

**MULTI-FUNCTIONAL KIOSK****FIELD OF THE INVENTION**

- 5 The present invention relates to an interactive multi-functional kiosk, in particular, to a kiosk which is especially suitable for use in a retail outlet for performing a variety of transactions.

**BACKGROUND OF THE INVENTION**

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Presently, retail terminals used in retail outlets generally require some manual intervention. For example, when paying for items, a cashier has to key in prices and bag the items purchased. They usually do not enable self-checkout. Whilst self-checkout systems are available, these are expensive and generally tailored  
15 only performing a dedicated function.

It is not uncommon to find in retail outlets a variety of electronic devices relating to specialised applications, such as point-of-sales process, bar-code scanning, product enquiry, product location, advertisements, etc. They are generally  
20 purchased separately, and it is therefore expensive to build up an inventory of such machines. Furthermore, when such devices are located as kiosks stationed in public areas, they are often bulky and are not easily transportable or replaceable.

- 25 For example, US Patent No. 5,878,211 discloses a multi-functional retail terminal, but it involves the use of a portable computer and docking station. It provides essentially a point-of-sale device for use by the staff of the retailer and not for the customers. It is not meant as an interactive unit.

- 30 US Patent No. 5,826,267 discloses an information kiosk which provides selective access to the world-wide web in high traffic areas. Nonetheless, its function is limited to the specific purposes of providing information but not as, for example, a point-of-sale transactional device.

- 35 The present invention seeks to integrate various functions which may be useful in a retail environment into a single product unit. In the event, it may be convenient to use and save space and costs for the retailer. It may also be capable of

handling transactions locally or over a wide-area network, such as the internet infrastructure to increase efficiency.

### **SUMMARY OF THE INVENTION**

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According to the present invention there is provided a multiple-function kiosk suitable for use in a retail outlet or the like, said kiosk including:

- a housing;
- a screen associated with said housing for presentation of data;
- 10 at least one data input means; and
- control program means for managing said at least one input means and for processing information;
- said kiosk being connected over a network to a host and being adapted to provide at least two of the following:

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- (a) point-of-sale means to enable self-checkout;
- (b) electronic advertising means to present a plurality of advertisements on said screen;
- (c) network communications and video-conferencing means to enable
- 20 communication between communication points on said network;
- (d) electronic-commerce means for placing orders for items that are not available in said retail outlet;
- (e) electronic promotion means for dispensing promotion coupons according to individual customer preferences and for obtaining
- 25 customer feedback; and
- (f) electronic customer feedback means for collecting customer feedback on products and services, such as customer surveys.

The control program means may be adapted to provide product enquiry means

30 and security means associated with the point-of-sale means. The control program means may also be adapted to provide product information enquiry functions and/or provide a product locator with directional information from any source to any destination. The advertising means may be capable of being changed centrally from a location on the network to an individual kiosk. The

35 network communications and video-conferencing means may be connected to the internet. The electronic-commerce means may place orders both from a retailer to a supplier and by a customer to the retailer.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

A preferred embodiment of the present invention will now be described with  
5 reference to the accompanying drawings wherein:-

Figure 1 is a perspective view of a kiosk according to the preferred embodiment  
of this invention;

10 Figure 2 is a view of the kiosk from the right side of Figure 1;

Figure 3 is a sectional view of the kiosk in Figure 1 along sectional line A-A;

Figure 4 is a diagrammatic representation of the layers of the network set-up  
15 according to the preferred embodiment of this invention; and

Figure 5 illustrates the hardware connectivity of the system according to the  
preferred embodiment of this invention.

## **20 DETAILED DESCRIPTION OF PREFERRED EMBODIMENT**

### **Special features of the kiosk unit**

Figure 1 is a perspective view of a kiosk according to a preferred embodiment of  
25 this invention. The kiosk 10 consists of a housing 20 made of fibre glass or  
equivalent material with various self-service enabled functions. The fibre glass  
material allows for splash and weather-proofing. A collapsible frame on the kiosk  
caters for the flexibility of having a 15-inch, 17-inch or 18.1-inch touch-screen  
device 22. The kiosk 10 is compact and slim and has options for wall or desktop-  
30 mounting, or it may be floor-standing.

An internet web-based video camera or equivalent 24 is installed on the kiosk 10  
to capture all activities at the kiosk 10 to capture all selected activities for security  
purposes. A de-magnetizing device 26, is installed as an internal unit or as an  
35 external peripheral unit, for demagnetizing magnetic strips on items purchased by  
customers. An external peripheral unit (not shown) is attached to the main kiosk  
unit containing a keypad for any country's proprietary debit card devices, such as

the NETS EFT POS terminal used in Singapore.

The internal hardware devices are modular in nature and are self operating. A bag-holding unit (not shown) for holding the plastic bags for the customer to bag  
5 the items upon checking out is also attached.

As regards hardware configuration, the kiosk 10 preferably includes a Pentium II 200 MHZ processor or above or equivalent. There may be at least 64MB of DRAM, 8GB of Hard Disk space, a CD-ROM Drive, Floppy Drive , 3 COM Port, a  
10 USB Port and 2 LPT Ports. A modem card capable of a data-transfer rate of 56 kbps and above or equivalent is also preferred.

Optionally, in order to attain the functions envisaged in the preferred embodiment of the invention, an omni-directional scanner 30, magnetic and/or Smart Card  
15 reader 31, microphone 32, speakers 33 and a thermal or dot matrix printer 34 are also provided.

Figure 4 is a diagrammatic representation of the layers of the network set-up according to the preferred embodiment of this invention. A number of  
20 businesses are linked to a portal website which may be in turn linked to one or more satellite servers, depending on the network transmission load, over a wide-area network, such as over the internet. Each satellite server may transmit and receive data to and from one or more local servers, which in turn are connected to one or more kiosk units 10 connected to it.

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Figure 5 illustrates the hardware connectivity of the system according to the preferred embodiment of this invention. At a first layer, a host server is connected on the one hand to a participating company's server through an external application gateway server. On the other, it is connected to a  
30 participating bank's server through a merchant server and/or 3rd party payment gateway for payment purposes to enable cashless transactions. At a second layer, a number of satellite (sub-net) servers are connected to the host server. The second layer is optional and is only used if the network traffic load is deemed to be heavy. At a third layer, the sub-net servers can either be connected to  
35 individual kiosks, or they may instead be connected to customer servers for further data handling before being connected to the individual kiosks at a fourth layer.

At the user level, the kiosks are capable of a number of functions. The functions of the kiosk in the preferred embodiment of the invention are described in detail below:

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**Point-of sale means to enable self check-out with electronic payment**

A customer purchases his items, walks to the kiosk 10 and selects the self check-out option. The customer scans each item, one at a time or all items' information  
10 are captured instantaneously using Radio Frequency Identification system (RFID) until the last item is reached. The kiosk screen 22 displays the price for each item as they are scanned and accumulates the amount accordingly until the last item is scanned. As each item is scanned or as all items' information are instantaneously captured using RFID, any item that is tagged with a security  
15 magnetic strip can be de-magnetized by holding the item near to the de-magnetization device 26.

The customer drops each successfully scanned and de-magnetized item into a plastic bag holding unit with plastic bags. In the event of any unsuccessful de-  
20 magnetization of any item, the system will prompt the user to re-perform the de-magnetization of the item through the touch-screen display 22. When all of the items have been successfully scanned and de-magnetized, the system will prompt the customer for payment, via the touch screen 22. The customer will be given the option of any of the following payment modes : Credit card, Debit card  
25 or Smart card. The customer selects the payment mode and completes the payment. The system's printer 34 will print the receipt for collection by the customer. The customer removes the plastic bag containing the purchased and paid items. The customer leaves the kiosk unit 10 and the next customer begins the process again.

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During the self check-out process, the web video camera 24 captures all or selected activities at the kiosk 10. It is activated by either the customer touching the touch-screen 22 or through the activation of selected functions or sequence of functions, such as where "transaction void" is encountered.

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All product items or high value items are tagged with a magnetic strip which is preferably located within close proximity from the item bar code identifier and all

exits from the retail location are equipped with a magnetic detector device capable of detecting any magnetized magnetic strip on the product and generates an alarm and/or notification to the relevant outlet staff. The kiosk 10 has a de-magnetizing device that may de-magnetize each item upon scanning of the bar codes via the bar code scanner 30. Thus, any item not scanned via the bar code scanner 30 will not have its magnetic strip de-magnetized and upon the customer departing the retail location through any exit, the magnetic detector device would activate an alarm and/or notification to the relevant outlet staff. The kiosk unit 10 may also be equipped with a verifying mechanism in the form of software and/or hardware to detect unsuccessful de-magnetization of the item upon successful scanning of the item bar code or successful de-magnetization of the item upon unsuccessful scanning of the item bar code. In these events, the kiosk 10 may prompt the customer to re-perform the scanning and/or de-magnetization of the magnetic strip.

In order to detect any unsuccessful demagnetization of an item, a Radio Frequency Identification system (RFID) is used to identify all items or selected items. The RFID consists of a transmitter (a form of microchip) and a receiver (on the kiosk). The micro chip acts as the transmitter and/or transceiver and the kiosk as the receiver and/or transceiver. All product items or high-value items are tagged with a microchip with RF capability, a magnetic strip and a bar code product label. The information stored in the microchip includes the unique product identification information of each item, eg. its product code and description, price, etc. This microchip is preferably located within close proximity from the item bar code label identifier. The de-magnetization device 26 may have two capabilities:

- (a) De-magnetizing the magnetic component tagged to the product;
- (b) RF data detection and translator device for capturing the data on the microchip device using RF technology.

In the same way, the Radio Frequency Identification system (RFID) allows each, or all items tagged with the microchips with RF capability to have their information captured at the same time.

The de-magnetization device 26 may de-magnetize each unique item upon successful:

- (a) scanning of bar codes for capturing product identifier information

via the bar code scanner;

- (b) capturing of unique product identifier information from the microchip via the RF data detection and translator device; and
- (c) matching of the product identifiers from the product identifier information on the bar code label via the bar code scanner and product identifier information from the microchip via the RF detection device.

5 If a unique item has its bar code scanned by the scanner 30 and has its product identifier information captured, the de-magnetization device 26 will only generate a burst of de-magnetization pulse for the specific item scanned. Thus, any item that does not fulfill the above three conditions will not have its magnetic component de-magnetized.

15 A plastic bag holding unit is connected to a weighing scale monitoring system that monitors the existence of one or more items in the plastic bag and is equipped with a sensor that may trigger a security alert when the customer performs the check-out process by removing the plastic bag with one or more items without completing the payment.

20 Optionally, the kiosk 10 may provide customer promotion services. The kiosk 10 identifies whether the customer is a member via prompts on the touch-screen 22. If the customer has already used the VIP membership card for payment, the system would have identified the customer as a member and this step may be omitted. The customer confirms membership via the entry of his membership number or swiping of his membership card. The kiosk unit 10 displays general and/or customer-specific promotions and allows an option to print the promotion coupons through the printer 34. The customer takes the promotion coupons and on his/her current or next visit to the store is able to redeem the stated items at prices according to specific promotion schemes.

The kiosk, when used with its point-of-sales functionality, may optionally have the following features:

- 35 (a) automatic interface from the credit card and debit card terminal (EFT POS) to the point-of-sale system without the need for duplicate entry of the amount and identification of the card.

- (b) For credit card payment, there may be no need to use the EFT POS terminal as internet-based modes of payment using merchant servers can be used instead. However, the EFT POS terminals can be used as an alternative to the above method for whatever reasons, such as customer requirements. In this case, the EFT POS terminals may be encased within the kiosk unit.

### **Product information enquiry functions**

The customer may look for information on selected items by activating the enquiry functions via the touch-screen 22. The customer may select or enter either the product code, name, category or product usage or any related form of wild cards, or navigate through a general item grouping hierarchy. The system searches the product inventory database and displays a possible list of items. The customer makes the appropriate selection and narrows the search down to the targeted item(s). Upon selection of the targeted items, a picture of the item can be displayed and a multi-media presentation of the item can be activated via an option on the touch screen 22.

Optionally, the system can include the following special enquiry features. In the event of a successful search, the system will also recommend alternative products of higher, lower or equivalent value as the items and with that display a comparison of their differences, such as differences in their properties.

In the event of a successful search, the available quantity will also be displayed upon the customer's request through an option on the touch-screen 22. If there is no available quantity in the store, the system will display a list of outlets with their available quantity, sorted in any order within any sorting criteria, such as distance from the current outlet from any specified location or quantity available, etc. In the event of a successful search and the available quantity is more than one unit, the customer has the option to locate the product within the outlet through a function on the touch-screen 22.

**Product locator with directional information on the shortest path from any source to any destination**

The customer has the option to select from the Product information enquiry screen the Product Locator. The map of the outlet is displayed on the touch-screen 22 showing the shortest path from the current location of the customer, at the kiosk 10 or from any other specified reference location, to the location of the targeted product. A detailed description of the shelf number will also be displayed. The customer has the option to print the description of the shelf via the touch-screen 22 and have the information and/or navigation map printed by the printer 34. The customer takes the information receipt and proceeds to search for the targeted product.

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LCD displays or other visible indicators may be placed at various product locations within the outlet and they will light up when the customer successfully selects the product. These will act as a physical guide for the customer when searching for the targeted items. These LCD displays or other visible indicators are activated upon successful selection of the item and are de-activated either manually by the customer or retailer's staff or automatically after a certain time period has elapsed following activation.

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#### **Advertising means which can be remotely and dynamically maintained**

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The retailer upon whose premises the kiosk 10 is located can canvass for his supplier to run electronic advertisements on his kiosk 10 or allow for customers to have their personal advertisements on the kiosk. The retailer can charge the supplier and his customer for the advertisement.

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The retailer has the option to main the content of the advertisement centrally in order to ease maintenance and release of the advertisement. Deployment of the advertisements to the individual kiosk unit from another location is via the internet.

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Optionally, the system will control the validity of the advertisement via the entry of start and end date/time for each individual advertisement, which may run 24 hours a day. The system also allows customers to feedback their interest in any particular advertisement for the retailer to follow up on possible sales.

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#### **Network Communications and Video-Conferencing means**

The retailer's staff can use the kiosk 10 for daily routine face-to-face communications, such as daily briefings, without the need to be in the same proximity. The retailer's staff can send standard e-mail messages to the kiosk 10 during the course of the day for the purpose of operational communication. The  
5 retailer can also conduct regular training without having to gather all personnel at the same location or to have the trainer on-site. The multi-media features of the kiosk 10 would deliver effective training.

Further, the customer can seek personal assistance by using the kiosk 10 as an  
10 intercom system. A friendly face from the retailer's customer service section would appear timely on the touch-screen 22 to assist the customer.

#### **Electronic Commerce means**

15 The customer can place orders for items that are not directly available in the specific retail outlet via internet ordering. Options will be made available on the touch-screen 22 for the customer to place orders. This can be coupled with home delivery or self-collection at specified outlets which may be the nearest outlet from the existing location or from any customer-specified location. The  
20 retailer can also place orders from its supplier for ordering stocks during off-peak hours.

#### **Electronic Promotion means which can be remotely and dynamically maintained**

25 The retailer upon whose premises the kiosk is located can run electronic promotions on their kiosk unit. The retailer has the option to maintain the content of the promotion centrally in order to ease maintenance and release of the promotion. Deployment of the promotions to the individual kiosk from another  
30 location is also via the internet.

The retailer captures buying habits of customers via the relevant customer sales-related system on the kiosk and/or from any other conventional point-of-sales system to produce history-of-sales information for specific customers, such as  
35 VIP Membership customers. The customer enters the retailer's premises to purchase items and uses the kiosk with the promotion coupon through the touch-screen options. The kiosk unit registers the customer identification and based on

his/her historical buying habits generates customer-specific promotions. The customer takes the promotion coupons and on his/her current or next visit is able to redeem the stated items at prices according to a specific promotion scheme.

- 5 The kiosk unit 10 is preferably positioned strategically according to the various combination of functions offered and/or used. The versatility and easy portability of the kiosk unit makes this possible. For example, the kiosk unit 10 can be positioned near exits for using the self check-out function with electronic payment with credit, debit and Smart cards. For product information enquiry functions, it  
10 can be positioned near the entrances and other prominent places. For electronic advertisement, the kiosk unit 10 can be located just outside the outlet to attract passers-by.

- Although the description describes the use of the kiosk in a retail outlet, it can  
15 also be located anywhere else where its convenience and multi-functionality are useful, such as at ticketing companies, public service companies, government agencies, banks, stock brokerage firms and public areas.

- While the invention is susceptible to various modifications and alternative forms,  
20 a specific embodiment thereof has been shown by way of example in the drawings and the above detailed description. It should be understood, however, that there is no intent to limit the invention to the particular form disclosed, but on the contrary, the intention is to cover all modifications, equivalents and alternatives falling within the spirit and scope of the invention as defined in the  
25 appended claims.

**PARTS LIST WITH REFERENCE TO THE DRAWINGS**

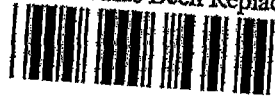
| <b>Part No.</b> | <b>Name of Part</b>                  |
|-----------------|--------------------------------------|
| 5 10            | Kiosk                                |
| 20              | Kiosk housing                        |
| 22              | Touch-screen device                  |
| 24              | Web-based Video camera or equivalent |
| 26              | De-magnetization device              |
| 10 30           | Omni-directional scanner             |
| 31              | Magnetic and/or Smart card reader    |
| 32              | Microphone                           |
| 33              | Speakers                             |
| 34              | Receipt printer                      |

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CLAIMS



1. A multiple-function kiosk suitable for use in a retail outlet or the like, said kiosk including:
  - 5 a housing;
  - a screen associated with said housing for presentation of data;
  - at least one data input means; and
  - control program means for managing said at least one input means and for processing information;
- 10 said kiosk being connected over a network to a host and being adapted to provide at least two of the following:
  - (a) point-of-sale means to enable self-checkout;
  - (b) electronic advertising means to present a plurality of  
15 advertisements on said screen;
  - (c) network communications and video-conferencing means to enable communication between communication points on said network;
  - (d) electronic-commerce means for placing orders for items that are not available in said retail outlet;
  - 20 (e) electronic promotion means for dispensing promotion coupons according to individual customer preferences and for obtaining customer feedback; and
  - (f) electronic customer feedback means for collecting customer feedback on products and services, such as customer surveys.
- 25 2. A multiple-function kiosk according to claim 1 wherein said advertising means is capable of being changed centrally from a location on the network to an individual kiosk.
- 30 3. A multiple-function kiosk according to claim 1 wherein said network communications and video-conferencing means are connected to the internet.
4. A multiple-function kiosk according to claim 1 wherein said kiosk is adapted to provide product enquiry means and security means associated with  
35 said point-of-sale means.
5. A multiple-function kiosk according to claim 1 wherein said kiosk is



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adapted to provide product information enquiry functions.

6. A multiple-function kiosk according to claim 1 wherein said kiosk is adapted to provide a product locator with directional information from any source  
5 to any destination.

7. A multiple-function kiosk according to claim 1 wherein said electronic-commerce means places orders both from a retailer to a supplier and by a customer to the retailer.



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