

Smart e-Purse



Introduction:

Smart card technology has been around for more than 20 years. Since its first introduction into the market, its main application is for the payphone system. As card manufacturing cost decreases, smart card usage has expanded. Its use in Asia is expected to be growing at a much faster pace than in Europe. According to a survey performed by Ovum Ltd. [Microsoft1998a], the number of smart card units will reach 2.7 billion by 2003. The largest markets will be in prepayment applications, followed by access control, and electronic cash applications. According to a recent study by Dataquest [Microsoft1998c], the overall market for memory and micro processor based cards will grow from 544 million units in 1995 to 3.4 billion units by 2001. Of that figure, micro processor based smart cards, which accounted for only 84 million units in 1995 will grow to 5.5 billion units in 2010.

What is a Smart Card:

A smart card is a plastic card with a microprocessor chip embedded in it. The card looks like a normal credit card except for its metal contact (in contact card only), but applications performed could be totally different. Other than normal credit card and bankcard functions, a smart card could act as an electronic wallet where electronic cash is kept. With the appropriate software, it could also be used as a secure access control token ranging from door access control to computer authentication. Obviously, large storage capacity is one of the advantages in using smart card, but the single-most important feature of smart card consists of the fact that their stored data can be protected against unauthorized access and tampering. Inside a smart card, access to the memory content is controlled by a secure logic circuit within the chip. As access to data can only be performed via a serial interface supervised by the operating system and the secure logic system, confidential data written onto the card is prevented from unauthorized external access. This secret data can only be processed internally by the microprocessor. Due to the high security level of smart cards and its off-line nature, it is extremely difficult to "hack" the value off a card, or otherwise put unauthorized information on the card. Because it is

hard to get the data without authorization, and because it fits in one's pocket, a smart card is uniquely appropriate for secure and convenient data storage. Without permission of the card holder, data could not be captured or modified. Therefore, smart card could further enhance the data privacy of user. Therefore, smart card is not only a data store, but also a programmable, portable, tamper-resistant memory Storage Microsoft considers smart card as an extension of a personal computer and the key component of the public-key infrastructure in Microsoft Windows tools.



Goal: Smart Cards to be used for e-Purse or e-Wallet application

Overview:

Many successful E-purse schemes have been implemented in "close communities" including college campuses, clubs, hotels, food malls, shopping complex and massive transportation services. It could be applied to fast food outlets, Laundromats, photocopy machines, fax services and vending machines. Generally speaking, debit and prepaid cards for small value payments will soon be common when more merchants accept this payment scheme. The future of smart card in electronic commerce is not just in payment cards, but also loyalty cards, airline tickets and other value-added cards. Customers' preferences, bonus and other information could be kept in the card. Companies could then obtain their customers' preferences and shopping histories for planning more customer-oriented marketing strategies. The card could also be personalized to hold the cardholder's profile. In this way, companies could become more competitive in attracting customers.

Smart card as electronic wallet

The smart card is being used for payment in different aspects all over the world. They are being used for both bankcard and prepaid debit card functions. Furthermore, because the smart card is easily portable, it is also being used for both online and offline payment. In the area of electronic commerce, smart cards are being used for storing and protecting a number of keys. With the use of smart card for payment, security risk could be reduced as each transaction is considered an individual event. Furthermore, even if a particular smart card is hacked, the user account will still be safe. Together with the use of the pin number, biometrics and visual verification smart cards can prevent unauthorized access and user's privacy and security could be achieved. When electronic payment is widely accepted in daily uses, transactions would become more efficient. A single card could be used for different applications.

Smart e-Purse Application

The Smart Card system application software enables simple administration of the smart card's electronic purse. The member details are easily maintained on the system with the ability to add a member onto the system, edit an existing member's information and delete a member from the system. Members are maintained in categories where, among other things, the category determines the credit limit and access privileges for the member. Clicking one button will initialize a Smart card for a member. If lost, a Smart card can be hot listed. A new card can be issued by clicking a button and the member's current balance will be automatically transferred. Funds can be added or removed from the card by simply showing the card to the reader Clicking on a transaction type (Credit, Debit) Entering an amount Clicking "Write to Card". A statement can be printed detailing the member's purchase history. Transactions can be listed in detail or summary format by date and location. This software can be in integrated with the existing system.



Based on type of facility the Smart card system will perform the following function:

- a. If a member comes in, the PC/POS will display the same and the member card will be charged for using the facility as per the total usage period.
- b. If a dependent comes in, the PC/POS will display the same. The Smart card system will charge the dependents card with the appropriate charges for the total usage period and the same will be stored at the PC/POS located in that facility center.
- c. If guests accompany a member, then the PC/POS will display the same. The Smart card system will charge the members card with the appropriate guest charges (fixed by the administrator) and the total usage period, and the same will be stored at the PC/POS located in that facility center.
- d. If guests accompany a dependent, then the PC/POS will display the same. The Smart card system will charge the dependents card with the appropriate guest charges (fixed by the administrator) and the total usage period, and the same will be stored at the PC/POS located in that facility center.

The bar, restaurant and other facilities in operational infrastructure will consist of one PC/POS, one Smart Card Terminal fitted and one POS terminal. Figure below shows the infrastructure setup. The PC/POS will be loaded with Application module and a Smart Card Terminal will be connected to it. The PC/POS will in turn be networked to the central server.

When a member places the order to the stewards / bartenders present at the restaurant / bar, the list of items will be entered into the KOT / BOT present with the stewards / bartenders. The steward / bartenders need to present the same at the POS counter where in a temporary bill is generated. This temporary bill is to be given to the member while serving the ordered items. This procedure is to be followed each time an order is placed by the member. When the member has completed the food the stewards / bartenders takes the members Smart card and present the same at the POS counter.

The final bill be generated and the final amount is charged in to the Smart card. The Smart card along with the final bill will be returned back to the member for his signature or for debiting the card for making the payment for the transaction by e-purse. Cash transactions are also done through the same software in the PoS.



The Smart card system located in the office will enable the administrator to perform the following tasks:

- a. Electrical personalization (writing data into the chip) of the card. Once the card is electrically and graphically personalized the cards can be issued to the members.
- b. The administrator has complete control of the issuing of cards to members and the dependents using smart card. The Card can be issued for a new member, simply by clicking "new card".

Point of Sale

Card Active. Monthly Billing.

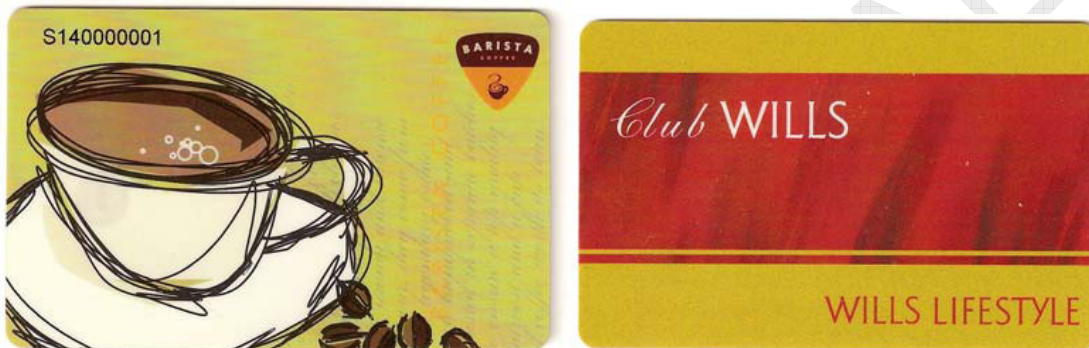
Bill Date : 11/08/2003 Paid On : Card Bill No : 010000001
 Card ID : 0000101 Card Name : ---Select---

SL	Item	Unit	Qty	Amount	
01	Pakora	Bottle	200	2	400.00
02	---Select---				

Restaurant	Total :	400.00
Rohit	Discount :	0.00
11/08/2003	Tax :	0.00
11:59:10	Amt. Payable :	400.00

Smart Card System Features

- 1) Members / Dependents I.D. with photograph
- 2) Pre-payment for cashless spending or E-Purse
- 3) Charges incurred by Members at the various facilities written in the card
- 4) Easy to follow Windows based software
- 5) Menu driven stand-alone Smart card terminal software
- 6) The above separate transactions are collated into a member profile.



The system can build up purchasing / usage profiles of what, and when a member buys / uses, irrespective of the fact that the purchases / usages were made in numerous different facilities. The one card operates everything needed for the smooth operation, streamlining its administration, accounting and management tasks for the customer.

Handheld Smart Card Terminals (OPTIONAL)

Handheld Smart Card Reader/Writer can also be provided at various input points that can download data to the host PC from time to time.

