The Rise of Blockchain Applications in Marketing Management

Subjects: Others

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The adoption of blockchain technology by companies can change the way they interact with stakeholders, redefining communication strategies and other marketing processes. 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

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 [1].

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 [2]. 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 [3][4]. 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 [5]. This is a process of sharing network data between the distribution chain participants, and a continuous improvement of this process [6].

Retailers and online services have been encouraged to accept payments through digital methods, regardless of the currency value [7][8]. For example, Microsoft has adopted blockchain technology to pay for various services, including Xbox Live and Skype [9]. 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 [10].

Transactions contain hash sets with public key stamps of all parties involved, cryptographically signed by the sender [11] [12]. 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 [3][13]. 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 [14].

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 [15].

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 [7][16][17].

Product traceability is becoming an increasingly essential and differential requirement in many distribution chain industries [5]. This process allows access to information about the product's itinerary, content, collection dates, origin, and destination

[18]. For example, the brand Carrefour adopted blockchain technology to control its distribution network and manage the entire production process [19].

The transaction cost theory explores the ideal structure for companies in minimizing the total cost under exogenous conditions concerning the nature of transactions [3][20]. 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 [21].

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 [22]. 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 [23]. This can lead to beneficial effects on the performance of distribution chain networks by providing an effective solution to balance information asymmetries between partners [15][24].

Decentralization is an essential property of blockchain technology, controlling any information tampering and increasing its veracity [25]. The notion of protecting and securing distribution chain management details through blockchain has captured the interest of the industry [26], leading to perspectives that encompass transaction confidence in the security and privacy threats that companies face in the digital media value chain [23].

Blockchain is also expected to go through disruptive developments that lead to entirely new and unexplored possibilities in distribution chain management [27][28]. 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 [15]. From the supplier to the consumer, it improves their confidence in transactions and adds value to all stakeholders [17].

3. Loyalty Programs

Loyalty programs can significantly benefit brands, generating ever-increasing sales and profits [29]. As such, brands strive to ensure that consumers remain faithful to their products and services [23]. 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 [30].

Brand strategies have undergone significant transformations with Internet implementation [23], for example, building customer relationships, enabling interactivity, and providing more personalized offers [31]. 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 [8][20].

Several companies already use blockchain for this purpose, such as Cathay Pacific and Air Asia [29][32], 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 [33]. 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 [34].

4. Digital Marketing

Implementing new IT helps restructure business processes, facilitate changes, and establish innovative methods to link a company to customers and suppliers [35]. These new technologies have brought new marketing terms and tactics, demonstrating that a traditional marketing plan can evolve into an e-marketing plan [36].

Through the blockchain distributed data storage network, it is possible to protect consumers' privacy by preventing it from being tampered [35]. The available data will be more authentic, reliable, secure, and effective in creating solutions that prevent data falsification [37].

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 [38][39]. 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 [40].

Digital advertising has become a vital force for virtual and real economies [36]. The proliferation of fraudulent advertisements in the digital world has brought a negative experience for some Internet users [41]. 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 [42].

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 [20][36].

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 [43]. 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 [43].

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 [44]. 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 [43].

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 [41].

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 [45]. 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 [46].

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 [47].

Blockchain thus provides a new direction for protecting data, maximizing consumer relations with the brand and transmitting confidence in any sector [32][48]. 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 [49].

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 [50][51]. 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 [7][10].

In the private or closed blockchain, there are no required cryptographic incentives or proof of work. There is no anonymity [5]. For example, entities produce and distribute products in the distribution chain network, but access is restricted to the chosen network [52]. In this case, there will be functions that provide certificates to network actors in the distribution chain and maintain the private network [42]. 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 [10].

Blockchain's architecture helps systems reduce corruption, fraud, and bureaucracy in their ecosystems [53][54]. This facilitates efficient and immutable transactions between entities without intermediaries, eliminating spending situations and duplicate transactions while ensuring anonymity and security [10][55].

6. Internal Management of Marketing

As companies grow and stakeholders observe their development, they recognize that blockchain provides effective solutions to business problems [56]. 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 [57].

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 [58]. Companies create incentive mechanisms such as the monetary base or reputation [7][59]. 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 [60].

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 [61]. Blockchain was built to operate without a central authority, with a secure history for exchanging data using a timestamp to verify each exchange [62]. 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 [63].

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