(51) International Patent Classification:
G07F 19/00 (2006.01)  G06F 17/30 (2006.01)

(21) International Application Number:
PCT/HU2012/000121

(22) International Filing Date:
13 November 2012 (13.11.2012)

(25) Filing Language: Hungarian

(26) Publication Language: English

(30) Priority Data:
P 12 00427 18 July 2012 (18.07.2012)  HU


(72) Inventors: CSISZÁR, Tibor; Jokai u. 64, H-9444 Fertőszentmiklós (HU). K0 KAI, Tamás; Szligeti István, H-5000 Szolnok (HU).

(74) Agent: GÖDÖLLE, KÉKES MÉSZÁROS & SZABÓ; Patent and Trademark Attorneys, Keleti Karoly u. 13/b, H-1024 Budapest (HU).


Published: with international search report (Art. 21(i))

(54) Title: SERVICE PROVIDER SYSTEM AND METHOD FOR PROVIDING SERVICE

(57) Abstract: Firstly, the invention is a service provider system comprising a terminal (10) adapted to provide service to a user, comprising a computer device comprising interactive components. The system further comprises a service provider server (16) connected to the computer device through a network (24), adapted to remotely control a part of the interactive components belonging to the service, and a workflow server (18) capable of remote control, connected to the computer device through the network (24), and adapted to support service provision. All of the interactive components are controlled remotely by network messages, and at least one interactive component is controlled from the workflow server (18). Secondly, the invention is a method for providing service through the terminal (10).
SERVICE PROVIDER SYSTEM AND METHOD FOR PROVIDING SERVICE

TECHNICAL FIELD

The invention relates to a service provider system comprising a terminal adapted to provide services to a user, and to a method for providing service.

PRIOR ART

As a result of the technical development in our days the demand has increased on wide spectrum of services for remotely accessible services, over the Internet as an example. A need has also arisen for certain services, for example services used on a day-to-day administration, that these services should be available not only locally, in a few customer service offices, but from almost any location, through suitably configured terminals. A number of solutions are known that answer these needs to a greater or lesser extent. There are known service provider systems that allow using different services in combination through terminals that may be installed almost anywhere. Also, terminals are known that are capable of providing less complex services entirely without applying human labour, and more complex services can be used through a call center based customer service, instead of conventional customer service offices.

Through known terminals a wide range of different services can be reached, terminals for queue number dispensing, for helping orientation, for printing tickets, and a number of enhanced functionality ATM-s are known. Some known terminals are capable of providing access to live customer services. These terminals are often provided with multiple different entry and input channels, for instance, some ATM-s are equipped with supervision systems adapted to check the user's activity, as well as means for banknote reception in addition to the card slot and money dispensing slot necessary for their basic functionality. A common feature shared by most known terminals is that they have a display screen capable of displaying various kinds of data where the display screen may be a touchscreen allowing data entry as well.

Several documents are concerned with terminals having extended functionality. US 5,604,341, US 5,929,897, US 7,883,009 B2 and US 7,932,921 B1 disclose a possibility of video telephone communication with an office clerk through a

Some known terminals provide customized behaviour based on specific features or data related to a user. These terminals select customized behaviour by means of previously stored algorithms, the software controlling the operation of the terminal is not modified dynamically. According to the solution disclosed in US 7,883,009 B2 an ATM is applied for displaying customized client-targeted advertisements.

Known terminals include apparatuses that provide services in cooperation with service provider servers. US 2007/0250384 A1 discloses a multifunctional terminal adapted to allow service-related activities, telephone calls and calls to a customer service. In the system according to the document the terminal is connected to a central server that is also applied for performing logging tasks. Service provider servers connected to the central server can be accessed from the terminals through the central server. The content related to a service being provided to the display of the terminals through XML (Extensible Markup Language) based communication by the service provider servers. The screen of the terminals is shared between a virtual touchscreen keyboard and a portion that displays content coming from the service provider servers. The service provider servers are for instance Java web servers, and for example card reader, banknote and check reader device, headphone and microphone, printer are connected to the terminals.

US 2006/0074803 A1 discloses a system allowing to handle different documents of money substitution, wherein the service providers are connected to the
terminals through a central system, and the possibility to access human operators is provided from the terminals. In the system according to US 2010/0122094 A1 a terminal, a central management server and service provider servers are connected to a central network. In the system according to US 2011/0004555 A1 mobile terminals communicate with content providing servers through, or managed by, a central management server. US 2012/0005314 A1 discloses a system wherein service provider servers are connected to the terminals, and the system consisting of the service provider servers and the terminals is managed by a management server.

In the system disclosed in US 2011/0098105 A1 the services provided by a betting server are made available through a number of terminals of different type (such as a PC, PDA, notebook, or cell phone). A distributed customer service system is disclosed in US 2001/0047270 A1, while US 2005/0238547 A1 discloses a multimedia kiosk. US 2009/0299901 A1 discloses an apparatus and method allowing automated remittance of funds. US 7,949,606 B1 discloses a kiosk for supporting the selling of intellectual property.

Irrespective of the functionalities and services provided by them, most of the above described solutions have the common disadvantage that the terminals run specialised software developed for fulfilling specific tasks and having restricted functionality determined at development time by the developers. In case when the processes related to the services being provided is modified, for instance because of the changing of the legal regulation concerning the service, the specialised software of the terminals can only be modified in case the operation of the terminals is suspended for a given period of time.

Developing the service provision processes supported by the conventional components of known service provider systems, for instance, automated machines, kiosks, terminals, etc. requires a significant amount of software development and testing resources. In order to support a given service provision process, in known systems and apparatuses stand-alone components have to be developed and run on the terminals and servers that are applied for providing the required functionality in close cooperation with one another. Furthermore, in known systems it is usually unavoidable to modify or extend all affected software
components if a given process is changed or new processes are introduced, which, especially in case of processes involving the management of financial transactions, requires a significant amount of testing and validation. In most cases even the most thorough testing cannot guarantee the absence of bugs, which means that each modification poses new risks. The extension of the range of supported processes and the modification of existing functions are thus significantly limited in known terminal-based service provider systems.

In view of the known solutions the need has arisen to provide such service provider systems for service provision to users with the application of terminals wherein the services provided through the terminals may be flexibly modified and/or extended.

DESCRIPTION OF THE INVENTION
The primary object of the invention is to provide an apparatus which is free of the disadvantages of prior art solutions to the greatest possible extent.

A further object of the invention is to provide a service provider system and a method for providing service wherein the terminal does not run specialised software developed specifically for the computer device thereof but where all interactive components of the computer device of the terminal adapted for interaction with a user, that is, the input and output components thereof, are controlled from a service provider server and/or from a workflow server. This allows for making modifications, extensions in the services being provided through the terminal even at runtime. Since the interactive components are controlled exclusively in a remote manner, it is sufficient to make the modifications or extensions in the services at the remote, central control location, thus eliminating the need for implementing the changes at the terminals.

The objects of the invention can be achieved by providing a service provider system according to claim 1, and a method for providing service according to claim 11. Preferred embodiments of the invention are defined in the dependent claims.

BRIEF DESCRIPTION OF DRAWINGS
Preferred embodiments of the invention are described below by way of example with reference to the following drawings, where

Fig. 1 is a schematic drawing illustrating the components of a preferred embodiment of the service provider system according to the invention,

Fig. 2 is a schematic drawing illustrating the components of the terminal according to a preferred embodiment of the service provider system according to the invention,

Fig. 3 illustrates an exemplary service provision process carried out by the components of the service provider system according to the invention,

Fig. 4 illustrates a further exemplary service provision process carried out by the components of the service provider system according to the invention,

Fig. 5 illustrates a yet further exemplary service provision process carried out by the components of the service provider system according to the invention.

MODES FOR CARRYING OUT THE INVENTION

Fig. 1 illustrates an embodiment of the service provider system according to the invention. The service provider system comprises at least one terminal 10 adapted to provide service to a user, the present embodiment comprising more than one terminal 10. All terminals 10 comprise a respective computer device comprising interactive components. The computer device may be a computer, or any other device adapted to perform functions of a computer. Preferably, one part of the interactive components is input component, another part thereof is output component. The input and output components may be implemented as peripherals connectible to the computer device that are adapted, respectively, to receive or input data, information, or various objects (such as identification cards, documents, or currency), and to display in some form, or dispense such data, information, or objects. Peripherals capable of functioning as input or output components are described later in the section presenting the components of the terminal 10.

The service provider system according to the invention further comprises a service provider server 16 being connected to the computer device through network 24 or other suitable network, being adapted for remotely controlling a part of the interactive components corresponding to the service, the present embodiment
comprises more than one service provider server 16. Separate service provider servers 16 may belong to different services, and a given service provider server 16 may belong to more than one service. The service provider system according to the invention further comprises a workflow server 18 being capable of remote control, being also connected to the computer device through a network, in the preferred embodiment through network 24, and being adapted to support service provision. In the present embodiment the workflow servers 18 are connected to the service provider servers 16 through connections 30. Preferably, a separate workflow server 18 is connected to each service provider server 16, through connections 30 in the embodiment according to Fig. 1.

All of the interactive components are controlled remotely by network messages, and at least one interactive component is controlled from the workflow server 18. The network messages are implemented for instance as http or XHTML messages.

In the embodiment according to Fig. 1, the service provider system further comprises an interconnecting server 12 being connected to the computer device through the network 24, the service provider server 16 and the workflow server 18 are connected to the computer device through the interconnecting server 12, and the interactive components are controlled by network messages transferred through the interconnecting server 12. In the embodiment shown in the drawing the workflow servers 18 are connected through respective direct connections 31 to the interconnecting server 12. Thereby each workflow server 18 is accessible from the interconnecting server 12 directly through the connection 31, and not only through the service provider server 16 belonging thereto. According to the present embodiment, therefore, the service provider server 16 and the workflow server 18 are connected to the computer device through network 24, via the interconnecting server 12.

In the present embodiment, the service provider system further comprises operator workstations 20 adapted to support service provision, being connected to the terminal 10 through the interconnecting server 12 via connection 32, and being operated by human operators, as well as supervisor workstations 22 that are
adapted to supervise the operator workstations 20, and are connected to the interconnecting server 12 through connection 34.

In Fig. 1, three dots drawn between two components of the service provider system represent that the given component, for instance the terminal 10 and the service provider server 16, may be present in the service provider system in an arbitrary number of instances.

As it has been pointed out above, in certain embodiments the servers 16, 18 are connected to the computer device not through network 24, that is, through the interconnecting server 12 and connections 30, 31, but through a different network. In all preferred embodiments of the system according to the invention the computer device is connected to the service provider server 16 and to the workflow server 18 through a network, and, since the services may be accessed remotely from the terminal 10, the terminals 10 are spatially separated from the servers 16, 18. The servers 16, 18 may also be connected to the computer device directly through respective separate networks, which implies that the interconnection topology of the servers and the computer device may be different from what is shown in Fig. 1. In addition, the workflow servers 18 may be connected to the operator workstations 20 through a direct network, or network connection. In case the network messages are not transferred to the computer device of the terminals 10 through the network 24, or to the operator workstations 20 through the interconnection server 12, then central logging of the given messages on the interconnecting server 12 is not provided for. In embodiments that do not comprise an interconnecting server 12, certain logging tasks may be performed by the service provider server 16 or the workflow server 18.

Accordingly, in preferred embodiments the network messages are transferred to the computer device through the connections 30 and 28, or the connection 31, as well as through network 24, whereas they are transferred to the operator workstation 20 through connections 31, 32, or connections 30, 28, and 32. Preferably connections 28, 31, 30, 32, and 34 are bidirectional connections, for instance wired or wireless connections.

In certain embodiments of the service provider system according to the invention the interconnecting server 12 is responsible for routing requests and answers that
are transferred in the form of network messages, as well as for logging the provided services. In other embodiments, requests may be sent by the terminal directly to the servers 16, 18. The interconnecting server 12 also provides connection between the terminals 10 and the service provider servers 16, the workstations 20, 22 and other components of the service provider system.

Preferably, a so-called SSO (Single Sign On) service is installed on the interconnecting server 12 that allows a given user of a terminal to log in only once for using multiple services one after the other at the terminal. Thereby the procedure of using more than one different service one after the other, a "session", initiated by a given user, may be handled in an uniform manner by the different servers and workstations comprised in the service provider system. A session is created with a user login, and it is ended with the user logout or if it is inactive for a prolonged period causing a timeout.

The interconnecting server 12 also has call center functionality, which means that in case the terminals 10 are utilized for using services involving assistance of an operator, the interconnecting server 12 may perform all the tasks related to the distribution, redirecting, and supervision of incoming requests. These functions are not necessarily required in case service-specific operator workstations 20 are applied. Preferably, the terminals 10 are continuously monitored by the interconnecting server 12 that performs logging of the service provision processes performed on the terminals 10, and also provides remote configuring and software updates for the terminals 10. In embodiments comprising an interconnecting server 12, the interconnecting server 12 performs the logging of the entire service provider system regarding the data arising from the use of the service provider system in a flexibly configurable manner. These functions may be implemented on the interconnecting server 12 by applying relational database software.

In the embodiment according to Fig. 1, system interfaces 14, as well as user interfaces 15 are connected to the interconnecting server 12. The system interfaces 14 may be applied for configuring the interconnecting server 12 in a flexible manner, and may allow simple interconnection of the interconnecting server 12 with optional other applications. The user interfaces 15 are applied by
the interconnecting server 12 to provide access for native and web-based clients, among others for the operator workstations 20 and the supervisor workstations 22.

The service provider servers 16 are adapted to provide any kind of service, for instance servers providing business functionality, and can be operated utilizing - preferably standardised - network applications. Existing network customer service systems may preferably be integrated as service provider servers 16 in the service provider system according to the invention. Once the existing customer service systems are integrated in the service provider system according to the invention, they become accessible through the terminals 10, involving that their services can be accessed through a new channel. As the terminals 10 may comprise a large number of input and output components, they may be applied for creating service provider systems that provide more extensive services than known network customer service systems. Therefore, by the integration of existing service provider servers in the service provider system according to the invention, it is not necessarily required to establish or develop new service provider servers 16. In case existing service provider servers are integrated in the service provider system according to the invention, modes of user access already made available to users by the service provider servers 16 before the integration (browser of a computer, smartphone, tablet etc.) are complemented by the possibility of accessing the system through the terminals 10. The extended range of functionality of the terminals 10 allows the access channel through the terminal 10 to provide a wider-than-before range of functionality for service provision. For integration of existing service provider servers it may become necessary to optimise user interfaces to provide optimal presentation and usability through the terminals 10, and optimisation may involve building in functionalities provided by the interactive components of the terminals 10 that were not hitherto available from the existing service provider servers. The implementation of these functionalities is allowed by the workflow server 18. In this case, specific requests coming in from the terminals 10 should be embedded in specific locations of the source code of the program controlling the operation of the given service provider server 16. Of course the service provider system according to the invention may comprise not the existing service provider servers 16 only, but new service
provider servers 16 can be developed or implemented inside the frameworks set up by the service provider system according to the invention.

Existing service provider servers become integrated in the service provider system according to the invention with the help of the workflow servers 18. The workflow servers 18 provide that not only the components corresponding to the existing access channels of existing service provider servers, but all interactive components of the terminal 10 can be remotely controlled. As it will be explained below in relation to Fig. 2, existing service provider servers in their original configuration are capable of controlling through network messages only certain input and output components. However, the functionality of the service provider system according to the invention is extended by such interactive components that cannot be controlled by the existing service provider servers; the workflow server 18 is included in the service provider system for controlling these interactive components. The whole range of functionalities of the interactive components of the terminal 10 can therefore be exploited only with the help of the workflow server 18. It may be conceived to provide such a service provider server 16 that also possesses the functionalities of the workflow server 18 with the combination of these two units. Thereby, in certain embodiments of the system according to the invention the service provider server 16 and the workflow server 18 may be implemented as a single integrated server unit.

One of the tasks performed by the workflow servers 18 connected to the service provider servers 16 is to establish communication connections between the service provider servers 16 and the operator workstations 20 and/or supervisor workstations 22 through the interconnecting server 12. To isolate different services and their data from one another, preferably a separate workflow server 18 belongs to each service provider server 16, but workflow servers 18 may also be shared between service provider servers 16.

In embodiments comprising an operator workstation 20 and/or a supervisor workstation 22 the terminal 10 comprises as input component a sound transmission device 42 being adapted to transmit sound from the terminal 10 to the operator workstation 20, and an image transmission device 44 being adapted to transmit images from the terminal 10 to the operator workstation 20. The sound
transmission device 42 is preferably implemented as a microphone, while the image transmission device 44 is a camera, for instance a web camera. The operator workstation 20 is a computer device equipped with network access, running a preferably operating system independent native application of the service provider system according to the invention. It is provided by the software component of the service provider system that the operators may perform tasks arising in relation to the services being provided on the terminals 10, and preferably they may even contribute to the services of different service provider servers 16 or workflow servers 18. The operator workstations 20 may preferably access a given service provider server 16 or more than one service provider servers 16, and also can have access to other applications assisting in service execution. Thanks to the communication connection provided by the interconnecting server 12 a permanent audio and video connection may be established between the operator workstations 20 and the terminals 10, the connection speed being preferably adapted to the available bandwidth. If necessary, the terminals 10 may be remotely controlled by the operators. By this possibilities in case the user has a question while using the terminal 10 the operator can hear and see the user and the user’s screen on a moving picture, and if there is a demand, the operator may carry out activities for the user by remotely controlling the user interface of the terminal 10.

The supervisor workstations 22 and the operator workstations 20 may have identical physical form but may have different functionalities. The supervisor workstations 22 are primarily applied for real-time or subsequent supervision of the operators’ work, and they also allow intervention into the operators’ workflow.

Fig. 1 illustrates the logical structure of the service provider system according to the invention, showing the different servers (interconnecting servers 12, service provider servers 16, and workflow servers 18) as logical blocks, but it is not necessary that multiple separate servers belong to the service providers. It may be conceived that the service provider system according to the invention is implemented such that the functions of the servers 12, 16, and 18 physically are performed by a single server, and the software components corresponding to the
different servers 12, 16, 18 are running on this single computer having sufficiently powerful hardware.

Fig. 2 illustrates the components of one embodiment of the terminal 10 connected to the interconnecting server 12. The terminal 10 does not function as an execution client only, but remotely controlled with network messages from the service provider servers 16, it provides uniformly accessible server services in a manner, that its interactive components are remotely controlled by network messages. The terminal 10 comprise a computer device 36 that is connected to the network 24 and comprise interactive components. Input components are comprised of all such devices and modules that are adapted to allow the user of the terminal 10 to input information, data, or even objects to the service provider system through the terminal 10. Output components are comprised of such devices and modules that are capable of displaying data or information for the user, or are capable of dispensing objects. Accordingly, the input components of the present embodiment consist of a keyboard 50, a pointing device 52, for instance a mouse, a scanner module 54, a card reader module 56, a biometric identification module 58, a document reception/scanner module 61, and a currency reception module 64, the output components consisting of a display screen 46, a loudspeaker 48, a document printer/display module 60, a currency dispenser module 62, and a receipt printer module 65.

Instead of being implemented as a conventional display, the display 46 can also be a touchscreen. In addition to visually displaying information and data, the touchscreen may perform the functions of a keyboard and pointing device. Therefore, if a touchscreen is connected to the terminal 10, it is not required to attach an additional keyboard and pointing device.

The loudspeaker 48 is included in order to play sounds belonging to the content to be played back on the terminal 10 by the service provider servers 16, as well as for conveying the voice of the operators of the operator workstations 20. Bidirectional audio connection with the operators is provided by a sound transmission device 42, implemented as a microphone in the present embodiment, for instance.
The scanner module 54 is adapted e.g. for reading ID card photographs, thereby the scanner module 54 allows the identification of users not having electronic access means on the terminal 10, if necessary with cooperation of operators. The card reader module 56 being implemented for instance as a magnetic and chip card reader, allows performing card operations. The biometric identification module 58 may be capable of reading different biometric identifiers, allowing fingerprint or retina based user identification. The document printer/display module 60 allows the production of documents, for instance by means of a laser printer, as well as displaying the produced document under a transparent surface. The document printer/display module 60 is preferably arranged such that the document placed under the transparent surface can be signed using a pen. The document reception/scanner module 61 provides input of paper-based information and the received material can be digitized by the document reception/scanner module 61 possibly with character recognition. Preferably, a signature verification module is attached to the document reception/scanner module 61, which help to check the signature of the printed documents for instance with operator assistance.

Banknotes and coins, for instance six different denominations of notes and coins, are dispensed utilizing a currency dispenser module 62. The currency reception module 64 is adapted for receiving and accepting banknotes and coins in the previously specified denominations. A receipt printer module 65, utilized for printing receipts in sizes smaller than other documents, for instance on thermal paper, as well as for dispensing such receipts, may also be attached to the computer device 36 of the terminal 10. The terminals 10 may be freely extended utilizing other interactive components.

In the embodiment of the terminal 10 shown in Fig. 2 the computer device 36 comprises a browser 38 and a local host 40 controllable by network messages, where the interactive components are controlled either through the browser 38 or the local host 40. Some of the components of the computer device 36 of the terminal 10 may be accessed (and thus, controlled) through the browser 38 by network messages, while other components may be accessed through the local host 40 also by network messages, for instance http calls. Components of the computer device 36 that are connected to the browser 38 may be controlled from
the service provider servers 16 as well as from the workflow servers 18. Components connected to the local host 40 can only be controlled from the workflow servers 18. The display 46, the loudspeaker 48, the keyboard 50, and the pointing device 52 can be accessed through the browser 38. The sound transmission device 42, the image recording device 44, the scanner module 54, the card reader 56, the biometric identification module 58, the document printer/display module 60, the document reception/scanner module 61, the currency dispenser module 62, the currency reception module 64, and the receipt printer module 65 can be accessed through the local host 40.

Components that can be controlled by existing service provider servers may be accessed through the browser 38 in a manner known per se. However, in case workflow servers 18 are connected to the existing service provider servers, the components accessible through the local host 40 also become remotely controllable. Therefore, by applying a workflow server 18 a broader set of functionalities becomes accessible through the terminal 10 compared to the functionalities of other access channels of the existing service provider servers. The control of such interactive expansion components is implemented in the workflow servers 18. The local host 40 may preferably be applied for accessing and controlling also the components connected to the browser 38. In that case the control through the local host 40 overwrites the control through the browser 38.

Communication between the components of the service provider system, that is, between the terminals 10, the servers 12, 16, 18, and the workstations 20, 22 is preferably performed applying encrypted https protocol, in which for instance the following formats may be embedded:

- XHTML
- JSON (JavaScript Object Notation)
- XML (with Base64 encoded embedded binary content if so desired)
- Arbitrary binary content

Audio and video are transmitted as a TCP/IP data stream, preferably applying the following standard compression algorithms:

- Audio: GSM, MP3
- 15 -

- Video: H263, Theora, VP8

Preferably, the transfer rate of the video is dynamically adapted to the available bandwidth. Recorded data streams may be stored for instance in AVI format.

Certain embodiments of the invention relate to a method for providing service. The method according to the invention is a method for service provision utilizing a terminal 10, the terminal 10 comprising a computer device 36 having interactive components, where a service provider server 16, adapted for remotely controlling a part of the interactive components, is connected to the computer device 36 through a network, for instance through network 24, and all of the interactive components are controlled remotely by network messages, and at least one interactive component is controlled from a workflow server 18 being adapted for remote control, being connected to the computer device 36 through the network, and being adapted to support service provision.

In certain embodiments of the method according to the invention an interconnecting server 12 is connected to the computer device 36 through the network, and the interactive components are controlled by network messages transferred through the interconnecting server 12.

In certain embodiments of the method according to the invention the terminal 10 is controlled by a technology independent of the operating system and programming environment of the computer device, particularly by HTML, Javascript, or Ajax technology. In further embodiments of the method according to the invention the service provided through the terminal 10 is logged on the interconnecting server 12.

The operation of the service provider system is illustrated below by example portions of the service provision method carried out utilizing the service provider system according to the invention. Fig. 3 illustrates a method for providing a service carried out between the browser 38 of the computer device 36 of a terminal 10, a service provider server 16, a workflow server 18, the local host 40 of the computer device 36 of the terminal 10, and an operator workstation 20. In the framework of the method illustrated, a user uses a service of choice utilizing a terminal 10.
As the first step of the method for service provision, a user selects a service to be used from the list of services offered by the terminal 10 utilizing the touchscreen, keyboard, and/or pointing device of the terminal 10. Corresponding to the choice, in operational step S100 a network message (in the present embodiment an http request) is sent by the browser 38 to the service provider server 16 that provides the chosen service. In operational step S110 a further network message, preferably a standardized message, for instance in XHTML format, is sent to the browser 38 by the service provider server 16 as a response to the network message sent in operational step S100. The browser 38 processes the received response, and displays it on the display screen of the terminal 10, or plays it back through the loudspeaker thereof.

As a result of the response received from the service provider server 16, a form appears on the display screen, pre-filled with data taken from the response that are related to the service being provided. Using the keyboard and pointing device of the terminal 10 arbitrary selections or data entry tasks may be performed on the displayed form. Input data are sent back by the browser 38 as a network message to the service provider server 16 in operational step S120. Depending on the service being provided, communication according to operational steps S110 and S120 may be repeated any number of times, for instance in case a given service requires data input from the user in multiple stages.

The following section explains operational steps in which a service provider server 16 answers a request coming from a terminal 10 through interactive components of the terminal 10 that are connected to the local host 40 thereof, for instance through one of the devices or modules described above. There are two different possibilities for doing that.

In the first case, as a result of the request sent to the service provider server 16 in operational step 120, in operational step S130 a network message is sent in the form of an http request by the service provider server 16 to the workflow server 18 connected thereto. As a response to this request, in operational step S170 a network message implemented as a standard XHTML response arrives to the browser 38 from the given workflow server 18. This network message may arrive directly but it preferably arrives to the browser 38 through the interconnecting
server 12. The network message sent in operational step S170 either acknowledges the successful completion of the task, or contains an error message. In this first case, the corresponding input or output component is accessed by the workflow server 18 through the local host 40 as shown in Fig. 3, and the communication process consisting of at least one request and reply, both implemented as network messages, is executed in operational steps S140 and S150. Finally, utilizing the reply received in operational step S160 from the workflow server 18, the service provider server 16 becomes capable of answering the request received from the terminal 10 in operational step S120. The request is answered in operational step S170. As a result of operational step S130, instead of utilizing one of the components, operator intervention may become necessary. In that case, instead of performing operational steps S140 and S150 the workflow server 18 records the task in the task list of the operator workstation 20 in operational step S145, and receives an answer from there in operational step S155. After the operator task has been completed, in operational step S160 the corresponding answer is sent to the terminal 10 in the form of a network message. Operational steps S140 and S150, as well as steps S145 and S155 may be repeated as many times as necessary, and may be combined with operational steps S100, S110, S120. In case the workflow server 18 is connected to the terminal 10 only through the service provider server 16, all network messages applied for controlling the component of the computer device 36 of the terminal 10 are forwarded to the computer device 36 of the terminal 10 from the service provider server 16, the messages having been initiated either on server 16 or server 18. If, however, a separate connection exists between the workflow server 18 and the computer device 36, some network messages may be sent directly from the workflow server 18 to the computer device 36. In a manner described above, this connection connects the workflow server 18 with the interconnecting server 12, and thus the workflow server 18 is connected to the computer device 36 through the interconnecting server 12. It should be noted here that there are input components, for instance the keyboard, which may not have functions that need to be controlled.

In the other case, in embodiments where the service provider server and the workflow server 18 are integrated in a common server, instead of performing
operational steps S130, S140, S150, S145, S155, S160 this common server may call the local host 40 directly by sending a network message in operational step S135, and receiving an XHTML answer to the request in operational step S165 in the form of a network message. This option necessitates that all error handling functions related to components of the terminal 10 called in the above manner and, in embodiments not comprising an interconnecting server 12, also the possible logging functions (all of which are available in the separate workflow server 18) have to be implemented in the service provider server 16.

The service provider system according to the invention solves the problems posed by the prior art inflexible systems. If the communication between the components of the service provider system is performed in the above described manner, in the form of network messages, and the interactive components of the computer devices 36 of the terminals 10 are controlled from the service provider server 16 and/or the workflow server 18, then preferably the business processes may be built from "prefabricated" modules or building blocks by specifying the communications schemes consisting of network messages that correspond to the sub-processes related to the service to be provided. Thereby, in certain embodiments of the service provider system according to the invention the service comprises a service provision process consisting of modules, and the system comprises a graphical program adapted for building the service provision process from the modules. Thus, for the definition and modification of the services available on the terminals 10, for instance for the replacement of certain building blocks, it is not required to test and validate all components of the service provider system, but only to modify sub-processes or building blocks in a centralised manner. Process modelling aided by graphical software programs is a straightforward task and therefore it may be performed even by the business experts themselves.

According to the invention it is sufficient to implement the modification or replacement of building blocks centrally, on the service provider server 16 or on the workflow server 18. When a given service is used, the service provider server 16 or the workflow server 18 will answer the requests coming in from the computer device 36 of the terminal 10 by those network messages that are actually
implemented on the servers. In case, therefore, the changes have already been implemented on the service provider server 16 or on the workflow server 18, the entire service provision process is carried out with the implemented changes, without there being a need for a separate action on the terminal 10. Thereby it becomes possible to dynamically modify the services provided by the terminals 10 without suspending the operation thereof.

In the service provider system according to the invention the processes of the services being provided and the business logic belonging to the services are therefore not implemented on the terminals 10 and workstations 20, 22. The service provision process carried out on the terminal 10 is controlled by network messages that are generated by the service provider servers 16 or the workflow servers 18. In contrast to known service provider systems, the service provider system according to the invention receives not only the information to be displayed on the display of the terminal 10 from the service provider server 16, but all interactive components of the computer device 36 are remotely controlled, with at least one interactive component being controlled from the workflow server 18. Accordingly, the only pieces of software that need to be installed on the computer device 36 of the terminal 10 in relation to the interactive components are the driver programs of those particular components. It is not necessary to develop for the terminal 10 a framework specific to the interactive components thereof, since the interactive components become controllable from the service provider server 16 or from the workflow server 18 by installing their driver programs. Contrary to known systems, therefore, input and output components are controlled not by the terminal 10, but instead they are controlled remotely, from the servers 16, 18. This also allows for easier modification of the service provision processes.

During the definition of the process implemented from building blocks, the entity that executes each given operational step also gets defined. In contrast to known and widespread workflow process management systems, the execution entity may not only be a software component but also a person, for instance a user or operator, as well as an input or output component, such as the document printer/display module 60 or the document reception/scanner module 61. As the generated service provision processes are implemented in the service provider
system according to the invention, the system determines and downloads the sub-processes to be performed by each component (execution entity). In case the generated process is properly defined and the building blocks are error-free, the risk of modification or expansion in the service provider system according to the invention is reduced to minimum. If a fundamentally new process or sub-process is to be implemented in the service provider system according to the invention, then, obviously, software development cannot be avoided. However, thanks to the improvements presented above, in the service provider system according to the invention only the new building blocks have to be programmed, tested, and validated, and this task may be performed more easily and effectively than the comprehensive testing of the entire system that has to be carried out in known systems.

The modelling of the service provision processes as described above yields further advantages. Data logging performed by the interconnecting server 12 allows for the subsequent analysis and tracking of completed processes, while the corresponding statistical data are produced automatically. Utilizing a graphical software application for building the process from building blocks allows that modelling can be carried out using high-level concepts, in a form easily accessible and comprehensible also by business experts. Certain components of the service provision process (for instance displaying data on the display of the terminal 10, controllability on the touchscreen, virtual keyboard on the touchscreen, sound and video transmission between the terminal 10 and the operator workstations 20, version upgrades of the operating software of the terminal 10, managing the interfaces of the input and output components) are performed by the cooperation of the terminals 10 and the interconnecting server 12, allowing that the developers of the service provision process model, for instance the developers of business logic, need not deal with the details of implementation. Such process steps and portions that are performed by the terminals 10 and the interconnecting server 12 can be incorporated by process developers in the model of the service provision process as ready-made building blocks.

In certain embodiments of the service provider system according to the invention the terminal 10 is controlled by a technology independent of the operating system
and programming environment of the computer device 36, particularly by HTML, Javascript, or Ajax technology.

Typical customer service activities can all be implemented in the service provider system according to the invention. On the other hand, since the computer devices of the terminals 10 can be upgraded with additional interactive components as desired, practically any other type of service may also be implemented utilizing the service provider system according to the invention, such as dispensing or collection of products, even in a manner tailored to the customers.

The most important categories of building blocks included in the service provider system according to the invention are the following:

- User identification (such as ID card-based, biometric, combined, etc.)
- Document printing and signing
- Signature authentication (based on specimen signature or ID card, with operator assistance if necessary)
- Document reception and digitizing (document is either returned or retained)
- Financial operations (distributing or collecting currency)
- Receipt production

Fig. 4 and 5 show example portions of the method, the sections being built up from building blocks, where the components of the service provider system according to the invention, such as the terminal 10, the workflow server 18, the operator workstation 20, as well as the user 66 and the operator 68, perform a service provision process defined by building blocks implementing specific operational steps. Irrespective of the given operational step, the result of execution may be unsuccessful for practically all operational steps. In this case the process is either interrupted at that point (giving appropriate information to the user 68), or further error handling steps are performed by the service provider system. In an exemplary case, if the verification of a signature is unsuccessful, then the service provider system may issue a request for repeating the signing. Error handling steps are preferably incorporated in all building blocks, and therefore in the interest of lucidity they are not shown in the diagram.
According to the method for service provision illustrated in Fig. 4 the available services are displayed on the terminal 10 in operational step S200, and the user 66 selects the desired service in operational step S210. In the subsequent operational steps S220 ID card-based identification is required, involving all components of the service provider system shown in the figure, that is, in addition to the terminal 10, the workflow server 18, and the operator workstation 20 also the user 66 and the operator 68. As an exemplifying building block of the method, ID card-based identification is explained in relation to Fig. 5. If the identification in operational step S220 has been successful, the user 66 fills in an appropriate form on the terminal 10 in operational step S230, which is followed by printing out and signing the form in operational step S240 utilizing the appropriate interactive components of the terminal 10. The signature verification performed in operational step S250 is a complex building block wherein the workflow server 18, the operator workstation 20, and the operator 68 are all involved. In case the signature is accepted, the corresponding receipt is printed out by terminal 10 in operational step S260 and the process is completed.

Fig. 5 illustrates the details of ID card-based identification, a building block applicable in numerous preferred embodiments of the method for providing service according to the invention. In the initial operational step S300 of the process the user 66 places his or her ID card on the appropriate interface of the terminal 10, for instance on the scanner module 54 in case the computer device 36 of the terminal 10 has such a component. In operational step S310 the terminal 10 takes at least one photo of the ID card utilizing the interface component. A network message is sent out to inform the workflow server 18 of the event, and in operational step S320 the workflow server 18 publishes the ID checking task by sending it out to the operator workstation 20. In operational step S330 the task lists of the operator workstations 20 are automatically refreshed, then an operator 68 accepts the given task in operational step S340. This causes the workflow server 18 to retrieve data required for the identification from an official central database in operational step S350. In operational step S360 the given task is displayed only on the operator workstation 20 of the operator 68 who has accepted the given task in operational step S370, and the operator 68 in case the identification is successful, orders the workflow server 18 in operational step S380
to allow the process to be continued. As a result of operational step S380 next operational step S390, that is to be performed after ID card-based identification, is displayed on the terminal 10. Thereby the ID card-based identification process is completed successfully. In case the identification is unsuccessful, the process is interrupted by the workflow server 18 in operational step S385, an appropriate information message is displayed on the terminal 10 in operational step S395, and the ID card-based identification process is completed unsuccessfully.

It should be emphasised here that in the portions of the method illustrated in Fig. 4 and 5 communications between the components of the system is performed by means of network messages. Accordingly, the arrows representing data flow between steps shown in columns corresponding to the terminal 10, the workflow server 18, and the operator workstation 20 stand for network messages sent between the terminal 10, the server 18, and the workstation 20.

Network messages transferred between the terminal 10, the servers 12, 16, 18, and the workstations 20, 22 may be network requests or answers sent as a response to the requests. The requests and answers herein described are in the XHTML format, their characteristic structure being illustrated with the following samples. The data content of the network messages may generally are built from the following components:

- terminalld: The identifier of the terminal 10 where the user uses the given service,
- businessServerld: The identifier of the service provider server 16 corresponding to the service being used,
- workflowServerld: The identifier of the workflow server 18 utilized during the service being provided,
- sessionld: The identifier of the session corresponding to the service being provided.

Request and answer types (requestType, answerType) of the network message may be extended as desired, and the data content (requestData, answerData) can also be configured in a flexible manner. Types of requests and answers, and the data content are determined by the sub-processes utilized during the service being
provided. For instance, in case of a cash withdrawal process the request type is cash dispensing, and the data content is the sum to be withdrawn.

The XML code below illustrates an exemplary request:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<terminalRequest>
  <terminalld>...</terminalld>
  <businessServerld>...</businessServerld>
  <workflowServerld>...</workflowServerld>
  <sessionId>...</sessionId>
  <requestType>...</requestType>
  <requestData>
    ...
  </requestData>
</terminalRequest>
```

The header of the request specifies the format of the request (xml version="1.0"), and the encoding ("UTF-8"). The next line specifies that the network message contains a request coming from the terminal 10 (terminalRequest). Conforming to the syntax the request is closed by the line "/terminalRequest". The identifiers listed above are included between the tags corresponding to the given identifiers.

After the identifiers, the type of the request is also specified. Data to be transferred are contained between the "requestData" tags of the network message.

The XML code below illustrates an exemplary reply:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<businessServerAnswer>
  <terminalld>...</terminalld>
  <businessServerld>...</businessServerld>
  <workflowServerld>...</workflowServerld>
  <sessionId>...</sessionId>
  <answerType>...</answerType>
  <answerData>
    ...
  </answerData>
</businessServerAnswer>
```
It is specified in the answer that the reply came from a service provider server 16 (businessServerAnswer). The header of the answer is identical to the header of the request initiating the answer, and the answer comprises the same identifiers that are comprised in the corresponding request. The type of the answer (answerType) is also specified in the answer, the answer containing the data to be transferred therein between the "answerData" tags. The type of an answer is determined by the type of the request that initiated it. For instance, if the type of the request is cash withdrawal then the type of the answer can be either cash dispensing or cash dispensing denied. Data contained in the exemplary answer comprise items (for instance, item1), lists (for instance, list1 or list1 list2), and list items (such as list1 Item1 or list1 list2 Item1).

If the type of the request is the above described user identification then the data sent in the request comprise data related to the user, and the answer comprises data indicating that the user data are accepted. The identification may be performed as for example by forwarding (by the workflow server 18 belonging to the service) the data sent in the request to the operator who has accepted the identification task. The operator then compares the data received from the server with the data recorded about the user in the database corresponding to the given service, and declares the identification successful if a match is found and unsuccessful if the data do not match. The outcome of the identification is
subsequently sent by the workflow server 18 belonging to the service to the terminal 10 on which the user initiated the service provision process.

The invention is, of course, not limited to the preferred embodiments described in details above, but further variants, modifications and developments are possible within the scope of protection determined by the claims.
1. Service provider system comprising
   - a terminal (10) adapted to provide service to a user (66), comprising a
     computer device (36) comprising interactive components, and
   - a service provider server (16) being connected to the computer device
     (36) through a network (24), and being adapted to remotely control a
     part of the interactive components belonging to the service,

   characterised in that
   - it comprises a workflow server (18) being capable of remote control,
     being connected to the computer device (36) through the network (24)
     and being adapted to support service provision, and
   - all of the interactive components are controlled remotely by network
     messages, and at least one interactive component is controlled from the
     workflow server (18).

2. The system according to claim 1, characterised in that
   - it comprises an interconnecting server (12) being connected to the
     computer device (36) through the network (24),
   - the service provider server (16) and the workflow server (18) are
     connected to the computer device (36) through the interconnecting
     server (12), and
   - the interactive components are controlled by network messages
     transferred through the interconnecting server (12).

3. The system according to claim 2, characterised in that data of service
   provided through the terminal (10) are logged on the interconnecting server
   (12).

4. The system according to claim 2 or 3, characterised in that it comprises at
   least one operator workstation (20) being adapted to support service
   provision, being connected to the interconnecting server (12) and being
   operated by an operator (68).
5. The system according to claim 4, characterised in that the interactive component comprises a sound transmission device (42) being adapted to transmit sound from the terminal (10) to the operator workstation (20), and an image transmission device (44) being adapted to transmit images from the terminal (10) to the operator workstation (20).

6. The system according to any of claims 1 to 5, characterised in that the computer device (36) comprises a browser (38) and a local host (40) being controllable by network messages, and the interactive components are controlled via the browser (38) or through the local host (40).

7. The system according to any of claims 1 to 6, characterised in that the terminal (10) is controlled by a technology independent of the operating system and programming environment of the computer device (36), particularly by HTML, Javascript, or Ajax technology.

8. The system according to any of claims 1 to 7, characterised in that the service comprises a service provision process consisting of modules, and the system comprises a graphical program for building the service provision process from the modules.

9. The system according to any of claims 1 to 8, characterised in that one part of the interactive components are input components, and another part thereof are output components.

10. The system according to claim 9, characterised in that the input components are a keyboard (50), a pointing device (52), a scanner module (54), a card reader module (56), a biometric identification module (58), a document reception/scanner module (61) and/or a currency reception module (64), and the output components are a display (46), a loudspeaker (48), a document printer/display module (60), a currency dispenser module (62), and/or a receipt printer module (65).

11. Method for providing service through a terminal (10), the terminal (10) comprises a computer device (36) comprising interactive components, and a service provider server (16) being adapted for remotely controlling a part
of the interactive components, and being connected to the computer device (36) through a network (24),
characterised in that
all of the interactive components are controlled remotely by network messages, and at least one interactive component is controlled from a workflow server (18) being connected to the computer device (36) through the network (24), being adapted to support service provision and being adapted for remote control.

12. The method according to claim 11, characterised in that an interconnecting server (12) is connected to the computer device (36) through the network (24), and the interactive components are controlled by network messages transferred through the interconnecting server (12).

13. The method according to claim 11, characterised in that the data of the service provided through the terminal (10) is logged on the interconnecting server (12).

14. The method according to any of claims 10 to 12, characterised by controlling the terminal (10) by a technology independent of the operating system and programming environment of the computer device (36), particularly by HTML, Javascript, or Ajax technology.
Fig. 5
**A. CLASSIFICATION OF SUBJECT MATTER**

INV. G07F19/00 G06F17/30

According to International Patent Classification (IPC) and both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

G07F G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
</table>

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:
  * "A" document defining the general state of the art which is not considered to be of particular relevance
  * "E" earlier application or patent but published on or after the international filing date
  * "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  * "O" document referring to an oral disclosure, use, exhibition or other means
  * "P" document published prior to the international filing date but later than the priority date claimed

Date of the actual completion of the international search: 23 May 2013

Date of mailing of the international search report: 04/06/2013

Name and mailing address of the ISA:
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016

Authorized officer: Gavrilov, Bogdan
### DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>paragraph [0032] - paragraph [0054]; figures 1-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>paragraph [0054] - paragraph [0094]; figures 4-8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>Patent document cited in search report</td>
<td>Publication date</td>
<td>Patent family member(s)</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-----------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>US 2009112868 A1</td>
<td>30-04-2009</td>
<td>CN 101836185 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 2011503688 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KR 20100072014 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2009112868 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 2009055083 A1</td>
</tr>
<tr>
<td>US 2003233372 A1</td>
<td>18-12-2003</td>
<td>NONE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KR 20090091744 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2009119601 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2009150799 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 2008084666 A1</td>
</tr>
</tbody>
</table>