the present study was to explore which variables are more relevant concerning the topic of blockchain technology and its importance for marketing, considering the opinions of marketing-related professionals.

According to our results, we can verify that blockchain technology is an asset to the marketing sector, with greater relevance in the supply chain area and marketing management, according to its characteristics and advantages listed above. The basis of robust technology such as blockchain solves existing security flaws in the marketing environment, with reliable information sharing and protection of user data [1].

The constant need to collect and process information, draft and negotiate contracts, and enforce agreements to manage and maintain relationships show that the application of blockchain technology is effective in overcoming problems of collaboration and trust in the networks of distribution chains [6,7]. In turn, the combination of communication channels

between the marketing manager and the consumer will affect a business's ability to stand out from competitors and gain competitive advantage [1]. Thus, we can conclude that implementing blockchain will undoubtedly contribute to better performance and better business results in the marketing sector.

5.1. Theoretical and Practical Implications

This research work provides relevant information for the scientific literature considering the advantages for organizations with the implementation of blockchain technology. Marketing managers will be able to improve their management systems and marketing campaigns according to the different characteristics of customers. At the same time, it will help companies revolutionize their strategic advantage over the competition by analyzing customer expectations and needs to understand the perspective of the target consumer and revolutionize their products and services.

5.2. Limitations and Recommendations for Future Research

As expected, there were some limitations in the development of the present study. This research only focused on the Quora social platform. For future investigations, it would be interesting to collect information from more social platforms and social networks, such as LinkedIn, and gather opinions directly from professionals based on surveys or focus groups to complement the actual findings. Finally, another promising future research avenue is to investigate the brevity of the adoption of companies and consumers of this disruptive technology with the use of technology adoption models such as the Technology Acceptance Model (TAM) or the Unified Theory of Acceptance and Use of Technology (UTAUT), which can influence the success of the implementing blockchain technology in the marketing sector.

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