A Review: STUDENT SMART CARD

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Abstract - Smart cards are secure portable storage devices used for several applications especially security related ones involving access to system`s database either online or offline. For the future of smart card to be bright, it is important to look into several aspects and factors especially those resulted due to the rapid advancement in infromation and communication technology.This paper looks into current trends in smart card technology and highlights what is likely to happen in the future.Moreover, the paper addresses other aspects in order to identify the core concepts that are of interest to smart card developers and researchers.More emphasis is given to four key characteristics of smart cards: portability, security,open platform and memory management, as they are believed to be at the heart of many smart card applications.

INTRODUCTION

 Smart cards have been used excessively during the last twenty years. In recent years though, a new generation of smart cards evolved programmable smart cards. In this paper the authors give an oversight of the current state of the technology and compare the cards on the market. The range of uses for a smart card has increased every year to include applications in a variety of markets and disciplines. In previous years, the information age has proposed an array of security and privacy issues that have called for promoted smart card security applications.

IN 1950 Diners Club generated the first plastic card to be used for payment applications .

 The synthetic material PVC was used for this card since it ensured that the card will last for a considerable time period.

This card identified you as member of a selected group, and was accepted by certain restaurants and hotels. Later, VISA and Master Card entered the market, and eventually the cost pressures off raud, tampering, merchant handling, and bank charges made the machine-readable card format using a magnetic stripe unavoidable.

This technology is used only for storage of data and its security features are weak. Therefore, magnetic stripe technology is considered unsuitable for storing sensitive data and for highly sophisticated applications. In 1968, German inventors Jurgen Dethl of and Helmut Grotrupp filled the first Integrated Circuit Card related patents.

Same type of applications followed in France in 1974 and Japan in 1970.

The French Postal and Telecommunications services (PPT) successfully completed a field trial with telephone cards in 1984.

Several millions of French telephone smart cards were in circulation in 1986. Their number reached nearly 60 million in 1990, and 150 million in late 90's. Today, according to data monitor, smart cards shipments are more than 4 billion.

Related Work

1. Magnetic Smart cards

2. Optical cards

3. Memory cards

4. Microprocessor cards

5. Dual interface cards

6. Multi component cards

7. Hybrid cards

8. Proximity cards

Magnetic Smart Cards

A magnetic stripe card is a kind of card capable of collecting data by improving the magnetism of tiny iron-based magnetic particles on a band of magnetic material on the card. The magnetic stripe, infrequently called swipe card or magstripe, is read by hitting past a magnetic reading head. Magnetic stripe cards are normally used in credit cards, identity cards, and transportation tickets. They may also comprise an RFID tag, a transponder device and/or a microchip mostly used for business premises access control or electronic payment.

Magnetic recording on steel tape and wire was discover in Denmark around 1900 for recording audio.[1] In the 1950s, magnetic recording of digital computer data on plastic tape covered with iron oxide was invented. In 1960, IBM used the magnetic tape idea to evolve a efficient way of securing magnetic stripes to plastic cards,[2] under a contract with the US government for a security system. Now determine the physical cretic of the card, including size, flexibility, location of the magstripe, magnetic characteristics, and data formats. They also provide the standards for financial cards, including the allocation of card number ranges to different card issuing institutions.[www.wikepedia.com]

Optical Cards

Optical card A form of optical storage in which the intermediate is in credit-card form, studied for uses similar to those of a magnetic-stripe card but with much higher efficiency (several megabytes).[www.osapublishing.org]

Memory Cards

Memory cards cannot operate files and have no processing power for data management. All memory cards trasnfuse to readers through isochronic protocols. In every memory cards you read and write to a fixed track on the card. There are three elementary types of memory cards: Straight, Protected, and Stored Value. Before designing in these cards into a moved system the issuer should check to see if the readers and/or terminals adherence the communication protocols of the chip. Most contactless cards are variants on the protected memory/segmented memory card idiom.[www.smartcardbasics.com]

Microprocessor Smart cards

A microprocessor smartcard is determine as an IC chip link card with a microprocessor and memory. The appearance of a credit card, this smart card contains a small microchip that can process and save thousands of bits of electronic data. Memory cards or magnetic stripe cards can only save information, As the microprocessor smart card is truly smart as it has its own operating system able to procedure data in response to a given situation.

This ability to record and change information in its own non-volatile, physically secured memory makes the smart card a strong and practical tool. Smart cards are small and portable, they can interact with computers and other automated systems, and the data they bear can be updated forthwith.[www.cardwerk.com]

Dual interface cards

Dual-interface smart cards inclusive a single chip, with both contact and contactless interfaces. With these cards, it is possible to entry the same chip using either of these methods, with a very high level of safety.

The chips used in these cards also fall into two types: microcontroller chips and memory chips. A memory chip is like a small floppy disk with facultative safety. Memory chips are less costly than microcontrollers but with a analogical decrease in data management safety. Cards that use memory chips underlet on the security of the card reader for processing and are ideal for situations that demand low or medium safety.

A microcontroller chip can add, delete, and otherwise change information in its memory. A microcontroller is like a small computer, with an input/output port, operating system, and hard disk. Smart cards with an embedded microcontroller have the masterely ability to store large amounts of data, take away their own on-card functions (e.g., encryption and digital signatures) and interact sanely with a smart card reader.[www.paragon-id.com]

Multicomponent cards

These types of cards are for a distinct market solution. For example, there are cards where the finger print sensor is built on the card or one company has built a card that generates one-time password and displays the data for use with an online banking application. Vault cards have rewriteable magnetic stripes. Each of these technologies is specific to a particular vendor and is typically patented.[smartcard-deswal.blogspot.com]

Hybrid Cards

These have more than two technologies embedded within a single card. These cards use any two of the above-described types in a single chip. Some usage of smart card demand more than two technologies like the proximity card and the contact card united in a single chip.

Smart card technology of embedding various functions along with the basic ones is progressing fastly. There are many benefits that are making the use of smart cards very popular.[www.techspirited.com]

Proximity Cards

A proximity card or prox card is a "contactless" smart card which can be read without pour out it into a reader device, as required by previous magnetic stripe cards such as credit cards and "contact" type smart cards.[4] The proximity cards are part of the contactless card technologies. Held near an electronic reader for a instant they enable the identification of an encoded number. The reader usually generates a beep or other sound to signalize the card has been read.

The term "proximity card" refers to the older 125 kHz devices as distinct from the newer 13.56 MHz contactless smartcards. Second generation prox cards are used for mass and distance reading usage. Proximity cards typically have a read range up to 50 cm (< 15 inches)[3] which is the main difference from the contactless smartcard with a range of 2 to 10 cm (1 to 3 inches). The card can often be left in a wallet or purse[5], and read by simply holding the wallet or purse near the reader. These early proximity cards can't hold more data than a magnetic stripe card, and only cards with smart chips (ie, contactless smartcards) can hold other types of data like electronic funds equilibrium for contactless payment systems, history data for time and attendance or biometric templates. When

used without encoding data, only with the card serial number, contactless smartcards have similar functionalities to proximity cards.

[www.wikepedia.com]

Types of smart cards	Advantages	Drawbacks
Magnetic Smart card	• More secure • Adaptable • Protected storage	• Minimal security • Limited amount of data. • Minimal functionality.
Optical Smart card	• Processing power. • Persistent. • More secure	• Less battery powered. • Absence of hand held readers.
Memory Smart card	• Data Storage. • Reusable. • More secure	• Memory is limited. • Processing power is limited.
Microprocessor Smart card	• Data integrity. • Flexibility. • More Secure.	• Lack of sharing. • Duplication.
Dual Interface Smart card	• Availability. • Easily replicated. • More secure.	• Need of Smartphones. • Risk of malware attacks.
Multicomponent Smart card	• Confidentiality. • Affordability. • More secure.	• Tough to retrieve information. • Card must be recharged.
Hybrid Smart card	• Reliability. • Organized information. • More secure.	• Increased cost of production. • Vulnerable to fluids.
Proximity Smart card	• User comfort. • Represent Liquidity. • More secure.	• Size cannot be fixed. • Dependence of electrical energy.

Future scope

The future of Smart Cards is looking bright. The many existing and potential advantage smart card has to offer both the public and the private sectors of the industry raise the interests of many large corporations such as Wachovia and Motorola. Compared to the conventional magnetic stripe cards, smart cards offer increase security, convenience, and economic usage. Reducing fraud, decreasing time to complete redundant paperwork, and having the potential to have one card to access diverse networks and applications are just some of such examples. The discussion for the future of the smart card across the global industries can be divided into public and private sectors and are discussed below.Soon it will be possible to entry the data in smart cards by the use of Biometrics.

CONCLUSION

 Smart cards can add facility and maintenance to any transaction of value and data but the preference facing today's managers can be difficult. We prospect this site has adequately presented the options and given you sufficient information to make informed assessments of performance, expense and security that will manufacture a smart card system that apt today's requirement and those of tomorrow.

Security is very sensitive issue in smart card especially due to the various independent parties involve throughout the card's life cycle leading to what is now called dividend in rely. There is need to evolve a method in which even without rely none of the parties can cheat one another. Further, to overcome the lack of security provided by passwords or PINs for authentication and access control, some researchers believe that biometric is the best original means of authentication.

The results of this study decode that security has an important and positive effect on user delight and consequently on user acceptance. It means that with growing the level of protection, the level of user adoption will be enhanced. Ultimately, further examination needs to be completed in the future to discriminate factors that will confer users better understanding of the system and also set up new techniques to enlarge the safety level of the smart card.

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