

The history and applications of the chip card

Author: Burlacu Ștefan
Ling. cons.: E. Cușnir

Chip or smart cards are widely spread in the modern life. Their most common applications are in mobile phones and electronic means of payment. Where else are the smart cards used? How did they appear? The answers to these questions you will find in the article below.

The automated chip card was invented by German rocket scientist Helmut Gröttrup and his colleague Jürgen Dethloff in 1968, the patent was finally approved in 1982. The first mass use of the cards was for payment in French pay phones and started in 1983 (Télécarte). Smart-card-based electronic purse systems (in which value is stored on the card chip, not in an externally recorded account) were tried throughout Europe from the mid-1990s, most notably in Germany, Austria, Belgium, France, the Netherlands, Switzerland, Norway, Sweden, Finland, UK, Denmark and Portugal. Later, the international payment brands MasterCard, Visa and Europay agreed to work together to develop the specifications for the use of smart cards in payment cards intended as either debit or credit cards. The major boom in smart card use came with the introduction of the smart-card-based SIM used in GSM mobile phone equipment in Europe.

Contact smart cards have a contact area, comprising several gold-plated contact pads, that is about 1 cm⁴. When inserted into a reader, the chip makes contact with electrical connectors that can read information from the chip and write information back. The cards do not contain batteries; energy is supplied by the card reader. Contact smart card readers are used as a communication medium between the smart card and a host, for example, a computer, a point of sale terminal, or a mobile telephone [1].

In *contactless smart card*, the chip communicates with the card reader through RFID induction technology. These cards

require only close proximity to an antenna to complete transaction. They are often used when transactions must be processed quickly or hands-free, such as on mass transit systems, where smart cards can be used without even removing them from a wallet. Examples of widely used contactless smart cards are Hong Kong's Octopus card, South Korea's T-money (Bus, Subway, Taxi), London's Oyster card. All of them are primarily designed for public transportation payment and other electronic purse applications.

Applications [2]:

- *Computer security*: the Mozilla Firefox web browser can use smart cards to store certificates for use in secure web browsing. Smartcards are also used for single sign-on to log on to computers.
- *Financial*: the applications of smart cards include their use as credit or ATM cards, SIMs for mobile phones, authorization cards for pay television, pre-pay utilities in household, high-security identification and access-control cards, public transport and public phone payment cards.
- *Health care (medical)*: smart health cards can improve the security and privacy of patient information, provide portable medical records and provide secure access to emergency medical information.
- *Identification*: a quickly growing application is in digital identification cards. In this application, the cards are used for authentication of identity with any other relevant or needed information about the card holder. Examples include the U.S. Department of Defense, Common Access Card, and the use of various smart cards by many governments as identification cards for their citizens.

Bibliography:

1. <http://bartleby.com/65/sm/smartcard.html>
2. Rankl W., Cox K., *Smart card applications*, New York, 2007, p.5