

APPLICATION OF SMART CARD IN DIFFERENT DOMAINS

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ABSTRACT

This article deals with smart card & its applications in different sectors. It also deals with all relevant aspects of smart card technology, and they illustrate the extent and complexity of relatively large smart card applications. Another objective of this article is to show smart card systems in which the cards are only one of several components. In such systems, the functionality, and user friendliness and (in most cases) nearly all of the system security depends on the smart cards used in the system. However, such systems should always be viewed as a whole, since they operate satisfactorily only when all of their components work together harmoniously.

KEYWORDS: Smart Card, VISA, Master Card.

APPLICATIONS OF SMART CARD

FINANCIAL SERVICES

Financial institutions are looking to use Smart Cards to deliver higher value-added services to businesses and consumers at a lower cost per transaction. These services include money on a card, corporate card programs, and targeted marketing programs based on analysis of

consumers' buying patterns. [1]. **EMV-EMV** is a standard for interoperation of IC cards ("chip cards") and IC capable POS terminals and ATMs, for authenticating credit and debit card transactions. The name EMV comes from the initial letters of Euro pay, Master Card and VISA, the three companies that originally cooperated to develop the standard.



Figure 1. Applications for EMV Cards

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Europay International SA was absorbed into MasterCard in 2002. JCB (formerly Japan Credit Bureau) joined the organization in December 2004, and American Express joined in February 2009. IC card systems based on EMV are being phased in across the world, under names such as "IC Credit" and "Chip and PIN". The EMV standard defines the interaction at the physical, electrical, data and application levels between IC cards and IC card processing devices for financial transactions. Portions of the standard are heavily based on the card interface defined in ISO/IEC 7816. The system is not compatible with the original Carte Bancaire smart cards systematically deployed in France since 1992. However, the French Carte Bancaire now also uses the EMV standard. The most widely known implementations of EMV standard are:

- VSDC-VISA
- MChip-MasterCard
- AEIPS-American Express
- J Smart-JCB

Visa and MasterCard have also developed standards for using EMV cards in devices to

support card-not-present transactions over the telephone and Internet. MasterCard has the Chip Authentication Program (CAP) for secure e-commerce. Its implementation is known as EMV-CAP and supports a number of modes. Visa has the Dynamic Password Authentication (DPA) scheme, which is their implementation of CAP using different default values. [4]

LOYALTY PROGRAMS

Airlines, retailers, and other companies that offer a range of ancillary services and loyalty programs along with their basic product want to use Smart Cards to deliver these programs with a higher level of service, improved ease of use, and at a lower cost. For example, airlines want to use Smart Cards not only as a vehicle for issuing and carrying tickets-even though the single benefit of being able to securely order/provide a ticket directly to chip cards via the Internet is substantial. Airlines also want to use the cards to provide tie-ins to their frequent-flyer programs and to cross-marketing deals with auto rentals and hotels, as well as to provide simplified access to private airline lounges[1].



Figure 2. Application for Loyalty programs

FEATURES FOR LOYALTY PROGRAMS: [7]

1. Improve Customer Retention and Spending, Loyalty programs improve customer retention and encourage spending. Customer acquisition is improved by distinguishing you and your services from the competition. This.
2. Build Loyalty with Smart Cards and Watch Your Business Grow, Showing appreciation will go a long way toward strengthening your relationships with your customers. One way to show customers that you value their business is to provide them with glossy, personalized loyalty smart cards. Customers can sign up for a loyalty program in-store as part of a marketing promotion or loyalty campaign.
3. With Loyalty Programs, Customers Can Be Rewarded for Their Patronage. With smart cards you can acknowledge frequent customers and award points according to their level of spending-you can encourage repeat purchases by enabling a points-based reward system. You can offer customers discounts and points toward merchandise, and record valuable data about their buying preferences at the same time. A loyalty solution can coordinate a customer loyalty campaign for just one business or for a group of affiliated companies. Merchants can team up to offer joint promotions.
4. Benefits of Smart Card-based Customer Loyalty Solutions. Smart cards increase transaction efficiency and promote increased purchasing, while decreasing costs due to human error, magnetic strip failure, or fraud. Unlike systems with magnetic stripes, smart loyalty cards are processed off-line. They only require a smart card terminal and a smart loyalty card. There is no costly infrastructure on the backend and no additional transaction costs to worry about-you are in control. It is less likely that a customer will lose or discard a smart card.
5. Rewards and Incentives. Multiple reward and

incentive options can be linked to the business location, purchase, smart card, product and or historical information. These options set the parameters for instant rewards and incentives to customers.

Smart Card Loyalty Programs Manage the Following Campaign and Card Functions:

- Loyalty point accumulation and redemption
- Transaction and customer data collected at a smart card terminal
- Loading and managing specific cardholder details
- Smart card personalization and configuration

CELLULAR PHONES

Cellular Phones, A plastic card containing important data about a person's identity to allow access to a network or premises. Also, a card containing subscriber information, often inserted into GSM phones for roaming in different countries. Cellular phone services in the United States are losing \$1.5 million per day because of fraud. Although Smart Cards offer a mechanism to secure cellular phones against fraudulent use, only Java Cards offer the ability to download new functions into a phone in real time.[1] A telephone card, calling card or phone card for short is a small plastic card, sized and shaped like a credit card, used to pay for telephone services. In most or all cases, having the physical card itself is unnecessary, knowledge of the access telephone number to dial, and the PIN, being sufficient. Standard cards which can be purchased and used without any sort of account facility give a fixed amount of credit and are discarded when used up; rechargeable cards can be topped up, or collect payment in arrears. The system for payment and the way in which the card is used to place a telephone call vary from card to card. Cards known as remote memory cards have a PIN associated with a specific land-line telephone account; calls using the card are billed to the associated account. [5]

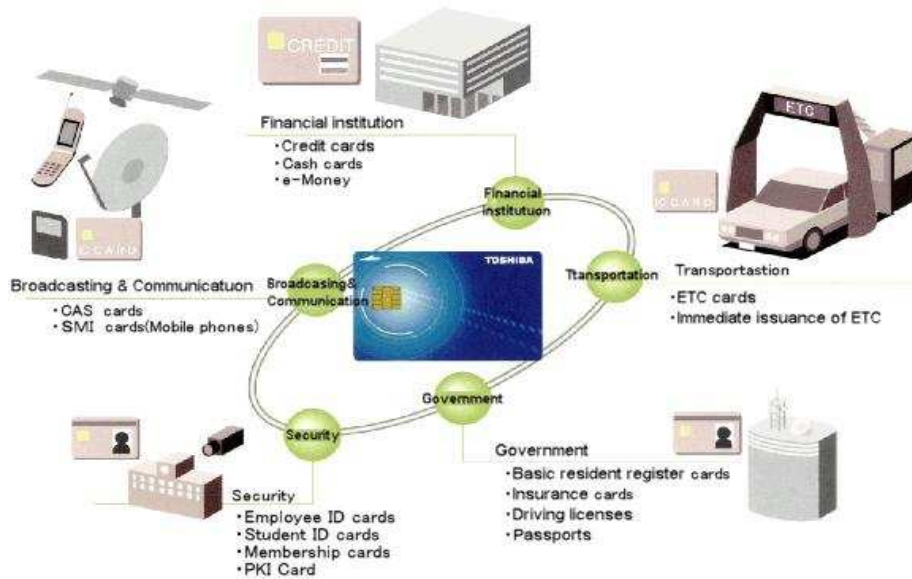


Figure 3.Applications for Cellular phones

The smart card used in GSM mobile telephones, which is called the ‘subscriber identity module’ (SIM), was and still is the pioneer in terms of functionality and memory capacity. This is in part due to the fact that smart cards used in mobile telephones, whose manufacturing costs are several hundred Euros, are significantly less price sensitive than other types of smart cards, such as those used for electronic payments or medical applications. Another decisive factor with regard to smart card technology is the generally high rate of evolution of the entire tele communications sector. The pioneering position with regard to technology and standardization that is presently held by the SIM.

HEALTHCARE APPLICATIONS

Health care organizations worldwide are implementing smart health cards supporting a wide variety of features and applications. Smart health cards can improve the security and privacy of patient information, provide the secure carrier for portable medical records, reduce healthcare fraud, support new processes for portable medical records, provide secure access to emergency medical information, enable compliance with government initiatives and

mandates, and provide the platform to implement other applications as needed by the healthcare organization.[2] *Web-Enabled Smart Card for Ubiquitous Access of Patient's Medical Record*-In the past decade, we have seen a rapid advancement in application of information technology to almost every sector of industries. The explosion of Internet growth fuelled by the so-called killer application-the World Wide Web, further accelerates this advancement. However, surprisingly, it was noted in [1,2] that most health care institutions, including those in the United States, still maintain most of their patient records in the form of paper charts. This scenario has rendered the almost impossible task of integrating and seamlessly managing patient’s record across hospitals, clinics and between countries or states. The emergence of smart card technology is recognized as a potential solution to effectively and accurately manage patient’s medical record [3,4]. In particular, smart card based on optical memory offers quantum storage capacity of up to 4-6 Mb. Such storage capacity translates to the ability of the card to store basic patient information such as name, address, photographs, PIN security, to medical information such as blood type, drug allergies and regular prescribed drugs. Moreover, medical records can be augmented to include.

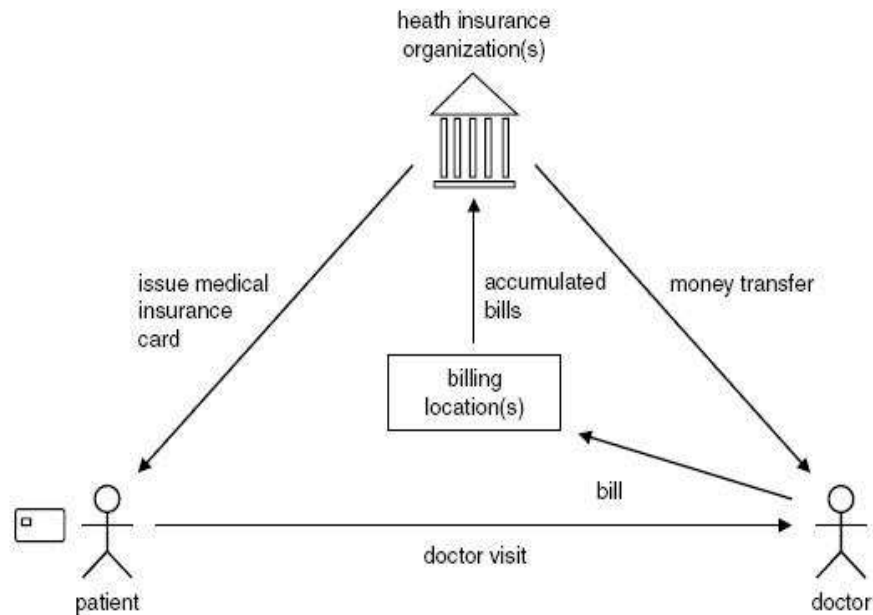


Figure 4. Basic architecture of the German health insurance card system

Multimedia-rich information such as scan photography images and voice recording, to facilitate rapid diagnosis of patient's potential symptom and problem. In short, smart card provides the rich benefits of storing comprehensive, accurate, and up-to-date medical history of a patient, while offering the ease of mobility in a pocket [5].

Although smart card presents an attractive alternative to recording complex medical record, it has failed to gain the critical mass required to spin off a wide market acceptance of such technology. Most usage of smart cards in medical arena is restricted to large organizations such as state hospitals, health insurance groups and government clinics. The lacks of a unified data structure and open programming interface have resulted in ad-hoc implementation of medical information systems based on smart card technology [6]. Building on the same spirit as the original Java, Sun has developed the Java Card

API specifications to facilitate the concept of "write once, run on all cards". [6]

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