iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** VI **Month of publication:** June 2023

DOI: https://doi.org/10.22214/ijraset.2023.54022

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue VI Jun 2023- Available at www.ijraset.com

Smart ID Card: A Complete Solution for Efficient Transactions and User Benefits

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***Abstract:** As we all know that in this digitalizing world, everything is getting advanced by the use of technology in someor the other way. Smart ID card is a unique system in which allthe necessary things such as payments, attendance, events andmany more such things can be embedded in a single card by theuse of necessary security and proper technology such as RFIDChips, NFC Tags, and IoT along with the provision for parentalcontrol in the same.*

***Keywords:** ISO; IoT; multifunction; identification; safety; smart card reader; encryption; recognition technology; smart card working*

I. INTRODUCTION

Smart ID card is a system in which all the necessary things such as payments and Attendance can be embedded in one single unit which can make life much easier to operate these necessary tasks. In this paper we will aim to make this system easy and user-friendly for all the citizens. We abide to make this Smart ID card a viable solution for all the transactions and makeuse of its features.

The traditional identification methods have evolved with technological advancements, and Smart ID Cards are one of the latest innovations in this regard. A Smart ID Card is a modern identification card that is equipped with a microchipand uses cutting-edge technology to enable efficient transactions and provide numerous benefits to users. The smart card technology has revolutionized the identification process by offering a complete solution for secure and efficient transactions. It enables users to access a wide range of services and benefits, such as cashless transactions, easy access to public services, and improved security. This technology is being adopted by various industries, including banking, healthcare, and government services, as it offers a secure and convenient way of identification. In this article, we will explore the benefits of Smart ID Cards and how they are transforming the way we identify ourselves andconduct transactions.

As a group, we have developed smart ID cards which can not only be used for college purposes but also for companies. Our smart ID card system has a payments system along with the attendance but with the payments system included we decided to put a cashback option in the form of points which can be further converted into various form of rewards such as tickets to the in-campus events, discounts for various items and many more.

Our ID System will also be available in each and every user'smobile, wherein the users will be able to keep a track of all the in-campus events with the help of calendar and make payments for the same Our ID card makes it easy for everyone to not only to mark attendance but also saves thetime which is lost in marking manual attendance.

1) By using our ID card system the users will get cashbackon certain amount of transaction.
2) Our system will allow the user's parent to vieweachand every transaction the user makes.
3) Our system will also allow the parents to set the limit of funds to be added in the card.

II. EASE OF USE

This paper is detailed study about smart ID card which is meant for the ease of students for marking the attendance and making payments. Our ID card will contain RFID/NFC tag which will store all the data of students and thereby perform some necessaryoperations like attendance and payments by the use of this data.

1) Attendance- By using this system we can mark attendance of each and every user by just a tap an of card, so thatthe time which is lost in marking manual attendance can be avoided. By implementation of this system each and every userwill be prompted to carry their ID card every day.

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2) Payments (with cashback)- By using this system user can make payments at various places like canteen and In- campus events through the smart ID card. Parents can also set the upper limit of funds to be added in the card so that they cankeep a track of the user's activities like expenditure. For EAC transaction the user will receive some cashback in the form ofpoints, some of which can be exchanged for some cash or tickets Events.
3) Transaction Security- This system eliminates the use of cash transaction between the buys and the sellers. The individual can also recharge the ID card with the help of mobile application. This system will ensure that no extra money is spent by the user.
4) Authentication: Smart ID cards are used to authenticate individuals in a variety of settings, including government agencies, financial institutions, and businesses. The microchip card stores personal information of people and is easily accessible by authorized personnel.
5) Cashless Transactions: Smart ID cards can be used for cashless transactions in a variety of settings, including public transportation, retail stores, and vending machines. Simply swipe or tap your card to complete the transaction, no cash or physical credit card required.
6) Access control: Smart ID cards can be used to control access in various environments such as office buildings, schools and hospitals. The card can be programmed to access specific areas and can track the user's movements for security purposes.
7) Healthcare: In the healthcare industry, smart ID cards are used to store patient information such as medical history, prescriptions and allergies. This allows healthcare providers to access patient information quickly and accurately and improve patient care.

In short, smart ID cards provide a comprehensive solution for secure identification and efficient transactions. Due to their ease of use and versatility, they are quickly becomingan integral part of our daily lives.

III. SMART CARD: AN OVERVIEW

Our smart card has the capability to store and run certain conduct similar as marking attendance and making payments in the simplified way. Our smart card is integrated with RFID chip that's used for wireless communication. This identification card is an extremely movable device that makes the stoner's work lightly wear it every day. RFID chips used in our card have certain storehouse size for storing stoner data. RFID chips used on our card are necessary to make contactless payment.

The RFID anthology reads the RFID chip through the law written in the RFID chip. RFID chips can be classified into unresistant and active RFID chips passive RFID includes external power force and can only be amped when the anthology is present. Passive RFID compendiums can cover an area of over to 3 measures. It can store 128 bytes data and thus has a small size.

It has a veritably high continuity and expires for life. They are cheaper in comparison to any other RFID compendiums Active RFID- It contains an internal battery that ensures power to operate. They give signals in a wide range up to 100 measures. Since they're always under the voltage of their shelf continuance is limited to 5 times.

Smart ID cards use advanced technologies such as Near Field Communication (NFC) and Radio Frequency Identification (RFID) to enable contactless transactions and access control. It can also be used for biometric authentication such as fingerprint and facial recognition. In short, smart ID cards provide a secure, efficient and convenient way to store and transfer personal information. They are being used more andmore in various industries and are changing the way you identify yourself and conduct transactions.

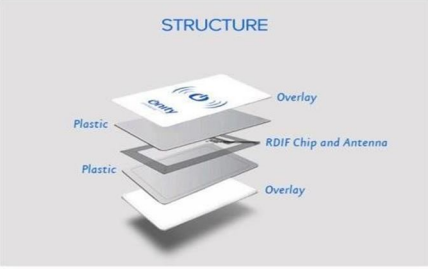


Fig. 1. Structural view of a plastic smart card.

A structural view of the chip card is shown in Fig. 1 over. Tocover the smart card chip from bending, it generally consistsof several plastic cards on top of each other. The plastic subcaste on this RFID chip is also visible when we take it view of its internal structure. Colorful operations, communication protocols and manufacturing specifications are defined by the International Organization for Standardization (ISO).

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The following ISO norms presently live for smart cards norms that have been.

1) Standards that have been developed regarding RFID include ISO11784/ 11785- Identification of It uses134.2 kHz.
2) ISO 14223 – Radio frequency identification of creaturesAdvanced transponders.
3) ISO/ IEC 14443 This standard is a popular HF (13.56 MHz) standard for High FID, which is used as base of ICAO9303 RFID-enabled passports The Near Field Communication standard that enables mobile bias act asRFID albums transponders.
4) ISO/ IEC ISO/ IEC 15693 This is also popular HF (13.56 MHz) standard for High FID extensively used for contactless smart payment and credit.
5) ISO/ IEC 18000 Information technology – Radio frequency identification for item operation.
6) ISO 18185 This is an assiduity standard for electronics seals or "e-seals" for tracking weight holders using frequency433 MHz and 4 GHz by using this system, the stoner is equipped with numerous conducts and features to choose from.

By using this system, the user is equipped with many actions and features to choose from. To make it effective all data to be provided is to be stored in the system in a secure manner. Transactions made through these cards are carried out using RFID chips that serve as wireless communication medium between the user and the recipient. RFID chips also contain a built-in small amount memory that allows it to retain certain information until it is processed.

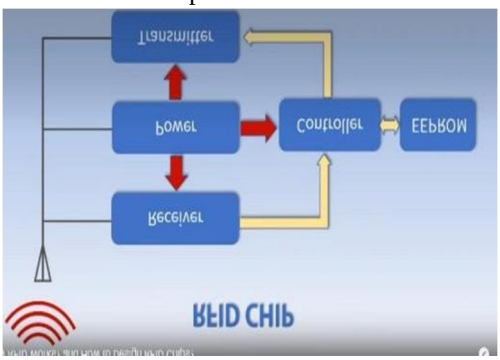


Fig. 2. RFID chip Architecture

The above illustration shows the internal armature of the RFID chip. A power force is needed in order to give power to do the necessary operations. The RFID system is divided intotwo types as follows, Transmitter and Receiver.

Transmitter sends the information and the receiver receives the information and after entering does some operations. AnEEPROM (electrically erasable programmable read-only memory) is needed to store a small quantum of data. A regulator is used to control and communicate the data inflowin an RFID chip.

IV. SECURITY CONCERNS IN SMART CARD

Our goal is to provide users with a unique ID by adding RFID technology. This also increases security when makingpayments.

Make sure you have a secure system in place with a PIN or password to prevent theft or fraud. So, if your RFID card is lostor stolen, no intruder/scammer will be able to transact your money without its Safety is our top priority. To build a secure system, the payment portal will be disabled for at least12 hours inthe event of multiple logins or multiple transactionfailure.

Our system is encrypted. This means that RFID readers are checked once a month to ensure or verify that no other externaldevices are attached or connected to the RFID reader to revealpersonal information.

For added security, a user's parent or guardian can set transaction limits to prevent overspending it uses machine learning algorithms to detect suspicious activity and fraud. Our primary motivation for security is to allow access only to appropriate authorities so as not to violate confidentiality protocols.

Security is required, but privacy, authentication, confidentiality, integrity, and availability remain the same. A secure and encrypted system requires a cryptographic model that encrypts data and increases the security of operation. A message is considered encrypted if the information has been transformed into other data and can only be accessed by decrypting it back to its original form. Encrypting certain information requires a key to both encrypt and decrypt the data.As such, data encryption is required for each secure platform. Various techniques can be used toencrypt a given amount of data, including Symmetric andAsymmetric Data Encryption Models.

Asymmetric method: This method is also known as: public- Key-Cryptography and the data is encrypted using cryptographic asymmetric keys.

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Symmetric Method: in this method, a single symmetrickeyis used to encrypt the data.

1) *Data privacy:* Smart ID cards store large amounts of sensitive personal information. Therefore, it is important to ensure that your information is protectedfrom unauthorized access and data breaches. Appropriate data encryption and security measures must be taken to protect cardholder privacy.
2) *Duplicate cards:* Smart ID cards can be duplicated. This means that someone can copy the card without the owner's knowledge or consent. This can lead to identity theft and unauthorized access to restricted areas. Advanced security measures such as unique digital signatures and biometrics should be implemented to prevent card duplication.
3) *Unauthorized access:* Smart ID cards can provideaccess to restricted areas or systems. If your card is lost or stolen, someone may have unauthorized access to sensitive information and space. Therefore, in case the card is lost or stolen, appropriate measures shouldbe taken, such as immediately deactivating the card orreissuing a new card.
4) *Malware attacks:* Smart ID cards contain microchips that are vulnerable to malware attacks. These attacks can lead to identity theft and card malfunction. Therefore, it is essential to implement proper anti- malware protection and regularly update your card software.

In summary, smart ID cards are exposed to various security issues such as data privacy, card duplication, unauthorized access, and malware attacks. To ensure the security of smart ID cards, appropriate security measures such as data encryption, biometrics and anti-malware should be implemented.

V. SMART CARD APPLICATIONS

The invention of smart cards changed everyone's life. Everyday these smart cards are important part of our lives. Such as Credit/Debit cards, hotel key cards, etc. The main reason for the popularity is their flexibility, security, and easeof use. Smart cards can store a large amount of data by the use of a small chip known as a microcontroller, they give a person their unique identity.

Smart cards have different applications in each area. Serves as an employee or student card for marking attendance. Hotelkeys and event ID cards are one application in which they canbe used effectively.

Nowadays, Smart cards are being used in every industry likeRailways, governments, or metros name it and you have it. Here are some applications where smart cards are being used daily.

1) Employee/Student ID - as the amount of data increases, it becomes very difficult for people to store this data manually. In this case, the smart ID card fulfills its purpose perfectly. The UID number in the identification card chip provides a unique identity to each employee/student and also secure sending of this data to an authorized authority.
2) Credit/Debit Cards: With the rise of digital money, almost everyone these days owns either a credit/debit card for transactions. Additionally, these credit/debit cards have a chip in them that stores a huge amount of owner data. They are also linked to banks where users have an account. Since the exact amount is transferred securely, there is no need to worry about change. Along with making payments with such ease, they also have a strong secure platform, so there is no suspicious activity.
3) Hotel Cards: Whenever we go to a hotel today, we can't find a traditional metal key, but instead we can see a simple plastic card that serves as a new room key that opens the door in just fractions of seconds when we tap the door handle. People like smart cards as a traditional key because smart cards are more convenient.
4) NFC business cards: with the increase of business in the world where millions of businesses are created, there will be a need to visit/business card in NFC business cards, just take out the business card and tap on someone's mobile phone, we will see the NFC tag will display the information along with the contact number of the personwho the card she knocked.
5) Wireless communication: SIM cards are an efficient way of communication between users. Where one can talk to anyone, anywhere, anytime in real time using a mobile phone.
6) Access Control - Many industries have a special room where only authorized persons can enter a certain room. For this reason, smart cards are widely used where only the person who has the smart RFID card can access the important room.
7) Financial transactions: Smart ID cards can be used for secure financial transactions such as ATM withdrawals and credit card payments. The card's chip can store the cardholder's financial information, which can be used to authenticate transactions and prevent fraud.
8) Education: Smart ID cards can be used in educational institutions for various purposes including student identification, access control and library lending.
9) Transportation: Smart ID cards can be used for transportation purposes, such as electronic receipt of tolls and payment of public transportation fares. The card chip can store the cardholder's account information. This can be used to authenticate transactions and prevent fraud.

VI. FUTURE SCOPE OF RESEARCH WORK

The future of smart cards is certainly very bright. They are widely accepted in Asia, Europe and occupy such continents due to their safety and convenience. Various countries like Italy, Germany and many other countries around the world willintroduce a national E-Id card in the coming years. Smart cards are now used worldwide in many applications including Healthcare A smart health card will help store various patient information such as medical, biological records and many more. This makes it easy for doctors to recognize problems thatpatients have faced in the past.

1) Payment's systems: Transit fare payment cards, contact/contactless debit and credit cards.
2) Telecommunications: Calls can be made from phone booths using a smart ID card and this can be topped up with cash points, so you don't have to use coins in publicphone booths, and it can also reduce vandalism.
3) Secure ID Applications: ID cards, driver's licenses employeeidentity badges, electronic passports.
4) Colleges/schools: If the student taps the card, then we will be able to see his entire year attendance at once.
5) Events: The user will be notified about each and every event that will be taking place in the following using thesmart ID card.
6) Blockchain integration: Smart ID cards can be integrated with blockchain technology, which can provide greater security and privacy protection for personal information.
7) Global acceptance: As smart ID cards become more common and advanced, they may become globally accepted as a standard form of identification and authentication.
8) Environmental sustainability: Smart ID cards of the future may incorporate eco-friendly materials and designs, making them more environmentallysustainable.

The future scope of smart ID cards is vast, with potential applications and advancements that can improve security,convenience and sustainability. As technology evolves, sowill smart ID cards and it will be exciting to see what advancements and innovations they bring.

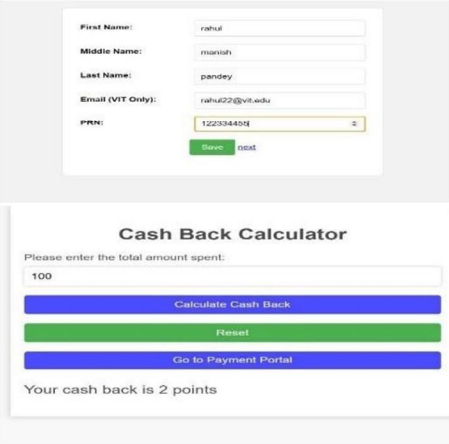
VII. CONCLUSION

Currently ID card is used only for identification, which isgood, but we can further innovate it's use by including payment and attendance in it. By adding payment and cashback points optionin id card it will be convenient for theuser to handle money and by adding option for markingattendance it will comply the userto carry their ID cards.

The above study suggests that the use of this technology i.e.,smart card can revolutionize the school and corporate world.Itwill help the user to pay their bills with smart ID wallet andalsohelp in marking his or her participation in the respectivesector.In fact, the smart card is a "one-size-fits-all" option for users.

Thus, Smart ID cards provide a complete solution for efficient transactions and user benefits. They have numerousapplications in various industries including government services, healthcare, education, transportation and finance. Smart ID cards can provide enhanced security, better convenience and more accurate identification through the use of biometric data and advanced technology. While theremay be security concerns, these can be overcome by proper implementation and management of the card system. The future scope of smart ID cards is also promising, with potential advancements such as increased security, IoT integration, contactless payments and blockchain integration. Overall, smart ID cards provide a convenient, secure, and efficient solution for identification and transaction purposes, and their potential benefits make thema valuable tool in a variety of industries.

VIII. RESULT



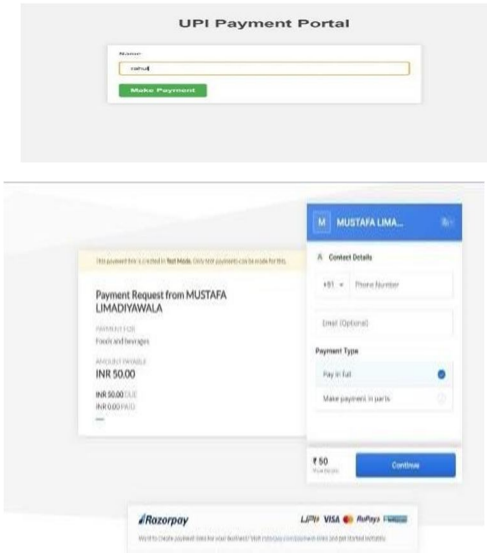


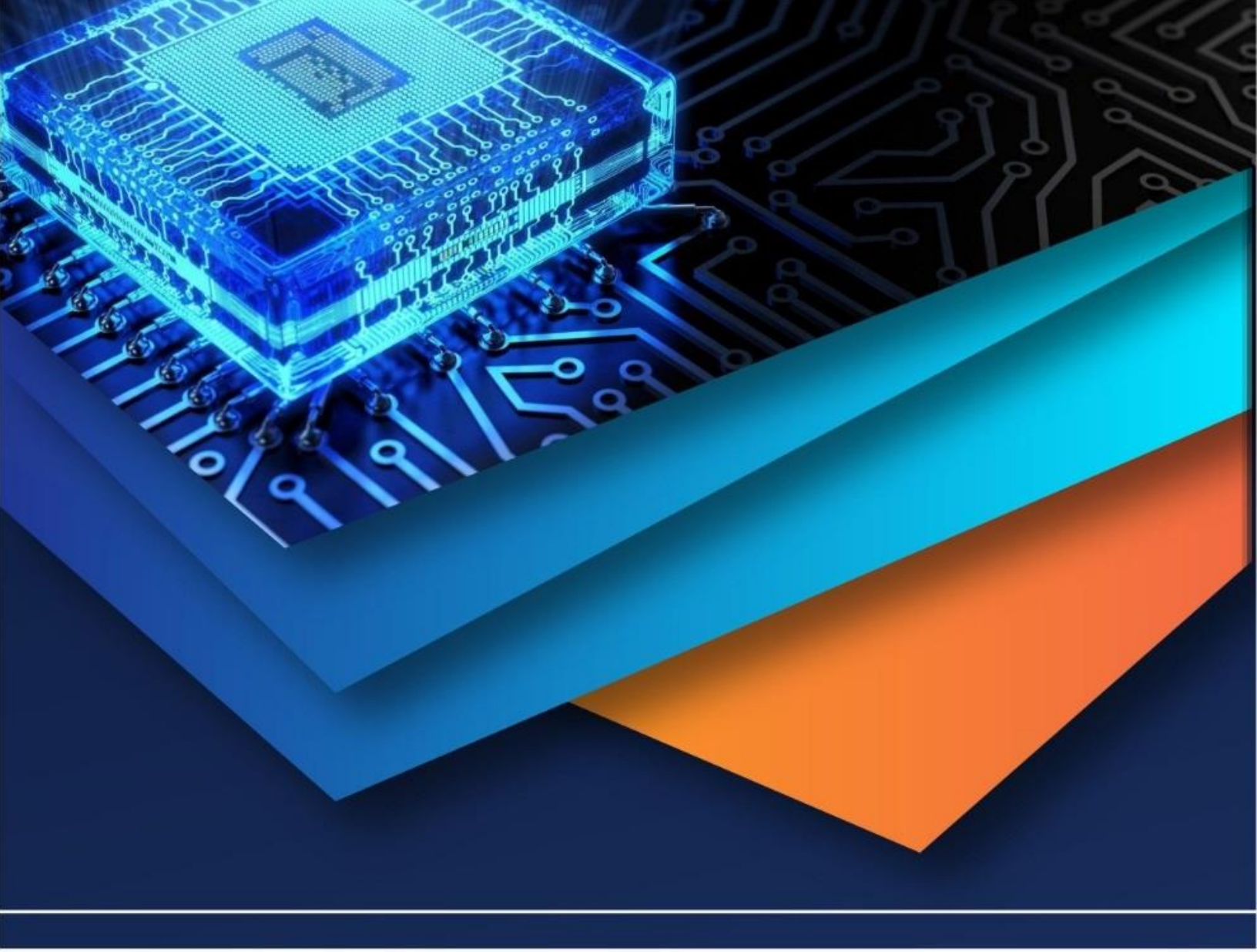
Fig.3. Images of cash back calculator and payment portal



Fig.4. Image of testing the model

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