

A SYSTEM AND METHOD FOR PROVIDING REFILLABLE PRODUCTS ON AN ONLINE PLATFORM

Technical Field

[0001] The present disclosure generally relates to a system and method for streamlining user interactions on eCommerce platforms. More particularly, it specifically relates to a system and method for providing refillable product options on an online platform.

Background

[0002] The following discussion of the background to the invention is intended to facilitate an understanding of the present invention. However, it should be appreciated that the discussion is not an acknowledgment or admission that any of the material referred to was published, known or part of the common general knowledge in any jurisdiction as at the priority date of the application.

[0003] The eCommerce industry has experienced rapid growth and evolution, particularly in response to increasing consumer demand for sustainable and eco-friendly product options. Traditional consumer goods, such as detergents, shampoos, beauty products, and other liquid products, are often packaged in non-reusable, single-use plastic containers, contributing significantly to plastic waste. Consumers are increasingly seeking more sustainable alternatives, such as refillable product options.

[0004] Current eCommerce systems have begun to incorporate features that support refillable products, though the extent and effectiveness of these capabilities vary significantly across platforms. Despite the advancements in eCommerce systems and refillable product options, several significant shortcomings persist:

[0005] Integration Challenges: Integrating refillable product options into existing eCommerce systems presents challenges. Current systems do not provide a streamlined method for users to select and purchase refillable products seamlessly within their regular shopping experience.

[0006] Logistical Complexities: Implementing refillable systems requires robust supply chains and technological advancements. The process of collecting, cleaning, and redistributing reusable packaging adds complexity and cost to the supply chain.

[0007] Technological Limitations: Current eCommerce systems may not be fully equipped to handle the logistics of refillable products, including efficient systems to track and manage the return and reuse of packaging.

[0008] Therefore, a need arises for a system and method that enables users to seamlessly integrate refillable product alternatives into eCommerce platforms during the checkout process while considering factors such as proximity, urgency, and stock levels. This invention presents a solution by streamlining this process without disrupting the user's flow or requiring them to navigate separate sections of the platform.

[0009] The present invention attempts to overcome at least in part some of the aforementioned problems and to provide for an improved approach for addressing the foregoing challenges.

Brief Description of the Drawings

[0010] In the drawings, like reference characters generally refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead generally being placed upon illustrating the principles of the invention. The dimensions of

the various features or elements may be arbitrarily expanded or reduced for clarity. In the following description, various embodiments of the invention will be better understood with reference to the detailed description when considered in conjunction with the non-limiting examples and the accompanying drawings, in which:

[0011] FIG. 1 is a block diagram of an exemplary system for integrating refillable products on an eCommerce platform in accordance with an embodiment of the present disclosure;

[0012] Fig. 2 illustrates a flowchart of a method for recommending refillable product options on an online platform according to various embodiments;

[0013] Fig. 3 illustrates a flowchart of another method for recommending refillable product options on an online platform according to various embodiments; and

[0014] Fig. 4 illustrates various ways of redeeming a redemption voucher at a collection point for a refillable product option according to various embodiments; and

[0015] Fig. 5 illustrates a dynamic pricing model based on various factors for determining the price of a refillable product option according to various embodiments.

Detailed Description

[0016] Reference will now be made in detail to an exemplary embodiment of the present invention, examples of which are illustrated in the accompanying drawings. While the invention will be described in conjunction with the embodiment, it will be understood that they are not intended to limit the invention to these embodiments. On the contrary, the invention is intended to cover alternatives, modifications, and equivalents, which may be included within the spirit and scope of the invention as defined by the appended description. Furthermore, in the following detailed description of embodiments of the present invention, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be recognized by one of ordinary

skill in the art that the present invention may be practiced without these specific details. In other instances, well-known methods, procedures, components, and circuits have not been described in detail as not to unnecessarily obscure aspects of the embodiments of the present invention.

[0017] In the specification the term “comprising” shall be understood to have a broad meaning similar to the term “including” and will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps. This definition also applies to variations on the term “comprising” such as “comprise” and “comprises”.

[0018] It is to be appreciated that the embodiments of this invention as discussed below are preferably a software algorithm, program or code residing on computer useable medium having control logic for enabling execution on a machine having a computer processor. The machine typically includes memory storage configured to provide output from execution of the computer algorithm or program.

[0019] As used herein, the term “software” is meant to be synonymous with any code or program that can be in a processor of a host computer, regardless of whether the implementation is in hardware, firmware or as a software computer product available on a disc, a memory storage device, or for download from a remote machine. The embodiments described herein include such software to implement the equations, relationships and algorithms described. One skilled in the art will appreciate further features and advantages of the invention based on the above-described embodiments.

[0020] Embodiments described in the context of one of a server and a method are analogously valid for the other server and method. Similarly, embodiments described in the context of a server are analogously valid for a method, and vice-versa.

[0021] Features that are described in the context of an embodiment may correspondingly be applicable to the same or similar features in the other embodiments. Features that are described in the context of an embodiment may correspondingly be applicable to the other embodiments, even if not explicitly described in these other embodiments. Furthermore, additions and/or combinations and/or alternatives as described for a feature in the context of an embodiment may correspondingly be applicable to the same or similar feature in the other embodiments.

[0022] In the context of various embodiments, the articles “a”, “an” and “the” as used with regard to a feature or element include a reference to one or more of the features or elements.

[0023] As used herein, the term “and/or” includes any and all combinations of one or more of the associated listed items.

[0024] Throughout the description, the term “module” may be understood as an application specific integrated circuit (ASIC), an electronic circuit, a combinational logic circuit, a field programmable gate array (FPGA), a processor which executes code, other suitable hardware components which provide the described functionality, or any combination thereof. The term of “module” may include a memory which stores code executed by the processor.

[0025] To achieve the stated features, advantages and objects, the present invention is directed to a system and a method for providing refillable products on an online platform.

[0026] The primary objectives of this invention are to:

- Provide a comprehensive eCommerce solution that natively supports the sale and management of refillable products, eliminating the need for third-party applications and reducing integration challenges.
- Implement advanced remote dispensing technologies to streamline the refilling process and enhance user convenience.
- Incorporate dynamic pricing models tailored for refillable products to optimize costs, manage inventory effectively, and incentivize consumer adoption of sustainable options.
- Develop an efficient system for tracking, returning, and managing refillable containers, leveraging IoT technologies and smart sensor platforms to minimize logistical complexities.
- Create a user-friendly interface that educates consumers about the benefits of refillable products and simplifies the process of purchasing and refilling, thereby addressing barriers to adoption.
- Integrate sustainability metrics and reporting tools to measure and communicate the environmental impact of using refillable products, fostering consumer engagement and brand loyalty.

[0027] By addressing these objectives, the invention seeks to revolutionize the eCommerce landscape for refillable products, promoting sustainability, reducing single-use plastic waste, and meeting the growing consumer demand for eco-friendly shopping options.

[0028] The present disclosure discloses a system and method that addresses the challenges of integrating refillable products into an eCommerce platform checkout process by providing a system and method that seamlessly integrates refillable products into eCommerce platforms without disrupting the flow or requiring them to navigate separate sections of the eCommerce platform.

[0029] In the context of this invention, the term “refillable product” can refer to, but not limited to, beauty products, home cleaning products, personal care products and FMCG products such as beverages, milk products, soft drinks, etc..

[0030] Referring now to Fig. 1, a block diagram of an exemplary system 100 for integrating refillable products on an eCommerce platform or an online platform 114, is illustrated, in accordance with an embodiment of the present disclosure. The system 100 may include a computing device 102, a user device 112, the online platform 114, an integrated platform 120, and a data server 116 communicably coupled to each other through a wired or wireless communication network 110. The computing device 102 may include a processor 104, a memory 106 and an input/output (I/O) device 108.

[0031] In an embodiment, examples of processor(s) 104 may include, but are not limited to, microcontrollers, microprocessors, digital signal processors (DSPs), application-specific integrated circuits (ASICs), field-programmable gate arrays (FPGAs), system-on-chip (SoC) components, or any other suitable programmable logic devices. The processor 104 is responsible for executing the instructions stored in the memory 106 to carry out the functionality of the system 100, including presenting candidates to a user through the online platform 114.

[0032] In various embodiments, an online platform is an electronic online platform that is associated with one or more merchants or other business entities that provides goods and/or

services, such as a retailer, grocery store, service provider, or any other type of entity that provides goods and/or services that consumers may purchase. Some examples of online platforms include e-commerce platforms, online aggregators, any online platform that provides goods or services for sale or incentives.

[0033] In various embodiments, a user of the online platform may be any suitable type of entity, which may include a person, consumer, passenger, family, company, corporation, governmental entity who registers a user account on the online platform for identifying a payment account to process a financial transaction. A user account identifier will be assigned to each user account (i.e., the user).

[0034] In an embodiment, the computing device 102 is remotely or physically connected to the online platform 114. The integrated platform 120 can share the computing device 102 with the online platform or has a separate computing device (not shown). In an embodiment, the memory 106 may store instructions and data, including one or more modules that, when executed by the processor 104, may cause the processor 104 to present refillable products to the user, as will be discussed in greater detail herein below. In an embodiment, the memory 106 may be a non-volatile memory or a volatile memory. In an embodiment, the memory 106 may also store a single module or a combination of different modules to present refillable products to a user through the online platform 114. Examples of non-volatile memory may include but are not limited to, a flash memory, a Read Only Memory (ROM), a Programmable ROM (PROM), Erasable PROM (EPROM), and Electrically EPROM (EEPROM) memory. Further, examples of volatile memory may include but are not limited to, Dynamic Random Access Memory (DRAM), and Static Random-Access memory (SRAM).

[0035] In various embodiments, the integrated platform 120 is a cohesive software framework designed to facilitate the seamless integration and interoperability of various

digital solutions with an online platform, such as an eCommerce platform. The integrated platform 120 encompasses the necessary tools, modules, and interfaces that allow for the efficient and effective incorporation of additional functionalities, ensuring unified and consistent operations across the digital ecosystem. The integrated platform may be realized through an open-source solution, enabling transparency, customizability, and community-driven enhancements. Some commercial examples of integrated platforms include but not limited to magento, prestashop, WooCommerce, Opencart, etc..

[0036] In an embodiment, the I/O device 108 may comprise of variety of interface(s), for example, interfaces for data input and output devices, and the like. The I/O device 108 may facilitate inputting of instructions by a user communicating with the computing device 102. In an embodiment, the I/O device 108 may be wirelessly connected to the computing device 102 through wireless network interfaces such as Bluetooth®, infrared, or any other wireless radio communication known in the art. In an embodiment, the I/O device 108 may be connected to a communication pathway for one or more components of the computing device 102 to facilitate the transmission of inputted instructions and output results of data generated by various components such as, but not limited to, processor(s) 104 and memory 106.

[0037] In an embodiment, the online platform 114 may serve as a medium through which the system 100 interacts with the user. The online platform 114 receives user input, the computing device 102 processes it, and the online platform 114 presents the selected products by the purchaser in a checkout cart. The integrated platform 120 determines the selected products and recommends refillable product options based on the selected products in the checkout cart. The integrated platform 120 interacts with the data server 116 to access necessary data, including but not limited to historical data, location data, inventory data and pricing data to recommend refillable product options and prices. In an embodiment, the online platform 114 may be an eCommerce platform, although it is not

limited to this application. The online platform could encompass various other types of platforms. For the sake of clarity, an exemplary embodiment will be described within the context of an eCommerce platform, but the same principles can be applied to other domains.

[0038] In an embodiment, the data server 116 may be enabled in a remote cloud server or a co-located server and may include a database 118 for retaining various data inputs and outputs necessary for operations of the system 100. In an embodiment, the data server 116 may store data input by the user device 112 or output generated by the computing device 102. It is to be noted that within the data server 116, a Large Language Model (LLM) is stored for use by the computing device 102. In an embodiment, examples of the LLM may include, but are not limited to, zephyr, code Large Language Model Meta AI (LLAMA), Generative Pre-training Transformer (GPT), etc. The LLM stored within the data server 116 serves as a foundational component for various computational tasks and applications. In an embodiment, the computing device 102 may be communicably coupled with the data server 116 through the communication network 110.

[0039] In an embodiment, the communication network 110 may be a wired or a wireless network or a combination thereof. The communication network 110 can be implemented as one of the different types of networks, such as but not limited to, ethernet IP network, intranet, local area network (LAN), wide area network (WAN), or a Metropolitan Area Network (MAN). Various devices in the system 100 may be configured to connect to the communication network 110, in accordance with various wired and wireless communication protocols. Examples of such wired and wireless communication protocols may include, but are not limited to, a Transmission Control Protocol and Internet Protocol (TCP/IP), User Datagram Protocol (UDP), Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), Zig Bee, EDGE, IEEE 802.11, light fidelity (Li-Fi), 802.16, IEEE 802.11s, IEEE 802.11g, multi-hop communication, wireless access point (AP), device to

device communication, cellular communication protocols, and Bluetooth (BT) communication protocols. Further the communication network 110 can include a variety of network devices, including routers, bridges, servers, computing devices, storage devices, and the like.

[0040] In an embodiment, the computing device 102 may receive a plurality of inputs from the user device 112 through the communication network 110. In an embodiment, the computing device 102 and the user device 112 may be a computing system, including but not limited to, a laptop computer, a desktop computer, a notebook, a workstation, a server, a portable computer, a handheld or a mobile device. The user device 112 communicates with the computing device 102 and the online platform 114 over the communication network 110 to submit input and receive output, facilitating a personalized user experience. The computing device 102 may either be embedded in the user device 112 or exist as a standalone device working in conjunction with the user device 112 to process the data.

[0041] In an embodiment, the computing device 102 may perform various processing functions in order to present refillable product options and prices to the user on the online platform 114. The computing device 102 may send the input from online platform 114 to the integrated platform 120 to perform processing functions for the purpose of recommending refillable product options and prices to the user based on the products selected in the checkout cart. By way of an example, the computing device 102 may receive an input via the user device 112. In an embodiment, the input may be related to the product choices or payment functions of the purchaser made on the online platform 114.

[0042] Fig. 2 illustrates a flowchart of a method for providing refillable product options on an online platform according to various embodiments. The present invention relates to a method for providing refillable product options to users on online platforms by seamlessly integrating an integrated platform with the online platform. This invention addresses the

growing need for sustainable and efficient refillable product systems while leveraging advanced technologies to enhance user experience and operational efficiency. The exemplary method may be performed by the processor 104 of the computing device 102 and/or the data server 116 executing instructions encoded on a computer-readable medium storage device. It is to be understood that the one or more steps of the process may be implemented by other components of the system including other computing devices or data servers that the online platform and integrated platform are connected to via the communication network 110.

[0043] The objective technical problem addressed by this invention is the lack of a comprehensive, scalable, and efficient system for managing refillable products on an online digital platform. Traditional systems often struggle with inventory management, user engagement, and seamless integration of refillable products into existing eCommerce platforms. The present invention solves these issues by providing a unified solution that optimizes the entire refillable product lifecycle.

[0044] In various embodiments, the present invention relates to a method for providing refillable product options on an online platform. It includes an integrated platform for integrating with an online platform. An integrated platform may be understood as a comprehensive and cohesive software framework that enables various digital solutions to work together seamlessly within an online platform, such as an eCommerce platform. This ensures efficient operations and enhances user experience by allowing different functionalities to be combined into a unified system.

[0045] At step 210, a user selects a product from an online platform and adds it to the user's shopping cart. The user may be understood as an individual interacting with an online platform to purchase goods or services on a user device. This arrangement allows the user

to easily navigate and choose products for purchase, facilitating a smooth shopping experience.

[0046] At step 220, when the user has completed the selection of products, the user will initiate the checkout process by proceeding to purchase the products. The system triggers a connection to the integrated platform 120, and at step 230, the integrated platform 120 checks for refillable product options or alternatives based on the user's products in the checkout cart. In an embodiment, the integrated platform 120 may be understood as a specialized software component or module responsible for identifying, determining and managing refillable product options. This arrangement ensures that the system can offer sustainable and eco-friendly alternatives to traditional products, promoting environmental responsibility.

[0047] At step 230, the integrated platform 120 identifies whether a refillable product option or alternative is available for the selected product in the checkout cart. A refillable product alternative may be understood as a product designed to be reused and refilled, reducing waste and the need for single-use packaging. This arrangement provides users with eco-friendly options, contributing to sustainable consumption practices. If a refillable product is available, the integrated platform proceeds to check for the user's location and determine a price for the refillable product options.

[0048] At step 240, the integrated platform 120 checks the location of the user and determines a price for the refillable product option based on a dynamic pricing model. Dynamic pricing may be understood as a pricing strategy that adjusts prices based on various factors such as location, demand, and time of day. This arrangement allows for personalized pricing, enhancing the user experience and optimizing sales. In an embodiment, dynamic pricing is implemented to optimize revenue and enhance user experience in the refillable product ecosystem. Dynamic pricing in this context involves

adjusting prices in real-time based on various factors, allowing for a flexible and responsive pricing strategy. In an embodiment, the dynamic pricing can be determined by a dynamic pricing model. In various embodiments, the integrated platform includes a dynamic pricing model that determines the price of the refillable product option and is determined by one or more of the following key factors:

[0049] Location: The integrated platform checks the user's location via GPS or user input, identifying the nearest refill stations or retail locations offering the refillable alternative. This allows for location-based pricing adjustments, considering factors such as regional demand, local competition, and cost of living.

[0050] Proximity to Refill Stations: The integrated platform adjusts pricing based on the user's proximity to the nearest refill station, potentially offering discounts for closer stations to incentivize usage.

[0051] Time of Day: The integrated platform accounts for urgency based on the time of day, potentially offering higher prices at night when fewer stations are available or discounts if the user is about to run out of the product.

[0052] Machine Capacity and Stock Levels: The integrated platform adjusts pricing based on refill station capacity and stock levels, potentially offering discounts to encourage usage of remaining stock before a reload.

[0053] Demand: The integrated platform analyzes real-time demand fluctuations for refillable products. When demand is high, prices can be increased to maximize revenue, whereas during low demand periods, prices might be reduced to stimulate sales

[0054] In an embodiment, the integrated platform 120 also checks the user's location via GPS or user input, eg. from the user account identifiers such as shipping address, and identifies the nearest refill stations or retail locations offering the refillable alternative. GPS may be understood as a satellite-based navigation system that provides location information. As mentioned previously, the location is one of the factors that determine the price of the refillable product option. It also ensures that users can conveniently access refillable products within the proximity of their location, promoting their use and increasing customer satisfaction. The availability of refill stations is cross-referenced with real-time data to ensure that the refillable product can be dispensed nearby at a collection point. Real-time data may be understood as information that is updated instantly as changes occur. This arrangement provides users with accurate and up-to-date information on refill station availability, enhancing the reliability of the service.

[0055] In an embodiment, the dynamic pricing model adjusts the price of the refillable product option based on proximity to the nearest station, urgency based on the time of day, machine capacity and stock levels. In an embodiment, a rules-based algorithm optimizes the price of the refillable product option. In an embodiment, a machine learning model optimizes the pricing in real-time. Machine learning may be understood as a subset of artificial intelligence that enables systems to learn from data and improve performance over time. This arrangement ensures that pricing is competitive and fair, taking into account various factors that influence cost and availability.

[0056] At step 250, the integrated platform 120 presents the user on the online platform 114 with one or more refillable product options, price and associated savings based on the dynamic pricing model. This arrangement provides users with transparent pricing information and eco-friendly options, encouraging sustainable purchasing decisions. The user is therefore given the option to swap the original products in their checkout cart with the refillable product options. This allows users to make informed choices about their

purchases, promoting the use of refillable products and reducing waste. If the user decides to switch out one or more selected products in the checkout cart with the refillable product options, the user will swap out the checkout cart with the selected refillable product options at step 260 and the online platform 114 will determine the final price of the products in the checkout cart.

[0057] At step 270, the user proceeds to pay for the products through the online platform's payment gateway, which handles the transaction for all items, including the refillable product options. This arrangement ensures a seamless and secure payment process, enhancing user convenience and trust in the platform.

[0058] At step 290, the non-refillable products in the checkout cart are processed for shipping according to the online platform's standard logistics arrangement. At step 280, the integrated platform will issue or send a redemption voucher to the user via email or text message on a mobile device for redeeming for the refillable product option at a collection point in proximity to the user's location. At step 295, the user will proceed to the collection point to dispense the refillable product at a nearby refill station. The redemption voucher can be redeemed in various ways at the refill station. This arrangement ensures efficient and flexible logistics, accommodating both traditional and refillable product. Upon issuance of the redemption voucher by the integrated platform 120, the integrated platform 120 activates the redemption voucher via a redemption API and reserves the refillable product in the system. The redemption voucher is sent via a communication network to the selected refill station for redemption by the user. In various embodiments, the act of redeeming the redemption voucher for the refillable product at the refill station can be done through a mobile app on a mobile device that connects to the integrated platform via a remote API, NFC connectivity on the app or through a QR code for scanning to authenticate and dispense the refillable product. This arrangement provides multiple convenient

methods for users to access and redeem refillable products, enhancing user experience and promoting the adoption of sustainable practices.

[0059] Fig. 3 illustrates another method for recommending refillable product options on an online platform according to various embodiments. A method for integrating refillable product options into an online platform is shown in accordance with an exemplary embodiment. At step 300, a user selects one or more products for purchase on an online platform, represented by a user interface on a computing device or a mobile device. Once the selection of one or more products is made, at step 310, the online platform proceeds to trigger a connection to an integrated platform which recommends refillable product options and prices based on the one or more selected products. The integrated platform communicates with the online platform to present the user with one or more refillable product options. In an embodiment, the integrated platform can recommend the refillable product options at the point of selection of the products or at the checkout cart. At step 320, if the user has selected one or more refillable options and purchased the products in the checkout cart, the online platform proceeds to issue a redemption voucher at step 330 for each of the refillable product options to the user upon payment. In an embodiment, the redemption voucher can be sent to the user in various ways, for example, to the mobile device or through other communication methods like email or text message. When the user goes to the collection point to redeem the refillable product option, at step 340, the user presents the redemption voucher at a dispensing machine, where the user redeems the voucher for the refillable product. The dispensing machine comprises a user interface that allows the user to present the redemption voucher for collecting and dispensing the refillable product. The mobile device communicates with the online platform to facilitate the selection and purchase of the refillable product. This arrangement ensures seamless integration of refillable product options into the online shopping experience, enhancing user convenience and promoting sustainable consumption.

[0060] Fig. 4 illustrates various ways of redeeming a redemption voucher at a refill station point for a refillable product option according to various embodiments. The aforesaid figure illustrates a multi-modal interaction between a mobile device and a refill station in accordance with an exemplary embodiment. The method and system enables users to interact with the refill station using various methods including QR codes, NFC technology, and traditional payment cards to redeem a refillable product. The figure comprises several key elements:

[0061] User with a mobile device displaying a QR code: A user scans a QR code on the refill station using a mobile device. The mobile device comprises a display showing the QR code.

[0062] Refill station with a QR code scanner 101: The refill station's camera scans a QR code displayed on the user's mobile device to authenticate and initiate the refill process.

[0063] User with a mobile device using NFC: A user utilizes NFC technology by bringing the mobile device close to the refill station to activate and redeem a refill. The mobile device communicates with the refill station via NFC.

[0064] Refill station with NFC technology: The refill station comprises NFC technology that interacts with the user's mobile device to facilitate the redemption and refill process.

[0065] User with a payment card: A user employs a traditional payment network card or a proprietary card to initiate a refill at the refill station. The payment card is used to authenticate the user's identity and payment credentials.

[0066] Refill station with a card reader: The refill station includes a card reader that reads the user's payment card to process the voucher redemption and enable the refill.

[0067] Mobile app suggesting refill station: The mobile app suggests refill station based on location and user preferences. The app uses APIs over cloud to redeem a refill, interacting with the refill station to complete the process.

[0068] Each interaction method shown in the figure ensures that users have multiple options to engage with the refill station, enhancing accessibility and user experience. The system's design allows for seamless integration of technology and user-friendly interfaces, promoting efficient and secure transactions.

[0069] **Fig. 5** illustrates a dynamic pricing model based on various factors for determining the price of a refillable product option according to various embodiments. In an embodiment, the integrated platform includes a dynamic pricing model that determines the price of the refillable product option and is determined by the following key factors:

[0070] **Location:** The integrated platform checks the user's location via GPS or user input, identifying the nearest refill stations or retail locations offering the refillable alternative. This allows for location-based pricing adjustments, considering factors such as regional demand, local competition, and cost of living. In other words, the dynamic pricing model adjusts pricing based on the user's proximity to the nearest refill station, potentially offering discounts for closer stations to incentivize usage.

[0071] **Time of Day:** The integrated platform accounts for urgency based on the time of day, potentially offering higher prices at night when fewer stations are available or discounts if the user is about to run out of the product.

[0072] **Machine Capacity and Stock Levels:** The integrated platform adjusts pricing based on refill station capacity and stock levels, potentially offering discounts to encourage usage of remaining stock before a reload.

[0073] It should be noted that although the drawings herein may show a specific order and composition of method steps, it is understood that the order of these steps may differ from what is depicted. For example, two or more steps may be performed concurrently or with partial concurrence. Also, some method steps that are performed as discrete steps may be combined, steps being performed as a combined step may be separated into discrete steps, the sequence of certain processes may be reversed or otherwise varied, and the nature or number of discrete processes may be altered or varied. The order or sequence of any element or apparatus may be varied or substituted according to alternative embodiments. Accordingly, all such modifications are intended to be included within the scope of the present disclosure as defined in the appended claims. Such variations will depend on the machine-readable media and hardware systems chosen and on designer choice. It is understood that all such variations are within the scope of the disclosure. Likewise, software and web implementations of the present disclosure could be accomplished with standard programming techniques with rule-based logic and other logic to accomplish the various database searching steps, correlation steps, comparison steps, and decision steps.

[0074] The present invention achieves several significant technical effects:

[0075] Improved Efficiency: By automating processes and optimizing resource allocation, the system significantly reduces manual tasks and errors, enhancing overall productivity in managing refillable product systems.

[0076] Enhanced Scalability: The use of cloud technologies and virtualization allows the system to scale seamlessly, accommodating growing data volumes and user bases without compromising performance.

[0077] Real-Time Responsiveness: The combination of high-performance computing, dynamic pricing algorithms, and API integrations enables the system to respond in real-time to market changes and user interactions.

[0078] Personalized User Experience: Through the integration of location-based services and multi-modal redemption methods, the system provides a highly personalized and convenient experience for users of refillable products.

[0079] Optimized Inventory Management: The system's advanced data processing capabilities and real-time analytics enable more accurate inventory forecasting and management, reducing waste and improving supply chain efficiency.

[0080] Seamless Integration: The robust API integration methods allow for easy incorporation of the integrated platform into existing online platforms and third-party services, enhancing its versatility and adoption potential.

[0081] The methods described herein may be performed and the various processing or computation units and the devices and computing entities described herein may be implemented by one or more circuits. In an embodiment, a "circuit" may be understood as any kind of a logic implementing entity, which may be hardware, software, firmware, or any combination thereof. Thus, in an embodiment, a "circuit" may be a hard-wired logic circuit or a programmable logic circuit such as a programmable processor, e.g. a microprocessor. A "circuit" may also be software being implemented or executed by a processor, e.g., any kind of computer program, e.g., a computer program using a virtual machine code. Any other kind of implementation of the respective functions which are described herein may also be understood as a "circuit" in accordance with an alternative embodiment.

[0082] While the invention has been particularly shown and described with reference to specific embodiments, it should be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention as defined by the appended claims. The scope of the invention is thus indicated by the appended claims and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced.

ABSTRACT
A SYSTEM AND METHOD FOR PROVIDING REFILLABLE PRODUCTS ON
AN ONLINE PLATFORM

The present invention discloses a system and method for providing refillable products on an online platform process by providing a system and method that seamlessly integrates refillable products into an online platform without disrupting the flow or requiring them to navigate separate sections of the online platform.

Figure 2