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USING BLOCKCHAIN TECHNOLOGY TO ENHANCE DATA PRIVACY IN E-COMMERCE

Preserving user data privacy is one of the most significant concerns in today's digital economy, especially for visitors engaging in e-commerce activities. As online transactions increase, concerns about data leakages, misuse, and manipulation have grown significantly. When e-commerce platforms sell directly to customers, they rely on traditional 'centralized' systems, which contain customer data integrated into large systems, raising the attractiveness of such systems to hackers. Often, such systems share information with third parties, which poses a degree of unauthorized or leak usage. Losses resulting from critical security incidents and privacy violations have impacted consumer trust. Various innovative technologies are urgently required to address these instances. The uniqueness of blockchain technology, which offers a decentralized and tamper-resistant structure, provides an adequate answer to these questions and improves data security while giving back the customer's control of their data [1].

Thanks to blockchain, sensitive user information cannot be stored in a central place, eliminating single points of failure; in contrast to centralized systems, blockchain stores data in encrypted form, accessible only with the user's private key, which enhances security to the maximum level. However, blockchain systems also have disadvantages: for example, smart contracts facilitate the completion without needing users to disclose their identities and details to third parties since smart contracts automate the process. Also, blockchain provides pseudonymity to the users - the anonymity of users is guaranteed by unique cryptographic methods that prevent tracing while the data remains clear [2].

One of blockchain's most substantial benefits is its empowering users by returning control of personal data to them. Users of decentralized identity systems will have their personal information protected and can grant access to it on a need-to-know basis, reducing reliance on intermediaries. Such change can revolutionize e-commerce by restoring consumer confidence and giving companies an upper hand in a growing privacy-centered market [3].

The possibility of immutable information protected from fraud appeals to e-commerce, an industry frequently affected by fraud. E-commerce platforms are gradually shifting to blockchain technology, where data interference is highly unlikely due to the network's consensus mechanism, which makes every change dependent on all other network participants. In addition, the power of blockchain can also enhance customer trust in businesses, as companies may be able to prove regulatory compliance in terms of personal data processing using blockchain.

Apart from privacy and security, e-commerce platforms can take advantage of blockchain technology in a more customer-friendly manner by allowing customers to define the terms of data sharing. Users selling access to their data to companies instead of the other way around will make data commercialization more ethical and open. Not only does this model maintain privacy, but it also allows users to be compensated for their data, benefiting both consumers and companies. Such a shift can influence user behaviour, encouraging businesses to adopt more customer-focused strategies, which incorporate user data in a more decentralized way and allow networks to be more user-oriented [4].

However, there are some constraints when implementing a blockchain-based model. First among the issues is scalability, where, as in many popular blockchain networks, including Bitcoin and Ethereum, the volume of transactions is high but limited on a global scale. Another disadvantage is the high power usage, especially in blockchain networks, using the Proof of Work method to achieve consensus, making a Proof of Stake preferable. On top of this, the usability of a blockchain-based system is not adequate for the masses who are not tech-informed [5].

In conclusion, it is possible to consider the application of technologies based on blockchain for individuals as an advanced method of providing privacy, confidentiality, and anonymity in online and offline activities related to e-commerce.

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