A Review paper on contactless money cards: Campuses to go cashless

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ABSTRACT

Customers can pay with Contactless Payment without needing cash or a card swipe. To use this method, customers must "Tap" or "Wave" their card over a card reader. The interface will establish a connection with the bank account, and immediate payment will be made. Contactless technology has uses for higher education in both payments and verification. The adoption of RFID student ID cards on campuses improves transactional convenience, flexibility, and security. Universities can give students simple access to lectures and other guarded campus places and events by issuing them their RFID ID cards. The same card that students use for access can also be used to effortlessly pay for requirements across many campus departments, like stationary, the library, the canteen, college transportation, and tuition.

Keywords: *Contactless smart cards, contactless payment, cashless campus, Student Smart Card System, RFID smart card readers, and smartcards.*

1. Multi-purpose student card system using smart card technology.

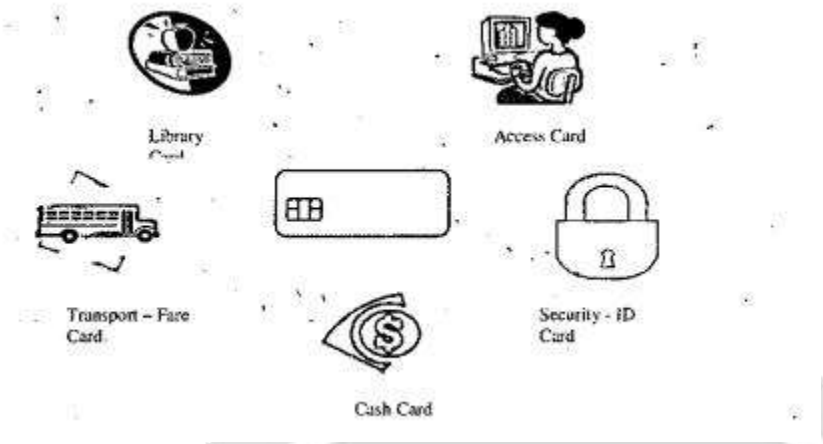
Payments made utilizing near-field communication (NFC) technology are often referred to as contactless payments. Thanks to this technology, devices that are close to one another can effortlessly communicate and exchange data. There are many different types of contactless payments, such as contactless cards and digital wallets. Space, security, dependability, and functionality are all areas where smart cards significantly outperform magnetic strip cards [I]. As was already established, magnetic strip cards have extremely little storage—usually just a few bytes—while smart cards can typically hold a hundred times more data than magnetic cards. Smart cards may be more useful and adaptable than magnetic cards because of their larger data storage capacity. In addition to serving as student identification cards, they may also be used as access cards for computers and physical doors and currency cards for retail stores to hold money. Smart cards offer the advantages of accurate and reliable data storage, therefore they can be thought of as a kind of database.[2]

1.1 Smart Cards

A computer chip embedded in or in a piece of plastic the size of a credit card is called a smart card. The card can be programmed to carry out particular activities as well as store data or information. It is more dependable, more secure

or higher security, disposable and reusable, has multiple uses across a wide range of industries, and is compatible with many consumer products.

1.2 Overview diagram



1.3 Inferences

The use of smart cards is only getting started. Smart cards would enhance security generally and reduce inefficiencies brought on by a
cashless society, data consistency, and student card functioning. We can see how adaptable, useful, and usable smart cards are through the applications and how they can enhance the setting in which they were first used. Smart cards can be adapted by various industries to increase their functionality and usability, as demonstrated by the implementation in education.

2. MULTIPURPOSE STUDENT SMART CARD

To carry many cards, one card can simultaneously be an ID, a Visa, a stored-value money card, and an archive of personal information, such as phone numbers or medical histories. Currently, there are a variety of Smart card implementations in use in our society since different designers utilize different programming languages and data structures, which means that they are not all connected to one another. Singapore is one example where they use a variety of smart cards for the same purpose, which is to store a value that is tied to money. Our goal is to create a multipurpose card framework that allows you to handle multiple forms of technology with a single card.[3]Here, in this research, the authors present the concept of combining various applications in one clever card.
Therefore, the person does not need to carry different cards for different uses. The person can carry one card and use it for a number of different things. In this essay, we offer a smart card that may be used for a variety of activities, including voting, participation, and transportation (ticketing). It will also function as a personal ID.

2.1 Inference

The development of the Campus Smart Card is a comprehensive administration structure that is connected together. After careful consideration, the offered configuration program has given the requirement of a computerized Campus and Smart Card: It is made with advanced technology and takes into account long-term planning; the selection of the device models is made with standards of prudence and development, reasonable development, ensuring original speculation, ensuring consistent execution, solid operation, and greatness-based openness and expansibility. Other factors, such as the plant for creating real information, data transfer, and capacity security are also taken into account in addition to the standard preparing capacity of programming and equipment. consistently followed the criterion of "maintaining a strategic distance from manual intercession as might reasonably be expected" in addition to the framework's design. The framework alone completed a significant amount of the job. To make the framework much

more reliable, easier to maintain and operate, and less demanding for the clients. A critical feature of "Digital Campus" is the "Campus Smart Card." It is aware of full utilization, personality verification, financial management, open data management, and other capabilities, providing information that may be used to discover additional data and providing barriers to the advancement of scholars.

3. Designing and Implementation of Smart Card Technology for the Students of Higher Education

Information is transformed digitally through the process of digitization. The term "digital economy" refers to the economic system built on digital computing technologies. The Internet Economy or Web Economy are other names for the digital economy. Currently, in the majority of the world's nations, people often carry a few credit cards, an identification card, an ATM card, and sometimes a few more plastic cards in their wallets. These plastic cards have unknowingly grown to play a significant role in their daily lives. Currently, smart cards are used in the telecommunications, retail, and transportation industries. Combining digitization and the digital economy is the goal of building and implementing a student card system for institutions of higher learning that use smart card technology. A smart card is a card with a barcode that is simply an individual card given to each student. An optical scanner can read a barcode, which is made up of a series of alternating dark and light stripes. It is a method of automatic identification. A barcode is an optical, machine-readable representation of data, and the data it contains typically provides information about the item it is attached to. Students' work can be made easier with the help of the student smart carStudents can use this card in locations like the library, canteen, stationery stores, and online document storage. showcasing smart cards' capability, strength, adaptability, and utility.[4]

3.1 Proposed system

Everyone maintains several cards in their wallets, including a library card, an identity card, an ATM card, a driver's license, and actual cash. One card will soon be able to replace all of these cards. The smart card is utilized for payment, security, and identification purposes. The transportation, telecommunications, and retail industries all use smart cards.

Currently, smart card implementations can be found all over the world, but they are not uniform, meaning that each developer utilizes a distinct set of programming standards and data structures. As a result, there are many different types of smart cards in use today. In this essay, the authors are fusing the digital economy with digitization. the goal is to suggest creating and implementing a student card system for institutions of higher learning that leverages smart card technology, or a card with many applications. This will improve the existing student identification cards used by many educational institutions and solve the issue of having numerous cards for the same purpose. The majority of smart cards are the same size as a typical credit card. Consider that a student at a university can use the university identity card (ID card) as a fundamental form of identification to enter the university's buildings, use the library, pay for meals, buy items from the campus store, or access the vending machines. Some cards can also be used to access the university's intranet, network, and internet resources. The contactless scanner is unable to recognize the smart card in this scenario. Utilizing several technologies or apps on a single ID card can save on card issuance costs.

3.2 Inference

The potential uses for smart cards go well beyond what has already been implemented. Students' work can be made easier with the usage of student smart cards. With the assistance of the office staff, the student can replenish this card as needed. The student can use this card in places like the library, canteen, and stationery stores, among others. The card's unique ID is stored when it is scanned, and the transaction or process will proceed as necessary. From the student's account, money is taken out. This card can be used to submit significant documents that the student will require for any of their assignments. The fine amount will be determined based on the information saved and retrieved with the use of an ID stored on the card, and the student may use this card to pay fines at the library. The same applies to the canteen and stationery store when the cash amount is taken from the student's account.

The student only needs to carry the portable card, in this case. This card is incredibly helpful for students and simplifies a lot of their assignments. Smart cards will increase overall security, efficiency brought on by a cashless world, data consistency, and student card functionality. We can see how adaptable, useful, and usable smart cards are through the applications and how they might benefit the environment. Smart cards can be adapted by different industries to increase their functionality and usage; education is just one.

4. CONCLUSIONS

Smart cards are a good fit for this situation. Nearly half of Gen Z consumers say they make contactless payments at least twice a week, and 65% view the technology as a "must-have" payment option. These preferences are poised to reshape the campus payment ecosystem. Soon students will not only appreciate it but expect them to use it as one card for everything from cafeteria meals to bus rides. Fortunately, this service can be easily provided with contactless smart cards. While contactless cards are not necessarily more hygienic than cards that require contact, public trust in touch technology plunged during the pandemic. According to a Capgemini survey, 77% of consumers expect the world to increase their use of touchless technology during the pandemic. 62% expect to rely more on touchless solutions even after the pandemic is over[5].Higher education institutions will benefit from contactless technology for both payment and verification applications. Contactless student ID cards bring added ease, convenience, and security to everyday transactions and experiences on campuses across the country.[6]

5. REFERENCES

[1]. https://www.globalpaymentsintegrated.com/en-us/blog/2020/09/15/the-history-of-contactless-payments
[2]. Multi-Purpose Student Card System Using Smart Card Technology: S. Ornar, Member, IEEE, H. Djuhari The University of New South Wales UNSW, Sydney, NSW 2052, Australia
[3]. Praveen, C.; Mathew, G.; Lakshmi, A., and S.Anusuya (2017). Multipurpose Student Smart Card. International Journal of Pure and Applied Mathematics
[4]. Singh, A., Chopra, A., Imran, M., and Singh, R. (2017). Designing and Implementation of Smart Card Technology for the Students of Higher Education. International Journal of Computer Science and Mobile Computing IJCSMC, 6, 144-149.[4]
[5]. https://blog.hidglobal.com/2021/05/its-time-universities-invest-contactless-smart-cards
[6]. https://arrowpayments.com/blog/contactless-cards-for-student-id/