trusted security manager (TSM). Payment card issuers have to sign up for such a TSM service and to pay for such services.

There are various technical complexities to make the loading process work smoothly, especially when some part of the loading process fails in the middle of a chain of transmissions from the issuer to the TSM to the Internet, via mobile operators' networks to the phone, to the chip. Furthermore, not all standards have been worked out, and there are multiple competing parties making it more difficult to become ubiquitous.

SUMMARY

The present disclosure relates to devices, systems, and methods including a magnetic stripe capture, storage and transmission device for use in conjunction with a mobile wallet application to capture, store and transmit magnetic stripe card data to merchants' conventional point of sale (POS) terminals and other devices with magnetic stripe readers (MSRs) or checkout systems, in physical and virtual environments. The system provides a convenient buying experience for consumers, a secure and informative transaction for merchants, and in some cases additional data to be transmitted to the MSR for the purpose of loyalty, identification (ID), or access control.

According to a first aspect of the present invention, there is provided a system for a magnetic stripe card capture, storage and transmission device comprising: a mobile communication device; and a magnetic stripe transporter (MST) comprising a microprocessor, a first magnetic stripe reader (MSR), a magnetic field transmitter including a driver and an inductor for transmitting magnetic pulses, a memory means, an audio jack interface and a communication interface, the driver being configured to send current and signal to the inductor to generate varying magnetic fields; wherein the magnetic field transmitter is configured to transmit the magnetic pulses to a reader head of a second MSR of a merchant point of sale (POS) device or other MSR device without contact with the reader head; wherein the MST interfaces with the mobile communication device through

the audio jack interface or the communication interface; and wherein the MST is adapted to capture magnetic stripe data and store the magnetic stripe data encrypted into the memory means and to decrypt and transmit the magnetic stripe data to the second MSR.

MSR on board the MST and store the card track data in a memory means or secure element. For payment cards, the application loads the primary account number (PAN) data of the card to an online digital wallet via the mobile wallet application. Card information can also be deleted from the memory means and the server using the application. The MST operated in the Transmit and Use Mode is configured to allow a user to select a specific payment card as a top of wallet or default card for use in transmission of the stored track data to the merchant POS system when a button is activated or pressed. In another aspect, if non-payment cards are stored in the MST, one non-payment card can be stored as the default card to transmit without authenticating to the wallet application and selecting such a card. Non-payment cards include hotel keys, door passes, or ID and Loyalty cards that can be loaded to the MST in a separate memory means for transmission later.

The MST operated in the POS Card read Mode is configured to allow a user to swipe a payment card with the MST's MSR and transmit the card data to a POS application on the mobile communication device then to the payment server and processor. The mobile communication device may be a smartphone, a tablet, or a personal computer. The MST further includes a battery and a charging circuit. The microprocessor is configured to provide security and communications with the mobile communication device. The memory means stores payment card data securely. The MST is configured to transmit card track data to a merchant checkout application on the mobile communication device to create a card-present transaction for the merchant. The MST may also be configured to read payment cards and to transmit payment card data to the mobile communication device and associated POS application that in turn then transmits the transaction and card data to the payment servers and processors like a POS.

According to a second aspect of the present invention, there is provided a method for a magnetic stripe card capture, storage and transmission device comprising: pairing a magnetic stripe transporter (MST) with a mobile wallet account and associating a serial number of the MST to the mobile wallet account;

initializing and unlocking the MST upon receiving an authentication of the mobile wallet account; capturing magnetic stripe card data; storing the magnetic stripe card data encrypted into a memory means of the MST; decrypting the encrypted magnetic stripe card data by the MST; and generating varying magnetic fields from an indicator to transmit the decrypted magnetic stripe card data to a reader head of a first magnetic stripe reader (MSR) of a merchant point of sale (POS) or other MSR device without contact with the reader head.

In an embodiment, the disclosure features a method for securely capturing, storing and transmitting magnetic stripe card data. A magnetic stripe transporter (MST) dongle includes a microprocessor, a driver configured to send current and signal to an inductor that creates varying magnetic fields, a battery, a charging circuit, a magnetic stripe card reader, a memory means or secure element, an audio jack interface, and a communication interface (for example, a USB interface, a 30pin or 9pin Apple interface, and a Bluetooth interface, etc.) working in conjunction with a consumer mobile communication device and a wallet application or mobile application for capturing magnetic stripe card data, storing the card data securely, and transmitting such data to merchants' point of sale (POS) terminals, checkout systems, or other MSR devices, in a physical and virtual environment.

According to a third aspect of the present invention, there is provided a magnetic stripe transporter (MST) comprising: a microprocessor; a first magnetic stripe reader (MSR); a magnetic field transmitter including a driver and an inductor, the driver being configured to send current and signal to the inductor to generate varying magnetic fields; and a memory means, wherein the MST is adapted to: capture magnetic stripe data through the first MSR, encrypt the magnetic stripe data, store the magnetic stripe data as encrypted into the memory means, decrypt the magnetic stripe data, and generate the varying magnetic fields from the inductor to transmit the magnetic stripe data as decrypted from the magnetic field transmitter to a reader head of a second MSR of a merchant point of sale (POS) device or other MSR device, the magnetic field transmitter

configured to transmit the magnetic stripe data as magnetic pulses without contact with the reader head.

The systems and methods disclosed herein provide a number of advantages, for example, the magnetic card track data can be captured and stored in the MST's secure memory means directly by the user or from the server

CLAIMS

What is claimed is:

1. A system for a magnetic stripe card capture, storage and transmission device comprising:

a mobile communication device; and

a magnetic stripe transporter (MST) comprising a microprocessor, a first magnetic stripe reader (MSR), a magnetic field transmitter including a driver and an inductor for transmitting magnetic pulses, a memory means, an audio jack interface and a communication interface, the driver being configured to send current and signal to the inductor to generate varying magnetic fields;

wherein the magnetic field transmitter is configured to transmit the magnetic pulses to a reader head of a second MSR of a merchant point of sale (POS) device or other MSR device without contact with the reader head;

wherein the MST interfaces with the mobile communication device through the audio jack interface or the communication interface; and

wherein the MST is adapted to capture magnetic stripe data and store the magnetic stripe data encrypted into the memory means and to decrypt and transmit the magnetic stripe data to the second MSR.

2. The system of claim 1, wherein the mobile communication device comprises a mobile wallet application and a valid mobile wallet account that initializes and unlocks the MST upon authentication of the mobile wallet account, wherein the MST can only operate with one valid mobile wallet account at a time.

3. The system of claim 2, wherein the magnetic stripe data is payment card data and the mobile communication device further comprises a payment POS or checkout application that interacts with the MST and accepts the payment card data from the MST.

4. The system of claim 2, wherein the mobile wallet application interacts with the MST to provide modes of operation including at least one of an

Initialization and Reset Mode, a Load Card Delete Card Mode, a Transmit & Use Mode, a Disconnected Transmit Mode, and a POS Card Reader Mode.

5. The system of claim 4, wherein the MST operated in the Initialization Reset Mode is configured to allow a user to pair a new or reset the MST to a valid mobile wallet account through the wallet application, and associate a serial number of the MST to the specific valid mobile wallet account such that a paired MST can only be accessed or used with the specific valid mobile wallet account it is paired with.

6. The system of claim 4, wherein the MST operated in the Load Card Delete Card Mode is configured to allow a user to swipe a card on the MSR of the MST, convert card data into encrypted card track data to be stored to the memory means on the MST, wherein the encrypted card track data is also transmitted to a wallet server via the mobile communication device and wallet application such that the server can decrypt the card track data and match the card track data to a name of the mobile wallet account.

7. The system of claim 4, wherein the MST is configured to allow a card issuer and wallet application provider to load an encrypted or non-encrypted card track data to the memory means on the MST remotely from a server.

8. The system of claim 7, wherein the MST is configured to allow a wallet application provider to load loyalty account information with magnetic stripe data in a discretionary field of the track data, to be read by the card issuer upon completion of a transaction.

9. The system of claim 4, wherein the MST operated in the Transmit and Use Mode is configured to allow a user to select a specific payment card or non-payment card stored in the MST as a default card to transmit, and to change the default card.

10. The system of claim 4, wherein the MST operated in the Disconnected Transmit Mode is configured to allow a user to unlock the MST after authentication of the wallet application to the MST and allow the MST to be unplugged or disconnected from the mobile communication device and remain on for a predefined period of time to transmit a default payment card stored on the MST to the second MSR of the merchant POS device or other MSR device in response to a pressing of a button on the MST.

11. The system of claim 4, wherein the MST operated in the Disconnected Transmit Mode is configured to allow magnetic stripe data to be transmitted by enabling a default card to be transmitted without first authenticating to the wallet account.

12. The system of claim 1, wherein the mobile communication device is one of a smartphone, a tablet, and a personal computer.

13. The system of claim 1, wherein the MST further comprises:

a battery; and

a light-emitting diode (LED) indicator adapted to illuminate upon a transmission and indicate a battery capacity of the battery.

14. The system of claim 1, wherein the MST stores payment card track data in a secure memory means or secure element that can be either on the MST or on the mobile communication device.

15. The system of claim 14, wherein the MST is configured to read a magnetic payment card's track data and to transmit the payment card track data to a POS application on the mobile communication device to be transmitted to a payment server for decryption and processing with merchant account information.

16. A method for a magnetic stripe card capture, storage and transmission device comprising:

pairing a magnetic stripe transporter (MST) with a mobile wallet account and associating a serial number of the MST to the mobile wallet account;

initializing and unlocking the MST upon receiving an authentication of the mobile wallet account;

capturing magnetic stripe card data;

storing the magnetic stripe card data encrypted into a memory means of the MST;

decrypting the encrypted magnetic stripe card data by the MST; and

generating varying magnetic fields from an inductor to transmit the decrypted magnetic stripe card data to a reader head of a first magnetic stripe reader (MSR) of a merchant point of sale (POS) or other MSR device without contact with the reader head.

17. The method of claim 16, further comprising pairing the MST with the mobile wallet account, and associating a serial number of the MST to the mobile wallet account.

18. The method of claim 16, further comprising allowing a user to reset the MST.

19. The method of claim 16, further comprising:

allowing a user to swipe a card on a second magnetic stripe reader (MSR) of the MST;

converting data on the card into encrypted card track data;

storing the encrypted card track data to a secure memory means of the MST; and

transmitting the encrypted card track data to a wallet server via a mobile communication device such that the wallet server can decrypt the encrypted card track data and match the card track data to a name of the mobile wallet account.

20. The method of claim 16, further comprising allowing a user to select a specific payment card stored in the MST as a default card to transmit in a connected or disconnected mode.

21. The method of claim 16, further comprising:

allowing a user to unlock the MST after authentication of a wallet application to the MST; and

allowing the MST to be disconnected from a mobile communication device and remain on to allow a user or a merchant to transmit a default card on the MST to the first MSR of the merchant POS system upon activation of a button on the MST.

22. A magnetic stripe transporter (MST) comprising:

a microprocessor;

a first magnetic stripe reader (MSR);

a magnetic field transmitter including a driver and an inductor, the driver being configured to send current and signal to the inductor to generate varying magnetic fields; and

a memory means,

wherein the MST is adapted to:

capture magnetic stripe data through the first MSR,

encrypt the magnetic stripe data,

store the magnetic stripe data as encrypted into the memory means,

decrypt the magnetic stripe data, and

generate the varying magnetic fields from the inductor to transmit the magnetic stripe data as decrypted from the magnetic field transmitter to a reader head of a second MSR of a merchant point of sale (POS) device or other MSR device, the magnetic field transmitter configured to transmit the magnetic stripe data as magnetic pulses without contact with the reader head.

23. The MST of claim 22, further comprising:

at least one of an audio jack interface and a communication interface,

wherein the MST is adapted to interface with a mobile communication device through the audio jack interface or the communication interface.