

**MANAGING PRIVACY AND SECURITY IN A CASHLESS SOCIETY:  
A TECHNOLOGICAL CHALLENGE**

**#1**CHILUVERU HARSHITHA, *Department of MCA,*

**#2**Dr. N.CHANDRAMOULI, *Associate Professor,*

**#3**Dr.V.BAPUJI, *Associate Professor & HOD,*

*Department of Master of Computer Applications,*

**VAAGESWARI COLLEGE OF ENGINEERING, KARIMNAGAR, TELANGANA**

**ABSTRACT:** A cashless society is one in which all monetary transactions are handled digitally rather than through physical means of exchange like cash or coins. The need for both personal privacy and secure data storage has increased in the digital era. To protect users' privacy in a cashless society, researchers are working on new banking services that generate random credit card numbers, using blockchain to track all transactions, and launching an awareness campaign to educate and inform key stakeholders about security and privacy risks. Zero-day vulnerabilities, bugs, and varying degrees of social acceptance affect both card randomization and blockchain. In this study, we explore effective methods for protecting personal data in a cashless society.

**Keywords:** *Blockchain, Randomized numbers, Privacy, Transactions.*

## **1. INTRODUCTION**

Systems are dynamic, thus it's important to update their components frequently to keep them working efficiently and achieving their objectives. It takes a deep understanding of the many moving pieces of the financial system to ensure its smooth operation. All monetary transactions in a cashless society are conducted electronically rather than with actual currency. One of the most crucial considerations in a cashless economy is customer confidentiality. Protecting individuals' anonymity in a society where financial transactions are commonplace is crucial. Many buyers have no idea what data is being collected from them or where it will be used. The entire work demonstrates an understanding of the need of privacy and offers a three-pronged strategy for doing so. The first step in making people more aware of the need for privacy is to encourage the collecting of data and education on privacy. In addition, a random number generator credit card system can reduce the likelihood that thieves will be able to access users' personal information. The use of blockchain technology to verify identities is also on the rise. Taking these three measures will

significantly boost security. Hackers will have a harder difficulty interfering with the blockchain system, making it difficult to correlate data to specific people, giving users a more accurate picture of the services they use. All members of a cashless society would have to have their monetary dealings recorded on the internet, which could pose security risks. If people in a cashless society don't take precautions to safeguard their financial data, various companies may be able to gather extensive personal information on them.

## **2. LITERATURE SURVEY**

Several case studies have been conducted in India and elsewhere to investigate the feasibility of a "cashless economy." Fraud, security, use trends, and emerging e-payment technologies are only some of the topics that have received much research. Research on the topic of a cashless economy should be reviewed in its entirety. In order to paint a comprehensive picture, we looked at the work done in India on this project. Doing a comprehensive assessment of the studies is seen by many to increase interest in our topic and make it simpler for researchers to uncover gaps in the

literature. A comprehensive literature search reveals a dearth of research that examines cashless transactions from the perspectives of both consumers and businesses. Many studies have focused on the characteristics of individual card types, such as debit or credit cards, but have neglected to consider the interplay between smart cards, charge cards, and check cards. Worthington's 1995 article, "The Cashless Society," presents the concept of a cashless society as a crucial development for the 21st century. As our culture evolves, paper money and coins will be phased out in favor of more convenient digital payment systems enabled by a wide range of plastic cards. Some people could benefit more than others from a cashless society. Reasons for backing a cashless world are investigated. What could happen to marketers that push plastic card payments is also explored. This research analyzes the plastic card as a payment product through the lenses of three distinct time frames: the immediate after purchase, the delayed after purchase, and the prepaid. It also makes educated guesses as to how various plastic card types might influence the expansion of a cashless society. Mandeep Kaur and Kamal Kaur wrote a study in 2008 that found Indian banks made significant efforts in the 1990s to issue plastic cards that might be used as currency. However, Indian consumers did not welcome the product when it was originally introduced to the market. Numerous factors, including shifts in disposable income, marital status, and educational attainment, technological advancements, and consumers' expanded vocabularies, have contributed to these shifts in taste. Plastic money, according to Patel and Amin's (2012) "Plastic Money: The Pathway to a Cashless Society," has become an integral aspect of modern commerce, simplifying and advancing human life. Plastic currency improves the efficiency of the financial system and helps authorities crack down on criminal activity like money laundering, which is beneficial to the administration of tax law.

### **3. PRIVACY AND SECURITY CONCERNS**

A system consists of various components that are interconnected and cooperate to achieve a common goal. The people, institutions, and organizations that make up a cashless society include the government and financial institutions. Digital currency transactions are instantaneous because of this mechanism. There are numerous privacy and security concerns that must be considered as we progress toward a cashless system.

Acquiring information and wisdom through systematic inquiry. Since credit card transactions are increasingly conducted electronically, it is standard practice for merchants to record them in their databases. For bookkeeping and tax reasons, every company keeps track of the channels via which their clients interact with them. However, many organizations amass extensive databases of customer details. When anything is purchased at a store like Target using a credit card, the store retains meticulous records of the transaction. This file is linked to the customer's card and any other data about them that Target may have. People might easily be manipulated into divulging knowledge they regret giving. Users value privacy that prevents companies and governments from monitoring their financial dealings and exploiting that information unethically. The data may be retained and commercialized if its quantity and quality make it suitable for commercial or governmental purposes. Personal information is traded by "data traders," who buy and sell it. In many cases, people's personal data is gathered without their express permission. It is more difficult to prevent data corporations from acquiring private information in the current world. The majority of human activity is documented and put to various uses. It's possible that some people will view the action in issue as an intrusion on their personal space. It's critical that we acknowledge the diminishing amount of personal space we enjoy in modern life.

Ethical Considerations Wherever government agencies or their partners utilize data to draw

conclusions about people, protecting the privacy of personal information is of the utmost significance. People who fit particular criteria may be linked to wrongdoers using government databases. Personal information is a valuable tool for law enforcement in their pursuit of criminals. People who buy specific items at specific times can be identified using machine learning algorithms. There is a risk of misidentification if an individual without a criminal history acquires a similarly timed item. Without access to extensive transaction data, the government agency may have a more difficult time connecting innocent people to criminals. However, connections are not only created between criminals. The frequency of a product purchase could be used by insurance companies and banks to infer the presence of health issues or the borrower's propensity to default on a loan.

#### 4. SYSTEM DESIGN

Keeping privacy and security norms in place is of paramount importance in a digital world. The existing approach does not adequately protect user privacy or data. The system employs cutting-edge data protection methods including blockchain and random number generation. The card number is assigned a random number generated by the random number generator. Thus, a new random number is generated every time a payment or transaction is initiated using the card number. In financial transactions, a random number is substituted for the actual card number. This makes it challenging for those providing the services to really see the card number. The system's safety is improved as a result of this. Blockchain technology is similarly employed to safeguard the confidentiality of financial dealings conducted online. The blockchain system encrypts sensitive user data such as login credentials to ensure that it remains secure at all times. The employment of cryptographic algorithms and encryption keys is fundamental to blockchain technology. This technique ensures that the agreement is communicated to, understood by, and

implemented by the appropriate parties only. The identities of the participants are verified as well.

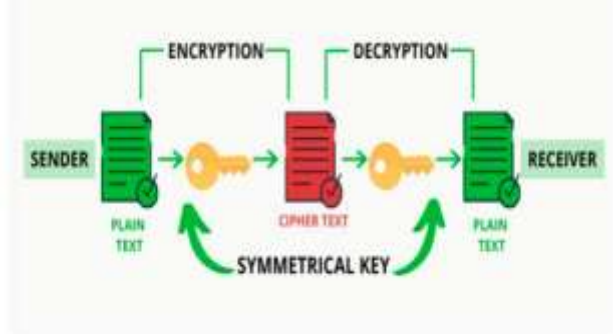


Fig 1. Process of Encryption and Decryption.

Credit card systems that employ randomization techniques can help ensure that only authorized individuals have access to users' private information. Blockchain technology is thought to provide a reliable means of authentication. When these two measures are implemented, safety will increase dramatically.

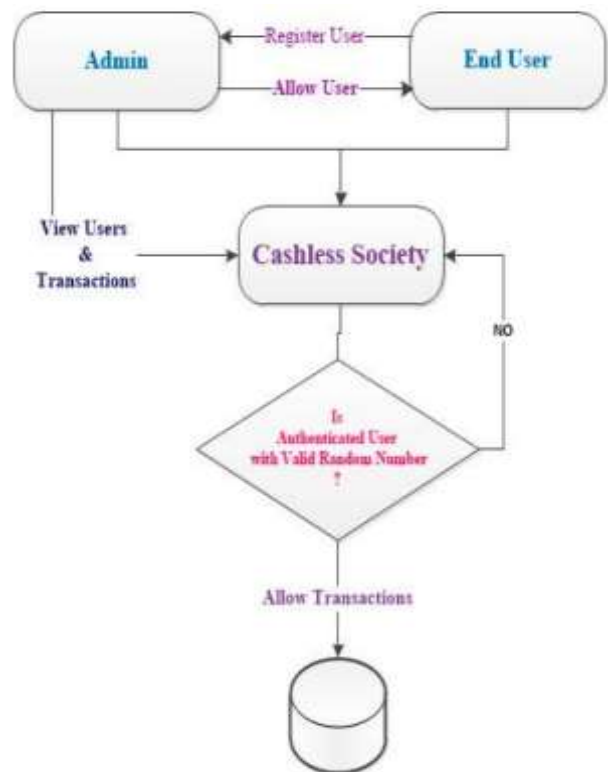


Fig 2. System Architecture of Cashless Society: Managing Privacy and Security

#### 5. IMPLEMENTATION

1. Information privacy and data security are paramount. Numerous apps have been discovered to illegally share user data with third parties. To address concerns regarding data security, this session focuses on data privacy and protection.

The term "data protection" refers to the measures taken to prevent unauthorized individuals from gaining access to, using, sharing, or stealing sensitive data. Passwords and other sensitive information can be masked for security purposes. The procedure will reveal minimal data about application purchase requests. This allows for the confidentiality of user data.

Data security refers to the steps taken to prevent unauthorized parties from accessing, using, sharing, disturbing, altering, or destroying stored information. The safety of users' information should be prioritized when developing tools to facilitate their work. Users need not worry about the security of any data they enter into this app. The module's session security prevented unauthorized access attempts.

### 2. Random Number Generation

Fictitious numbers can be used in the credit card system, which will have a main account number that is linked to fictitious card numbers. The numbers on the cards are then associated with particular events. Therefore, a random number generator can assist users in determining if an unauthorized individual is attempting to gain access. Each transaction's use of the random-number-generated secret key will be unique.

### 3. Block Chain

The blockchain serves as the foundation for a novel business model. Anyone may verify the transactions recorded in the blockchain because it is a distributed ledger. The blockchain will record the specifics of each transaction, including the parties involved. The above approach provides a greater degree of safety than more conventional forms of writing. Using a blockchain network, a secure and unbreakable system for verifying and encrypting monetary transactions can be established. People are more likely to feel safe venturing into an establishment that employs both human guards and cutting-edge security equipment.

The administrator is accountable for ensuring the smooth operation of the administrative hub. These processes include things like recording user data,

assigning a transaction-specific number to each user's card number, and encrypting user data for security during financial transactions.

Users will find this function helpful because it streamlines their work with the system and with money.

## RESULTS



Fig.5.1. Cashless Society User Login/Sign Up page



Fig .5.2. User's Bank Account details page



Fig.5.3. Different Users transactions Analyse page





Fig .5.4. Risk Users display page



Fig .5.5 User transactions Analyse page

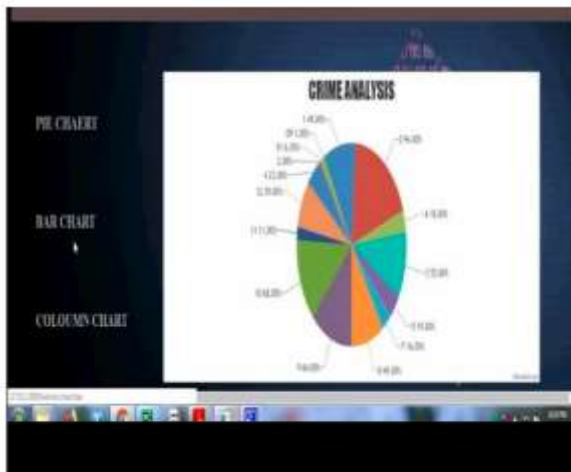


Fig .5.6 Pie chart representation for crime analysis

## 6. CONCLUSIONS

Moving toward a cashless society could put people at risk due to the collection and use of transaction data. The findings demonstrated several inherent issues with a cashless society. The intricate system could be modified to incorporate private and secure solutions. The ideal solution to an issue may need a number of diverse

strategies. The identifying process used by the blockchain improves the privacy and safety of the system. Credit cards made at random can help people conceal their account details. Both of these responses to the dynamic nature of the financial system have proven successful.

## REFERENCES

- [1] Andrew Ferguson, The rise of big data policing: surveillance, race, and the future of law enforcement,” New York; New York University Press, 2017.
- [2] Meadows, Donella H., and Diana Wright. Thinking in Systems: a Primer. Chelsea Green Publishing, 2015.
- [3] Swan, M. (2015). Blockchain: Blueprint for a New Economy. Sebastopol, CA: OReilly Media, Inc.
- [4] “Leverage Points:Places To Intervene In A System.”The Academy for System Change.N.p.,2020.Web.3 Feb.2020.
- [5] ] ” The Rise of Big Data Policing- Tec h Crunch . . ” n . d . A c c e s s e d F e b r u a r y 5 , 2 0 2 0 . h t t p s : / / t e c h c r u n c h . c o m / 2 0 1 7 / 1 0 / 2 2 / t h e - r i s e - o f - b i g d a t a - p o l i c i n g / .
- [6] Abrazhevich, Classification and characteristics of electronic payment systems, in: Lecture Notes in Computer Science, LNCS 2115, 2001, pp. 81–90.
- [7] More wedge, C. K., Holtzman, L., &Epley, N. (2007). Unfixed resources: perceived costs, consumption, and the accessible account effect. Journal of Consumer Research, 34(4), 459–467
- [8] Humphrey, D. B. (2004): —Replacement of cash by cards in U.S. Consumer Payments, Journal of Economics and Business, 56, 211–225.
- [9] Marco, A. &L.Bandiera (2004): -Monetary Policy, Monetary Areas and Financial Development with Electronic Money, IMF Working Study, IMF.
- [10] Moses-Ashike, H. (2011), —Cashless Economic can Reduce Risk of Carrying Huge Cashll, [Online] Available: <http://www.businessdayonline.com/.../22217>.

[11] Odior, E.S., and Banuso, F.B. (2012):  
Cashless Banking in Nigeria: Challenges, Benefits  
& Policy Implications. European Scientific  
Journal. Vol 8, pp. 12 – 16.