

# EXHIBIT 4

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### US Utility Patent Application for

## Method and apparatus for providing electronic purse

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## Method and apparatus for providing electronic purse

### BACKGROUND

#### Technical Field

**[0001]** The present invention is generally related to commerce over networks. Particularly, the present invention is related to electronic purses that can be advantageously used in portable devices configured for both electronic commerce (a.k.a., e-commerce) and mobile commerce (a.k.a., m-commerce).

#### Description of the Related Art

**[0002]** Single functional cards have been successfully used in enclosed environments such as transportation systems. One example of such single functional cards is MIFARE that is the most widely installed contactless smart card technology in the world. With more than 500 million smart card ICs and 5 million reader components sold, MIFARE has been selected as the most successful contactless smart card technology. MIFARE is the perfect solution for applications like loyalty and vending cards, road tolling, city cards, access control and gaming.

**[0003]** It is noticed that such enclosed systems are difficult to be expanded into other areas such as e-commerce and m-commerce because stored values and transaction information are stored in data storage of each tag that is protected by a set of keys. The nature of the tag is that the keys need to be delivered to the card for authentication before data can be accessed during a transaction. This constraint makes systems using such technology difficult to be expanded to an open environment

such as the Internet for e-commerce and cellular networks for m-commerce as the key delivery over a public domain network causes security concerns.

**[0004]** There is, thus, a need for a mechanism in devices, especially portable devices, functioning as an electronic purse (e-purse) to be able to conduct transactions over an open network with a payment server without compromising security.

### SUMMARY

**[0005]** This section is for the purpose of summarizing some aspects of embodiments of the present invention and to briefly introduce some preferred embodiments. Simplifications or omissions in this section as well as the title and the abstract of this disclosure may be made to avoid obscuring the purpose of the section, the title and the abstract. Such simplifications or omissions are not intended to limit the scope of the present invention.

**[0006]** Broadly speaking, the invention is related to a mechanism provided to devices, especially portable devices, functioning as an electronic purse (e-purse) to be able to conduct transactions over an open network with a payment server without compromising security. According to one aspect of the present invention, a device is loaded with an e-purse manager. The e-purse manager is configured to manage various transactions and functions as a mechanism to access an emulator therein. The transactions may be conducted over a wired network or a wireless network.

**[0007]** According to another aspect of the present invention, a three-tier security model is proposed, based on which the present invention is contemplated to operate. The three-tier security model includes a physical security, an e-purse security

and a card manager security, concentrically encapsulating one with another. Security keys (either symmetric or asymmetric) are personalized within the three-tier security model so as to personalize an e-purse and perform secured transaction with a payment server. In one embodiment, the essential data to be personalized into an e-purse include one or more operation keys (e.g., a load key and a purchase key), default PINs, administration keys (e.g., an unblock PIN key and a reload PIN key), and passwords (e.g., from Mifare). During a transaction, the security keys are used to establish a secured channel between an embedded e-purse and an SAM (Security Authentication Module) or backend server.

**[0008]** The invention may be implemented in numerous ways, including a method, system, and device. In one embodiment, the present invention is a method for providing an e-purse, the method comprises providing a portable device embedded with a smart card module pre-loaded with an emulator, the portable device including a memory space loaded with a midlet that is configured to facilitate communication between an e-purse applet therein and a payment server over a wireless network, wherein the portable device further includes a contactless interface that facilitates communication between the e-purse applet therein and the payment server, and personalizing the e-purse applet by reading off data from the smart card to generate one or more operation keys that are subsequently used to establish a secured channel between the e-purse and a SAM or a payment server.

**[0009]** According to another embodiment, the present invention is a system for providing an e-purse, the system comprises a portable device embedded with a smart card module pre-loaded with an emulator, the portable device including a memory space loaded with a midlet that is configured to facilitate wireless communication between an e-purse applet therein and a payment server over a wireless network, the portable device further including a contactless interface that

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