Benefits of Smart Cards versus Magnetic Stripe Cards for Healthcare Applications

Smart cards have significant benefits versus magnetic stripe ("mag stripe") cards for healthcare applications.

First, smart cards are highly secure and are used worldwide in applications where the security and privacy of information are critical requirements.

- Smart cards embedded with microprocessors can encrypt and securely store information, protecting the patient's personal health information.

- Smart cards can allow access to stored information only to authorized users. For example, all or portions of the patient's personal health information can be protected so that only authorized doctors, hospitals and medical staff can access it. The rules for accessing medical information can be enforced by the smart card, even when used offline.

- Smart cards support strong authentication for accessing personal health information. Patients and providers can use smart health ID cards as a second factor when logging in to access information. In addition, smart cards support personal identification numbers and biometrics (e.g., a fingerprint) to further protect access.

- Smart cards support digital signatures, which can be used to determine that the card was issued by a valid organization and that the data on the card has not been fraudulently altered since issuance.

- Smart cards use secure chip technology and are designed and manufactured with features that help to deter counterfeiting and thwart tampering.

- Smart cards can help to reduce healthcare fraud by providing strong identity authentication of patients and providers.

The use of secure smart chip technology, encryption and other cryptography measures makes it extremely difficult for unauthorized users to access or use information on a smart card or to create duplicate cards. These capabilities help to protect patients from identity theft, protect healthcare institutions from medical fraud, and help healthcare providers meet HIPAA privacy and security requirements.

Second, smart cards provide the capacity to store healthcare information on the card and the flexibility for securely adding information to a patient healthcare card after issuance. For healthcare applications, this can deliver several benefits.

- Patient healthcare information and prescriptions can be stored on the card and updated after issuance, providing up-to-date information when a patient is receiving medical care from multiple providers or in an emergency situation.

- Multiple patient identification or patient record identification numbers can be written to the smart card, facilitating record exchange and assisting with coordination of care among multiple healthcare providers.

- Patient healthcare information can be written to and updated on the card by authorized healthcare providers, with updated information then available for both the patient and other healthcare providers (if authorized) to access.

Third, smart cards can support a wide variety of functions to improve healthcare provider and insurer processes, including[1]:

- Quickly and accurately identifying patients, reducing medical identity theft and improving quality of care.

- Streamlining patient registration and patient information access at any points of care, reducing routine paperwork and eliminating errors.

- Supporting audit logging and remote access accountability.

- Enabling secure access to healthcare websites.

- Storing all necessary applications and information on the card, enabling offline access to critical healthcare information using portable readers.

Magnetic stripe cards, by contrast, have significant disadvantages for healthcare and other identity and payment applications.

- Magnetic stripe cards have minimal security. Because data is very easily read from and written to a magnetic stripe card, information can be easily stolen and a duplicate magnetic stripe card can be created. It is straightforward for a thief to "swipe" a magnetic stripe card and to collect all of the information from the card; the thief simply needs a magnetic stripe reader that has the ability to capture the information from the card (which all readers do). The thief can then either use that information directly or create a duplicate magnetic stripe card.

- Magnetic stripe cards store only a limited amount of data (less than 2 Kbytes) and are not updated after issuance, providing no ability to securely store or update healthcare information.

- Magnetic stripe cards support minimal functionality and require an online infrastructure to access healthcare applications and information.

Magnetic stripe cards have had a well-established position in the marketplace for over 30 years. However, many industries and government organizations recognize the limitations of magnetic stripe technology and are replacing magnetic stripe ID cards with smart cards. For example, the global payments industry is migrating from magnetic stripe bank cards and infrastructure to smart payment cards based on the Europay MasterCard Visa (EMV) specification. Over 1.2 billion smart card-based credit and debit cards are now issued globally and 18.7 million point-of-sale terminals accept EMV cards.[2] Eighty countries globally are in various stages of EMV chip migration, including Canada and countries in Europe, Latin America and Asia, with migration to EMV smart payment cards now starting in the U.S.

For legacy applications that are accessed with magnetic stripe cards, a smart healthcare card can incorporate a magnetic stripe to support legacy applications.

Table 1 summarizes the key differences between smart cards and magnetic stripe cards for healthcare applications.

As the costs for smart cards and smart card readers have dropped dramatically, and as the reader infrastructure is replaced or upgraded, smart card technology is poised to capture market share in financial services, personal identification and healthcare markets–where security, privacy and information portability are crucial.

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[1]   Additional information on the use of smart cards for healthcare applications can be found on the Smart Card Alliance web site, http://www.smartcardalliance.org/pages/smart-cards-applications-healthcare-identity
[2]   Source: EMVCo, http://www.emvco.com

Table 1. Comparison of Smart Cards and Magnetic Stripe Cards for Healthcare Applications

	Requirement / Feature	Smart Cards	Magnetic Stripe Cards
Support for Healthcare Application Requirements	Reduction in medical fraud	●	◐
	Accurate, positive identification of the individual	●	◐
	Accurate information on eligibility and health plan	●	◐
	Elimination of card re-issuance cost	●	◐
	Secure, authenticated access to private healthcare information	●	No
	Support for health information exchange	●	◐
	Improved patient privacy and security	●	No
	Real-time, portable electronic health record	●	No
	Immediate emergency access to patient health information	●	No
	HIPAA compliance	●	○
	Support for two-factor authentication for accessing online electronic health records	●	No
	Support for digital signatures to enable strong audit	●	No
Technology Features	Storage capacity	●	○
	Security features	●	○
	Post-issuance modification	●	◐
	Cost of ID device	◐	●
	Cost of reader	●	◐
	Support for multiple sets of application data on the card	●	No
	On-card biometric storage	●	No
	On-card biometric match	●	No
Legend	WORST ○ ◔ ◐ ◕ BEST		

About the Smart Card Alliance Healthcare Council

The Smart Card Alliance Healthcare Council brings together payers, providers, and technologists to promote the adoption of smart cards in U.S. healthcare organizations. The Healthcare Council provides a forum where all stakeholders can collaborate to educate the market on the how smart cards can be used and to work on issues inhibiting the industry.

About the Smart Card Alliance

The Smart Card Alliance is a not-for-profit, multi-industry association working to stimulate the understanding, adoption, use and widespread application of smart card technology.

Through specific projects such as education programs, market research, advocacy, industry relations and open forums, the Alliance keeps its members connected to industry leaders and innovative thought. The Alliance is the single industry voice for smart cards, leading industry discussion on the impact and value of smart cards in the U.S. and Latin America. For more information please visit http://www.smartcardalliance.org.