

COMPUTER-IMPLEMENTED METHOD AND SYSTEM FOR MANAGEMENT OF AVIATION RESOURCE BIDDING PROCESS

TECHNICAL FIELD

5 **[0001]** Various aspects relate to methods, systems, and non-transitory computer-readable media for managing an aviation resource allocation/bidding process. The methods, systems, and non-transitory computer-readable medium may be suited for managing bidding process of aviation fuel for various airlines and airports.

BACKGROUND

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[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
15 the priority date of the application.

[0003] Aviation market sales of resources, such as aviation fuel, is an important aspect of any aviation resource provision company. In the context of an aviation resource provision company's expansion and globalization, a typical process may include the bidding of aviation resources. As aviation market sales business continue to develop, management of
20 aviation resource bidding processes may pose multi-dimensional challenges. Conventionally, an aviation resource provision company may manage the aviation market bidding of one or more subsidiaries/units by regularly collecting manual data and then summarizing and reporting. Such conventional management lacks centralization,

integration, and standardization. In addition, such conventional management processes may face problems such as untimely reporting and inaccurate data.

[0004] There exists a need for an improved aviation market bidding management platform. A further need exists to provide an efficient data processing method of data
5 associated with the management and bidding platform in a safe and secure manner.

SUMMARY

[0005] The technical solution seeks to provide a system, method and management platform for aviation resource allocation. In some aspects, the management platform may take into account the historical experience of past processes and data in an aviation resource
10 management. One or more modules may be implemented to model the entire process of bidding management in an integrated manner.

[0006] In some embodiments, a full-process management method is provided. This may include a process flow from obtaining a resource bidding offer data (e.g. receipt of a bidding invitation) to the end of the bidding process. In the context of an aviation resource
15 management, the bidding management process may involve the collection and storage of data such as airline and airport information, customer information, supply sales volume and price, bid winning and unsuccessful results, etc. The aforementioned data may be stored, reviewed, and approved bidding decisions may be analyzed for possible reasons for winning and losing, thereby improving future bidding efficiency, success, and accuracy. In some
20 embodiments, the system may be configured to implement bidding data online, process solidification, and statistical analysis of historical data to provide quotation reference. Such a system advantageously improves information integration and work efficiency. Various credit limits and risk exposures may be well controlled.

[0007] According to an aspect of the present disclosure there is provided a computer-implemented method for managing an aviation resource bidding process, the method comprising the steps of: obtaining, by a sales module, a resource bidding offer data associated with at least one airline; creating, by the sales module, a resource bidding reply data, the resource bidding reply data configured to respond to the resource bidding offer data; including, by a supplier module, a quotation data appended to the resource bidding reply data; developing a supply strategy based on the quotation data; calculating an estimate based on the supply strategy, the estimate based on a supply volume and a discount parameter; and submitting, by the sales module, the resource bidding reply data and the quotation to a processor associated with the airline.

[0008] One or more of the aforementioned modules may be combined.

[0009] According to another aspect of the disclosure there is provided a system for managing an aviation resource bidding process, the system comprises a processor, the processor comprises a sales module and a supplier module, and configured to: obtain, by the sales module, an aviation resource bidding invitation data associated with at least one airline; create, by the sales module, an aviation resource bidding reply data, the aviation resource bidding reply data configured to respond to the aviation resource bidding invitation data; include, by the supplier module, a quotation data to the resource bidding reply data; develop, by the sales module, a supply strategy based on the quotation data; wherein the development includes calculating an estimate based on the supply strategy, the estimate based on a supply volume and a discount parameter; and submit, by the sales module, the resource bidding reply data, the supply strategy, and the quotation to another processor associated with the airline.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Throughout the drawings, it should be noted that like reference numbers are used to depict the same or similar elements, features, and structures. The drawings are not necessarily to scale, emphasis instead generally being placed upon illustrating aspects of the disclosure. In the following description, some aspects of the disclosure are described with reference to the following drawings, in which:

FIG 1. is a block diagram showing an example electronic device for managing an aviation resource bidding process, according to an embodiment of the present disclosure;

FIG. 2 is a block diagram showing an example system for managing an aviation resource bidding process, according to an embodiment of the present disclosure;

FIG. 3 shows an exemplary system of the present disclosure, the system comprising a sales module and a supplier module;

FIG. 4A is a flow chart illustrating a data flow for the management of an aviation resource bidding process, according to an embodiment of the present disclosure;

FIGS. 4B, 4C, 4D, and 4E show exemplary data structure and parameters of different modules of the aviation resource bidding management system, according to some embodiments of the present disclosure;

FIGS. 5A, 5B, 5C, 5D, 5E, 5F, and 5G illustrate various embodiments of user interface, such as GUI, for login and basic data manipulation and viewing by a user of the system 200;

FIGS. 6A(i) to 6A(iii), FIGS. 6B(i) to 6B(iii), FIGS. 6C(i) to 6C(iii), FIGS. 6D(i) to 6D(viii), FIGS. 6E(i) to 6E(iii), FIGS. 6F(i) to 6F(x), FIGS. 6G(i) to 6G(viii), FIGS. 6H(i) to 6H(iii), FIGS. 6I(i) to 6I(iv), FIGS. 6J(i) to 6J(iv), FIGS. 6K(i) to 6K(iii), FIGS. 6L(i) to 6L(iii), FIGS. 6M(i) to 6M(ii), and FIG. 6N illustrate various embodiments of user interface, such

as GUI, for one or more authorized users to provide user inputs according to the present disclosure; and

FIG. 7 shows a general flow chart depicting a method for managing an aviation resource bidding process according to the present disclosure.

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DETAILED DESCRIPTION

[0011] The following detailed description refers to the accompanying drawings that show, by way of illustration, specific details and aspects in which the disclosure may be practiced. One or more aspects are described in sufficient detail to enable those skilled in the art to practice the disclosure. Other aspects may be utilized and structural, logical, and/or electrical changes may be made without departing from the scope of the disclosure. The various aspects of the disclosure are not necessarily mutually exclusive, as some aspects can be combined with one or more other aspects to form new aspects or embodiments. Various aspects are described in connection with methods and various aspects are described in connection with devices. However, it may be understood that aspects described in connection with methods may similarly apply to the devices, and vice versa.

[0012] It should be understood that the singular terms "a", "an", and "the" include plural references unless context clearly indicates otherwise. Similarly, the word "or" is intended to include "and" unless the context clearly indicates otherwise.

[0013] It will be further understood that the terms "comprise" (and any form of comprise, such as "comprises" and "comprising"), "have" (and any form of have, such as "has" and "having"), "include" (and any form of include, such as "includes" and "including"), and "contain" (and any form of contain, such as "contains" and "containing") are open-ended linking verbs. As a result, a method or device that "comprises," "has," "includes" or "contains" one or more steps or elements possesses those one or more steps

or elements, but is not limited to possessing only those one or more steps or elements. Likewise, a step of a method or an element of a device that “comprises,” “has,” “includes” or “contains” one or more features possesses those one or more features, but is not limited to possessing only those one or more features. Furthermore, a device or structure that is
5 configured in a certain way is configured in at least that way, but may also be configured in ways that are not listed.

[0014] Approximating language, as used herein throughout the specification and claims, may be applied to modify any quantitative representation that could permissibly vary without resulting in a change in the basic function to which it is related. Accordingly, a
10 value modified by a term or terms, such as “about,” “substantially”, is not limited to the precise value specified but within tolerances that are acceptable for operation of the embodiment for an application for which it is intended. In some instances, the approximating language may correspond to the precision of an instrument for measuring the value.

15 **[0015]** The term “exemplary” may be used herein to mean “serving as an example, instance, or illustration”. Any aspect or design described herein as “exemplary” is not necessarily to be construed as preferred or advantageous over other aspects or designs.

[0016] The terms “at least one” and “one or more” may be understood to include a numerical quantity greater than or equal to one (e.g., one, two, three, four, [...], etc.). The
20 term “a plurality” may be understood to include a numerical quantity greater than or equal to two (e.g., two, three, four, five, [...], etc.). The phrase “at least one of” with regard to a group of elements may be used herein to mean at least one element from the group consisting of the elements. For example, the phrase “at least one of” with regard to a group of elements may be used herein to mean a selection of: one of the listed elements, a plurality of one of

the listed elements, a plurality of individual listed elements, or a plurality of a multiple of listed elements.

[0017] The words “plural” and “multiple” in the description and in the claims expressly refer to a quantity greater than one. Accordingly, any phrases explicitly invoking the
5 aforementioned words (e.g., “a plurality of (objects)”, “multiple (objects)”) referring to a quantity of objects expressly refer to more than one of the said objects. The terms “group (of)”, “set (of)”, “collection (of)”, “series (of)”, “sequence (of)”, “grouping (of)”, etc., and the like in the description and in the claims, if any, refer to a quantity equal to or greater than one, i.e. one or more.

10 **[0018]** The term “data” as used herein may be understood to include information in any suitable analog or digital form, e.g., provided as a file, a portion of a file, a set of files, a signal or stream, a portion of a signal or stream, a set of signals or streams, and the like. Further, the term “data” may also be used to mean a reference to information, e.g., in form of a pointer. The term “data”, however, is not limited to the aforementioned examples and
15 may take various forms and represent any information as understood in the art. Any type of information, as described herein, may be handled for example via one or more processors in a suitable way, e.g. as data.

[0019] The term “bidding data” refers to data that are associated with the provision of a bid for an aviation resource. The aviation resource may include aviation fuel, such as
20 aviation turbine fuel, or jet fuel. In some embodiments, the jet fuel may include sustainable aviation fuel (SAF). In some embodiments, bidding data may suitably be secured or encrypted. Such encryption may include the provision of a data structure that is suitably complex, and/or conversion of the data into ciphertext, which can be decoded using a unique decryption key.

[0020] The term “associate”, “associated”, and “associating” may indicate a defined relationship (or cross-reference) between two items. For example, one or more airports may be associated with an airline. Such association may be based on, for example, one or more aircrafts of an airline being allocated slots or space at an airport for purpose of receiving
5 aviation resources, such as re-fueling of aircrafts.

[0021] The terms “processor” used herein may be understood as any kind of entity that allows handling of data. The data may be handled according to one or more specific functions executed by the processor or controller. Further, a processor or controller as used herein may be understood as any kind of circuit, e.g., any kind of analog or digital circuit.
10 A processor or a controller may thus be or include an analog circuit, digital circuit, mixed-signal circuit, logic circuit, processor, microprocessor, Central Processing Unit (CPU), Graphics Processing Unit (GPU), Digital Signal Processor (DSP), Field Programmable Gate Array (FPGA), integrated circuit, Application Specific Integrated Circuit (ASIC), etc., or any combination thereof. Any other kind of implementation of the respective functions,
15 which will be described below in further detail, may also be understood as a processor, controller, or logic circuit. It is understood that any two (or more) of the processors, controllers, or logic circuits detailed herein may be realized as a single entity with equivalent functionality or the like, and conversely that any single processor, controller, or logic circuit detailed herein may be realized as two (or more) separate entities with equivalent
20 functionality or the like.

[0022] The term “memory” detailed herein may be understood to include any suitable type of memory or memory device, e.g., a hard disk drive (HDD), a solid-state drive (SSD), a flash memory, etc.

[0023] The term “module” detailed herein refers to, or forms part of, or includes an Application Specific Integrated Circuit (ASIC); an electronic circuit; a combinational logic circuit; a field programmable gate array (FPGA); a processor (shared, dedicated, or group) that executes code; other suitable hardware components that provide a described
5 functionality; or a combination of some or all of the above, such as in a system-on-chip. The term module may include memory (shared, dedicated, or group) that stores code executed by the processor.

[0024] Differences between software and hardware implemented data handling may blur. A processor, controller, and/or circuit detailed herein may be implemented in software,
10 hardware, and/or as a hybrid implementation including software and hardware.

[0025] The term “system” (e.g., an aviation resource management system, a bidding system, a computing system, etc.) detailed herein may be understood as a set of interacting elements, wherein the elements can be, by way of example and not of limitation, one or more mechanical components, one or more electrical components, one or more instructions
15 (e.g., encoded in storage media), and/or one or more processors, and the like.

[0026] The term “first”, “second”, “third” detailed herein are used to distinguish one element from another similar element and may not necessarily denote order or relative importance, unless otherwise stated in the form of priority. For example, a first bidding data, a second bidding data may be used to distinguish two bidding transactions performed at two
20 different time periods.

[0027] The term “airline” detailed herein refers to an institution owning or associated with one or more aircrafts. The one or more aircrafts may be configured for air transport, which are usually scheduled, between specific geographical locations. The air transport may be for goods and/or passengers.

[0028] The term “airport” detailed herein refers to broadly to any area for aircrafts to at least perform a function of taking off, landing, and/or provision of aviation resources to the aircrafts. Airports may include an aerially accessible open space including at least one operationally active surface such as a runway for a plane to take off and to land or a helipad.

5 In some embodiments, airport may include infrastructure for the maintenance of aircrafts or the provision of aviation resources such as jet fuel.

[0029] The term “supply strategy” detailed herein broadly includes supply chain network management of aviation resources, and may include processes such as scheduling of movement/transport of aviation resources from various sources and destinations.

10 **[0030]** According to various aspects, the method of managing an aviation resource bidding process may include obtaining, by a sales module, a resource bidding offer data associated with at least one airline; developing a supply strategy based on the quotation data; calculating an estimate based on the supply strategy, the estimate based on a supply volume and a discount parameter; and submitting, by the sales module, the resource bidding reply
15 data and the quotation to a processor associated with the airline. In some embodiments, the processor may be part of the airline module 202. In other embodiments, the processor may be a separate processor from the airline module 202.

[0031] In some instances, aspects of the systems and methods described here provide technical improvements and advantages over existing approaches. For example, the
20 proposed systems and methods may provide a technical solution to improve efficiency of an aviation resource bidding process. This may be an improvement over the prior art where the resource bidding process may be manually performed and/or performed piecemeal. The use of a centralized system receiving data from various modules as input, and the use of

historical bidding data which may be pre-stored in dedicated databases, provides for an integrated system which improves data flow and efficiency.

[0032] The following examples pertain to various aspects and embodiments of the present disclosure.

5 **[0033]** FIG. 1 is a block diagram showing an example electronic device 100, according to an embodiment of the present disclosure. The electronic device 100 may be a laptop computer, a desktop computer, a tablet computer, an automobile computer, a smart phone, a personal digital assistant, a server, or other electronic devices capable of running computer applications. In some embodiments, the electronic device 100 includes a processor 102, an
10 input/output (I/O) module 104, memory 106, a power unit 108, and one or more network interfaces 110. The electronic device 100 can include additional components. In some embodiments, the processor 102, input/output (I/O) module 104, memory 106, power unit 108, and the network interface(s) 110 are housed together in a common housing or other assembly.

15 **[0034]** The processor 102 can execute instructions, for example, to generate output data based on data inputs. The instructions can include programs, codes, scripts, or other types of data stored in memory (e.g., memory 106). Additionally or alternatively, the instructions can be encoded as pre-programmed or re-programmable logic circuits, logic gates, or other types of hardware or firmware components or modules. The processor 102 may be, or may
20 include, a multicore processor having a plurality of cores, and each such core may have an independent power domain and can be configured to enter and exit different operating or performance states based on workload. Additionally or alternatively, the processor 102 may be, or may include, a general-purpose microprocessor, as a specialized co-processor or another type of data processing apparatus. In some cases, the processor 102 performs high-
25 level operation of the electronic device 100. For example, the processor 102 may be

configured to execute or interpret software, scripts, programs, functions, executables, or other instructions stored in the memory 106.

[0035] The example I/O module 104 may include a mouse, keypad, touch screen, scanner, optical reader, and/or stylus (or other input device(s)) through which a user of the electronic device 100 may provide input to the electronic device 100, and may also include one or more audio speakers for providing audio output and a video display device for providing textual, audiovisual, and/or graphical output. The I/O module 104 may be configured to display a plurality of graphical user interface (GUI) as shown in FIG. 5A to 5G. The plurality of GUI may be assessible via secured access by one or more authorized users.

[0036] The example memory 106 may include computer-readable storage media, for example, a volatile memory device, a non-volatile memory device, or both. The memory 106 may include one or more read-only memory devices, random-access memory devices, buffer memory devices, or a combination of these and other types of memory devices. In some instances, one or more components of the memory can be integrated or otherwise be associated with another component of the electronic device 100. The memory 106 may store instructions that are executable by the processor 102. In some examples, the memory 106 may store instructions for an operating system 112 and for application programs 114. The memory 106 may also store a database 116.

[0037] The example power unit 108 provides power to the other components of the electronic device 100. For example, the other components may operate based on electrical power provided by the power unit 108 through a voltage bus or other connection. In some embodiments, the power unit 108 includes a battery or a battery system, for example, a rechargeable battery. In some embodiments, the power unit 108 includes an adapter (e.g., an AC adapter) that receives an external power signal (from an external source) and converts

the external power signal to an internal power signal conditioned for a component of the electronic device 100. The power unit 108 may include other components or operate in another manner.

[0038] The electronic device 100 may be configured to operate in a wireless, wired, or cloud network environment (or a combination thereof). In some embodiments, the electronic device 100 can access the network using the network interface(s) 110. The network interface(s) 110 can include one or more adapters, modems, connectors, sockets, terminals, ports, slots, and the like. The wireless network that the electronic device 100 accesses may operate, for example, according to a wireless network standard or another type of wireless communication protocol. For example, the wireless network may be configured to operate as a Wireless Local Area Network (WLAN), a Personal Area Network (PAN), a metropolitan area network (MAN), or another type of wireless network. Examples of WLANs include networks configured to operate according to one or more of the 802.11 family of standards developed by IEEE (e.g., Wi-Fi networks), and others. Examples of PANs include networks that operate according to short-range communication standards (e.g., BLUETOOTH®, Near Field Communication (NFC), ZigBee), millimeter wave communications, and others. The wired network that the electronic device 100 accesses may, for example, include Ethernet, SONET, circuit-switched networks (e.g., using components such as SS7, cable, and the like), and others.

[0039] The processor 102 may be used to execute a computer-implemented method for managing an aviation resource bidding process according to the present disclosure.

[0040] FIG. 2 is a block diagram showing an example system 200 according to an embodiment of the present disclosure. The system 200 may comprise the electronic device 100 and in particular may include processor 102. In various embodiments, the system 200 may be implemented as a tender management system (TMS) in an online bidding system

providing direct or indirect aviation resource bidding services. In some embodiments, one or more airlines may be connected to the system 200 via airline module 202. Each airline module 202 may be configured to issue one or more aviation resource bidding offers 204, which may be in the form of an invitation to bid. The aviation resource bidding offer may
5 be sent via one or more electronic mails (emails), and the one or more emails may be encrypted using at least one encryption methods such as Secure Multi-purpose Internet Mail Extension (S/MIME), and/or Transport Layer Security (TLS).

[0041] In some embodiments, the system 200 may be in data communication with one or more bidding approval module 260. The bidding approval module 260 may be configured
10 to receive one or more bidding statuses from the system 200. The bidding statuses may then be verified, approved/rejected, and logged. In some embodiments, the bidding approval module 260 may form part of the system 200.

[0042] In various embodiments, the one or more aviation resource bidding offers may be in a data format and data structure as shown in FIG. 4B to 4D. The aviation resource
15 bidding offer may be encrypted and may require one or more layers of authentication.

[0043] In some embodiments as shown in FIG. 3, the system 200 may comprise a sales module 220 and a supplier module 240.

[0044] The sales module 220 may comprise historical data and domain knowledge of a sales team of an aviation firm. In the step of creating, by the sales module, the resource
20 bidding reply data, the sales module 220 may be configured to receive the aviation resource bidding offer, and the aviation resource bidding offer (e.g. a bidding invitation) may be executed in a Tender Management System (TMS system) of the sales module 220.

[0045] In some embodiments, the sales module 220 may be hosted in an independent server, and the historical data of the sales prices and fee combinations for each airport may

be hosted in a first associated database. In some embodiments, the first associated database may form part of the sales module 220.

[0046] In some embodiments, the supplier module 240 may be hosted in an independent server, and the historical data of the supply prices and fee combinations for each airport may
5 be hosted in a second associated database. In some embodiments, the second associated database may form part of the supplier module 240.

[0047] FIG. 4A shows an embodiment of a method 400 for managing an aviation resource bidding process. The method 400 may be suited for implementation of the bidding of a jet fuel by an aviation management platform.

10 [0048] The method 400 commences with step 402, an issuance of a bidding invitation from the airline module 202.

[0049] In step 404, based on the received bidding invitation by the sales module 220, the sales module 220 may be configured to generate a response to the bidding invitation. This may be in the form of a reply to a tender.

15 [0050] In step 406, as part of the updating and preparation of response, one or more airport data entries may be added by a user to the bidding invitation via a GUI. In some embodiments, the airport data may include one or more airport codes registered by the International Air Transport Association (IATA) or International Civil Aviation Organization (ICAO). After the entry and submission of the contract information for each associated
20 airport is completed, the supplier module 240 may provide a GUI to display the information, including a map illustrate various airports in the system 200.

[0051] In step 408, as part of the step of including, by the supplier module 240, a quotation data appended to the resource bidding reply data, the supplier module 240 may be

configured to allow a user to contact one or more suppliers associated with each airport to obtain the supplier's quotation of the aviation resources based on current/latest prices. The supplier module 240 may be configured to receive input quotation from the supplier, and may allow users to input relevant quotes in at least two ways: (a.) by selecting the aviation
 5 resource (e.g. jet fuel) supply price and a fee group template (BPA Template) of the airport where it is located, and (b.) by referring to the previous aviation resources (e.g. jet fuel) supply price and fee combination of the airport (BPA). It is contemplated human errors may be reduced and work efficiency may be improved through these two methods.

[0052] Upon completion of the input quotation, the existing quotation combination (or
 10 the most recent pre-determined number of quotations) may be configured and updated as the new BPA in the system 200. This previous BPA may form part of the historical BPA data of the system 200.

[0053] The resource bidding reply data with the quotation data, which includes the BPA, may then be sent to the sales module 220 for further processing.

[0054] In step 410, in the step of determining a supply strategy, the sales module 220
 15 may be configured to determine or develop a supply strategy.

[0055] In step 412, based on the BPA submitted and the bid winning results of an airport in the past, the sales module 220 may be configured to include a discount parameter correlated to a supply volume of the aviation resource e.g. jet fuel, and decide whether to
 20 modify other costs so as to maximize the chances of success of the bid. In some embodiments, the discount parameter may include a discount value expressed in percentage, which may maximize the chances of success of the bid.

[0056] In step 414, the step of submitting the resource bidding reply data by the sales module 220 to the airline module 202 may include generating the aviation resource sales

price e.g. jet fuel sales price and may include an expense parameter. In the context of jet fuel, the expense parameter may include past jet fuel sales prices and fee combinations at airports in the system (BPX). The past jet fuel sales prices may be based on a predetermined time horizon or period in the past.

5 **[0057]** In some embodiments, the TMS system of the sales module 220 may be configured to automatically calculate estimated profits based on the submitted bid to the airline module 202.

[0058] In some embodiments, the sales module 220 may be configured to obtain a bid decision input on whether to submit a quotation to the airline module 202 based on any
10 approval results determined by the approval module 260. The sales module 220 may be configured to monitor or track for an electronic notification from the airline module 202 (step 416) periodically regarding an outcome of the bid result, for example, whether the bid is a successful bid (i.e. success status), an unsuccessful bid (i.e. unsuccessful status), an abandoned bid (i.e. no winner), or if more data is required for a further round(s) of bid. In
15 some embodiments, the sales module 220 may receive a current ranking data of the bid with respect to other submitted bids, with a notification that another round of bidding with a reduce group based on a predetermined number of the top ranked bids may be conducted.

[0059] In step 418, upon receiving the notification from the airline module 202, the sales module 202 may be configured to update the bidding results within the system 200. If the
20 current round of bidding is won, lost, or abandoned, the process ends. If the sales team receives a new round of bidding invitations from the airline, the TMS system will automatically start a new round of bidding until the end of the process.

[0060] In step 420, the prepared response output of step 412 may be sent to the approval module 260 for approval. The process ends if the approval is rejected and step 412 may not be allowed to proceed to step 414, i.e. cannot be submitted to the airline module 202.

[0061] In some embodiments, the method 400 may be implemented as software codes
5 stored in a computer readable medium, such that when the software code is executed by a computer, will cause the computer to perform the method 400. Each of the modules 220, 240, 260 may be separately hosted, or may be an integrated centralized processor.

[0062] In some embodiments, the system 200 may perform various functions of the modules such as the maintenance of basic system data, including global airport information,
10 contact information of commonly used suppliers and airlines, commonly used location cost information, BPA/BPX template editing, and BPA/BPX historical record review. In some embodiments, the location cost information includes airport supply costs/charges.

[0063] In some embodiments, the software implementing the various functions and modules 200, 260 may be based on web pages and uses HTML form submission, to facilitate
15 process management. The software may be based on a python lightweight Flask web development platform, combined with the commonly used web open source front-end framework Bootstrap and its data table function, and AJAX asynchronous dynamic web page technology to facilitate a simple, easy and convenient operating platform.

[0064] In some embodiments, the system 200 may be deployed on an intranet, and users
20 for various modules may be required to be securely connected to the Intranet to access it. In some embodiments, the sales module 220 may be accessed by a contract team, which is a subset of a sales team, and the supplier module 240 may be accessed by a supply or purchasing team. For added security, members of each of the contract team may be denied access for the non-assigned modules.

[0065] In some embodiments, the data processed or stored by one or more of the modules may be stored as a decentralized database/ledger, i.e. data are stored across a network of distributed computers or servers. For example, the bidding information and financial-related documents may be stored in a blockchain structure.

5 **[0066]** FIGS. 4B to 4E show exemplary embodiments of the data structure and various data parameters. FIG. 4B shows the various parameters used in a bidding invitation and the usage/generation of a BPA parameter, by the supplier module. It is appreciable that the BPA and BPX parameters may be stored in a bpa table, as a bpa_type.

[0067] FIGS. 4C and 4D shows the various parameters used in the obtaining of various
10 parameters from one or more airports and generation/update of quotation based on the BPX parameter, by the sales module. It may be appreciable that a BPM table is configured to store awarded BPX values/parameters. The BPM may be regarded as a subset of the BPX.

[0068] FIGS. 5A to 5G illustrate various embodiments of user interface, such as GUI,
as possible implementations of user login and basic data settings for manipulation and
15 viewing by one or more authorized users of the system 200. The GUI may be implemented as web pages to facilitate a user in the preparation of a response/reply in response to an aviation resource bidding invitation, such as a bidding invitation of jet fuel.

[0069] Referring to FIG. 5A, a user authorized (hereinafter referred to as authorized user
or user) to access the sales module 220 may connect to a secured Intranet and uses a web
20 browser to log in to the official web address. FIG. 5A shows an example of the login interface 500 of the TMS system where a user can enter his details such as user name 501 and password 502, based on certain pre-set rules (e.g. password minimum character). One or more second factor authentication (not shown) may be performed. The TMS system verifies the identity information through an active directory (AD) domain account storing

users and device configurations. If the verification is successful, the page will jump to a main homepage.

[0070] FIG. 5B to FIG. 5G show examples of the webpages 503 to 508, which may display basic data and related settings to facilitate the creation or generation of the aviation resource bidding reply data. Basic data may refer to key supporting data involved in process management. It mainly includes airport data 504, contact information 505, fee list of each airport 506, BPA/BPX template 507, and historical BPA/BPX records 508, as shown in FIG. 5C to 5G.

[0071] Some embodiments or examples of the method 400 and the system 200 will be described with reference to FIG. 6A to FIG. 6N, which show various exemplary GUI for the implementation of various steps of the method 400, in the context of an aviation market bidding management.

[0072] In preparation of the bidding process, i.e. before receiving any bidding invitation from the airline module 402, the system 200 may comprise a tender collection module 270 for the collection of tender information from potential partner airlines in order to prepare for future formal biddings. Upon receiving a bidding invitation from an airline module 202, an authorized user of the sales module 220 may create a tender catalog and enter details of the bidding invitation contract of each airport. Referring to FIG. 6A(i) to (iii), a GUI “No Bid Tender” providing a menu selection may be accessed by an authorized user to create a tender catalog. FIG. 6A(i) may be a jump page providing tabs 601 and 602 to the authorized user. An authorized user will select tab 601 “Add invitation (Registered counterparty)” if the airline which the bidding invitation is received is an existing trading counterparty. Otherwise, tab 602 “Add invitation (non-registered counterparty)” may be selected by the authorized user.

[0073] Upon detecting, by the sales module 220, that the user has selected a registered airline via clicking on the tab 601, the system 200 may provide a GUI shown in FIG. 6A(ii) comprising a plurality of text boxes for input by the authorized user. The registered airline may be auto-populated 603. Otherwise, if the user is determined to have selected option 5 602, the system 200 may provide a GUI shown in FIG. 6A(iii) without any airline name populated.

[0074] Referring back to the jump page shown in FIG. 6A(i), the authorized user may access an input interface (e.g. webpage) to enter details of the bidding invitation contract for each airport. This may be via the authorized user clicking on an aircraft icon 604.

10 [0075] Upon detecting, by the sales module 220, that the user has clicked on an aircraft icon 604, the system 200 may provide a GUI 605 as shown in FIG. 6B(i) for the user to select to input one or more airport information. The GUI 605 may be a jump page with an add airport tab 606.

[0076] Once the user selects the add airport tab 606, the user may be redirected to the 15 FIG. 6B(ii), which is a GUI 607 for the user to enter various inputs. In some embodiments, known information already stored in one or more databases may be auto-populated. In the example shown in FIG. 6B(ii), various information such as bidding entity, commodity (e.g. type of aviation resource), contractual demand, contract term, volume, may be filled by the user. After the form is filled, the user may submit the information. FIG. 6B(iii) shows an 20 entry 608 after submission. If there are more airport information relating to other airports to be input, the user may select the add airport tab 606 again. FIG. 6B(iv) illustrates the GUI with two entries 609.

[0077] After receiving a formal bidding from the airline, the user (whom may be a contract administrator) may create an aviation resource bidding reply data, which may be a

bidding tender, with reference to FIG. 6C(i) to 6C(iii) and FIG. 6D(i) to 6D(viii). The creation of the bidding data may include the following steps performed by the sales module 220: to create a bidding invitation entry, entering/inputting or parsing details of bidding invitation contract for one or more airports associated with the airline, and sending the
5 created bidding invitation contract to the supplier module (e.g. managed by a purchasing team).

[0078] Referring to FIG. 6C(i), the sales module 220 may provide a jump web page 620 for displaying any pending bidding invitations that has not been closed or completed. In some embodiments, the pending bidding invitations may be provided via a drop-down menu
10 to view all records. The system 200 may be configured to determine or more bidding invitations that has not been closed via a flag data or input notification by an authorized user.

[0079] The jump web page 620 may comprise an “add invitation” tab 621 for a user to commence the creation of a new bidding invitation entry. FIG. 6C(ii) shows an input GUI
15 622 for a user to input bidding related details. Examples of such bidding related details may include a reference identifier 623 and an airline code/identifier 624.

[0080] After the bidding related details are input by the user, the bidding invitation directory is created and saved. FIG. 6C(iii) shows an entry indicating the successful creation of the bidding invitation entry.

20 [0081] After the creation of the bidding invitation entry, further data required for the preparation of a response to the bid, may be provided via one or more GUI for input by the authorized user, as shown in FIG. 6D(i) to 6D(x). It may be appreciable that this may form part of steps 404 and 406.

[0082] FIG. 6D(i) shows a selection of the bidding invitation for further data input based on FIG. 6C(iii). An aircraft icon 625 may be selected by a user to jump page 626 as shown in FIG. 6D(ii). Jump page 626 provides a user with an “Add airport” tab 627 for manual input by the user. In addition, the jump page 626 may further provide for the import of third-party information, such as via an Excel file, using an “Import function” or “Load Airport by Excel” tab 628.

[0083] FIG. 6D(iii) shows a GUI 629 after an authorized user selects the “Add airport” tab 627 for manually entering airport related data/information. This may be similar to the GUI shown in FIG. 6B(ii), and it may be appreciable that the pre-entered data in FIG. 6B(ii) may be extracted and pre-entered into the GUI 629.

[0084] FIG. 6D(iv) shows an example of a saved entry 630 after the user entered the airport data/information. In some embodiments, the number of modifications (rounds) may be indicated, e.g. ROUND1. The status is displayed as "OPEN", which means that the corresponding airport has not been submitted to the purchasing team which may access the supplier module 240 to provide quotation. At this time, the system allows modification and deletion. It is appreciable that additional airport entries may be made by clicking on the “Add airport” tab 627.

[0085] FIG. 6D(v) to FIG. 6D(viii) shows the exemplary GUIs if the user selects the “Import function” tab 628. In FIG. 6D(v), once the tab 628 is selected, the pop-up window 631 may be shown. The pop-up window 631 may provide a “Choose File” tab 632 for the user to load or import an Excel file 633, as shown in FIG. 6D(vi).

[0086] FIG. 6D(vii) shows an example after successful import of the Excel file. FIG. 6D(viii) shows an example of support for the import/upload of other files, such as .pdf file formats.

[0087] After the further data relating to airports are included, the entries are submitted and prepared to be sent to the supplier module 240. FIGS. 6E(i) to 6E(iii) show some embodiments of GUI for the submission of further data.

[0088] In FIG. 6E(i), the user may check one or more checkboxes 634 to select the
5 airport information entries to be submitted. The user may then click on a submit tab 635 to submit the check-boxed entries. In FIG. 6E(ii), a pop-up box 636 may be displayed for the user to confirm his submission via a “Submit” tab 635. After the submission is successful, the information may be displayed as shown in FIG. 6E(iii).

[0089] It may be appreciable that modification(s) and deletion(s) are no longer allowed
10 after submission. If modifications are required, a contract administrator may need to be informed to make the necessary changes to return the relevant airport tender.

[0090] The supplier module 240 may be configured to receive the airport contract information as output by the sales module 220. The supplier module 240 may be accessed by a purchasing team to complete the following operations, i.e. to update the Jet fuel supply
15 prices and fee combinations at airports in the system (BPA), the supply price so as to send the updated quotation back to the sales module 220.

[0091] FIGS. 6F(i) to 6F(x) show the various GUIs for a user to fill in a supply fee quotation. It may be appreciable that this may form part of step 408.

[0092] In FIG. 6F(i), a purchasing team user may select bidding invitations via an icon
20 637. The team user may then be brought to a jump page 638 which enables the user to input the airport supply cost quotation by entering a “+” button 639 as shown in FIG. 6F(ii).

[0093] In FIG. 6F(iii), a jump page 640 for updating the BPA may be displayed for the user to select a BPA via tab 641.

[0094] In FIG. 6F(iv), upon selection by the user via tab 641, the supplier module 240 system may be configured to display two filter lists 642, 643 based on the airports data/information. The filtered list 642 on the left shows the BPA template, while the filtered list on the right 643 shows the historical BPA. The user of the purchasing team may select
5 the appropriate BPA template or record as a reference quotation and continue editing.

[0095] In FIG. 6F(v), in the scenario where there is no quotation reference to draw from, the purchasing team may be required to manually add each expense. This may be performed via a "Save" tab 644.

[0096] If the user clicks on the tab 644, a pop-up window 645 appears. In the pop-up
10 window 645, the user may enter the BPA name via a text box 646 and save the same.

[0097] In FIG. 6F(vi) and (vii), the jump page 640 is shown with entries updated 647.

[0098] In FIG. 6F(viii) to 6F(ix), a user may select the relevant information where the quotation or fees have been added, and to submit the same via the submit tab 648. After successful submission, a confirmation notification 649 may be made via the GUI as shown
15 in FIG. 6F(ix).

[0099] After the supplier module 240 has updated the aviation resource supply price and fee combinations (e.g. Jet fuel supply prices and fee combinations) at airports in the system (BPA), the updated quotation data which includes the BPA is sent back to the sales module 220.

[0100] The sales module 220 is then configured to develop a supply strategy based on
20 the quotation data (BPA) received. The supply strategy may include updating a sales expense quotation entry, such as the BPX, based on the updated BPA.

[0101] FIGS. 6G(i) to 6G(vi) show the various GUIs for a user to update the sales expense quotation entry. It may be appreciable that this may form part of step 410 and 412.

[0102] FIG. 6G(i) to 6G(ii) show GUI functionalities to select an airport data entry to update the sales expense quotation entry using the BPX parameter. A user of the sales module 220 may be brought through the relevant jump pages shown in FIG. 6G(i) and FIG. 6G (ii) to select an airport entry via icon 650 and tab 651.

5 **[0103]** Once the user selects an entry, the GUI 653 shown in FIG. 6G(iii) displays the BPA quotation (as updated) for update/selection of modification of BPX via a “select BPX” tab 654 by the user.

[0104] FIG. 6G(iv) displays the GUI 655 for selection based on the BPA, or a BPX template may be selected or picked, or a record from filter lists 642, 643 may be used as
10 reference.

[0105] FIG. 6G(v) shows a GUI 656 for modifying a cost entry based on the selected BPX. For example, the rate 1.4 may be modified. Once the cost entry is modified, it may be saved as shown in FIG. 6G(vi).

[0106] FIG. 6G(vii) shows a GUI 657 ready for submission. In some embodiments, the
15 sales module 220 may be configured to receive further information relating to the tender, such as the aviation resource supply mode (supply model via, for example, self-supply or back-to-back supply), an estimated profit based on the updated BPA and BPX.

[0107] In some embodiments, the sales module 220 may be configured to allow a user of the sales module 220 to return the submission to the supplier module 240 or an
20 administrator for a final check, or further modification.

[0108] FIGS. 6H(i) to 6H(iii) show the various GUIs for a user to submit the sales expense quotation entry. It may be appreciable that these may form at least part of step 414.

[0109] In some embodiments, the sales module 220 may be configured to automatically generate quotations for the system 200 using a template. The template may be a MS WORD template. FIGS. 6I(i) to 6I(iii) are GUIs for a user to automatically generate a quotation for a selected airport.

5 **[0110]** In some embodiments, the approval module 270 may be configured to provide approval feedback by an administrator user. FIGS. 6J(i) to 6J(iv) show the GUIs for an administrator user to update the bid approval results. It may be appreciable that these may form at least part of step 420. In some embodiments, the approval results, once approved by the administrator, cannot be changed.

10 **[0111]** In some embodiments, upon receiving a bidding result from the airline module 202, the sales module 220 is configured to feedback and update the results in the system 200. FIGS. 6K(i) to 6K(iv) show the GUIs for an authorized user to update the bidding results, via providing a feedback to the sales module 220. It is appreciable that this may form at least part of step 418. In some embodiments, the bidding results have the following
15 four possibilities: Awarded: this round 's tender is awarded; On-going: go for next round of bidding; Cancel: this round's tender is canceled; Lost: lost this round's bidding.

[0112] If the bidding result is determined to be awarded, cancel, or lost, the bidding process will end; if a next round is required, the system 200 will automatically copy the bidding data of the previous round and automatically jump to the stage of sales fee quotation.
20 If there are no new changes in the contract information and supply information, the sales team only needs to modify the BPX in accordance with steps 410, 412 to submit the tender again.

[0113] In some embodiments, the sales module 220 may be configured to generate contract documents from fixed editable templates after the bid result is successful. The fixed

editable templates may be obtained from past contract templates for the specific airline and associated airports. FIGS. 6L(i) to 6L(iv) show the GUIs for an authorized user to generate the contract documents. By default, the system 200 may display bidding invitations that require the generation of contract as shown in FIG. 6L(i). A jump page may be shown in
 5 FIG. 6L(ii) to display all the airports associated with the airline. Each of the airport may have a specific file. FIG. 6L(iii) shows the system downloading the contract documents.

[0114] It is contemplated that the once the bidding results have been updated, the sales module 220 may be configured to close the entire bidding invitation. This may prevent unauthorized or inadvertent modifications to the contract, which is the binding document
 10 between the airline and the aviation company providing the aviation resource. FIG. 6M(i) and FIG. 6M(ii) shows the GUIs for a user to complete the closure.

[0115] In some embodiments, the system 200 may be configured to capture and display key information or data on one page, to facilitate ease of reference by one or more users of the system 200. FIG. 6N provides an example of the display.

15 **[0116]** FIG. 7 shows a generalized method 700 for managing an aviation resource bidding process, the method 700 comprising the steps of according to the present disclosure. The method 700 may be implemented as executable software codes stored in a non-transitory computer readable medium in one or more processors, for example, memory 106. The method 700 comprises the following steps.

20 **[0117]** Step 702: obtaining, by a sales module, an aviation resource bidding invitation data associated with at least one airline;

[0118] Step 704: creating, by the sales module, an aviation resource bidding reply data, the aviation resource bidding reply data configured to respond to the aviation resource bidding invitation data;

[0119] Step 706: including, by a supplier module, a quotation data appended to the resource bidding data reply;

[0120] Step 708: developing, by the sales module, a supply strategy based on the quotation data; wherein the developing includes calculating, by the sales module, an
5 estimate based on the supply strategy, the estimate based on a supply volume and a discount parameter; and

[0121] Step 710: submitting, by the sales module, the resource bidding data reply and the quotation to a processor associated with the airline.

[0122] The aforementioned instructions may include a computer program element or a
10 computer program product.

[0123] The system 200, method 400, and method 700 provides a one-stop aviation market bidding management, and provides a digital platform for building smart aviation market management. The various modules of the system 200, which can only be accessed by authorized users associated with each module ensures that the bid management process
15 is secure and minimizes data duplicity, data error, and data loss. By having a comprehensive system of GUI, a step by step guide is provided to users of the system 200 to complete a bid management process, thereby enhancing efficiency and further reduce human errors.

[0124] Some of the subject matter and operations described in this specification can be implemented in digital electronic circuitry, or in computer software, firmware, or hardware,
20 including the structures disclosed in this specification and their structural equivalents, or in combinations of one or more of them. Some of the subject matter described in this specification can be implemented as one or more computer programs, i.e., one or more modules of computer program instructions, encoded on a computer storage medium for execution by, or to control the operation of, data-processing apparatus. A computer storage

medium can be, or can be included in, a computer-readable storage device, a computer-readable storage substrate, a random or serial access memory array or device, or a combination of one or more of them. Moreover, while a computer storage medium is not a propagated signal, a computer storage medium can be a source or destination of computer
5 program instructions encoded in an artificially generated propagated signal. The computer storage medium can also be, or be included in, one or more separate physical components or media (e.g., multiple CDs, disks, or other storage devices).

[0125] Some of the operations described in this specification can be implemented as operations performed by a data processing apparatus on data stored on one or more
10 computer-readable storage devices or received from other sources.

[0126] A computer program (also known as a program, software, software application, script, or code) can be written in any form of programming language, including compiled or interpreted languages, declarative or procedural languages, and it can be deployed in any form, including as a stand-alone program or as a module, component, subroutine, object, or
15 other unit suitable for use in a computing environment. A computer program may, but need not, correspond to a file in a file system. A program can be stored in a portion of a file that holds other programs or data (e.g., one or more scripts stored in a markup language document), in a single file dedicated to the program, or in multiple coordinated files (e.g., files that store one or more modules, sub programs, or portions of code). A computer
20 program can be deployed to be executed on one computer or on multiple computers that are located at one site or distributed across multiple sites and interconnected by a communication network.

[0127] Some of the processes and logic flows described in this specification can be performed by one or more programmable processors executing one or more computer
25 programs to perform actions by operating on input data and generating output. The processes

and logic flows can also be performed by, and apparatus can also be implemented as, special purpose logic circuitry, e.g., an FPGA (field programmable gate array) or an ASIC (application specific integrated circuit).

[0128] While this specification contains many details, these should not be understood
5 as limitations on the scope of what may be claimed, but rather as descriptions of features specific to particular examples. Certain features that are described in this specification or shown in the drawings in the context of separate embodiments can also be combined. Conversely, various features that are described or shown in the context of a single embodiment can also be implemented in multiple embodiments separately or in any suitable
10 sub-combination.

[0129] Similarly, while operations are depicted in the drawings in a particular order, this should not be understood as requiring that such operations be performed in the particular order shown or in sequential order, or that all illustrated operations be performed, to achieve desirable results. In certain circumstances, multitasking and parallel processing may be
15 advantageous. Moreover, the separation of various system components in the embodiments described above should not be understood as requiring such separation in all embodiments, and it should be understood that the described program components and systems can generally be integrated together in a single product or packaged into multiple products.

[0130] A number of embodiments have been described. Nevertheless, it will be
20 understood that various modifications can be made. Accordingly, other embodiments and combinations of one or more of the described embodiments are within the scope of the following claims.

CLAIMS

1. A computer-implemented method for managing an aviation resource bidding process, the method comprising the steps of:

obtaining, by a sales module, an aviation resource bidding invitation data associated with at least one airline;

creating, by the sales module, an aviation resource bidding reply data, the aviation resource bidding reply data configured to respond to the aviation resource bidding invitation data;

including, by a supplier module, a quotation data to the aviation resource bidding reply data, wherein including the quotation data includes selecting an aviation resource supply price and a fee group template of at least one airport associated with the at least one airline, and selecting a previous aviation resource supply price and fee combination of the at least one airport associated with the at least one airline;

developing, by the sales module, a supply strategy based on the quotation data, wherein the developing includes calculating, by the sales module, an estimate based on the supply strategy, the estimate based on a supply volume and a discount parameter;

submitting, by the sales module, the aviation resource bidding reply data, the supply strategy and the quotation data to a processor associated with the at least one airline; and

generating, by the sales module, a contract document upon a positive determination that a bid result is successful,

wherein the sales module and the supplier module are each configured to be securely accessed by one or more users via one or more graphical user interfaces (GUIs).

2. The method of claim 1, wherein the processor associated with the at least one airline is an aviation resource bidding module, the aviation resource bidding module configured to

determine a bidding status based on the aviation resource bidding reply data and the quotation data.

3. The method of claim 2, wherein upon a positive determination that the bidding status is a successful bid, a cancelled bid, or an unsuccessful bid, the sales module is configured to update an approval module.

4. The method of claim 3, wherein the approval module is further configured to receive the supply strategy from the sales module for approval.

5. The method of any one of the preceding claims, wherein the aviation resource includes aviation turbine fuel.

6. The method of any one of the preceding claims, wherein the creating of the aviation resource bidding reply data includes adding at least one airport data, the airport data comprising airport codes registered by the International Air Transport Association (IATA) or the International Civil Aviation Organization (ICAO).

7. The method of any one of the preceding claims, further comprising a step of collating airline data and tender information from a plurality of partner airline modules before obtaining the aviation resource bidding invitation data.

8. The method of any one of the preceding claims, further comprising creating a bidding invitation directory associated with each of the at least one airline, and entering

details of the bidding invitation contract of one or more airport data associated with the at least one airline.

9. The method of any one of the preceding claims, wherein the aviation resource bidding invitation data is obtained from one or more encrypted electronic mails.

10. The method of any one of the preceding claims, wherein the developing of the supply strategy includes modifying the quotation data using an expense parameter, the expense parameter includes past jet fuel sales prices and fee combinations of the at least one airport associated with the at least one airline.

11. A system for managing an aviation resource bidding process, the system comprises a processor, the processor comprises a sales module and a supplier module, and configured to:

obtain, by the sales module, an aviation resource bidding invitation data associated with at least one airline;

create or generate, by the sales module, an aviation resource bidding reply data, the aviation resource bidding reply data configured to respond to the aviation resource bidding invitation data;

include, by the supplier module, a quotation data to the aviation resource bidding reply data, wherein, in the inclusion of the quotation data, the supplier module is configured to select an aviation resource supply price and a fee group template of at least one airport associated with the at least one airline, and a previous aviation resource supply price and fee combination of the at least one airport associated with the at least one airline;

develop, by the sales module, a supply strategy based on the quotation data; wherein the development includes calculating an estimate based on the supply strategy, the estimate based on a supply volume and a discount parameter;

submit, by the sales module, the aviation resource bidding reply data, the supply strategy and the quotation data to a processor associated with the at least one airline; and

generate, by the sales module, a contract document upon a positive determination that a bid result is successful,

wherein the sales module and the supplier module are each configured to be securely accessed by one or more users via one or more graphical user interfaces (GUIs).

12. The system of claim 11, wherein the sales module and the supplier module are each configured with different access for different user groups.

13. The system of claim 11 or 12, wherein the processor associated with the at least one airline is an aviation resource bidding module, the aviation resource bidding module configured to determine a bidding status based on the aviation resource bidding reply data and the quotation data.

14. The system of claim 13, further comprising an approval module, wherein upon a positive determination that the bidding status is a successful bid, an unsuccessful bid, an ongoing bid, or a cancelled bid, the sales module is configured to update the approval module; wherein in the determination that the bidding status is the successful bid, a bid contract is generated, and the bid contract is parsed and a quantity of the aviation resource determined.

15. The system of claim 14, wherein the approval module is further configured to receive the supply strategy from the sales module for approval.
16. The system of any one of claims 11 to 15, wherein data processed by the sales module and the supplier module is stored in a decentralized database or ledger.
17. The system of any one of claims 11 to 16, wherein, in the development of the supply strategy, the sales module is configured to modify the quotation data using an expense parameter, the expense parameter includes past jet fuel sales prices and fee combinations of the at least one airport associated with the at least one airline.
18. The system of any one of claims 11 to 17, wherein each of the sales module and the supplier module is configured to provide at least one user interface for respective users to input data, wherein the input data includes airport data, cost data, bidding invitation data, file data.
19. The system of any one of claims 11 to 18, wherein the aviation resource includes aviation turbine fuel.