**DETAILED INFORMATION ABOUT THE PROJECT**

**TOKEN GENERATION THROUGH CASHLESS TRANSACTION USING RFID**

**Problem statement**

As technology advances and the world becomes more digitalized, it is important for institutions to adapt to new methods of payment for the convenience and security of their users. In the context of a college campus, it has become increasingly apparent that traditional payment methods such as cash and UPI apps have significant disadvantages. For one, cash transactions require physical exchange of currency, which can be inconvenient and time-consuming. Additionally, carrying large sums of cash can be unsafe and prone to theft. On the other hand, UPI apps often require students to give sensitive payment information, such as passwords, which can be risky and leave students vulnerable to fraud. As a result, there is a need for a more efficient and secure payment system that can be used by students on campus. This project aims to address this need by developing a payment system that allows students to pay with their ID cards, using Radio-Frequency Identification (RFID) technology and Raspberry Pi. Our payment system will provide a secure, efficient, and user-friendly payment option for students to use in various places on campus.

**Introduction:**

The world is rapidly moving towards digitization, and digital transformation is becoming the need of the hour. The outbreak of COVID-19 has further accelerated this shift towards a digital world. Digital payments have played a significant role in these tough times, and it has become essential to have a seamless payment system that can provide a better experience to users. In order to keep up with this fast-paced digital world, educational institutions are also adopting new technologies to improve their operations and provide better services to their students and employees. In this context, our project aims to create a payment system for students inside the college. We can see that students inside the campus use different payment methods to complete their transactions. Some students opt for cash, while others use various UPI apps. Even for tiny transactions like buying a pencil, students need to give their UPI credentials to pay, which is not a safe and secure option. To address these issues, we have developed a payment system that enables students to pay using their ID cards inside the campus at various locations such as stationary shops, canteens, and food courts. Students can also use this system to pay their mess bill, and easily recharge their ID cards using the mobile application that we have developed. This system provides a user-friendly, efficient, and secure payment option that eliminates the need for physical exchange of cash or sensitive payment information while using third-party apps. The traditional payment system of cash has its limitations, including the risk of theft, loss, and mismanagement. Moreover, the traditional payment system can be time-consuming, especially when students have to stand in long queues to make their payments. On the other hand, the UPI system, although convenient, can be risky as students have to share their sensitive payment information with third-party apps.

Our project utilizes Radio-Frequency Identification (RFID) technology and Raspberry Pi to create a seamless payment experience for students using their NFC-enabled student ID cards. The RFID technology is used to read the information from the student ID card, RFID (Radio-Frequency Identification) is a wireless technology that uses radio waves to communicate data between a reader and a tag. It allows for contactless identification and tracking of objects, making it ideal for various applications such as access control, and payment systems. Raspberry Pi is a small, affordable computer that is designed to teach coding and electronics to people of all ages. It has a wide range of applications and can be used for various purposes, such as building a media center, controlling robots, and creating IoT devices. In your project, Raspberry Pi is being used to create a payment system that allows students to pay with their NFC-enabled student ID cards. Raspberry Pi as a mini computer updates data in real time firebase and communicates with RFID reader, printer and display. This system provides a user-friendly, efficient, and secure payment option that reduces the need for physical exchange of cash or sensitive payment information while using third-party apps. Our project not only provides a better payment experience for students but also helps the college management to manage the transactions more efficiently. The system allows for easy tracking of transactions, and both students and cashiers can track their payments through the mobile application that we have developed. Additionally, students can recharge their ID cards using the mobile application, which eliminates the need for them to stand in long queues to recharge their cards. This project contributes towards the digital transformation of the college by utilizing the power of new technology to create a better experience for users, and we believe it has the potential to revolutionize the way students make payments inside the campus. By adopting this technology, colleges will look more innovative and forward-thinking, providing a better experience for our students and paving the way for future advancements in the field of education.

**Objectives:**

* Develop a user-friendly, efficient, and secure payment system for students within the college using their NFC-enabled ID cards.
* Implement Radio-Frequency Identification (RFID) technology and Raspberry Pi to enable easy and seamless transactions for students and cashiers.
* Provide a solution to the existing problem of students having to use different payment methods for different transactions, reducing the need for physical exchange of cash or sensitive payment information while using third party apps.
* Enable students and cashiers to track their transaction history through a mobile application, ensuring transparency and accountability.
* Allow students to easily recharge their ID cards using the mobile application, reducing the need for manual top-ups.
* Improve the overall payment experience for students, making it faster and more convenient, leading to increased efficiency and productivity within the college campus.

**Scope:**

The scope of our project is to develop a seamless payment system for students using their ID cards within the college campus. By utilizing RFID technology and Raspberry Pi, we aim to create an efficient and secure payment experience for students at various locations on campus, including stationary stores, canteens, food courts, and mess halls for hostellers. The mobile application we have developed enables students to recharge their ID cards, track their transaction history, and provides a user-friendly interface. The system reduces the need for physical cash transactions, thereby creating a safer environment on campus. The project has the potential to scale up to other institutions, thereby creating a wider impact. The project aims to enhance the digital experience for students and contribute to the overall modernization of college infrastructure.

**Conclusion:**

The development of a payment system for students using their ID cards and RFID technology is a significant step towards the digitalization of payments in college campuses. The system offers a secure, user-friendly, and efficient payment option, reducing the need for physical exchange of cash or sensitive payment information through third-party apps. By leveraging RFID and Raspberry Pi technology, this project aims to address the limitations of existing payment systems by providing a seamless payment experience for students. Furthermore, this project has the potential to enhance the overall student experience, making transactions faster and easier for students. It also reduces the burden on cashiers by automating the payment process and makes it easier for students to keep track of their transaction history. The system's integration with a mobile application allows students to easily recharge their ID cards and access transaction details. This project's success could pave the way for further innovation in the field of digital payments and encourage the adoption of similar systems in other educational institutions.

**Future work:**

Our payment system can be extended in the future to include other payment options on campus including parking fees, event tickets, and library fines. In order to assure precise tracking of student attendance in real-time, we also want to link our payment system with the student attendance system. We also want to assist students better manage their spending by offering extra capabilities like budget tracking and expenditure statistics. Additionally, in order to provide smooth payment experiences, we want to link our payment system with the college's official mobile application. Extending our initiative to other educational institutions, including colleges, where students frequently encounter such payment-related difficulties, is another potential future destination for it. By broadening the breadth of our payment system and adding new features, we hope to provide students access to a more complete and effective payment option that will eventually enhance their on-campus experience.

**THANK YOU**