

A MULTIFUNCTIONAL KIOSK

TECHNICAL FIELD

5 This invention relates generally to a kiosk. More particularly, the present invention relates to a multifunctional kiosk with a vending function.

BACKGROUND ART

10 Hotel automation is one of the most efficient directions for hotel owners that want to maintain their position on the market and minimize operating costs. Hoteliers are slowly beginning to realize that automation is becoming more and more important. Some are about to take their initiatives. Others have been using such options for a long time. Hotel automation solutions facilitate the work of
15 receptionists at individual stages of guest service in a systematic and organized manner.

 The full spectrum of hotel automation solutions can be observed in the form of self-service kiosks. These devices are becoming progressively common,
20 allowing guests to complete their check-in/check-out procedures without the front desk assistance. Clear and simple messages make check-in/check-out procedures simple and hassle-free.

 In order to reap further benefits of the self-service kiosks, there are many
25 attempts made to improve operation and structure of the existing self-service kiosks, some of these examples are discussed in following prior art references: -

 US20090070155A1 discloses a method to manage a plurality of guest rental units, wherein the method provides a plurality of guest rental units, wherein
30 each guest rental unit comprises one or more bed rooms and a bath room. The

method further disposes a different rental kiosk adjacent to, and associated with, each guest rental unit, displays on each rental kiosk a vacancy status for a designated guest rental unit, and accepts a rental payment at each rental kiosk for a designated guest rental unit. In certain embodiments, the method displays upon
5 request the availability of a rental unit in accordance with a previous reservation made by the traveller. The kiosk displays this availability, and upon approval of the travellers credit card, assigns a room or rental unit to the traveller and enables said travellers credit card to also enable a locking device on the room or rental unit to permit entry to the traveller.

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EP2709045A1 discloses a system for making a hotel reservation and for automatic check-in, comprising a host server with databases for storing user data and biometric data of a guest, and adapted for allowing the guest to select a hotel and to make a reservation, and adapted for transmitting the user and biometric
15 data to a hotel server; the hotel server adapted for receiving the lodging reservation and the user data and biometric data, and for transmitting it to a kiosk; the kiosk comprising a kiosk database for storing the user data and biometric data, and a biometric identification module, and means for assigning a room, and a key dispenser module for providing a key, and a guest categorization engine and an
20 information selection and presentation engine to present highly personalized information, and optionally a review writer module integrated in the system.

The aforementioned references may strive to provide improved self-service kiosks. Nevertheless, they still have a number of limitations and shortcomings. For
25 instance, the self-service kiosks in the aforementioned references do not possess a vending function to generate profits for the hoteliers and to meet customer expectations. Furthermore, the self-service kiosks in the aforementioned references are not capable of providing refined human-kiosk interaction to customers for better accommodation experience.

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Accordingly, there remains a need to have a multifunctional kiosk which overcomes the aforesaid problems and shortcomings.

SUMMARY OF THE INVENTION

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The following presents a simplified summary of the invention in order to provide a basic understanding of some aspects of the invention. This summary is not an extensive overview of the invention. Its sole purpose is to present some concepts of the invention in a simplified form as a prelude to the more detailed description that is presented later.

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It is an objective of the present invention to provide a multifunctional kiosk with profitable vending functions.

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It is also an objective of the present invention to provide a multifunctional kiosk that provides refined human-kiosk interaction using an artificial intelligence algorithm.

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It is yet another objective of the present invention to provide a multifunctional kiosk which can cater for multiples users simultaneously to save cost, space and time.

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It is a further objective of the present invention to provide a multifunctional kiosk that is compatible with conventional room door key lock systems and allows hoteliers to convert their hotels into smart hotel without expensive room card system upgrade.

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Accordingly, these objectives may be achieved by following the teachings of the present invention. The present invention relates to a multifunctional kiosk comprising: at least one user interface interactively communicating with a user; and an online central processing unit communicably connected to the user

interface to operate according to a data entry; characterized by a storage unit comprising a room card storage unit and a product storage unit; a dispensing unit operatively connected to the storage unit and the online central processing unit for dispensing a room card, a product or a combination thereof; a programming unit to
5 programme the room card prior to dispensing; wherein the data entry includes manual input data by the user.

The foregoing and other objects, features, aspects and advantages of the present invention will become better understood from a careful reading of a
10 detailed description provided herein below with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

15 So that the manner in which the above recited features of the present invention can be understood in detail, a more particular description of the invention, briefly summarized above, may have been referred by embodiments, some of which are illustrated in the appended drawings. It is to be noted, however, that the appended drawings illustrate only typical embodiments of this invention and are
20 therefore not to be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

These and other features, benefits, and advantages of the present invention will become apparent by reference to the following text figures, with like reference
25 numbers referring to like structures across the views, wherein:

Fig. 1 is a perspective view illustrating a multifunctional kiosk of a first embodiment in the present invention;

30 Fig. 2 is a perspective view illustrating a multifunctional kiosk of a second embodiment in the present invention; and

Fig. 3 is a flow chart illustrating an automatic synchronization system in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

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As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention, which may be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted
10 as limiting but merely as a basis for claims. It should be understood that the drawings and detailed description thereto are not intended to limit the invention to the particular form disclosed, but on the contrary, the invention is to cover all modifications, equivalents and alternatives falling within the scope of the present invention as defined by the appended claims. As used throughout this application,
15 the word "may" is used in a permissive sense (i.e., meaning having the potential to), rather than the mandatory sense (i.e., meaning must). Similarly, the words "include," "including," and "includes" mean including, but not limited to. Further, the words "a" or "an" mean "at least one" and the word "plurality" means one or more, unless otherwise mentioned. Where the abbreviations or technical terms
20 are used, these indicate the commonly accepted meanings as known in the technical field.

The present invention is described hereinafter by various embodiments with reference to the accompanying drawings, wherein reference numerals used
25 in the accompanying drawings correspond to the like elements throughout the description. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiment set forth herein. Rather, the embodiment is provided so that this disclosure will be thorough and complete and will fully convey the scope of the invention to those skilled in the art. In the
30 following detailed description, numeric values and ranges are provided for various aspects of the implementations described. These values and ranges are to be

treated as examples only, and are not intended to limit the scope of the claims. In addition, a number of materials are identified as suitable for various facets of the implementations. These materials are to be treated as exemplary, and are not intended to limit the scope of the invention.

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The present invention relates to a multifunctional kiosk (100) comprises at least one user interface (2) interactively communicating with a user; and an online central processing unit communicably connected to the user interface (2) to operate according to a data entry; characterized by a storage unit comprising a room card storage unit and a product storage unit; a dispensing unit operatively
10 connected to the storage unit and the online central processing unit for dispensing a room card, a product or a combination thereof; a programming unit to programme the room card prior to dispensing; wherein the data entry includes manual input data by the user.

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In accordance with an embodiment of the present invention, the multifunctional kiosk (100) is implemented in a hotel. Alternatively, the multifunctional kiosk (100) can be implemented in a motel, a hostel, a guest suite or any other traveller hosting facilities.

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In accordance with an embodiment of the present invention, the user can be a guest, a visitor or any traveller hosting facilities users.

Referring to the drawings as shown in Figs. 1 to 2, the invention will now be
25 described in more details.

Fig. 1 is a perspective view illustrating a multifunctional kiosk (100) of a first embodiment in the present invention. The multifunctional kiosk (100) comprises a cabinet (14), a user interface (2), an online central processing unit, a storage unit,
30 a dispensing unit, a programming unit, an identity verification unit (10), a payment unit (8) and a receipt printer (6).

In accordance with an embodiment of the present invention, the user interface (2) is a touchscreen device which can interact with the user through outputting information to the user and receiving the manual input data from the user. For example, the touchscreen device can display room availability, available products for sale and advertisement to the user. Likewise, the user can choose a preferred room, select products, reserve a room or insert personal information via the touchscreen device. Preferably, the touchscreen device is a liquid crystal display (LCD) touchscreen panel. In a preferred embodiment, the multifunctional kiosk (100) comprises multiple user interfaces (2). For example, the multifunctional kiosk (100) comprises three multiple interfaces to cater for three users simultaneously. One user interface (2) can be disposed on the front side of the cabinet (14) and the other two user interfaces (2) can be disposed on the left side and the right side of the cabinet (14) respectively. Furthermore, these three user interfaces (2) can be controlled and connected to one online central processing unit for saving cost and internal space of the cabinet (14). As a result, it is not necessary to have three separate multifunctional kiosks (100) to meet large number of check-in demands.

In accordance with an embodiment of the present invention, the storage unit comprises the room card storage unit and the product storage unit. The room card storage unit is configured to store the room cards while the product storage unit is configured to store the products including, but not limited to, food, beverage, toys and toiletry. Both of the storage units physically reside in the cabinet (14). Both of the storage units are operatively connected to the dispensing unit and communicably connected to the online central processing unit. The room card storage unit can be a card deck box which releasably keeps the room cards. The product storage unit can be any conventional vending machine storage units.

In accordance with an embodiment of the present invention, the dispensing unit is configured to dispense the room cards and the products from the storage

unit. Preferably, the dispensing unit comprises a room card dispenser (12) and a product dispenser (4). The room card dispenser (12) can dispense the room cards released from the room card storage unit while the product dispenser (4) can dispense the products released from the product storage unit. Referring to Fig. 1, the room card dispenser (12) can be disposed beside the user interface (2) while the product dispenser (4) can be disposed below the user interface (2).

In accordance with an embodiment of the present invention, the programming unit is configured to programme the room cards to provide the room cards with room access. Preferably, the programming unit is disposed between the room card storage unit and the room card dispenser (12) so that the room cards can be programmed after they are released from the room card storage unit and before they go to the room card dispenser (12). In a preferred embodiment, the programming unit programmes each room card twice with two different codes for improved efficiency. The first programming is to provide the room card with room access and the second programming is to provide the room card with elevator floor access. Example of the programming unit includes, but not limited to, an encoder.

In accordance with an embodiment of the present invention, the identity verification unit (10) is configured to extract identity information of the user. Preferably, the identity verification unit (10) is a passport scanner which can extract identity information of the user from the passport of the user. Alternatively, the identity verification unit (10) can be an identity card reader which extracts identity information of the user from the identity card of the user. The identity verification unit (10) is communicably connected to the online central processing unit. The identity verification unit (10) can be further coupled with optical character recognition (OCR) scanning function to help user to automatically fill in the identity information by recognising texts displayed on the passport or the identity card for expedited and smooth check-in procedure. Further, the identity verification unit (10) can be employed to verify the identity of the user prior to selling certain products.

For example, the user is required to use the identity verification unit (10) to verify his identity when he is going to purchase restricted products such as cigarettes and alcoholic drink. If the online central processing unit detects that the user is below 18 years old after obtaining the extracted identity information, the user interface (2) will be triggered by the online central processing unit to prompt a message stating that the selected product is only available for people who are above 18 years old and the product storage unit will be locked to prevent the selling of the aforesaid products.

10 In accordance with an embodiment of the present invention, the payment unit (8) is configured to process payment and collect balance. The payment unit (8) can be a cash note acceptance unit, a debit/credit card reader or a quick response (QR) code scanner for electronic wallets. The payment unit (8) is communicably connected to the online central processing unit.

15 In accordance with an embodiment of the present invention, the multifunctional kiosk (100) comprises a receipt printer (6) to print receipt for any successful payments made. The receipt printer (6) is communicably connected to the online central processing unit.

20 In accordance with an embodiment of the present invention, the online central processing unit is configured to receive the data entry from the user. The data entry can be the manual input data inserted by the user via the user interface (2). The manual input data may include, but not limited to, room booking number, room preferences, personal information, additional room service requests and product selection. The data entry can also be the identity information extracted from the identity verification unit (10). The data entry can also be the identity information automatically filled in by the identity verification unit (10) through OCR function. The data entry can be the payment amount received by the payment unit (8). The online central processing unit can be further connected to an online database via a communication interface. The communication interface can be a

local area network (LAN) interface, a transmission control protocol/internet protocol (TCP/IP) connection or a wireless communications system. The online central processing unit can compare the received data entry with data stored in the online database from online booking. If the received data entry agrees with the stored data, the online central processing unit operates the storage unit, the programming unit, the receipt printer (6) and the user interface (2) accordingly.

For example, the user makes an online room reservation and provides his personal information which will be stored in the online database. When he comes to the multifunctional kiosk (100) for self-check-in, he inserts his personal information through the user interface (2) and scans his passport using the identity verification unit (10). Subsequently, the online central processing unit, which connects to the online database, compares the given data entry with the stored data, for example, reservation data of the user stored in the online database. If the given data entry and the stored data tally, the online central processing unit operates the programming unit to programme a room card, and operates the storage unit to release the programmed room card. For another example, the user wishes to purchase the products in the multifunctional kiosk (100) through the user interface (2). The user can select the desired product as well as make payment via the payment unit (8). After that, the online central processing unit receives information of the selected product and payment. If the received payment is sufficient and the selected product is available, the online central processing unit operates the product storage unit to release the selected product. The product is then dispensed via the product dispenser (4). The online central processing unit may operate the receipt printer (6) to print a receipt for the successful payment made. If the amount of the payment made is more than the price of the selected product, the online central processing unit operates the payment unit (8) to release the balance for the user to collect. For another example, if the user has paid deposit during the room reservation or the check-in procedure, the online central processing unit can operate the payment unit (8) to return the deposit to the user during the check-out procedure.

In accordance with an embodiment of the present invention, the multifunctional kiosk (100) comprises a reward system. The online central processing unit can obtain the number of times that a user performs self-check-in using the multifunctional kiosk (100) from the online database via the communication interface according to the name, identity card number or membership number of the user. Once the online central processing unit finds that the user has performed self-check-in using the multifunctional kiosk (100) for a certain number of times, the online central processing unit can operate the product storage unit to release a product as a reward to the user for being a regular customer or guest.

Fig. 2 is a perspective view illustrating a multifunctional kiosk (100) of a second embodiment in the present invention. Referring to Fig. 2, the multifunctional kiosk (100) comprises a room key locker (16) which is disposed adjacent to the user interface (2) and communicably connected to the online central processing unit. The room key locker (16) comprises a plurality of compartments. Every compartment can be equipped with a lock to store the room keys safely. For example, compartment number 5 is configured to store the room key of room number 5. Once the user completes the check-in procedure and he is given room number 5, the online central processing unit operates the room key locker (16) to unlock the compartment number 5 for the user to obtain the room key of room number 5. During the check-out procedure, the online central processing unit can randomly select an empty compartment for the user to return the room key. For example, even though the user obtains the room key from the compartment number 5, he may need to return the room key to the empty compartment number 9 which is instructed by the online central processing unit via a message from the user interface (2) so that no one can know which compartment is dedicated for which room key. With the room key locker (16), certain hotels can continue to use their existing room key systems instead of upgrading their room key systems to room card systems.

Further, every compartment of the room key locker (16) can be equipped with a radio frequency (RF) reader/detector communicably connected to the online central processing unit to detect if a room key associated with a RF tag key chain or sticker has already been returned to the room key locker (16). If the RF reader
5 does not detect presence of the room key at the check-out time, the online central processing unit will send a message to the registered phone number of the user or guest to remind the guest that the room key has not been returned yet and additional fees will apply for late check-out. In addition, if the guest has completed
10 the check-out procedure and the RF reader does not detect presence of the room key, the online central processing unit will send a message to the guest via the user interface (2) to inform the guest that the room key has not been returned yet to prevent fraud or avoid loss of the room key.

15 In accordance with an embodiment of the present invention, the online central processing unit is incorporated with an artificial intelligent algorithm to provide actual information and recommendation. The artificial intelligent algorithm is deployed to achieve refined human-kiosk interaction. For example, the artificial intelligent algorithm automatically tracks on the local weather based on weather
20 forecast. If the artificial intelligent algorithm detects that it is going to rain, the online central processing unit incorporated with the artificial intelligent algorithm will prompt a reminder to the user and suggest the user to buy an umbrella via the user interface (2). Thereafter, the user can buy the umbrella through the multifunctional kiosk (100). For another example, the artificial intelligent algorithm
25 automatically identifies facial expression of the user during the check-in procedure in conjunction with a facial recognition unit and a camera (24). If the artificial intelligent algorithm detects that the user is not in a good mood, the online central processing unit incorporated with the artificial intelligent algorithm will operate the product storage unit to release a product as a gift to the user so as to lift the spirit of
30 the user. For another example, the artificial intelligent algorithm can detect whether a child is standing beside the user during the check-in procedure in

conjunction with the facial recognition unit and the camera (24). If there is a child, the artificial intelligent algorithm will determine the gender of the child and the online central processing unit incorporated with the artificial intelligent algorithm will operate the product storage unit to drop a toy which suits the gender of the child as a welcome gift to achieve interactive and refined check-in experience. For another example, the artificial intelligent algorithm can determine whether the user is going on a family trip or a business trip based on the information or data stored in the online central processing unit or the online database. Accordingly, the artificial intelligent algorithm can propose the recommendations including, but not limited to, places worth visiting, popular local food or business services to the user via the user interface (2). In addition, the artificial intelligent algorithm can suggest the user to buy vouchers or admission tickets to utilize the vending function of the multifunctional kiosk (100) and to enhance travel experience of the user.

In accordance with an embodiment of the present invention, the multifunctional kiosk (100) comprises an intercommunication device (26). The intercommunication device (26) can be a conventional stand-alone voice communication system which allows interaction between the user and hotel operators in the event that the multifunctional kiosk (100) undergoes technical issues or the user wishes to seek assistance on how to operate the multifunctional kiosk (100). Preferably, the intercommunication device (26) is communicably connected to the online central processing unit and constantly monitored by the hotel operators through the communication interface, in which the hotel operators can provide on-site guidance to the user in relation to operation of the multifunctional kiosk (100) and immediate technical support to kiosk inoperative concerns through voice access. Further, the user can seek assistance from the hotel operators via live video chat through the use of the camera (24) and the user interface (2). The hotel operators can attend to queries of the user by receiving image input from the camera (24) and giving instruction output to the user from the user interface (2). With the intercommunication device (26) and the camera (24),

an effective, convenient and unmanned customer support system can be offered by the multifunctional kiosk (100) on top of the self-check-in and vending functions.

In accordance with an embodiment of the present invention, the multifunctional kiosk (100) comprises a remote switching device for switching on/off a power relay (20) remotely. The remote switching device further comprises a signal receiving unit and a signal converter. A user may issue a switching on/off signal from a different location using a remote control transmitter including, but not limited to, a remote controller and a mobile installed with a remote control application. Once the multifunctional kiosk (100) receives the switching on/off signal through the signal receiving unit, the signal converter converts the switching on/off signal into a switching on/off command and the switching on/off command effects switching on/off of the multifunctional kiosk (100) through the power relay (20) connected to the power supply. In the event that the multifunctional kiosk (100) software reset cannot be solved via built-in software, one can opt for the remote switching device to switch on/off the multifunctional kiosk (100) through the remotely-controlled power relay (20).

In accordance with an embodiment of the present invention, the multifunctional kiosk (100) comprises a note acceptor (18) and a coin acceptor (20). The note acceptor (18) and the coin acceptor (20) are intended to collect notes and coins from the user to convert them into a preferred currency in electronic form. For example, a Thai tourist can deposit his Malaysian Ringgit into the note acceptor (18) and the coin acceptor (20). Thereafter, the Thai tourist can select the currency that he wishes to convert such as Thai Baht and the acceptors (18 and 20) will convert the Malaysian Ringgit accordingly and send the converted money to the tourist's digital wallet or electronic wallet. The acceptors (18 and 20) can be communicably connected to the online central processing unit and disposed below the receipt printer (6) on the front side of the cabinet (14). Alternatively, the note acceptor (18) and the coin acceptor (20) can act as a means to receive payment from the user for product purchase or room reservation. Upon

successful transactions of currency conversion, product purchase or room reservation, the online central processing unit can operate the receipt printer (6) to print receipt or send electronic receipt to the user via email.

5 Fig. 3 is a flow chart illustrating an automatic synchronization system in accordance with an embodiment of the present invention. The multifunctional kiosk (100) can comprise an automatic synchronization system. In the automatic synchronization system, the latest data stored in the online database from online booking, for example, online booking data of the last 3 days can be further locally
10 stored and updated in the multifunctional kiosk (100) on a first-in-first-out basis so that the online central processing unit can continue to access the online booking data in the event that the communication interface is not functioning. For example, a user can proceed to have check-in/out procedures even though network connection is not working or offline because the online central processing unit can
15 retrieve the data of the user from the locally-stored online booking data instead of retrieving the data from the online database. After regaining the network connection, all of the reservations or check-in/out procedures that have been conducted during the offline time can be automatically synchronized between the online database and the online central processing unit. Further, the payment unit
20 (8) can be additionally connected to mobile internet access on top of the existing communication interface so that the user can continue to perform room reservation, product purchases or any kinds of payment in the event that the existing communication interface is not working or offline. The information of the product purchases can be automatically synchronized between the online
25 database and the multifunctional kiosk after regaining the network connection.

The exemplary implementation described above is illustrated with specific characteristics, but the scope of the invention includes various other characteristics.

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Various modifications to these embodiments are apparent to those skilled

in the art from the description and the accompanying drawings. The principles associated with the various embodiments described herein may be applied to other embodiments. Therefore, the description is not intended to be limited to the embodiments shown along with the accompanying drawings but is to be providing
5 broadest scope of consistent with the principles and the novel and inventive features disclosed or suggested herein. Accordingly, the invention is anticipated to hold on to all other such alternatives, modifications, and variations that fall within the scope of the present invention and appended claim.

10 It is to be understood that any prior art publication referred to herein does not constitute an admission that the publication forms part of the common general knowledge in the art.

In the claims which follow and in the preceding description of the invention,
15 except where the context requires otherwise due to express language or necessary implication, the word "comprise" or variations such as "comprises" or "comprising" is used in an inclusive sense, i.e. to specify the presence of the stated features but not to preclude the presence or addition of further features in various embodiments of the invention.

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Description of the reference numerals used in the accompanying drawings according to the present invention:

Reference Numerals	Description
100	Multifunctional kiosk
2	User interface
4	Product dispenser
6	Receipt printer
8	Payment unit
10	Identity verification unit

12	Room card dispenser
14	Cabinet
16	Room key locker
18	Note acceptor
20	Coin acceptor
22	Power relay
24	Camera
26	Intercommunication device

CLAIMS:

1. A multifunctional kiosk (100) comprising:
at least one user interface (2) interactively communicating with a user; and
5 an online central processing unit communicably connected to the user interface (2) to operate according to a data entry;
characterized by
a storage unit comprising a room card storage unit and a product storage unit;
10 a dispensing unit operatively connected to the storage unit and the online central processing unit for dispensing a room card, a product or a combination thereof;
a programming unit to programme the room card prior to dispensing;
wherein the data entry includes manual input data by the user.
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2. The multifunctional kiosk (100) as claimed in claim 1, wherein the kiosk (100) comprises multiple user interfaces (2) to cater for multiple data entries simultaneously.
- 20 3. The multifunctional kiosk (100) as claimed in claim 1, wherein the room card is programmed twice for room access and elevator access prior to dispensing.
4. The multifunctional kiosk (100) as claimed in claim 1, wherein the kiosk
25 (100) comprises a room key locker (16) for storing a plurality of room keys.
5. The multifunctional kiosk (100) as claimed in claim 1, wherein the kiosk (100) comprises an identity verification unit (10) for extracting identity information of the user.

6. The multifunctional kiosk (100) as claimed in claim 1, wherein the kiosk (100) comprises a payment unit (8) to process payment and collect balance/deposit.

5 7. The multifunctional kiosk (100) as claimed in claim 1, wherein the online central processing unit is incorporated with an artificial intelligent algorithm to provide actual information and recommendation.

8. The multifunctional kiosk (100) as claimed in claim 1, wherein the
10 multifunctional kiosk (100) comprises a remote switching device for switching on/off a power relay (20) remotely.

9. The multifunctional kiosk (100) as claimed in claim 1, wherein the multifunctional kiosk (100) comprises a note acceptor (18) and a coin acceptor (20)
15 for converting a currency into another currency in electronic form.