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Method and software application for automated generation of bills

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Abstract

The present invention provides methods and systems for processing bills electronically. Generally, a bill is created for a customer using billing information and master data from a biller and master data from a customer. Billing information is received from the biller by a first processing module having access to the master data of the biller. The first processing module generates a bill using the billing information and the master data of the biller. A second processing module having access to the master data of the customer provides customer data to the first processing module. The bill is transformed into a format specified in the master data of the customer by the first processing module if the format of the generated bill is not the format specified in the master data of the customer. The generated or transformed bill is transferred to the second processing module by the first processing module.

Method and Software Application for Automated Generation of Bills

Background of the Invention

Field of the Invention.

The technical field of this invention is in the area of electronic data processing. More particularly, the invention relates to methods, computer program, computer program products and systems for automated billing systems and, still more particularly, for processing, generating and presenting an electronic invoice to a customer for remote review and payment.

Description of the Related Art

It should be understood that the term "presentment" as used herein does not include the specialized definition normally associated with commercial paper, i.e. the production on a negotiable instrument to a drawee. Rather, the term refers to providing via electronic means information, particularly an "invoice" containing at least the same customer billing data typically included on a paper invoice. This electronic presentment may preferably but not limiting take place through the use of an internet- or intranet website or via email or SMS, e.g. by making a web site accessible to one or more persons. It may further take place by sending computerreadable storage media, like disks, ZIP disks, magneto-optical disks, CD-, CDRW-, DVD ROMs etc. e.g. via standard mail.

Methods and systems for electronic bill presentment and payment (EBPP) in enterprise resource planning software (ERP) environments are known from the state of the art. The document U.S. Pat. No. 6,044,362 discloses a system for automated electronic invoicing and payment for providing remote customer review of automated billing from an invoicer. The system

includes invoice presentment electronics having a control system and first communication electronics. The system also includes at least one remote authorization terminal having a customer interface, the terminal having second communication electronics adapted to operatively communicate with the first communication electronics. The control system of the invoice presentment electronics is adapted to provide billing data, regarding a customer invoice preauthorized for automated billing, to the first communication electronics for transmission to the second communication electronics. The customer interface of the remote authorization terminal is adapted to present the billing data to a customer and to receive a response relating to the billing data from the customer, the response indicating one of acceptance of the billing data for automated billing or modification of the billing data for modifying automated billing. Acceptance can either be an active response from the customer or a passive response, for example, automatic acceptance up to a preset limit.

U.S. Pat. No. 5,465,206 discloses a bill pay system wherein participating customers pay bills to participating billers through a payment network operating according to preset rules. The participating customers receive bills from participating billers of (paper/mail bills, e-mail notices, implied bills for automatic debts) which indicate an amount, and a unique biller identification number. To authorize a remittance, that customer transmits to its bank (a participating bank) a bill pay order indicating a payment date, a payment amount, that customer's account number with the biller, a source of fund and the biller's biller identification number, either directly or by reference to static data, containing those data elements. Bank C then submits a payment message to a payment network, and the payment network, which assigns the biller reference numbers, forwards the payment message to the biller's bank. For settlement, the customer's bank debits the customer's account and is obligated to a net position with the payment network;

likewise, the biller's bank receives a net position from the payment network and credits the biller's bank account. If the customer's bank agrees to send non-reversible payment messages, that customer's bank does not submit the transaction until funds are good unless the customer's bank is willing to take the risk of loss if funds are not good, in the case of a guaranteed payment network. The biller's bank, upon receipt of the payment message, releases the funds to the biller, and provides A/R data to biller in a form which biller B has indicated, the form being one which does not have to be treated as an exception item to the biller. The biller's bank is assured of payment by the payment network, unless the transaction is a reversible transaction according to the preset rules of the payment network. In specific embodiments, the customer initiates the bill pay orders manually, via paper at an ATM, via PC, or via telephone keypad.

An other system is known from the website www://ofx.net. Open Financial Exchange (ofx) is a broad-based framework for exchanging financial data and instructions between customers and their financial institutions. It allows institutions to connect directly to their customers without requiring an intermediary. Open Financial Exchange is an open specification that anyone can implement: any financial institution, transaction processor, software developer, or other party. It uses widely accepted open standards for data formatting (such as XML), connectivity (such as TCP/IP and HTTP), and security (such as SSL). Open Financial Exchange defines the request and response messages used by each financial service as well as the common framework and infrastructure to support the communication of those messages. The data of biller and customer are held in the same system.

However, those systems, which use a direct contact between biller and customer, have the disadvantage, that it is difficult to technically implement a business scenario, in

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5 which bills of different billers shall be presented to one customer. Further it is difficult to integrate and maintain such systems in the IT (information technology) systems of billers and customers, particularly if a high bill volume has to be handled.

10 Thus, there is a need for a method, software application and/or data processing system providing a more efficient solution of at least parts of the problems described above, particularly it is desirable to provide a software application having a mechanism for a more efficient bill processing.

Summary of the Invention

15 In accordance with one aspect of the invention, there is provided a method for processing bills electronically, wherein a bill is created for a customer using billing information and master data from a biller and master data from a customer, comprising the steps of:

- 20 a) receiving the billing information from the biller by means of a first processing module, said first processing module having access to the master data of the biller;
- b) generating a bill by means of said first processing module using the billing information and the master data of the biller;
- 25 c) requesting data of the customer from a second processing module by said first processing module, said second processing module having access to the master data of the customer;
- d) transforming the bill into a format specified in the master data of the customer by means of said first processing module if
- 30 the format of the generated bill is not the format specified in the master data of the customer;
- e) transferring the generated or transformed bill to the second processing module by said first processing module.

35 Another aspect of the invention, is to provide a computer system for processing bills electronically, wherein a bill is created for a customer using billing information and master data from a

- billers and master data from a customer, comprising:
- memory having program instructions;
 - input means for receiving and entering data;
 - output means for sending and presenting data
- 5 - storage means for storing data;
- a processor responsive to the program instructions to:
- a) receiving the billing information from the biller by means of a first processing module, said first processing module having access to the master data of the biller;
 - 10 b) generating a bill by means of said first processing module using the billing information and the master data of the biller;
 - c) requesting data of the customer from a second processing module by said first processing module, said second processing module having access to the master data of the customer;
 - 15 d) transforming the bill into a format specified in the master data of the customer by means of said first processing module if the format of the generated bill is not the format specified in the master data of the customer;
 - e) transferring the generated or transformed bill to the second
 - 20 processing module by said first processing module.

Method and system provide a technical contribution to the solution of the problem to provide a large amount of bills in an efficient way to a specific customer. A plurality of billers can

25 provide their billing information to the first module. The billing information are finally transformed into a bill of a format, specified by the respective customer.

Another aspect of the invention provides a computer readable

30 medium comprising instructions for processing bills electronically, wherein a bill is created for a customer using billing information and master data from a biller and master data from a customer, comprising instructions for:

- a) receiving the billing information from the biller by means of
- 35 a first processing module, said first processing module having access to the master data of the biller;
- b) generating a bill by means of said first processing module

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- using the billing information and the master data of the biller;
- c) requesting data of the customer from a second processing module by said first processing module, said second processing module having access to the master data of the customer;
 - 5 d) transforming the bill into a format specified in the master data of the customer by means of said first processing module if the format of the generated bill is not the format specified in the master data of the customer;
 - 10 e) transferring the generated or transformed bill to the second processing module by said first processing module.

Another aspect of the invention provides a computer data signal embodied in a carrier wave comprising:

- 15 code for processing bills electronically, wherein a bill is created for a customer using billing information and master data from a biller and master data from a customer, said code comprising instructions for:

- a) receiving the billing information from the biller by means of a first processing module, said first processing module having 20 access to the master data of the biller;
- b) generating a bill by means of said first processing module using the billing information and the master data of the biller;
- c) requesting data of the customer from a second processing module by said first processing module, said second processing 25 module having access to the master data of the customer;
- d) transforming the bill into a format specified in the master data of the customer by means of said first processing module if the format of the generated bill is not the format specified in the master data of the customer;
- 30 e) transferring the generated or transformed bill to the second processing module by said first processing module.

- Another aspect of the invention provides computer program comprising program instructions for performing the above 35 described method aspect if said instructions are executed on a computer system.

The first and second processing modules may be installed as computer programs on different hardware systems (computers or computer systems), and run separately and independently of each other. The different systems may be connected in the form of a network to communicate with each other.

Additional objects and advantages of the invention and its embodiments will be set forth in part in the description, or may be learned by practice. Objects and advantages of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims. Embodiments of the invention are disclosed in the detailed description section and in the dependent claims.

It is understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

Brief Description of the Drawings

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and, together with the description, explain the principles of the invention. In the drawings,

Fig. 1 is a schematic block diagram of the implementation of the inventive method within a computer system,

Fig. 2 is an exemplary block diagram of the inventive method,

Fig. 3 is an exemplary overview of an example of an inventive electronic bill presentment and paying system,

Fig. 4 is an exemplary block diagram of an interconnection of a first and second processing module,

Fig. 5 is an exemplary flow diagram of an inventive billing process,

Fig. 6 is an exemplary flow diagram of an inventive bill presentment process,

Fig. 7 is an exemplary flow diagram of a process for registering a customer for an inventive electronic billing process,

Fig. 8 is an exemplary flow diagram of a process for activating a registering of a customer by a biller,

Fig. 9 is an exemplary block diagram of a table for mapping the IDs of a biller for a customer to the IDs of a customer for a biller,

Fig. 10 is an exemplary block diagram of a the integration of e-banking into the inventive electronic bill presentment and paying system,

Fig. 11 is an exemplary flow diagram of a process for initiating and performing a bill review by a customer,

Fig. 12 is the continuation of the flow diagram in fig.11,

Fig. 13 is an exemplary block diagram of an archiving process for data of billers or customers.

Detailed Description

Computer system and program are closely related. As used hereinafter, phrases, such as "the computer provides" and "the program provides or performs specific actions", "a user performs a specific action" are convenient abbreviation to

express actions by a computer system that is controlled by a program or to express that the program or program module is designed to enable the computer system to perform the specific action or to enable a user to perform the specific action by means of a computer system.

Within the concept of this invention, the terms used shall have their usual meaning in the context of the field of data processing unless defined otherwise. A computer system can be a stand alone computer such as a PC or a Laptop or a series of computers connected as a network, e.g. a network within a company, or a series of computers connected via the internet.

A first embodiment of the inventive method as described in the summary section is characterized in that the method further comprises a step of f) making the transformed bill accessible to a third processing module by said second processing module.

A second embodiment of the inventive method is characterized in that the method further comprises g) making the transformed bill accessible to the customer.

A third embodiment comprises h) presenting or delivering the transformed bill to the customer.

A fourth embodiment comprises digitally signing the bill by said first processing module.

A fifth embodiment is characterized by providing the transformed bill with a link to a storage location of the transformed bill or of details of the bill for access of the customer.

A sixth embodiment is characterized by sending the bill or the transformed bill to a print service.

In a seventh embodiment the invention comprises encrypting the bill and/or the transformed bill by means of said first and/or second processing module.

An eighth embodiment comprises archiving the bill and/or the transformed bill by means of said first and/or second processing module.

An other embodiment is characterized by said third processing module providing means for presenting an overview over a customers bills. Advantageously, said third processing module providing means for verification of the bill. In a further embodiment of the inventive method, said third processing module providing means for workflow support or bill dispute.

A still further embodiment is characterized in that said second processing module providing means for country specific bill presentation and/or payment. A still further embodiment is characterized by said second processing module providing means for exchanging data with one or more further second processing modules. A still further embodiment is characterized by said second processing module receiving a payment order from the customer. A still further embodiment is characterized by said second processing module forwarding the payment order or a transformed payment order to a payment service provider.

A still further embodiment of the inventive method is characterized in that the billing information comprise address information of biller and/or customer and/or payment supplier, payment information, VAT information, itemized billing positions with relation to purchase order and/or accounting information. In a still further embodiment the master data of the biller comprise address information and/or data format information and/or information on communication addresses and/or bank and bank account information and/or user authentication information and/or user authorizations information and/or information on options for archiving

services and/or options for print services and/or options for notifications. In a still further embodiment the master data of the customer comprise address information and/or data format information and/or communication addresses and/or bank and bank account information and/or user authentication information and/or user authorizations and/or information on options for archiving services and/or options for notifications.

A still further embodiment is characterized by said second processing module having means for exchanging data with one or more further first processing modules. A still further embodiment is characterized by said second processing module having means for exchanging data with one or more further third processing modules.

A still further embodiment comprises said second or first processing module having means for mapping an ID of a biller for a particular customer to an ID of a customer for a particular biller.

A still further embodiment comprises directly transforming the bill from a format used by the biller into a format as specified in the master data of the customer without using an intermediate format.

The third processing modules may be installed as computer programs on the same hardware system as the first and second processing module or on a different hardware system and may run separately and independently of both other modules. The third processing module may also be a part of (integrated in) the second processing module.

Processors suitable for the execution of a computer program include, by way of example, both general and special purpose microprocessors, and any one or more processors of any kind of digital computer. Generally, a processor will receive instructions and data from a read-only memory or a random

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access memory or both. The essential elements of a computer are a processor for executing instructions and one or more memory devices for storing instructions and data. Generally, a computer will also include, or be operatively coupled to receive data from or transfer data to, or both, one or more mass storage devices (storage means) for storing data, e.g., magnetic, magneto-optical disks, or optical disks. Information carriers suitable for embodying computer program instructions and data include all forms of non-volatile memory, including by way of example semiconductor memory devices, such as EPROM, EEPROM, and flash memory devices; magnetic disks such as internal hard disks and removable disks; magneto-optical disks; and CD-ROM and DVD-ROM disks. The processor and the memory can be supplemented by, or incorporated in, ASICs (application-specific integrated circuits).

To provide for interaction with a user, the invention can be implemented on a computer having a display device such as a CRT (cathode ray tube) or LCD (liquid crystal display) monitor for displaying information to the user and a keyboard and a pointing device such as a mouse or a trackball by which the user can provide input to the computer. Other kinds of devices can be used to provide for interaction with a user as well; for example, feedback provided to the user can be any form of sensory feedback, such as visual feedback, auditory feedback, or haptic feedback; and input from the user can be received in any form, including acoustic, speech, or haptic input.

Reference will now be made in detail to the principles of the invention by explaining the invention on the basis of a data processing process, examples of which are illustrated in the accompanying drawings. Examples, mentioned therein, are intended to explain the invention and not to limit the invention in any kind.

The first processing module is hereinafter referred to as "biller service provider" (BSP), the second as "consolidator" and the third as "customer service provider" (CSP). If the CSP

is integrated in the consolidator, the resulting combination is referred to as "integrated CSP" (iCSP).

Fig. 1 depicts one example of an implementation of an embodiment of the invention: A computer system with program modules for performing the inventive method. Fig. 1 shows a computer system 101 comprising a computer 103 having a CPU 105, a working storage 112 (memory), in which software applications are stored for being processed by CPU 105. Said software applications comprise program modules 106, 109, 110 for carrying out the first, second and third processing module, respectively, according to the inventive method. Computer System 101 further comprises input means 117, output means 112 for interaction with a user, e.g. for starting the program modules and/or for data input, and general input/output means 104, including a net connection 114, for sending and receiving data, e.g. data on billing information, bills, payment orders, customer and biller master data, etc. A plurality of computer systems 101 can be connected via the net connection 114 in the form of a network 113. In such a case, each of the modules 106, 109, 110 may be installed and run separately and independently on the respective network computers 113. In this case the network computers 113 can be used as further input/output means, including the use as further storage locations. Computer system 103 further comprises a first storage means 107, in which master data of the customer are stored, and a second storage means 108, in which the master data of the biller are stored. According to the inventive method, the first processing module 110 (BSP) has access to the master data of the biller stored on the storage means 108, and the second processing module 106 (consolidator) has access to the master data of the customer stored on the storage means 107. A biller 111 and a customer 115 are connected, permanently, or on a need to use basis, to the computer system 103 via input/output means 104. A further connection may be established to a payment service 116. The interactions of biller 111 and customer 115 with the

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accompanying program modules 110, 109, respectively, are indicated by dashed arrows. Likewise the affiliation of the BSP and the consolidator to the respective storage means 108, 107.

Fig. 2 describes an example of a network connection of several program modules of BSPs 201a, 201b, consolidators 202a, 202b, 202c, and a CSP 203, each of them being installed on a separate computer system 204a,b, 205a,b,c and 208. The respective computer systems may be identical or different from each other, depending on the requirements of the application case. The computer systems may be located in different countries in the world. One or more billers can have access to that network via computer systems 206a,b using web browsers 207a,b. These computer systems 206a,b may be connected to each of the BSPs 204a,b. A customer can have access to the network via a computer system 210 having a web browser 211. For performing the payments associated with the bills, a computer system 209 of a payment service provider having an e-banking application may be connected to one or more of the consolidator systems 205a,b,c.

According to the inventive concept of separating the biller master data from the customer master data, as many BSPs as necessary can be connected to one consolidator. This avoids superfluous movement of data, because the customer master data need not be shifted or copied to the module which processes the bills, what would be necessary in the methods according to the state of the art. With this concept, billing volumes of over several million bills per month can be handled by using several BSPs, connected to one consolidator, for example. If customer master data need to be updated, this is very easy in the inventive system, because only the data base of the consolidator needs to be changed. The BSP data base is not affected by such an update. A further effect is that maintenance costs for the master data are reduced.

Fig. 3 gives an overview of possible formats and interfaces for the data exchange between a biller and the BSP, the BSP and the consolidator, the consolidator and the CSP, and between the CSP and a customer (payer). The biller side is split into three cases: Large billers using a SAP ERP system (SAP AG, D-69190 Walldorf, Germany), large billers using a non-SAP ERP system and small billers. The terms "large" and "small" herein are referenced to the turnover of the respective company or person, it is an arbitrary measure for demonstrating purpose only. The same applies for the customer side accordingly. The CSP is in the example for the Large payers integrated in the consolidator as iCSP and for the small payers it is a separate program module with two alternative implementations, SAP Portals CSP and Online Banking CSP. The BSP supports in this example four formats for the billing information: the IDOC, FLATFILE and EDIFACT format and a predefinable BSP format on which the systems of the biller and the BSP have to be adapted during the installation of the respective software. The systems in the biller side may communicate with the BSP on the basis of HTML, HTTPS, XML-IDOC (SSL), FLAT (SSL), EDI (SSL). BSP and consolidator may communicate via XML, as well as consolidator and CSP. The CSP and/or iCSP may communicate with the systems of the customer on the basis of HTML (HTTPS), XML-IDOC (SSL), EDI (SSL) and XML.

Fig. 4 shows an example of possible interfaces (IF) with which the BSP and/or CSP and/or iCSP may be provided: a biller or customer EDI/file IF, Web GUI (graphical user interface), ECX, Flat File Conversion, Print IF, Archiving IF, a Cost Event IF for connection with a billing engine, an IF for connection with a payment service (financial institution) or a CCX IF for connection with an internet service provider (ISP). In order to view their list of bill summaries, the biller can connect to the BSP, the customer, according to their preferences, directly to the CSP/iCSP or indirectly via a connection to financial institutions or ISPs. For itemized bill and registration, the customers may connect the BSP.

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The BSP stores all data associated with the biller in a Partner data base: Master data of the billers comprising address, identification keys, authorizations, billers integration level (interfacing capabilities and implemented processes), logos, place of logos on the bill, advertisement forms for personalized promotions, formats for credits, digital signatures, etc. The billing information, the generated and or transformed bills, bill details for web presentment may be stored by the BSP in a business object data base. Business object in this sense is the entirety of data, which belong to a business transaction as the cause for the specific bill. Typical billing information comprise article, type of article, number, position, ID, description of article, price, tax information, addresses (e.g. for delivery), references (URLs for details), dates (e.g. billing date) etc. The consolidator/iCSP stores all data associated with the customer and the financial institutions in a partner data base: master data of the customer comprising address of the customer, addresses for communication within the customers organization and between customer and biller, formats in which the bill shall be presented, addresses for providing a status information or dispute or review management, identification keys, authorizations, digital signatures, etc. The consolidated or aggregated bills, or bill summaries to be presented to the customer are stored by the consolidator/iCSP in a consolidator's business object data base. As many BSPs as necessary to handle the bill volume may be connected to a consolidator/iCSP in such a way.

In case the program modules 106, 109, 110 are processed by CPU 105 in Fig. 1 in order to carry out the inventive method, steps as described in the following section may be performed by the computer system 101 or the systems of the network as described above.

Fig. 5 presents a flow diagram of an exemplary implementation of an inventive process. The time axis in this type of flow

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diagram runs from top to bottom. A biller sends (by means of his ERP computer system) billing information to the BSP in a format agreed upon on registration of the biller at the BSP. The BSP creates on the basis of that billing information and of the billers master data a bill and assigns a status new to that object. The BSP then sends a request for information about the customer (CustomerInfoRequest) to the Consolidator/iCSP. The consolidator/iCSP responds to that request and returns to the BSP the available data from the customer master data base for the inquired customer (CustomerInfoResponse). In addition to the information given above, the response may contain information whether a customer request billing data for web presentment (thin consolidation, "thin" because only the main information are presented to the customer) or for processing in an ERP system (thick consolidation, "thick" because, the bill is sent electronically to the customer, including bill details) or in a digitally signed format according to applicable tax or other legal regulations or if the presented bill shall be encrypted. Further additionally, the response may contain information on the biller to customer relation (BCR regarding their respective IDs in their respective ERP systems. Still further additional, the response may contain authentication information for accessing itemized bills or for encryption (list of digital IDs, distinguished names, certificate serial numbers, etc. referencing X.509 certificates). The BSP then transforms the bill into the format received with the CustomerInfoResponse.

Data should be converted from the source to the destination format as directly as possible, as close to the source as possible and, if possible, conversions should be avoided, because it bears the risk of data loss. A BSP may use external conversion services, if a destination format can not be produced internally. Reasons: Directly converting bills on the BSP to the customer format allows to digitally sign the bills conforming to government regulations for VAT deductions. The customer may directly process and archive the invoice, what

results in a simple integration process. Application content may be preserved easier. Small total number of supported formats (Standardization) reduces transformation work and costs. PSP (payment formats) specific adaptations can be handled in the consolidator/iCSP.

In the context of EBPP systems according to the state of the art, conversion is done indirectly by using an intermediate („in-house“) format and source data are first converted into the in-house format and then converted into the destination format. This technique has the advantage, that the number of conversions is linear ($2n$) with respect to the number of formats (n), compared to $n(n-1)$ conversions in the case of direct conversions. However, irrespective of the fact that an intermediate format can also be used in the conversion on the present BSP, the conversion to the customer format should happen as early as possible in the presentment process. Converting the invoice to the end user format on the BSP has the advantage, that the bill can be signed on the BSP. Since the Biller out sources his billing process to the BSP, the delegation to the signature to the BSP is possible. Converting the PSP formats to Biller and Customer formats on the consolidator, has the advantage, that only the consolidator contains PSP (e.g. country) specific extensions. BSP and CSP stay independent of PSP formats.

Legally, the BSP, if implemented on a hardware system of a third party, may be treated an outsourcing partner of the biller. The same applies to the CSP and consolidator/iCSP accordingly. In this view, the BSP produces electronic and optionally paper bills on behalf of the biller. Delegation: The biller as a legal entity gives the right to digitally sign bills to the legal entity that operates the BSP. The BSP has to produce a digitally signed invoice message in a format accepted, readable and processable by the customer and valid for VAT deduction. This is achieved, using the conversion process described above. The Customer has the possibility to check the delegation online. The List of billers (see Customer

Registration for E-Bills) contains a hyperlink to the delegation document which resides on the BSP and is digitally signed by the biller.

In most European countries, until recently, for a refund of VAT (Value Added Tax), for purchased goods a paper invoice with a well defined minimum set of information, had to be presented to authorities. The invoice document had to be printed by the biller. Electronically transferred bills, printed by the Customer where not accepted. In the European Union and other countries (e. g. Switzerland), new laws and regulations allow VAT deduction on electronically transmitted bills, if they are digitally signed by the biller. The certificate and the procedure used for signing are regulated.

In order to generate the requested format, the BSP may have access to external conversion services, e.g. a web service. The bill presentment for a potential customer access is prepared. Triage: if the customer cannot be reached electronically, e.g. if the customerInfoResponse returns "unknown", the BSP can generate a paper bill and/or inform the biller accordingly. After reaching an invoice delivery date, contained in the billing information, the BSP delivers the transformed bill to the consolidator/iCSP (InvoiceDeliveryRequest) Additionally, die BSP submits to the consolidator/iCSP information on the integration status of the biller (BillerPreferences). These information may be useful for the consolidator/iCSP to perform operations on the received transformed bill: request for available credit advices or credit advice format, terminal business transaction state for biller (e.g. bill delivered or bill paid, etc.), supported processes (e.g. dispute, rejection remittance advice, etc.). The consolidator/iCSP confirms that a transformed bill is available for access by the customer by a ok-response to the BSP (InvoiceDeliveryResponse). The BSP sets the status of the bill to delivered, the consolidator/iCSP sets the status of the received transformed bill to open.

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The next process steps may depend on whether the customer is a web customer or an ERP customer or on whether payment preferences are applicable to the specific customer or on the connection status of the biller's and customer's payment service provider (PSP). Some options are: web presentment and payment using a banking portal (CCX IF), web presentment and payment using a ISP (e.g. yahoo) and a PSP, ERP connection and payment using a payment channel, ERP connection and payment using SAP EBPP system. The customer receives his transformed bill from the consolidator/iCSP or accesses the transformed bill via a web portal on the consolidator/iCSP data base (deliver bill). Optional steps can be based on a workflow for invoice verification, crosschecking with materials management, payment processing. Then a - optional digitally signed - payment order is sent to the consolidator/iCSP. The consolidator/iCSP then passes a payment scheduling information as comprised by the payment order to the BSP (SetEBPPStatusRequest). Then the BSP informs the biller about the - optionally scheduled - payment. Immediately or at a requested payment date, the consolidator/iCSP generates a payment order in a format required by the PSP and sends the payment order to the PSP. The payment order may be cryptographically authenticated. The PSP processes the payment, using interbank payment processing if required. The PSP of the customer requests the consolidator/iCSP to send a debit advice to the customer. The consolidator/iCSP generates the debit advice in a format the customer requires and sends the message to the customer (debit advice). The status of the transformed bill in the consolidator/iCSP is set to paid. The PSP of the biller requests the consolidator/iCSP to send a credit advice to the biller. The consolidator/iCSP generates the credit advice in a format requested by the biller and sends that message together with a status change request to the BSP (SetEBPPStatusRequest). The BSP sends the credit advice message on to the biller and changes the state of the bill to paid.

Fig. 6 shows an exemplary flow chart of a bill presentment process:

The customer or a user logs in at the CSP/iCSP (Standard procedures: digital ID's (X.509), SSL client authentication). The DN (distinguished name) must be authorized for Web access in the master data of the iCSP/Consolidator. The user may then select a client (customer) or, if the user has no clients, directly select the consolidated list of bills (GetListOfBills) of the customer for whom he has logged in. For every bill in the list, the following data may be typically presented: invoice reference, biller name, billers banking account, due date, amount with currency, business transaction (bill) state (open, (or dunning), due, scheduled, paid, paid with different amount, hyperlink for additional information to the bill (magnifier symbol or underlined invoice reference). The customer may choose the hyperlink for additional information to the bill. This (SSL) hyperlink points to a information page of the biller, normally hosted on the BSP (as an alternative, the page can also be on a web server of the biller). The BSP authenticates the customer based on a token (generated at the time the bill details were prepared and passed on as part of the bill summary), which is passed back to the BSP together with the hyperlink. If the customer requested a strong authentication, the bill is presented only, if the authentication matches one of the certificates specified in the CustomerInfoResponse (see previous fig.). The BSP maintains a number of HTML templates and selects the proper template based on the referenced business transaction (bill). The template may reference business transaction data to be filled in (e.g. useful for personalized advertisement). Based on the customer address and in agreement with the biller, local third party advertisement may be added. The generated HTML page comprises a hyperlink to the itemized bill. The customer selects the hyperlink to the itemized bill and receives (after authentication) the bill in a PDF format.

Fig. 7 shows an exemplary flow chart of a customer's registering process for e-bills:

The customer or a user logs in at the CSP/iCSP (Standard procedures: digital ID's (X.509), SSL client authentication). The DN (distinguished name) must be authorized for web access in the master data of the iCSP/Consolidator. The user may then select a client (customer) or, if the user has no clients, directly select the list of billers. The consolidator possesses a (normally administratively maintained) HTML template containing information to electronic billers. The list may be completed with logos and biller data from the BSP using hyperlinks (alternatively the data may be maintained locally on the Consolidator. The presented list also contains a customer registration status at the respective biller (inactive, active, registration_requested, registration_refused). The registration status is stored in a BCR table (Biller Customer Relation) on the Consolidator. The customer selects a biller. The URL for the registration form points the BSP (or to a Biller Web server). The BSP receives the Customer PID (Partner Identification Number) from the URL and, since the Customer cannot be authenticated, the BSP gets Customer master data matching the received PID from the Consolidator. Based on biller specific HTML templates, a registration form is presented, containing master data of the customer (not editable) and at least, buttons to register or cancel the registration. Additionally, the biller may require a BCN (Biller's Customer Number or debtor number). If the customer processes the bill in an ERP system, the registration form is extended by a field to fill in a CBN (Customer's Biller Number = creditor number). The customer completes the registration form and sends it back to the BSP. The BSP creates a BCR entry in the Consolidator with the status registration_requested. The BSP may notify the biller (e. g. per E-Mail) about the new registration (optional).

Fig. 8 shows an exemplary flow chart of a biller's activation of a customer's registration:

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The biller or a user (of a biller) logs in at the BSP (Standard procedures: digital ID's (X.509), SSL client authentication). The DN (distinguished name) must be authorized for Web access in the master data of the BSP. The user may then select a client (biller) or, if the user has no clients, directly define filter criteria (e.g. all registration_requested) to access the list of customers. The BSP sends the request on to the consolidator/iCSP and processes the consolidator/iCSP's response to present the list of customers to the biller. The biller inspects the registration information provided (a mismatch in the BCN and the customer name should be avoided) and sets the BCR status to active, if registration data are correct. The BSP sets the BCR state on the consolidator/iCSP using a SetBCRState request. After setting the proper state in the BCR table, the consolidator/iCSP may notify the customer (e.g. by E-Mail).

Fig. 9 illustrates the concept of the biller customer relation table:

The biller customer relation concept is designed to optimally support the integration of Billers or Customers ERP systems. BCN (Billers Customer Number): A BCN or debtor number may be stored in the consolidator/iCSP system. This enables the Biller to use existing Customer identifications in billing data sent to the BSP. Expensive mappings can be avoided. Based on the information acquired in the customer registration process the consolidator/iCSP can map the BCN to a unique Customer identification (e.g. the CPID, Customer Partner Identification).

CBN (Customers Biller Number): A creditor number used in the customers ERP system to identify the biller is also stored in the consolidator/iCSP during the customer registration process. This allows the BSP to map a BPID (Biller Partner Identification) directly to a Biller ID, known by the Customer ERP system during conversion on the BSP. Thus the customer does not need to implement difficult and expensive mapping of ID's.

Fig. 10 illustrates an e-banking integration using CCX IP. E-Banking solutions can integrate bill presentment, using a CCX (Consolidator CSP Exchange) interface. Customer may use multiple CSP's (Multi-banking): The CSP can fetch the current list of bills at the consolidator/iCSP for presentment, the bills are not simply routed by the CSP. This gives the customer the unique ability, to view and pay his bills from different CSP's (e.g. banks).

Figs. 11 and 12 show an exemplary flow chart of a workflow for bill review:

An employee of the customer, defined here as dispatcher, logs in at the consolidator/iCSP and selects the list of bills (see Web Bill Presentment). For bills not yet prepared for the review workflow, the dispatcher can select a SetUpReviewWorkflow. The form presented, allows the dispatcher to define a list of reviewers by entering their E-mail address (or aliases). The dispatcher can also enter text (questions, assign bill items, etc.). In parallel, the dispatcher can have the itemized bill presented (see Web Bill Presentment). The dispatcher sends the form back to the consolidator/iCSP (PostReviewForm). The iCSP/Consolidator sends an E-mail to the reviewers (if possible, using encryption or a private (in-house) network). The email may contain a hyperlink (URL) to the work item review bill and a short (customizable) description. Optionally, the email may contain an authentication token. The status of the business transaction changes to "bill review". The E-mail receiver connects to the iCSP/Consolidator URL listed in the E-mail. The iCSP preferably uses SSL client authentication and compares the received certificate with the authorized certificates in the master data or, authorizes the user based on a token in the URL or authenticates the user based on a user-id/password mechanism (the authentication/authorization scheme can be customized in the system). The iCSP/consolidator returns the current review form with all data added so far. The review form also contains a hyperlink to additional bill information (see Web Bill

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Presentment). The user can add comments and accounting information with respect to bill contents (e.g. position 3 not received, position 1 and 4 ok, charge to internal account No. XYZ) etc. The completed form is sent back to the iCSP/Consolidator (PostReviewForm). Other reviewers may process their workflow item in a similar way. The dispatcher or any other authorized user may access the review form via list of bills at any time. The system sends a message to a predefined address, once all reviewers have posted the review form and sets the state of the business transaction to „open“ or due“ depending on the due date. The reviewers do not need to have access to any other bills or the list of bills. Only the authentication/authorization has to be stored in the iCSP/consolidator (e.g. for reviewers with digital id's, only their DN has to be stored combined with the right for bill reviews).

Fig. 13 illustrates an exemplary archiving procedure: Archiving should meet the requirements of applicable regulations (VAT). The biller receives an archive in form of a CD or DVD ROM or an other read only device, that contains all his business transactions (bills) with the BSP. The customer may also receive an archive, in the same form as the biller, containing all his business transactions with the iCSP/Consolidator. The PSP and a support organization may also receive an archive, containing there own data. The archive may comprise:

An Index, digitally signed by the BSP respectively by the iCSP/Consolidator, wherein the index contains bill summaries of all the business transactions in the archive. The index may be digitally signed to have a proof of the archive content (Business Transactions cannot be removed) for every business transaction (bill presented) and may comprise:

A business transaction report containing the bill summary, a history of all business transaction events and hyperlinks to the original messages.

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All messages exchanged, e. g. the digitally signed invoice as a structured message (XML IDOC or EDIFACT, etc.), the invoice as PDF File also digitally signed, etc.

Optionally, cryptographic mechanisms are applied, to avoid any changes of the content of the archive. The archive may be produced periodically, according to the requirements of the biller or customer. The archive can be delivered to the biller or the customer. The receiver can confirm readability of the received archive by sending an „archive accepted“ message or by interactive confirmation of the acceptance. Business transactions may be removed from the BSP respectively iCSP/Consolidator after receiving all necessary acceptance messages and after a configurable number of working days (typically 90).

The inventive method system as described solves requirements on EBPP system such as: easy integration of biller- and customer IT systems, consolidation of bills of different billers for one customer, allowance for multiple financial institutions for payment, access security and privacy of bill details, compliance to national government VAT regulations, high scalability with respect to bill volume, allowance for cross border EBPP, bill review workflow.

Modifications and adaptations of the present invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. The foregoing description of an implementation of the invention has been presented for purposes of illustration and description. It is not exhaustive and does not limit the invention to the precise form disclosed. Modifications and variations are possible in light of the above teachings or may be acquired from the practicing of the invention. For example, the described implementation includes software, but systems and methods consistent with the present invention may be implemented as a combination of hardware and software or in hardware alone. Additionally, although aspects of the present

invention are described for being stored in memory, one skilled in the art will appreciate that these aspects can also be stored on other types of computer-readable media, such as secondary storage devices, for example, hard disks, floppy disks, or CD-ROM; the Internet or other propagation medium; or other forms of RAM or ROM. It is intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.

10 Computer programs based on the written description and flow charts of this invention are within the skill of an experienced developer. The various programs or program modules can be created using any of the techniques known to one skilled in the art or can be designed in connection with existing software. For
15 example, programs or program modules can be designed in or by means of [®] Java, C++, HTML, XML, or HTML with included Java applets or in SAP R/3 or ABAP. One or more of such modules can be integrated in existing e-mail or browser software.

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

A reference herein to a prior art document is not an admission that the document forms part of the common general knowledge in
30 the art in Australia.

What is claimed is:

1. A method for processing bills electronically, wherein a bill is created for a customer using billing information and master data from a biller and master data from a customer, comprising the steps of:
 - a) receiving the billing information from the biller by means of a first processing module, said first processing module having access to the master data of the biller;
 - b) generating a bill by means of said first processing module using the billing information and the master data of the biller;
 - c) requesting data of the customer from a second processing module by said first processing module, said second processing module having access to the master data of the customer;
 - d) transforming the bill into a format specified in the master data of the customer by means of said first processing module if the format of the generated bill is not the format specified in the master data of the customer;
 - e) transferring the generated or transformed bill to the second processing module by said first processing module.
2. The method of claim 1, further comprising:
 - f) making the transformed bill accessible to a third processing module by said second processing module.
3. The method of claim 1 or 2, further comprising:
 - g) making the transformed bill accessible to the customer.
4. The method of one or more of claims 1 to 3, further comprising:
 - h) presenting or delivering the transformed bill to the customer.
5. The method of one or more of claims 1 to 4, further comprising:
 - digitally signing the bill by said first processing module.

6. The method of one or more of claims 1 to 5, further comprising:
providing the transformed bill with a link to a storage location of the transformed bill or of details of the bill for access of the customer.
7. The method of one or more of claims 1 to 6, further comprising:
sending the bill or the transformed bill to a print service.
8. The method of one or more of claims 1 to 7, further comprising:
encrypting the bill and/or the transformed bill by means of said first and/or second processing module.
9. The method of one or more of claims 1 to 8, further comprising:
archiving the bill and/or the transformed bill by means of said first and/or second processing module.
10. The method of one or more of claims 1 to 9, further comprising:
said third processing module providing means for presenting an overview over a customers bills.
11. The method of one or more of claims 1 to 10, further comprising:
said third processing module providing means for verification of the bill.
12. The method of one or more of claims 1 to 11 further comprising:
said third processing module providing means for workflow support or bill dispute.
13. The method of one or more of claims 1 to 12, further comprising:

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said second processing module providing means for country specific bill presentation and/or payment.

14. The method of one or more of claims 1 to 13, further comprising:
said second processing module providing means for exchanging data with one or more further second processing modules.
15. The method of one or more of claims 1 to 14, further comprising:
said second processing module receiving a payment order from the customer.
16. The method of one or more of claims 1 to 15, wherein said second processing module forwarding the payment order or a transformed payment order to a payment service provider.
17. The method of one or more of claims 1 to 16, wherein the billing information comprise address information of biller and/or customer and/or payment supplier, payment information, VAT information, itemized billing positions with relation to purchase order and/or accounting information.
18. The method of one or more of claims 1 to 17, wherein the master data of the biller comprise address information and/or data format information and/or information on communication addresses and/or bank and bank account information and/or user authentication information and/or user authorizations information and/or information on options for archiving services and/or options for print services and/or options for notifications.
19. The method of one or more of claims 1 to 18, further comprising:
the master data of the customer comprise address information and/or data format information and/or

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communication addresses and/or bank and bank account information and/or user authentication information and/or user authorizations and/or information on options for archiving services and/or options for notifications.

20. The method of one or more of claims 1 to 19, further comprising:
said second processing module having means for exchanging data with one or more further first processing modules.
21. The method of one or more of claims 1 to 20, further comprising:
said second processing module having means for exchanging data with one or more further third processing modules.
22. The method of one or more of claims 1 to 21, further comprising:
said second or first processing module having means for mapping an ID of a biller for a particular customer to an ID of a customer for a particular biller.
23. The method of one or more of claims 1 to 22, further comprising:
directly transforming the bill from a format used by the biller into a format as specified in the master data of the customer without using an intermediate format.
24. The method of one or more of claims 1 to 23,
for use in an enterprise resource planning software.
25. A computer system for processing bills electronically, wherein a bill is created for a customer using billing information and master data from a biller and master data from a customer, comprising:
 - memory having program instructions;
 - input means for receiving and entering data;
 - output means for sending and presenting data
 - storage means for storing data;
 - a processor responsive to the program instructions to:

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- a) receiving the billing information from the biller by means of a first processing module, said first processing module having access to the master data of the biller;
 - b) generating a bill by means of said first processing module using the billing information and the master data of the biller;
 - c) requesting data of the customer from a second processing module by said first processing module, said second processing module having access to the master data of the customer;
 - d) transforming the bill into a format specified in the master data of the customer by means of said first processing module if the format of the generated bill is not the format specified in the master data of the customer;
 - e) transferring the generated or transformed bill to the second processing module by said first processing module.
26. The computer system of claim 25, further comprising:
- f) making the transformed bill accessible to a third processing module by said second processing module.
27. The computer system of claim 25 or 26, further comprising:
- g) making the transformed bill accessible to the customer.
28. The computer system of one or more of claims 25 to 27, further comprising:
- h) presenting or delivering the transformed bill to the customer.
29. The computer system of one or more of claims 25 to 28, further comprising:
- digitally signing the bill by said first processing module.
30. The computer system of one or more of claims 25 to 28, further comprising:
- providing the transformed bill with a link to a storage location of the transformed bill or of details of the bill for access of the customer.

31. The computer system of one or more of claims 25 to 30,
further comprising:
sending the bill or the transformed bill to a print
service.
32. The computer system of one or more of claims 25 to 31,
further comprising:
encrypting the bill and/or the transformed bill by means of
said first and/or second processing module.
33. The computer system of one or more of claims 25 to 32,
further comprising:
archiving the bill and/or the transformed bill by means of
said first and/or second processing module.
34. The computer system of one or more of claims 25 to 33,
further comprising:
said third processing module providing means for presenting
an overview over a customers bills.
35. The computer system of one or more of claims 25 to 34,
further comprising:
said third processing module providing means for
verification of the bill.
36. The computer system of one or more of claims 25 to 35,
further comprising:
said third processing module providing means for workflow
support or bill dispute.
37. The computer system of one or more of claims 25 to 36,
further comprising:
said second processing module providing means for country
specific bill presentation and/or payment.
38. The computer system of one or more of claims 25 to 36,
further comprising:
said second processing module providing means for

exchanging data with one or more further second processing modules.

39. The computer system of one or more of claims 25 to 38, further comprising:
said second processing module receiving a payment order from the customer.
40. The computer system of one or more of claims 25 to 39, wherein
said second processing module forwarding the payment order or a transformed payment order to a payment service provider.
41. The computer system of one or more of claims 25 to 40, wherein
the billing information comprise address information of biller and/or customer and/or payment supplier, payment information, VAT information, itemized billing positions with relation to purchase order and/or accounting information.
42. The computer system of one or more of claims 25 to 41, wherein
the master data of the biller comprise address information and/or data format information and/or information on communication addresses and/or bank and bank account information and/or user authentication information and/or user authorizations information and/or information on options for archiving services and/or options for print services and/or options for notifications.
43. The computer system of one or more of claims 25 to 42, further comprising:
the master data of the customer comprise address information and/or data format information and/or communication addresses and/or bank and bank account information and/or user authentication information and/or

- user authorizations and/or information on options for archiving services and/or options for notifications.
44. The computer system of one or more of claims 25 to 43, further comprising:
said second processing module having means for exchanging data with one or more further first processing modules.
45. The computer system of one or more of claims 25 to 44, further comprising:
said second processing module having means for exchanging data with one or more further third processing modules.
46. The computer system of one or more of claims 25 to 45, further comprising:
said second or first processing module having means for mapping an ID of a biller for a particular customer to an ID of a customer for a particular biller.
47. The computer system of one or more of claims 25 to 46, further comprising:
directly transforming the bill from a format used by the biller into a format as specified in the master data of the customer without using an intermediate format.
48. The computer system of one or more of claims 25 to 47, for use in an enterprise resource planning software.
49. A computer readable medium comprising instructions for processing bills electronically, wherein a bill is created for a customer using billing information and master data from a biller and master data from a customer, comprising instructions for:
- a) receiving the billing information from the biller by means of a first processing module, said first processing module having access to the master data of the biller;
 - b) generating a bill by means of said first processing module using the billing information and the master data of the biller;

- c) requesting data of the customer from a second processing module by said first processing module, said second processing module having access to the master data of the customer;
 - d) transforming the bill into a format specified in the master data of the customer by means of said first processing module if the format of the generated bill is not the format specified in the master data of the customer;
 - e) transferring the generated or transformed bill to the second processing module by said first processing module.
50. The computer readable medium of claim 49, further comprising:
- f) making the transformed bill accessible to a third processing module by said second processing module.
51. The computer readable medium of claim 49 or 50, further comprising:
- g) making the transformed bill accessible to the customer.
52. The computer readable medium of one or more of claims 49 to 51, further comprising:
- h) presenting or delivering the transformed bill to the customer.
53. The computer readable medium of one or more of claims 49 to 52, further comprising:
- digitally signing the bill by said first processing module.
54. The computer readable medium of one or more of claims 49 to 53, further comprising:
- providing the transformed bill with a link to a storage location of the transformed bill or of details of the bill for access of the customer.
55. The computer readable medium of one or more of claims 49 or 54 further comprising:

sending the bill or the transformed bill to a print service.

56. The computer readable medium of one or more of claims 49 to 55, further comprising:
encrypting the bill and/or the transformed bill by means of said first and/or second processing module.
57. The computer readable medium of one or more of claims 49 to 56, further comprising:
archiving the bill and/or the transformed bill by means of said first and/or second processing module.
58. The computer readable medium of one or more of claims 49 to 57, further comprising:
said third processing module providing means for presenting an overview over a customers bills.
59. The computer readable medium of one or more of claims 49 to 58, further comprising:
said third processing module providing means for verification of the bill.
60. The computer readable medium of one or more of claims 49 to 59, further comprising:
said third processing module providing means for workflow support or bill dispute.
61. The computer readable medium of one or more of claims 49 to 60, further comprising:
said second processing module providing means for country specific bill presentation and/or payment.
62. The computer readable medium of one or more of claims 49 to 60, further comprising:
said second processing module providing means for exchanging data with one or more further second processing modules.

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63. The computer readable medium of one or more of claims 49 to 52, further comprising:
said second processing module receiving a payment order from the customer.
64. The computer readable medium of one or more of claims 49 to 63, wherein
said second processing module forwarding the payment order or a transformed payment order to a payment service provider.
65. The computer readable medium of one or more of claims 49 to 64, wherein
the billing information comprise address information of biller and/or customer and/or payment supplier, payment information, VAT information, itemized billing positions with relation to purchase order and/or accounting information.
66. The computer readable medium of one or more of claims 49 to 65, wherein
the master data of the biller comprise address information and/or data format information and/or information on communication addresses and/or bank and bank account information and/or user authentication information and/or user authorizations information and/or information on options for archiving services and/or options for print services and/or options for notifications.
67. The computer readable medium of one or more of claims 49 to 66, further comprising:
the master data of the customer comprise address information and/or data format information and/or communication addresses and/or bank and bank account information and/or user authentication information and/or user authorizations and/or information on options for archiving services and/or options for notifications.

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68. The computer readable medium of one or more of claims 49 to 67, further comprising:
said second processing module having means for exchanging data with one or more further first processing modules.
69. The computer readable medium of one or more of claims 49 to 68, further comprising:
said second processing module having means for exchanging data with one or more further third processing modules.
70. The computer readable medium of one or more of claims 49 to 69, further comprising:
said second or first processing module having means for mapping an ID of a biller for a particular customer to an ID of a customer for a particular biller.
71. The computer readable medium of one or more of claims 49 to 70, further comprising:
directly transforming the bill from a format used by the biller into a format as specified in the master data of the customer without using an intermediate format.
72. The computer readable medium of one or more of claims 49 to 71,
for use in an enterprise resource planning software.
73. A computer data signal embodied in a carrier wave comprising:
code for processing bills electronically, wherein a bill is created for a customer using billing information and master data from a biller and master data from a customer, said code comprising instructions for:
a) receiving the billing information from the biller by means of a first processing module, said first processing module having access to the master data of the biller;
b) generating a bill by means of said first processing module using the billing information and the master data of the biller;
c) requesting data of the customer from a second processing

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- module by said first processing module, said second processing module having access to the master data of the customer;
- 5 d) transforming the bill into a format specified in the master data of the customer by means of said first processing module if the format of the generated bill is not the format specified in the master data of the customer;
- e) transferring the generated or transformed bill to the second processing module by said first processing module.
- 10 74. Computer program comprising program instructions for performing a method as of any of claims 1 to 24 if said instructions are executed on a computer system.
- 15 75. A method for processing bills electronically substantially as herein described with reference to the accompanying drawings.
76. A computer system for processing bills electronically substantially as herein described with reference to the accompanying drawings.
- 20 77. A computer readable medium substantially as herein described with reference to the accompanying drawings.
- 25 78. A computer data signal embodied in a carrier wave, the computer data signal being substantially as herein described with reference to the accompanying drawings.
79. A computer program substantially as herein described with reference to the accompanying drawings.

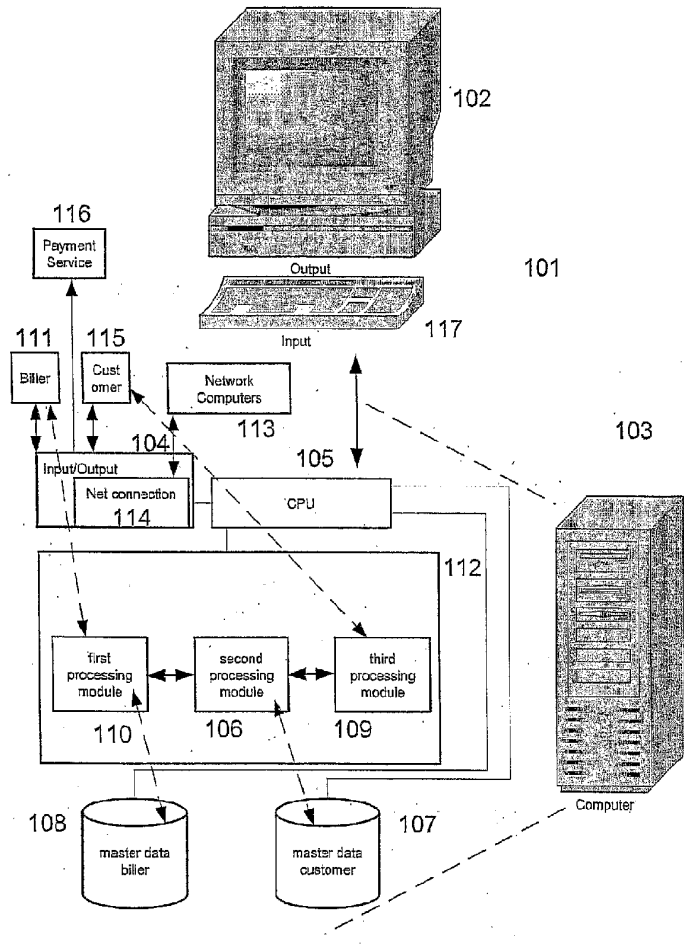


Fig. 1

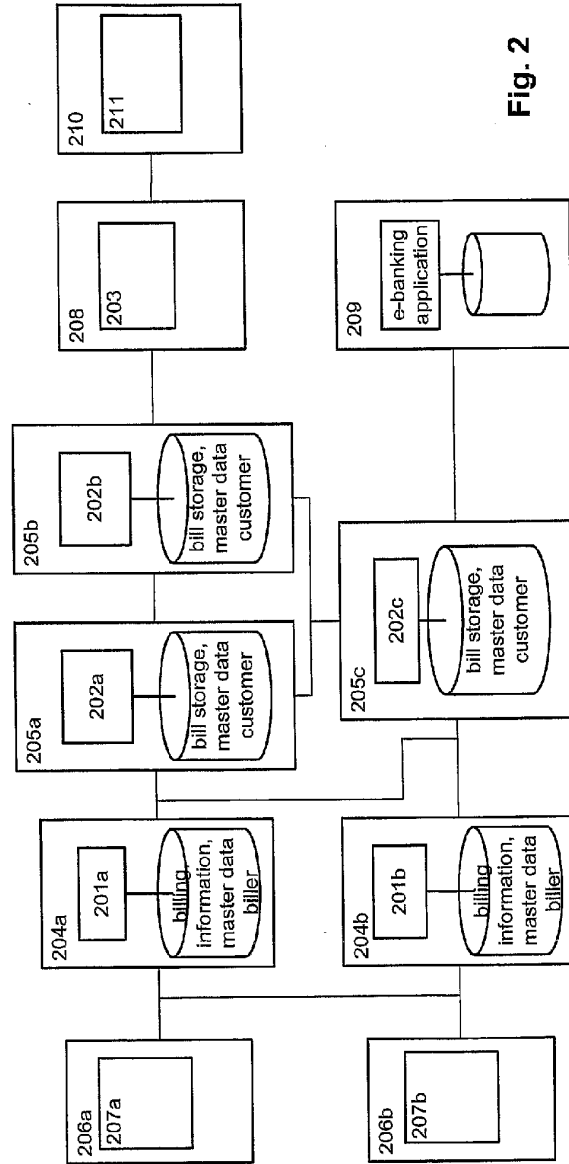


Fig. 2

Fig. 3

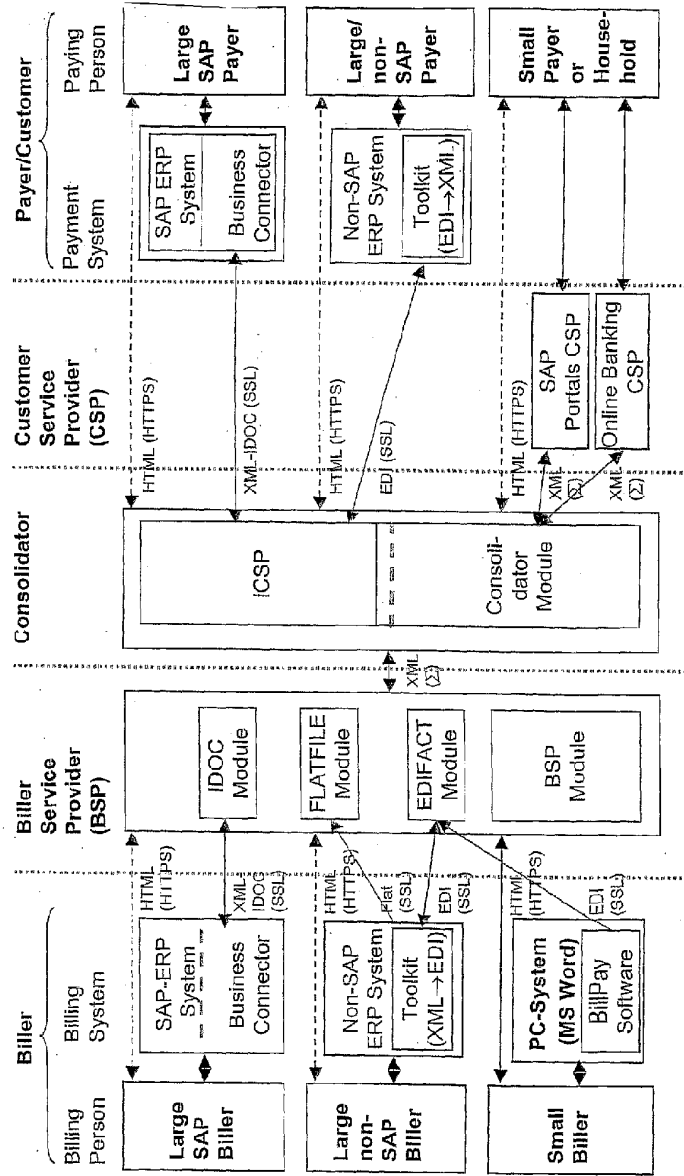
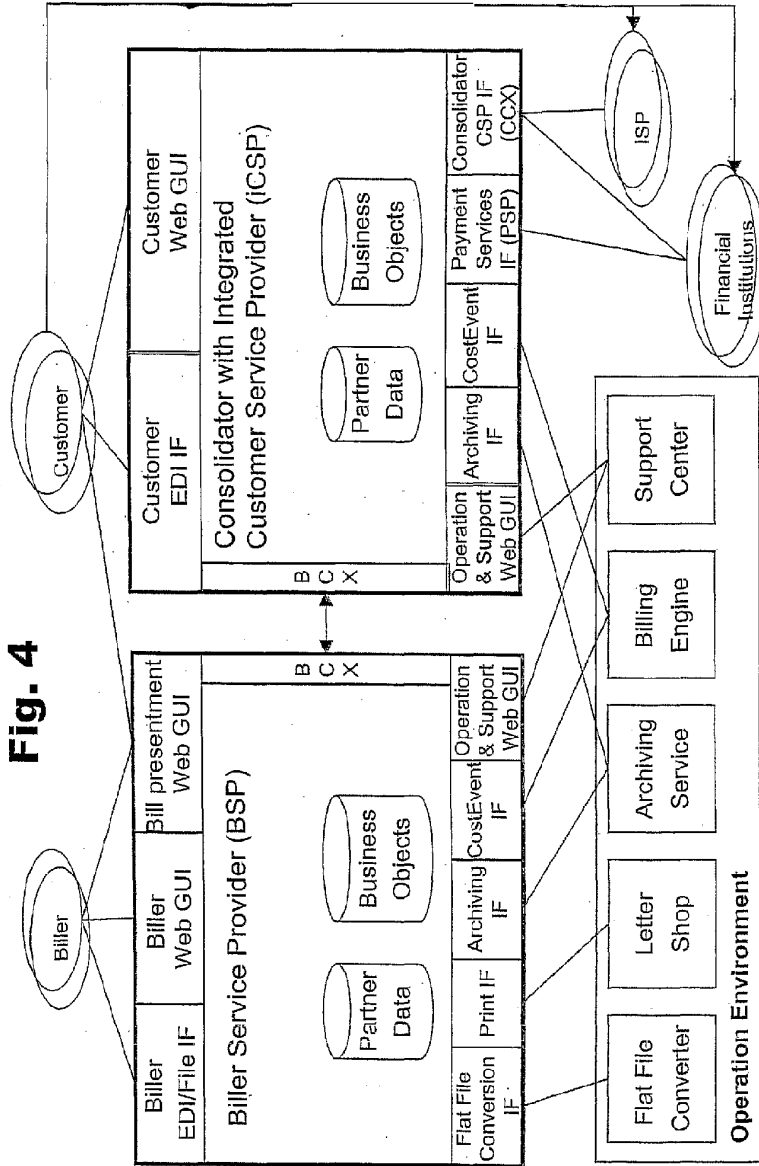


Fig. 4



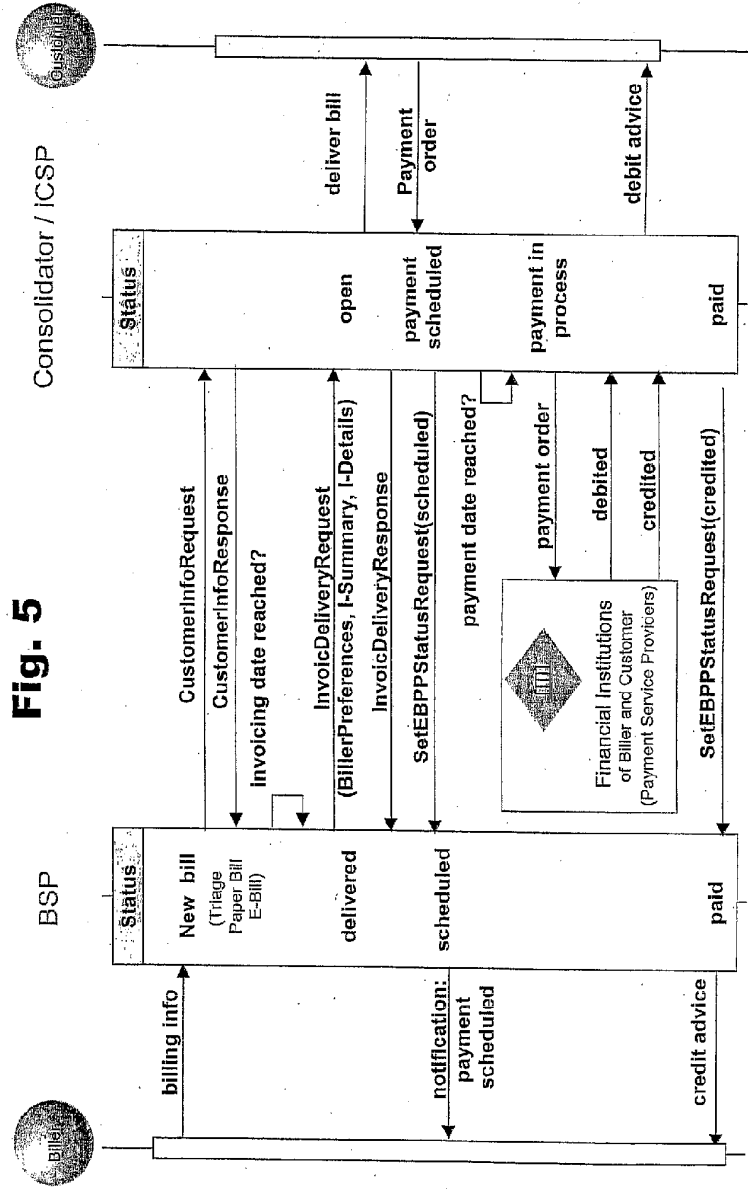
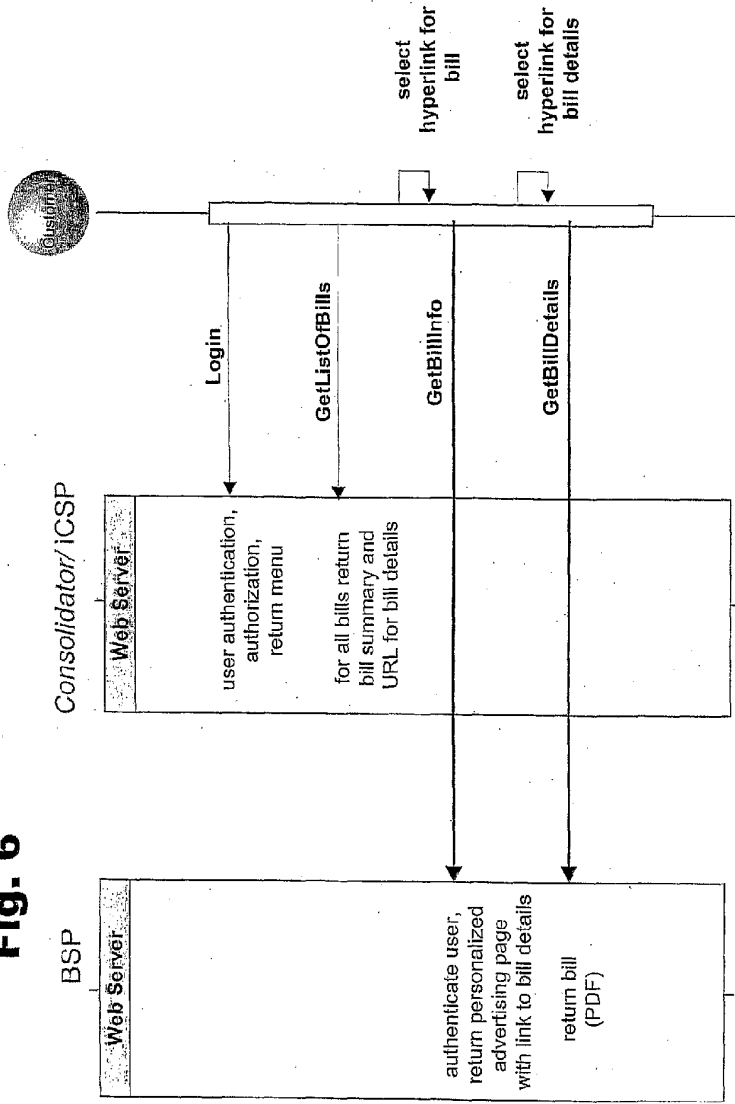


Fig. 5

Fig. 6



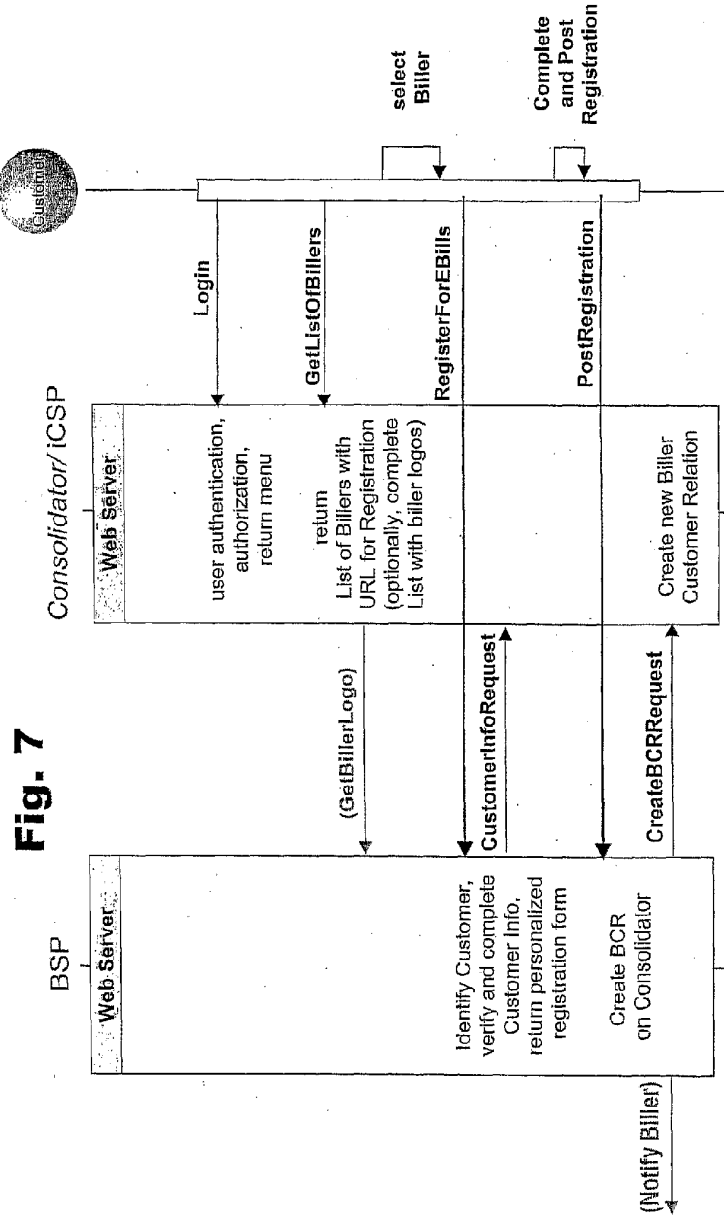
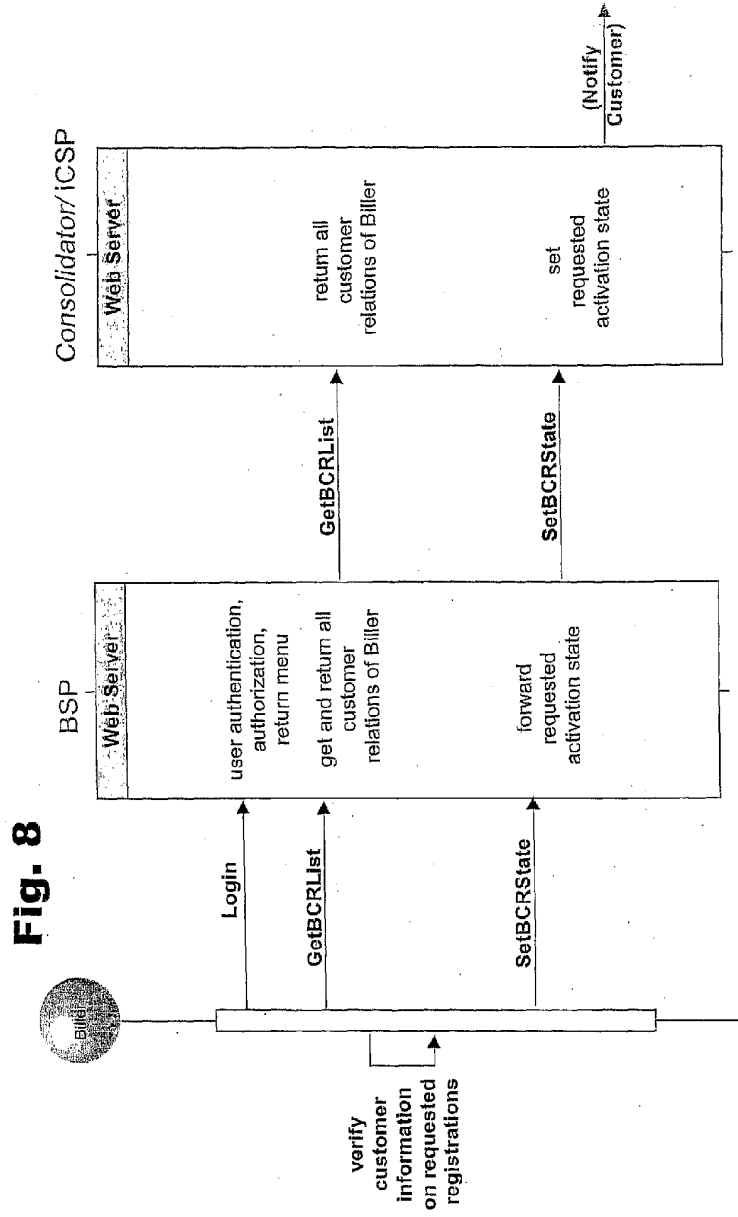


Fig. 7



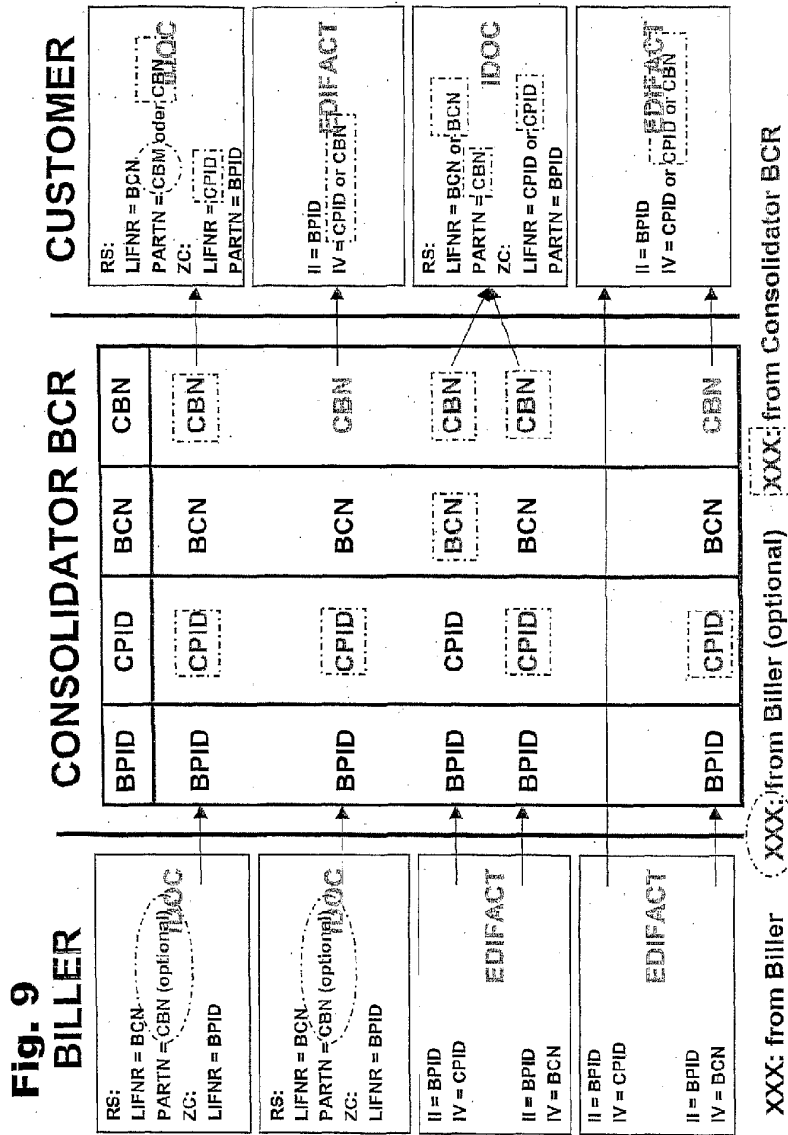
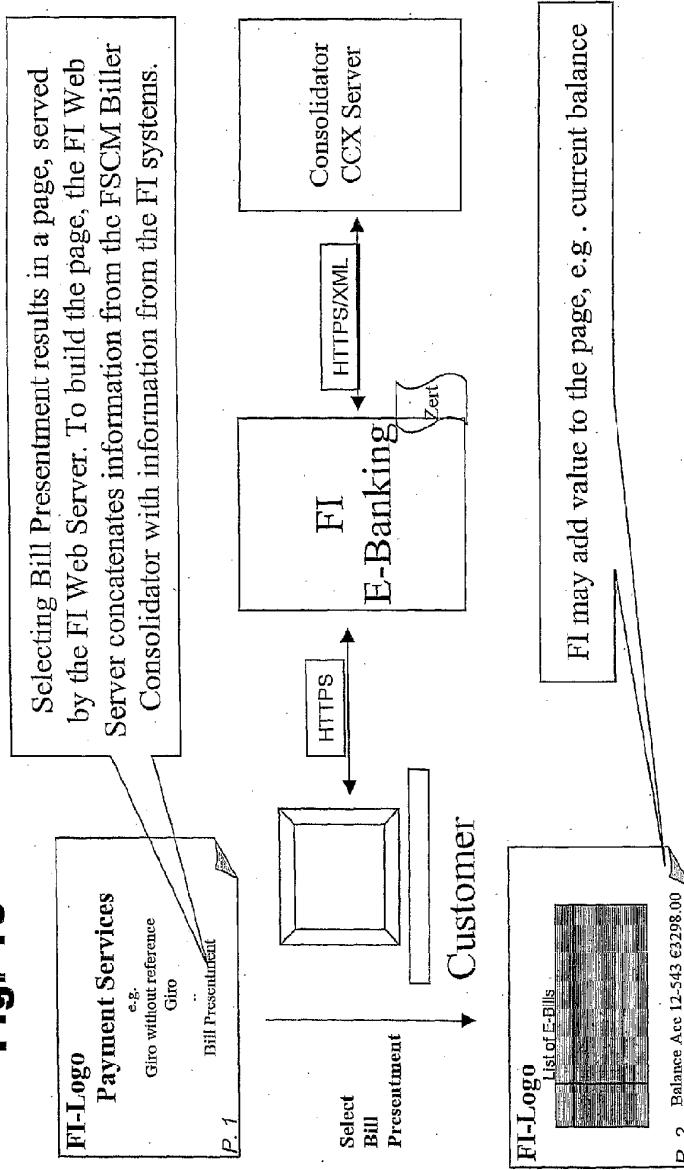


Fig. 10



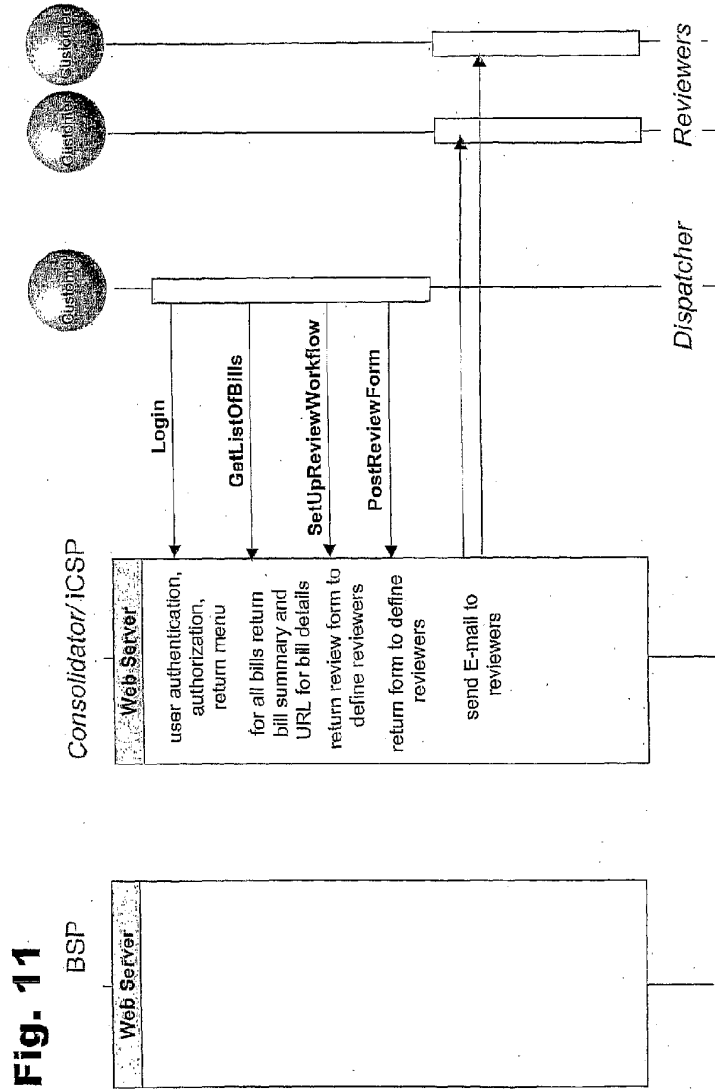


Fig. 12

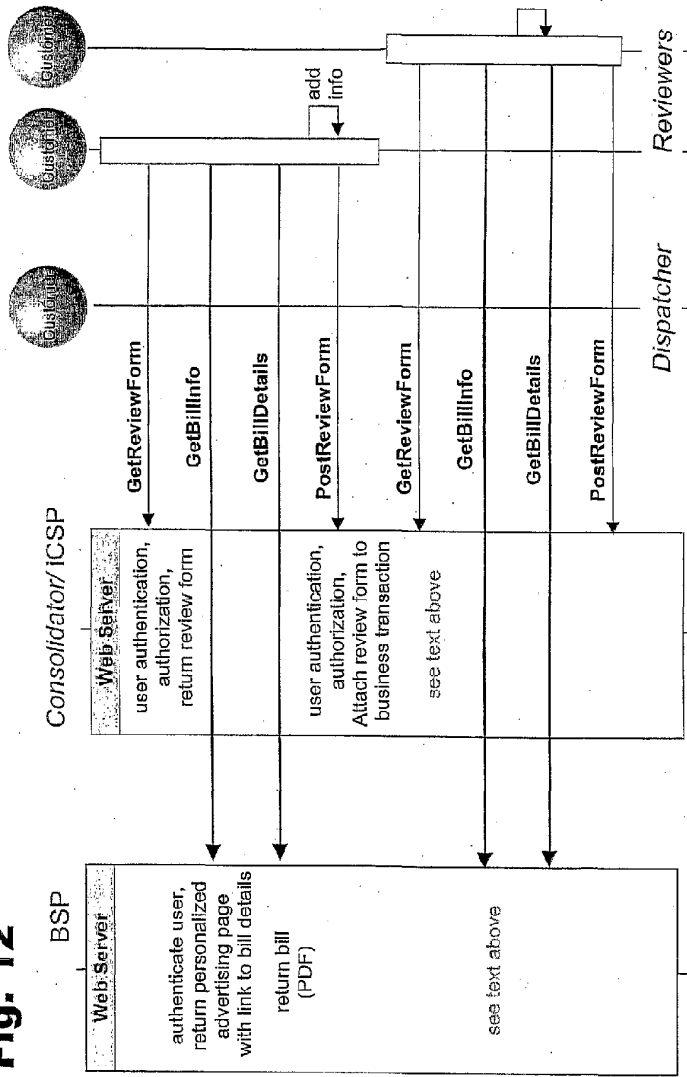
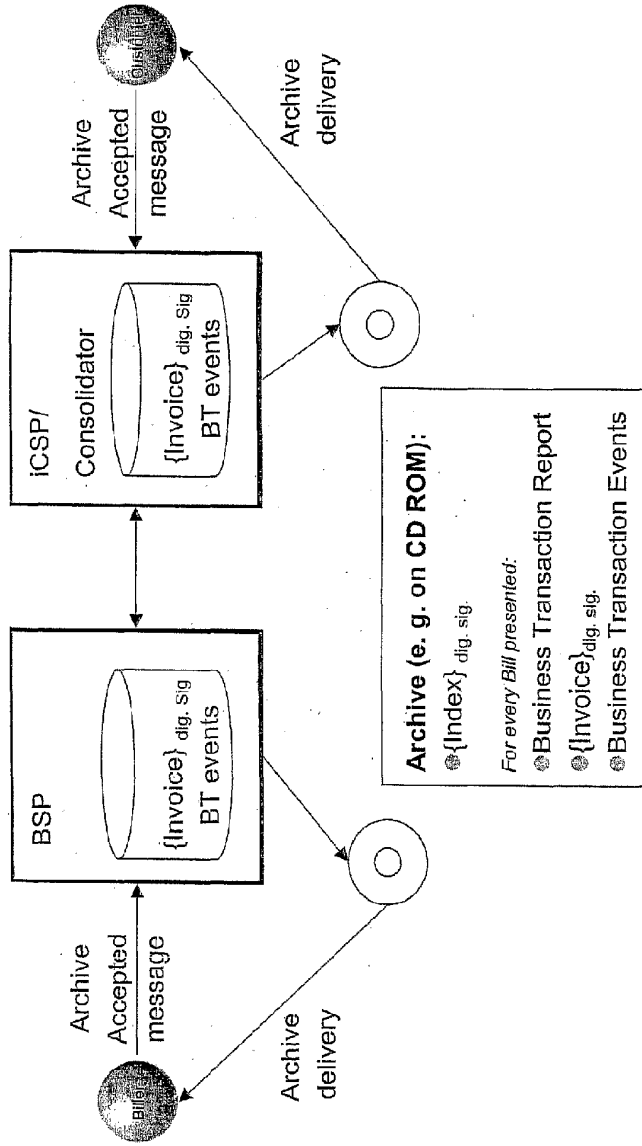


Fig. 13



PATENT COOPERATION TREATY

PCT


DECLARATION OF NON-ESTABLISHMENT OF INTERNATIONAL SEARCH REPORT

(PCT Article 17(2)(a), Rules 13ter.1(c) and Rule 39)

Applicant's or agent's file reference 2003P00211 W	IMPORTANT DECLARATION	Date of mailing (day/month/year) 07/01/2004
International application No. PCT/EP 03/08849	International filing date (day/month/year) 08/08/2003	(Earliest) Priority date (day/month/year) 30/08/2002
International Patent Classification (IPC) or both national classification and IPC		G06F17/60
Applicant SAP AKTIENGESELLSCHAFT		

This International Searching Authority hereby declares, according to Article 17(2)(a), that: **no international search report will be established** on the international application for the reasons indicated below

1. The subject matter of the international application relates to:
- a. scientific theories.
 - b. mathematical theories
 - c. plant varieties.
 - d. animal varieties.
 - e. essentially biological processes for the production of plants and animals, other than microbiological processes and the products of such processes.
 - f. schemes, rules or methods of doing business.
 - g. schemes, rules or methods of performing purely mental acts.
 - h. schemes, rules or methods of playing games.
 - i. methods for treatment of the human body by surgery or therapy.
 - j. methods for treatment of the animal body by surgery or therapy.
 - k. diagnostic methods practised on the human or animal body.
 - l. mere presentations of information.
 - m. computer programs for which this International Searching Authority is not equipped to search prior art.
2. The failure of the following parts of the international application to comply with prescribed requirements prevents a meaningful search from being carried out:
- the description
 - the claims
 - the drawings
3. The failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions prevents a meaningful search from being carried out:
- the written form has not been furnished or does not comply with the standard.
 - the computer readable form has not been furnished or does not comply with the standard.
4. Further comments: SEE FURTHER INFORMATION SHEET

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Roger Thomas
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Form PCT/ISA/203 (July 1998)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 203

The claims relate to subject matter for which no search is required according to Rule 39 PCT. Given that the claims are formulated in terms of such subject matter or merely specify commonplace features relating to its technological implementation, the search examiner could not establish any technical problem which might potentially have required an inventive step to overcome. Hence it was not possible to carry out a meaningful search into the state of the art (Art. 17(2)(a)(i) and (ii) PCT; see PCT International Search Guidelines, Chapter VIII, items 1 to 3). The problems which are addressed do not appear to require a technical, but rather an administrative/organisational, or business, solution. The implementation of this solution may include the use of generic technical features, however these do not interact to solve any overall technical problem but merely serve their well-known functions.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.