

PLATFORM-INDEPENDENT SYSTEM FOR COLLECTING AND CONSOLIDATING POINT OF SALE (POS) DATA AND METHOD THEREOF

5 TECHNICAL FIELD

[0001] This invention generally relates to data managing systems; and more particularly, it concerns a platform-independent, non-invasive method and system for collecting, consolidating and processing of data from a point of sale (POS) system.

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BACKGROUND ART

[0002] Implementing a point of sale (POS) system is currently the preferred practice for a great majority of business owners worldwide owing to its features that provide monitoring or managing of numerous different areas of business operations and data transactions. POS systems have been the favoured substitute for conventional cash registers with limited capabilities. The current POS systems typically comprises at least one server configured to manage at least one check out terminals or stations; and a POS software designed based on the respective industry the business owner is in. Accordingly, the POS software can be niche-centric.

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[0003] Generally when in effect, the POS system streamlines the business operations of the respective retailer or business owner; whereby the tasks provided includes tracking of transactions and records; facilitates purchases and even for employee management purposes. In some instances the POS system can be configured to be integrated with the available accounting system for each business owner to generate financial reports.

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[0004] In view of a shopping mall or complex having a plurality of retailers or business owners; each retailer is required to provide at least an overall purchase report within a predetermined period of time to the respective mall or complex operator. In this process the POS system plays a role for each retailer in providing financial reports; whereby the report are then compiled manually by the operator for their records and further analysis. The latter step of manually compiling can be a major encumbrance for the operator of malls and complexes and is often a time-consuming task; more particularly in the event that there is a large number of retailers within a mall or complex. Further, albeit its expediency in generating

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reports based on daily purchases; these reports are generally displayed or printed out as hardcopies; or physically provided for safekeeping. Accordingly, as the sales data is currently captured manually or physically; operation managers or mall operators thereby experience difficulties when it is time to collate information from each of the retailers within the respective mall. With the conventional system, a mall operator collects the printed receipts or documents of the likes to be collated; so as to attain the sales information on daily basis or over a predetermined period. Such process can be time-consuming, troublesome and owing to the fact that all data are manually entered and collated; accuracy can be compromised.

[0005] U.S. Patent Application No. **14/0040014** (Facebook Inc) endeavours to alleviate the above-discussed shortcoming by providing an ability to capture data digitally by fixing a sniffer module within the POS system of the retailer. The sniffer module is adapted to intercept receipt print queue; recognising the content and then generating the exact data in digital format which can be sent to a server for retrieval or further processing. This system partially addresses the problems associated to conventional systems; and more particularly to manually collection of sales data. It is adapted to collect and thus analyse sales data over a period of time for safekeeping of the respective vendor or retailer; and does not addresses the problem for a mall operator that handles multiple vendors or retailers. Further, the installation or fixing a sniffer module within a POS system at the retailer's end can be considered as an invasive approach hence entails modifications on the POS system in order to accommodate the module; apart from compromising the security aspect of the POS system. Therefore, in the event that there are multiple vendors or retailers; a plurality of sniffer modules have to be installed; subject to the number of vendors or retailers within the mall. Such requirement can lead to increased cost; either to be borne by the mall operator or the retailers; while creating an unwarranted prerequisite of installing an invasive module within all POS systems; to be imposed on all retailers for data collection. The latter circumstance may not be acceptable for all retailers or vendors within the mall. In view of data recognition, there is no explicit disclosure in enabling selection of data, thus unwanted data may be captured.

[0006] In US Patent Application No **13/492,568** (Laporte et al), there is provided a system adapted to augment or modify data received from the POS terminal to a format or output readable by another device, and more particularly a mobile device of a customer. Similar to that as disclosed in US Application '0014, the system and method is suitable to manage

transactions performed by one shop or retailer and may not fit to handle multiple vendors.

[0007] There is therefore a need for a non-invasive with a plug-and-play methodology system that is able to digitally collate, organize, analyse as well as combine data from a plurality of vendors.

SUMMARY OF INVENTION

[0008] In one aspect, there is provided a system for collecting and consolidate point of sales (POS) data comprising: at least one printing device; a point of sale (POS) terminal being in communication with the printer and configured to send a printing protocol data to the printer; a processing device that is platform-independent and configured to be in communication with the POS terminal and the printer such that any data being transferred from the POS terminal to the printer are captured digitally; an analytical server 12 configured to be in communication with the processing device 10 such that it receives the captured data and analyses said data to generate at least one type of report; wherein the processing device 10 is configured to select relevant data to be captured ; and sending said selected data to the analytical server 12 for further processing and to generate at least one type of report.

[0009] In one embodiment, the system for collecting and consolidate data in wherein the processing device captures data by interpreting the printing protocol data and rebuilding the receipt based on the interpretation.

[0010] In another embodiment, the system for collecting and consolidate data wherein the data from the POS terminal may be provided in ASCII type or non-ASCII type; whereby in the event that the data in in ASCII format, the processing device can directly select the relevant data and send them to the analytical server for further processing.

[0011] In yet another embodiment, the system for collecting and consolidate, wherein the data from the POS terminal; wherein if the data sent from the POS terminal is in non-ASCII format, the processing device converts the data into an OCR or readable format and then selects the relevant data to be sent to the analytical device.

[0012] In another embodiment, the system for collecting and consolidate data wherein the data captured can include image, texts, POS terminal identification, tenant identification, and

sales data.

[0013] In yet another embodiment, the system for collecting and consolidate sales data, wherein the processing device **10** is a non-invasive, plug-and-play operable and thus does not interrupt any communication of data between the POS terminal **5** and printer **14**.

[0014] In a further embodiment, the system for collecting and consolidate sales data, wherein the types of report include: a tenant overview report, an individual tenant sales report; retails types report; sales report based on types of goods and services; and sales report based on locations or zones.

[0015] In another embodiment, the system for collecting and consolidate sales data, wherein there is a plurality of POS terminals having at least one printer.

[0016] In yet another embodiment, the system for collecting and consolidate sales data wherein the data being transferred from the POS terminal **5** to the printer **14** includes printing protocol and sales transaction information.

[0017] In a further embodiment, the system for collecting and consolidate sales data, wherein the processing device **10** converts the data into customizable format; said customizable format includes readable text.

[0018] In yet another embodiment, the system for collecting and consolidate sales data, wherein the processing device **10** is configured to search and select keywords from the readable text format and represent the data into a new content.

[0019] In another embodiment, the system for collecting and consolidate sales data wherein the system comprises a database for storing all captured from the POS terminal.

[0020] In a further embodiment, the system for collecting and consolidate sales data wherein the system is connected to a network.

[0021] In another embodiment, the system for collecting and consolidate sales data, wherein the system further includes a dashboard and a user interface.

[0022] In another aspect, there is provided a processing device **10** for digitally capturing data being transferred from a point of sale (POS) terminal to a printer; the device **10** configured to be platform independent and plug-and-play operable.

5 [0023] In yet another aspect, there is provided a method for enabling user to collect and consolidate sales data from a point of sales (POS) terminal; wherein the POS terminal sends at least one printer protocol data to a printer; the method comprising: providing a processing device **10** that is platform-independent and configured to be in communication with a printer; digitally capture data transferred from the POS terminal to the printer; reconstructing
10 captured data; receiving the captured data from the processing device **10** and converting data into a customizable format; processing and analysing the captured data and generate at least one report.

[0024] In a further embodiment, the method wherein the step capturing data includes
15 interpreting the printer protocol data and reconstructing a new content based on the interpretation.

[0025] In another embodiment, the customizable format includes a readable text format.

20 [0026] In yet another aspect, a system for collecting and consolidating sales data from a plurality of point of sale (POS) terminals; each of the POS terminals is in communication with multiple printers and a that is configured to store all sales data from all POS terminals; comprising; a processing device configured to be in communication with the centralised server and POS terminals; said processing device digitally captures data that are being
25 transferred from the POS terminal to at least one printer; an analytical server being in communication with the processing device configured for receiving all captured data; and generating a report.

30 BRIEF DESCRIPTION OF ACCOMPANYING DRAWINGS

[0027] The drawings accompanying this specification as listed below may provide a better understanding of our invention and its advantages when referred in conjunction with the detailed description that follows hereinafter as exemplary and non-limiting embodiments of
35 our method, in which:

[0028] FIGURE 1A shows the overall architecture of the data collecting and consolidating system and method in accordance with an embodiment of the present invention;

5 [0029] FIGURE 1B to FIGURE 1E show examples of arrangements that may be implemented based on at least one or multiple POS terminals in accordance with a preferred embodiment of the present invention;

[0030] FIGURE 3A to FIGURE 3G show the dashboard and examples of reports that can be
10 generated by the analytic server in accordance with an embodiment of the present invention;

[0031] FIGURE 4A shows a process flow of the method in accordance with an embodiment of the present invention;

15 [0032] FIGURE 4B – FIGURE 4D show the tasks performed by the processing device in accordance with an embodiment of the present invention;

[0033] FIGURE 5 shows another architecture that can be implemented in accordance with an embodiment of the present invention.

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DETAILED DESCRIPTION OF EMBODIMENTS

[0034] As a broad, general description of our invention, it may be described as a method
25 and system for enabling a user to digitally consolidate and analyse sales data collected from a plurality of retailers or vendors; whereby the method and system includes an independent processor adapted to be in communication with any Point of Sale (POS) terminal. In one embodiment, the system disclosed herein requires minimal components and can communicate with readily available components that are installed at the tenants terminal.

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[0035] For avoidance of doubt, the term “operator” in this specification is used to mean a user or a mall/building operator which is given the task to collect sales data from at least one tenant within a building for further processing. Similarly, the term “tenant” is used to mean any person or organization that occupies a certain space (subject to a rental) within a
35 building owned or managed by the operator. The tenant can be a retailer or a vendor.

[0036] Broadly defined, with reference to **FIGURE 1A**, there is provided a system and method that is enabled for intercepting receipt print protocols provided by a POS system of a tenant; digitally deriving or selectively capturing data from the receipt and sending the captured data to another component for further processing. The system is adapted to collect data from a plurality of retailers or tenants in one or multiple locations (example); collect and consolidate the data; if required. With reference to **FIGURE 1A**, the system in accordance with an embodiment of the present invention comprises at least one POS terminal **5**; a processing device **10** adapted to collect sales data from at least one tenant; collating the sales data based on a predetermined period; and an analytical server **12** adapted for receiving data from the processing device and analyse data; and a printer **14**. In one example, the system may be connected to an operator network infrastructure, the operator network may include at least one wireless access point or a local connection link based on a connection protocol that allows all components of the system of the present invention to be in communication or interact with the existing components of the operator and tenants. In one example, the operator network; when implemented in a shopping mall; may be in the form of an operator's local area network (LAN) infrastructure **1**. Nevertheless, it is anticipated that the system can be connected to the network by means of UTP cabling; UTP/STP, wireless, GPRS, 3G, 4G LTE communication .

Point of Sale (POS) Terminal

[0037] The POS terminal in accordance with an embodiment of the present invention is a general-purpose terminal having components commonly found for performing tasks related to retail or sales transactions. The operational implementation of the system and method of the present invention is not restricted to any particular POS structure. In one embodiment, the components of the system in accordance with the present invention are adapted to complement with and enhance the existing features of the POS; thus providing a seamless integration with any POS platforms.

[0038] In accordance with an embodiment of the present invention, the physical set-up of the system in connection to the POS can be provided in two arrangements; serial and parallel; for a single POS terminal and multiple POS terminals. Both arrangements require only one processing device **10** to perform the tasks to be described in the following section. **FIG 1B** to

FIG 1E show the types of arrangement that can be provided; for both serial and parallel. **FIG. 1B** shows the physical set-up for a serial interface with one POS terminal; at which a serial splitter is used to allow serial interconnection. **FIG. 1C** shows an example of a serial interface arrangement for multiple POS terminals. With the presence of multiple POS terminals; each POS terminal is equipped with at least one serial splitter. The splitters are connected to the processing device **10** to allow communication of data; whereby the processing device **10** may be connected to multiple or a plurality of printers. **FIG. 1D** and **FIG 1E** show the parallel connection for both single and multiple POS terminals. Similar to that of the serial arrangement, a splitter, in this arrangement a parallel splitter is incorporated.

Processing Device

[0039] Still referring to **FIGURE 1A**, the processing device **10** in accordance with an embodiment of the present invention is a uniquely developed device and is adapted to be in communication with the POS terminal **5** and the printer **14** of at least one tenant; and is configured to be connected to network **1**. In one embodiment, the processing device **10** can interact or be in communication with an existing central server of the respective mall; and thus aids to send a copy of data to the centralised server which may be owned by the operator. Such feature effectively addresses the difficulties typically experienced by a mall operator in collecting sales data from each tenant. The device **10** is platform independent, hence plug-and-play operable with no requirement for integration or invasive installation into any POS terminal of the tenant. According to one embodiment of the present invention, the processing device **10** is configured to gather sales data collectively from a plurality of tenants; by way of capturing data digitally from each receipt generated by each POS terminal **5** owned by the tenants; and then collating said data prior to further analytical processing to be performed by the analytical server **12**. In one embodiment, the processing device **10** is configured to interpret the printing protocol data and rebuild a new content based on the interpretation. Preferably, the analytical server **10** of the present invention is configured to filter out unwanted data and select relevant data based on the operator's requirements.

[0040] There can be at least two types of representation or formats with respect to the protocol data being communicated; these are ASCII or non-ASCII. In order to select the relevant data, the processing device **10** is configured to In the event that the data is

presented in the form of ASCII file, the processing device 10 can read and search directly for keywords. Captured data by the processing device 10 will be sent to the analytical server 12 to be used for data collating; and generating structured reports. As for non-ASCII format; the processing device 10 is configured to interpret and reconstruct image via an OCR-enabled module; whereby the receipt image is reduced into readable data. Similar to that of the ASCII process, the processing device 10 then captures the relevant data and send them to the analytical server 12.

[0041] FIG. 2A to FIG. 2C are diagrams depicting the modes of data capture performed by the processing device 10 in accordance with an embodiment of the present invention. It is further anticipated that the modes and types of data capture may vary; depending on the user's request. With reference to FIG. 2A, the processing device 10 can capture every line item within the receipt printing protocol data. As shown in FIG. 2B, the processing device 10 is enabled to capture only the receipt total from the receipt printing protocol data. In another embodiment and as shown in FIG. 2C, the processing device 10 is enabled to capture only end of day sales data of at least one vendor/retailer.

[0042] Once connected to the POS terminal 5 and printer 14, the processing device 10 is enabled to capture or make a copy of data that are being communicated to and from the POS terminal 5 and the printer 14. It is anticipated that there may be provided an authorization procedure in order to allow a user to access the processing device 10 and all data within the operator's network 1 and information stored as well as being communicated all POS terminals 5.

Analytical Server

[0043] The analytical server 12 in accordance with an embodiment of the present invention is adapted to interact or communicate with the processing device 10; and can be further configured to communicate with the existing central server provided by the mall operator. Upon receipt of data communicated from the processing device 10, the analytical server 12 proceeds to analyse the data to generate an output; whereby the type of analysis may vary. The examples of analytical functions that can be performed includes; but not limiting to; a tenant's overview, each tenant's retail and shop data; categorizing the tenants based on their products and services (zoning) and daily sales of each tenant. The analytical functionalities

and types can be optional and enabled as a plurality of options to the user. The report generated by the analytical server **12** can be displayed to the user through a customised user interface module **12A** enabled in the user's computer. In one embodiment, the user interface module **12A** can include a dashboard. The dashboard in accordance with an embodiment of the present invention provides access to all functionalities of the analytical server **12**. Suitably, the analytical server **12** may serve as additional module to an existing central server of the mall; that aids significantly in providing structured reports for the operator ; whereby said structured reports are customised based on the operator's requirements. The analytical server **12** may replace the existing central server of the mall if there is any.

[0044] In another embodiment and as stated earlier, the analytical server **12** is equipped with report generating modules; whereby the examples of analytical functionalities and output generated are portrayed through the user interface and user dashboard in **FIGURE 3A-3G**. These reports can be made available via websites; applications, mobile applications or the likes, and can be made available to multiple authorised users. The reports can be provided based on predetermined frequencies; for instance daily, monthly, annually or whenever required by the authorised user. The report generating module allows the operator to quickly and easily generate detailed and structured reports based on the selected criteria presented to the operator. It can also offer alerts and overall sales diagnostics as well as solutions. In addition, the operator can detect technical faults or failures.

[0045] A system incorporating the methods of our present invention will now be described with reference to **FIGURE 4A**; as a flowchart generalizing the entire process. It is anticipated that regardless the original configuration of the POS system whether the process flow is embodied as a software run from the CPU, remotely from a server, or as on-site firmware, or combination thereof, our system is incorporated in the system as a plug –play and being an independent platform; it that does not disrupt the current POS or transactions process that may be provided.

[0046] As shown in **FIGURE 4A**, at **301**, the POS terminal of the respective tenant sends data; which includes printer protocol data to the printer; for this purpose a receipt printer **14**. During this process; the printer protocol data may include instructions or protocols related to sales made or or any form of sales transaction. Prior to data reaching the printer **14**, the

processing device **10** which interacts with the printer **14** and the POS terminal **5** detects the data at **302**; but does not intercept said communication. It should be noted that the data in this example include sales transaction data. At **303**, the processing device **10** makes a digital copy or captures the data. In this process, the processing device **10** interprets the printing protocol and captures data based on the request made by the operator or user of the system. As discussed earlier, the processing device **10** may need to convert the received data into a customizable or readable format in order to filter the relevant data; and then send all captured and filtered data to the analytical server **12** at **304**. The analytical server **12** receives the captured data; whereby data can be stored or/and generates a report at **305** based on the analysis of captured data. It is further anticipated that the type of report generated based on the reconstruction of data can vary; and can be provided in the form of several options to the user.

[0047] Continuing with the process, at the same time during the analysis of data is performed; the receipt printer **14** receives the protocol printer data; reads said data and prints out a receipt based on the received data. At the analytical server **12**, the output received from the processing device **10** is stored and can be retrieved at any point of time via the user interface module for audit purposes. The processing device **10** is enabled to process the data and converts the data into a customizable format; or in an embodiment, represents the data into a readable text format so as to allow data or information selection by user. In one example, the processing device **10** is configured to capture the total sales data and stores said data into a database. It should be noted that the analytical server **12** can perform predefined tasks based on the received data, such as, but not limiting to, collation of data for the purpose of a sales presentation, configurable or customised reports and the likes. As the data or information can be filtered and selected by the processing device **10** upon converted into a universal readable format, the user will be provided or presented with meaningful data and thus improves the efficiency of data representation.

[0048] Tasks performed by the processing device **10** will now be further described with reference to **FIGURE 4B**. During this step, in the event printing protocol data received is not in ASCII format, the data can be converted or represented into a text readable format; thus enables selection of data or information when necessary. As shown in **FIGURE 4B**, the conversion process starts with **401**, during which the processing device **10** picks up the bits and bytes that are packaged and to be sent to the printer **14**. At **402**, the processing device **10** breaks the data into readable blocks and selects the relevant data requested; prior to

translating the bits and bytes into a new content for storage and generating reports. In accordance with an embodiment of the present invention, during selection of data, the processing device **10** is configured to ignore irrelevant data and non-text graphics. Further, once the receipt data are broken into readable blocks; the processing device **10** can search and select at least one element to be sent to the analytical server **12** and hence used in a further analysis and then generate at least one report. In a preferred embodiment, the user may select the type of report he/she wishes to generate based on each analysis of data. Further in an embodiment, the conversion and selection of data may be performed based on an OmniRead Text Aware or OmniReader methodology customized based on the system of the present invention or any known readable text conversion techniques. **FIGURE 4C** to **FIGURE 4D** show a set of diagrams to further describe the conversion process in accordance with an embodiment of the present invention.

[0049] In another embodiment, the system of the present invention enables multi-mall implementation as accordingly represented in **FIGURE 5**. In this deployment, there can be a plurality of malls being interconnected; whereby there may be provided a central analytical unit that may comprise a plurality of analytical servers **12** connected to at least one processing device **10**, in which the processing device **10** is able to capture all data being transmitted to all printers **14** of all tenants in all malls. It is further anticipated that the central aggregate server is in communication with analytic servers via; but not limiting to; a wireless or a VPN connection.

[0050] At this juncture, it is further anticipated that the input data can be directly provided to the analytical server **12** by an authorised user in addition to being communicated through the processing device **10**. As previously stated, all connections within the network can be achieved by any form of network providers and systems; such as, but not limiting to; cellular connection, LAN connection and wireless access points. Further in accordance with an embodiment of the present invention, the operator or authorised user can monitor the sales operation of each tenant or collectively - multiple tenants. Such monitoring may include; remote monitoring from the respective operator/control centre that is enabled to alert or be alerted should there be any form of software or hardware failure or disconnection.

[0051] As previously mentioned, owing to the plug-and-play feature of the present invention, its implementation is not dependant on the original configuration of the existing POS system,

the process flow or algorithm. In one embodiment, the system and method of the present invention may be incorporated in the system as an add-on module thus in form of an apparatus implementing any of these methods. It should also be noted that while the foregoing is described as an example of implementation in a POS system, the present invention may be implemented or duplicated in a system comprising at least one POS terminal.

Secured, Seamless and Improved Accuracy

[0052] In accordance with an embodiment of the present invention, the system provides seamless communication of data; whereby all data transferred preferably undergoes a form of authentication thus ensuring data security. In the event that an error or failure is detected during transfer of data, the system automatically attempts to resend the data until it achieves a successful transfer. However, there may be provided a period of time that the system continues to send the data and if the period expires and the data fails to go through; the system sends an alert or indication to the operator on the failure. The error or failure can then be identified and then rectified accordingly. The processing device of the present invention can operate with parallel, serial and USB interface; supports HD displays as well as operable with WiFi and bluetooth connections.

[0053] It is further anticipated that; owing to the plug-and-play operable feature; the system of the present invention can be extended to other applications, such as; but not limiting to; digital signage feature, and loyalty card privileges.

[0054] As would be apparent to a person having ordinary skill in the art, the aforescribed method and system may be provided in many variations, modifications or alternatives to existing POS systems. The principles and concepts disclosed herein may also be implemented in various manner or form in conjunction with the hardware or firmware of the system which may not have been specifically described herein but which are to be understood as encompassed within the scope of the following claims.

CLAIMS:

1. A system for collecting and consolidating sales data from a plurality of point of sale (POS) terminals; each of the POS terminals is in communication with multiple printers 14 and a that is configured to store all sales data from all POS terminals; comprising;

a processing device 10 that is platform-independent and configured to be in communication with a centralised server and POS terminals; said processing device 10 digitally captures data that are being transferred from the POS terminal 5 to at least one printer 14 and;

an analytical server 12 being in communication with the processing device configured for receiving all captured data; and generating a report.
2. The system according to claim 1, wherein the said processing device (10) converts the data into customizable format including but not limited, to readable text.
3. The system according to claim 1, wherein the said processing device (10) converts the data into customizable format including but not limited, to readable text.