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(54) HANDLING MULTIPLE CURRENCIES IN A PROJECT MANAGEMENT SYSTEM

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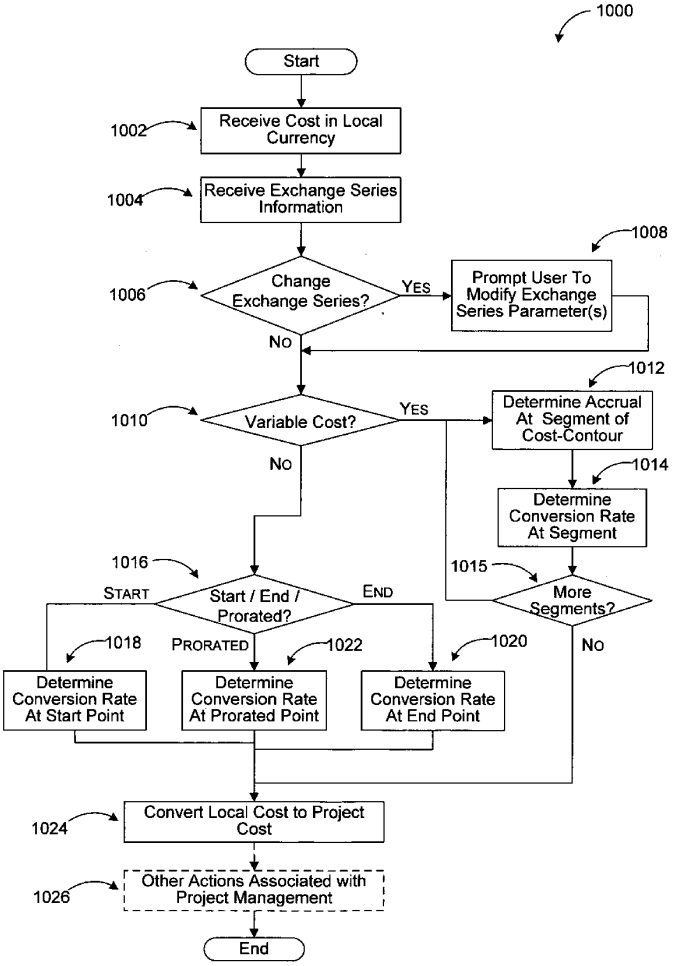
(57) **ABSTRACT**

A project management system is enabled to handle multiple currencies within managed projects. An exchange series includes currency definition parameters such as currency pairing, frequency of rate change, and effective date of exchange rate. Using the exchange series and a strong definition of cost for tasks and resources (i.e. indicating currency type along with value of cost), the project management system allows costs to be entered in local currency. Project level roll-ups are calculated employing time-phased currency conversion based on whether the cost is variable or fixed. For scheduling, speculative conversions are facilitated based on latest actual exchange rate information. Local and project currency costs are provided to a project server for enterprise level roll-ups and multi-project management.



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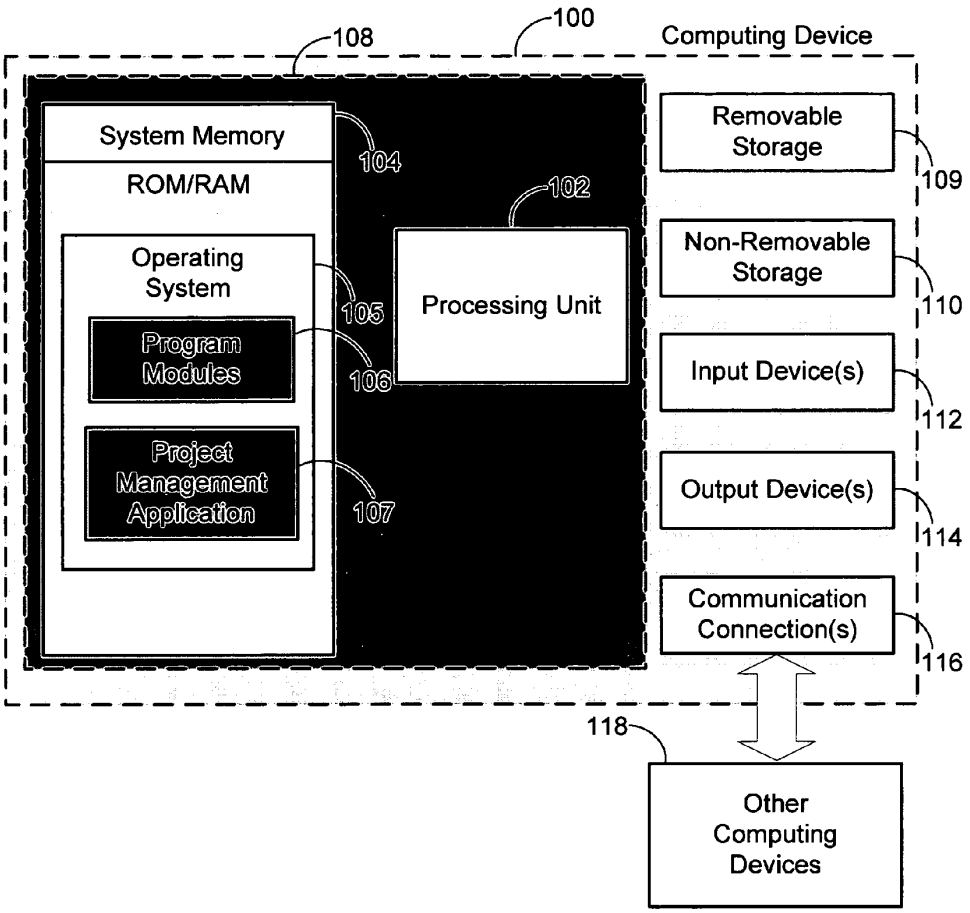
100
Computing Device
108
System Memory
ROM/RAM
104
Operating System
105
Program Modules
106
Project Management Application
107
102
Processing Unit
Removable Storage
109
Non-Removable Storage
110
Input Device(s)
112
Output Device(s)
114
Communication Connection(s)
116
118
Other Computing Devices

*Fig. 1*

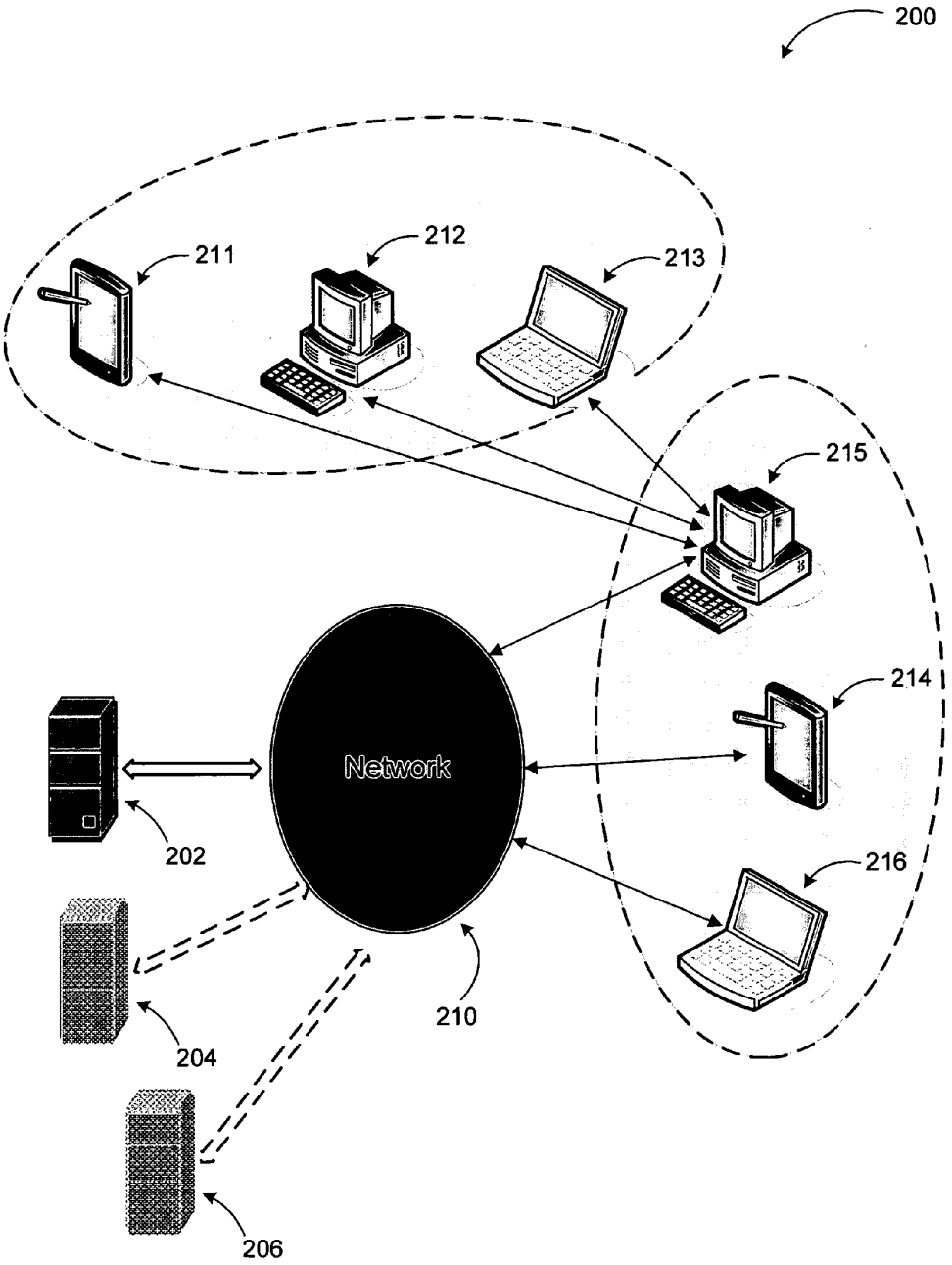


*Fig. 2*

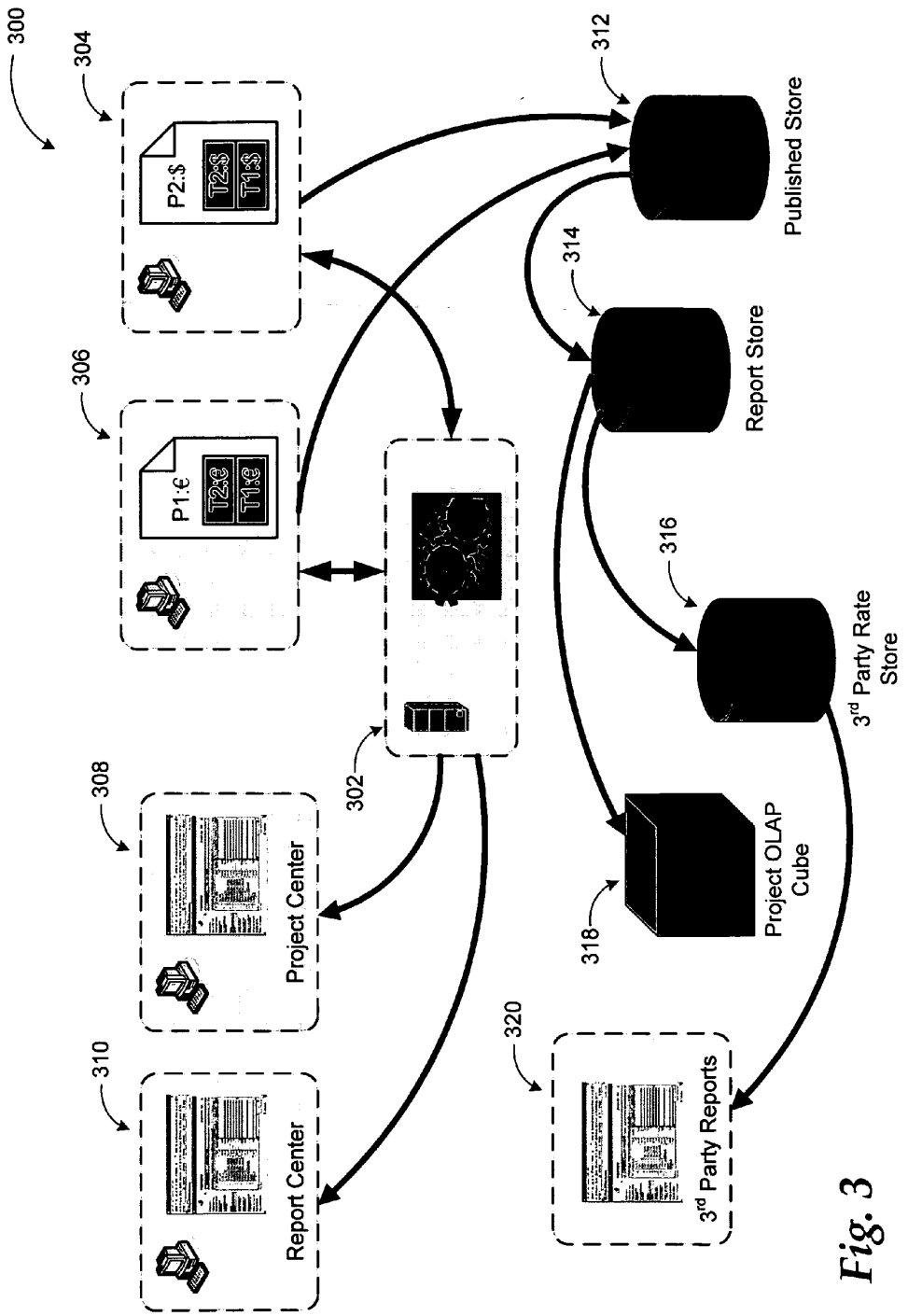
300
304
P2:$
T2:$
T1:$
306
P1:€
T2:€
T1:€
308
Project Center
310
Report Center
302
312
Published Store
314
Report Store
316
3rd Party Rate Store
318
Project OLAP Cube
320
3rd Party Reports

*Fig. 3*

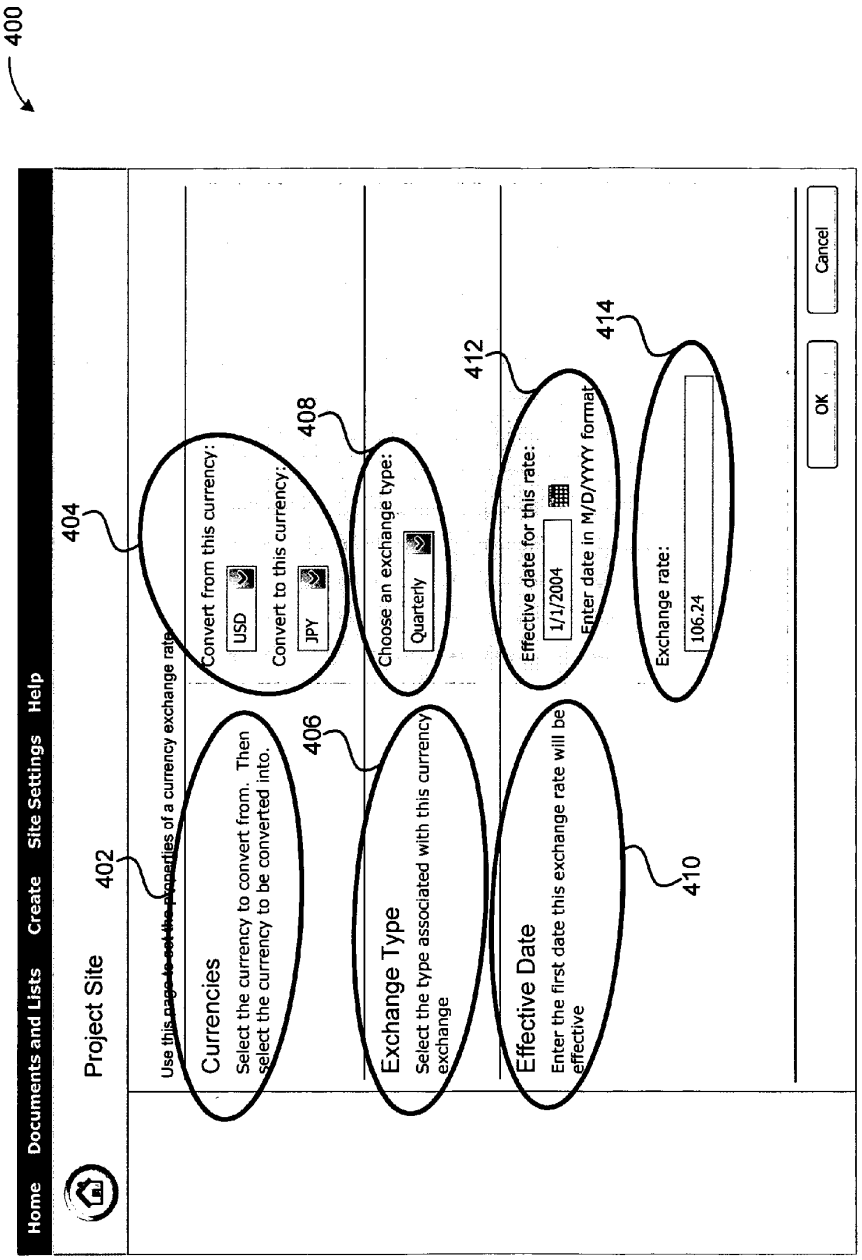
400
Home
Documents and Lists
Create
Site Settings
Help
Project Site
402
404
Use this page to set the properties of a currency exchange rate
Currencies
Select the currency to convert from. Then select the currency to be converted into.
Convert from this currency:
USD
Convert to this currency:
JPY
408
406
Exchange Type
Select the type associated with this currency exchange
Choose an exchange type:
Quarterly
412
Effective Date
Enter the first date this exchange rate will be effective
410
Effective date for this rate:
1/1/2004
Enter date in M/D/YYYY format
414
Exchange rate:
106.24
OK
Cancel

*Fig. 4*

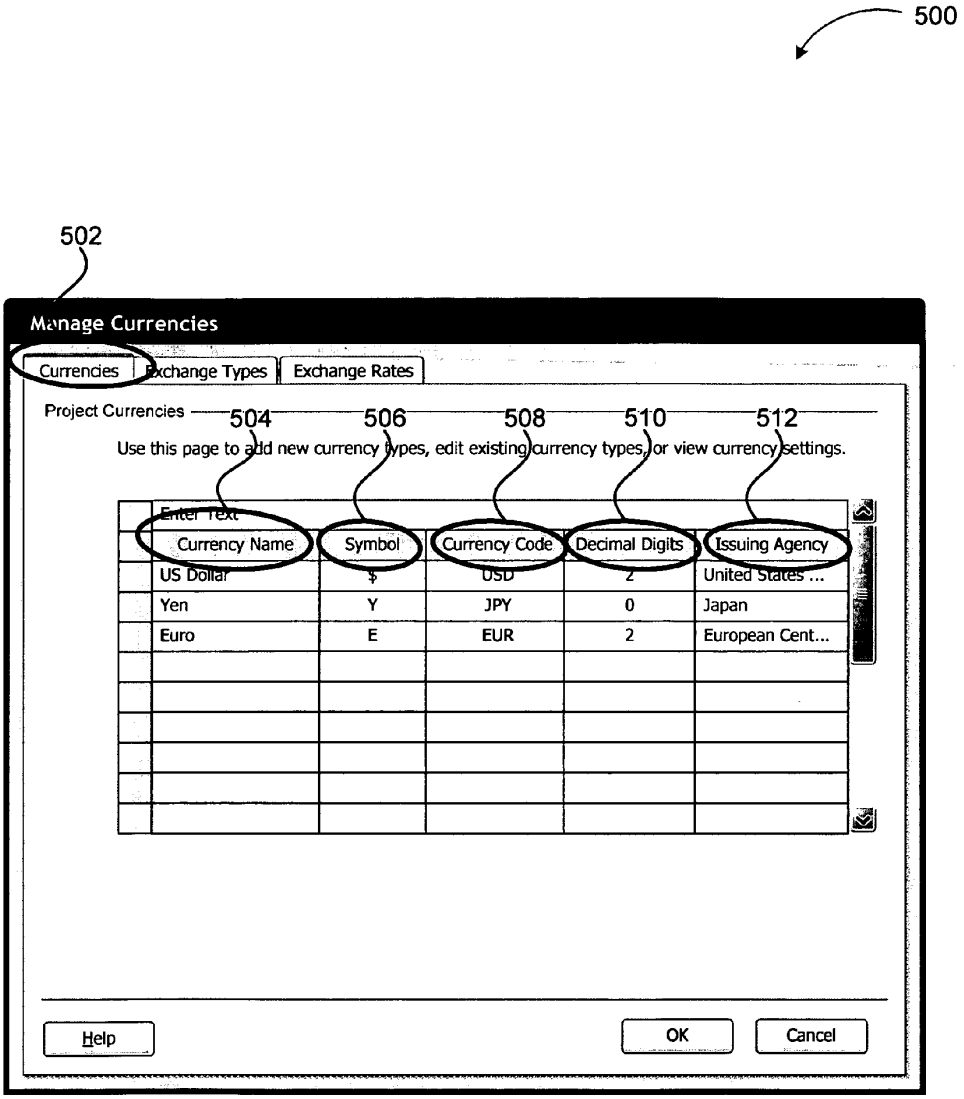
500
502
Manage Currencies
Currencies
Exchange Types
Exchange Rates
Project Currencies
504
506
508
510
512
Use this page to add new currency types, edit existing currency types, or view currency settings.
Enter Text
Currency Name
Symbol
Currency Code
Decimal Digits
Issuing Agency
US Dollar
$
USD
2
United States ...
Yen
Y
JPY
0
Japan
Euro
E
EUR
2
European Cent...
Help
OK
Cancel

*Fig. 5*

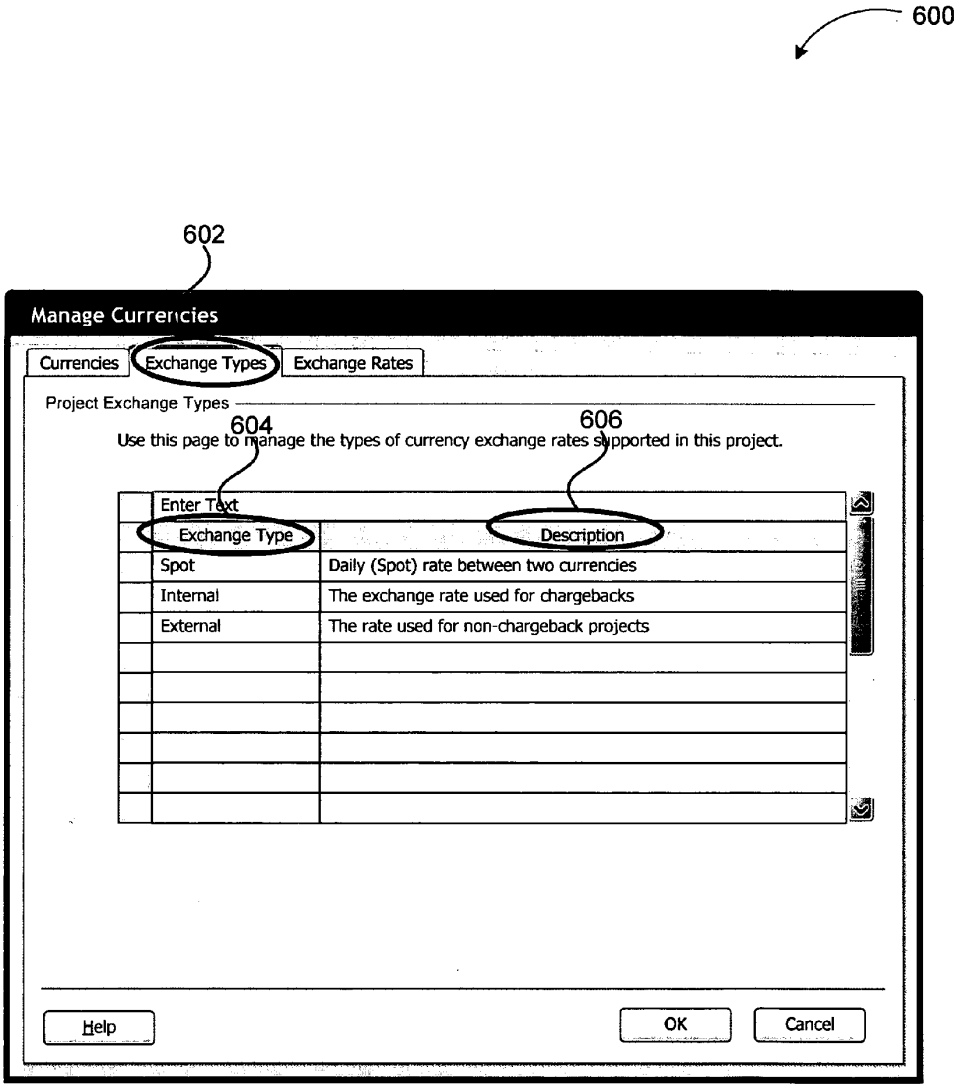
600
602
Manage Currencies
Currencies
Exchange Types
Exchange Rates
Project Exchange Types
604
606
Use this page to manage the types of currency exchange rates supported in this project.
Enter Text
Exchange Type
Description
Spot
Daily (Spot) rate between two currencies
Internal
The exchange rate used for chargebacks
External
The rate used for non-chargeback projects
Help
OK
Cancel

*Fig. 6*

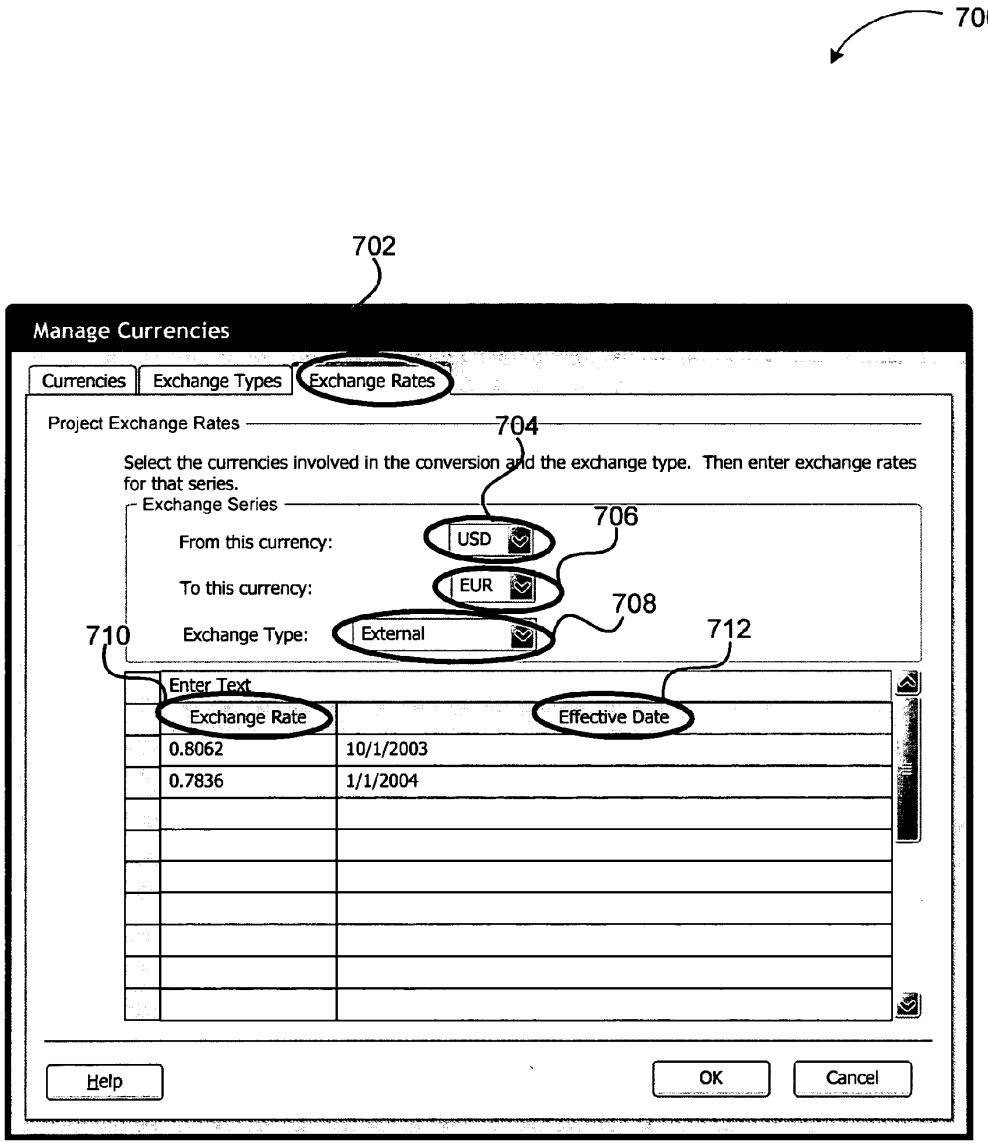
700
702
Manage Currencies
Currencies
Exchange Types
Exchange Rates
Project Exchange Rates
704
Select the currencies involved in the conversion and the exchange type. Then enter exchange rates for that series.
Exchange Series
706
From this currency:
USD
To this currency:
EUR
708
710
Exchange Type:
External
712
Enter Text
Exchange Rate
Effective Date
0.8062
10/1/2003
0.7836
1/1/2004
Help
OK
Cancel

*Fig. 7*

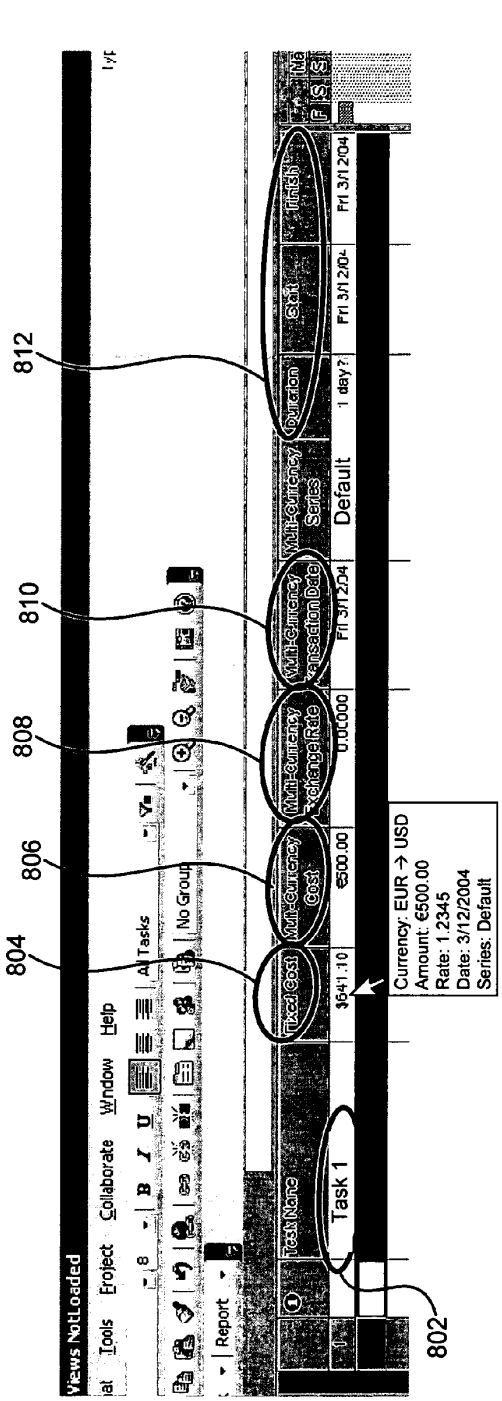
800
804
806
808
810
812
802
Views NotLoaded
Tools
Project
Collaborate
Window
Help
Report
All Tasks
No Group
Task Name
Task 1
Fixed Cost
Multi-Currency Cost
Multi-Currency Exchange Rate
Multi-Currency Transaction Date
Multi-Currency Series
Duration
Start
Finish
$641.10
€500.00
1.0000
Fri 3/12/04
Default
1 day?
Fri 3/12/04
Fri 3/12/04
Currency: EUR → USD
Amount: €500.00
Rate: 1.2345
Date: 3/12/2004
Series: Default

*Fig. 8*

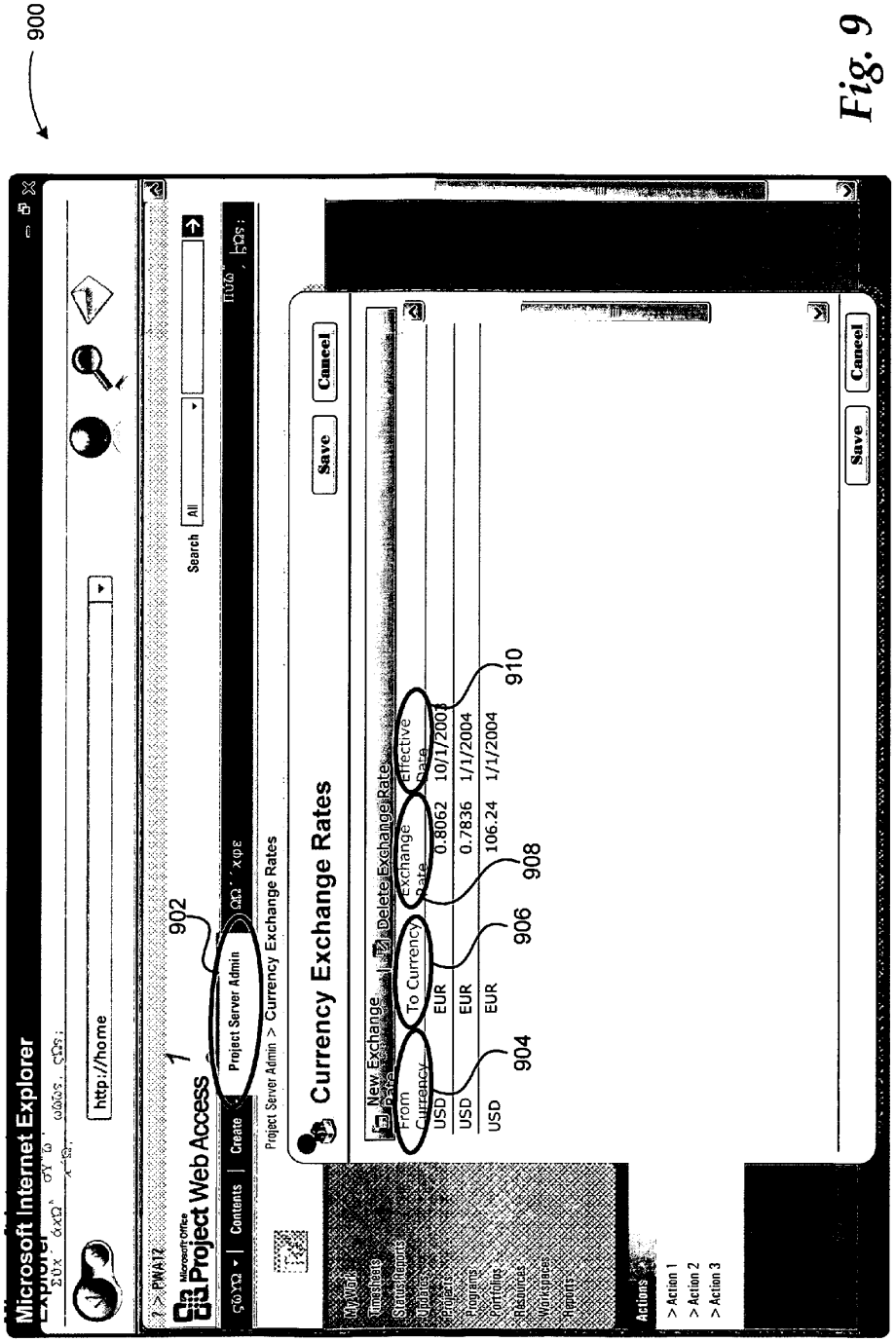
900
Microsoft Internet Explorer
http://home
Project Web Access
Search
All
Contents
Create
Project Server Admin
Project Server Admin > Currency Exchange Rates
Currency Exchange Rates
Save
Cancel
New Exchange Rate
Delete Exchange Rate
From Currency
To Currency
Exchange Rate
Effective Date
USD EUR 0.8062 10/1/2003
USD EUR 0.7836 1/1/2004
USD EUR 106.24 1/1/2004
Actions
> Action 1
> Action 2
> Action 3
1
902
904
906
908
910

*Fig. 9*

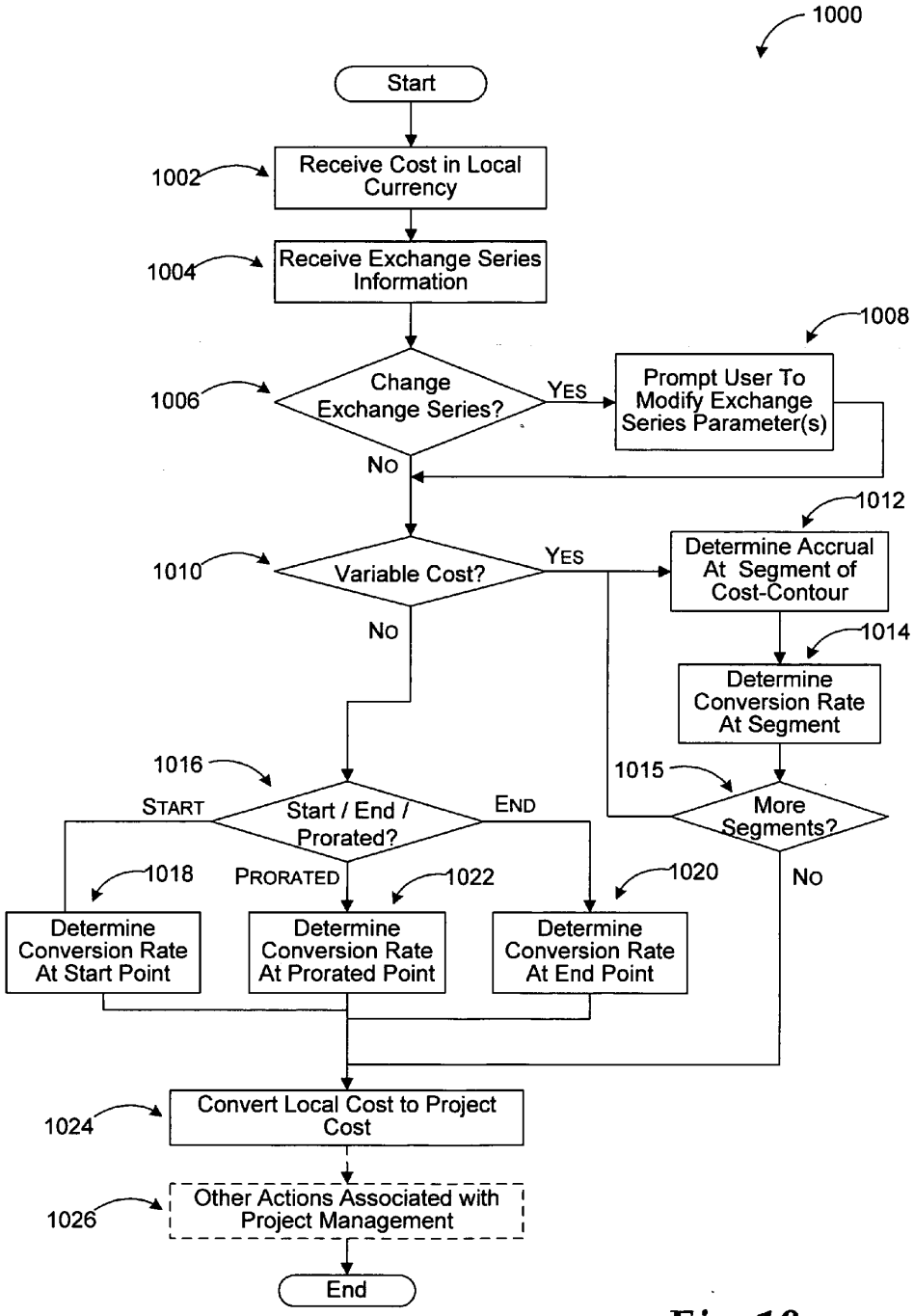
1000
Start
1002
Receive Cost in Local Currency
1004
Receive Exchange Series Information
1008
1006
Change Exchange Series?
YES
Prompt User To Modify Exchange Series Parameter(s)
NO
1012
1010
Variable Cost?
YES
Determine Accrual At Segment of Cost-Contour
NO
1014
Determine Conversion Rate At Segment
1016
1015
START
Start / End / Prorated?
END
More Segments?
1018
PRORATED
1022
1020
NO
Determine Conversion Rate At Start Point
Determine Conversion Rate At Prorated Point
Determine Conversion Rate At End Point
1024
Convert Local Cost to Project Cost
1026
Other Actions Associated with Project Management
End

*Fig. 10*

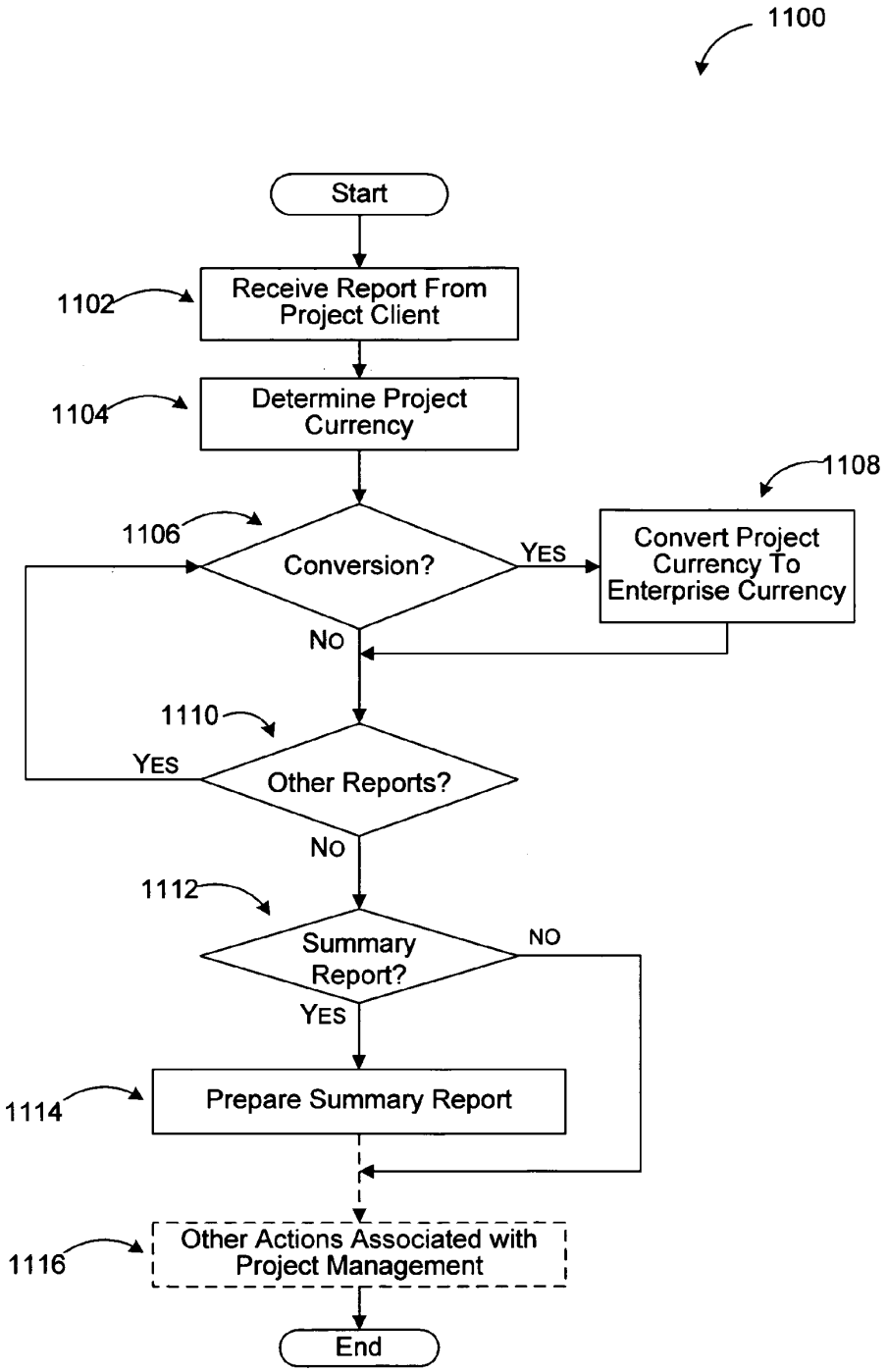
1100
Start
1102
Receive Report From Project Client
1104
Determine Project Currency
1108
1106
Conversion?
YES
Convert Project Currency To Enterprise Currency
NO
1110
YES
Other Reports?
NO
1112
Summary Report?
NO
YES
1114
Prepare Summary Report
1116
Other Actions Associated with Project Management
End

*Fig. 11*

# HANDLING MULTIPLE CURRENCIES IN A PROJECT MANAGEMENT SYSTEM

## BACKGROUND

[0001] Project management systems include a number of applications, computing devices, and input devices that schedule, track, and report tasks and resources associated with projects for a variety of organizations. In today's global economy, many enterprises execute projects in various countries, regions, and localities. While some projects may be managed at the local level and results reported to a higher organizational level such as enterprise level, other organizations might prefer to schedule and track projects across countries.

[0002] For example, an airline company may have maintenance projects in one country, production projects for its supplies in another, while operational support projects occur in any country that is served by the airline. An enterprise-wide project management system may receive input from executors of tasks associated with the different projects and track their progress as well as cost enabling planners to plan and schedule current and future projects.

## SUMMARY

[0003] A project management system is enabled to handle multiple currencies within managed projects. Costs for tasks and resources may be entered in a local currency and converted to the project currency based on whether they are variable or fixed. For variable costs, a time-phased cost contour may be employed. Fixed costs may be converted at the beginning of a task, at the end of a task, or prorated.

[0004] An exchange series including currency definition parameters such as currency pairing, name of the series, and effective date of exchange rate may be used to provide a user the ability to select between multiple currencies and exchange rates.

[0005] Project level roll-ups may be calculated after currency conversion based on exchange rate selection and date is performed, and support a time-phased cost accrual. For scheduling, speculative conversions may be facilitated based on latest actual exchange rate information. Furthermore, costs may be provided in local and/or project currency to a project server for enterprise level roll-ups and multi-project management.

[0006] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. **1** illustrates a computing device in which a multiple currency project management system according to an example aspect may be executed;

[0008] FIG. **2** illustrates an example system, where aspects of a multiple currency project management system may be implemented;

[0009] FIG. **3** is a conceptual diagram illustrating an architecture of a project management system using multiple currencies;

[0010] FIG. **4** illustrates a screen shot of a user interface for defining an exchange rate within a multiple currency project management application;

[0011] FIG. **5** illustrates a screen shot of currency management portion of the multiple currency project management application of FIG. **4**;

[0012] FIG. **6** illustrates a screen shot of exchange types management portion of the multiple currency project management application of FIG. **4**;

[0013] FIG. **7** illustrates a screen shot of exchange rates management portion of the multiple currency project management application of FIG. **8**;

[0014] FIG. **8** illustrates a screen shot of a multiple currency project management application showing a listing of tasks;

[0015] FIG. **9** illustrates a screen shot of project server administration portion of the multiple currency project management application of FIG. **5**;

[0016] FIG. **10** illustrates a logic flow diagram for a process of managing multiple currencies in a project management system; and

[0017] FIG. **11** illustrates a logic flow diagram for another process of managing multiple currencies by a project server in a project management system.

## DETAILED DESCRIPTION

[0018] Embodiments of the present disclosure now will be described more fully hereinafter with reference to the accompanying drawings, which form a part hereof, and which show, by way of illustration, specific exemplary embodiments for practicing the invention. This disclosure may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope to those skilled in the art. Among other things, the present disclosure may be embodied as methods or devices. Accordingly, the present disclosure may take the form of an entirely hardware embodiment, an entirely software embodiment or an embodiment combining software and hardware aspects. The following detailed description is, therefore, not to be taken in a limiting sense.

### Illustrative Operating Environment

[0019] Referring to FIG. **1**, an exemplary system for implementing some embodiments includes a computing device, such as computing device **100**. In a very basic configuration, computing device **100** typically includes at least one processing unit **102** and system memory **104**. Depending on the exact configuration and type of computing device, system memory **104** may be volatile (such as RAM), non-volatile (such as ROM, flash memory, etc.) or some combination of the two. System memory **104** typically includes operating system **105** and one or more program modules **106** working within operating system **105**.

[0020] In addition to program modules **106**, project management application **107** may also be executed within operating system **105**. Project management application **107** may be arranged to schedule, track, and provide various reports of tasks and resources associated with projects.

[0021] In one embodiment, project management application **107** may facilitate use of multiple currencies within projects and/or across distinct projects of an enterprise. To perform the actions described above, project management application **107** may interact with other computing devices through communication connection(s) **116**.

[0022] Computing device **100** may have additional features or functionality. For example, computing device **100** may also include additional data storage devices (removable and/or non-removable) such as, for example, magnetic disks, optical disks, or tape. Such additional storage is illustrated in FIG. **1** by removable storage **109** and non-removable storage **110**. Computer storage media may include volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information, such as computer readable instructions, data structures, program modules, or other data.

[0023] System memory **104**, removable storage **109** and non-removable storage **110** are all examples of computer storage media. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by computing device **100**. Any such computer storage media may be part of device **100**. Computing device **100** may also have input device(s) **112** such as retail devices, keyboard, mouse, pen, voice input device, touch input device, etc. Output device(s) **114** such as a display, speakers, printer, etc. may also be included.

[0024] Computing device **100** also contains communication connections **116** that allow the device to communicate with other computing devices **118**, such as over a network. Communication connections **116** are one example of communication media. Communication media may typically be embodied by computer readable instructions, data structures, program modules, or other data in a modulated data signal, such as a carrier wave or other transport mechanism, and includes any information delivery media. The term "modulated data signal" means a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media includes wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, RF, infrared and other wireless media.

[0025] FIG. **2** illustrates example system **200**, where aspects of a multiple currency project management system may be implemented. System **200** may include one or more networks that comprise any topology of servers, clients, Internet service providers, and communication media. The networks may also have a static or dynamic topology.

[0026] A multiple currency project management application, such as project management application **107** of FIG. **1**, may reside on server **202**. In one embodiment, the application may be run across distributed servers (e.g. servers **202**, **204**, **206**) in a federated system. Server **202** may include a number of other applications such as accounting applications, database applications, communication applications, and the like.

[0027] The project management application may interact with client devices, such as handheld computer **214**, desktop computer **215**, and laptop computer **216**, over network **210** to collect data associated with the project(s), provide reports, and perform other project related tasks. Client devices communicating with server **202** may include any type of computing device, not limited to the examples shown herein.

[0028] In another embodiment, one or more clients devices, such as handheld computer **214**, desktop computer **215**, and laptop computer **216**, may each run their own project management application and provide data to server **202** over network **210** for enterprise level project summary reporting.

[0029] In a further embodiment, one or more of the client devices may interact with yet other client devices (e.g. computing devices **211** through **213**) and receive project related data from those devices over other networks or the same network.

[0030] Network **210** may be a secure network such an enterprise network, or an unsecure network such as a wireless open network. Network **210** provides communication between the nodes described above. By way of example, and not limitation, network **210** may include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, RF, infrared and other wireless media.

[0031] The present invention is not limited to the above-described environment, however. Many other configurations of computing devices, communications, applications, and distribution systems may be employed to implement a multiple currency project management application.

## Illustrative Embodiments For A Multiple Currency Project Management Application

[0032] It may be challenging for multi-national organizations to manage projects in locales with different currencies. If such an organization tries to manage their projects across different locales, their project management system may not be able to handle currency conversions in a useful manner. This may be due to many aspects of project management systems.

[0033] A project management system may not account for the actual value of currencies with respect to each other. Costs may simply be variables with decimal numbers within the project application. This may result in customers being unable to see useful reports on costs across projects when projects are entered in more than one currency. For example, an enterprise with two projects managed in U.S. Dollars and Japanese Yen may find summary roll-up of costs in portfolio views useless, as the cost of the Yen project is directly added to the cost of the U.S. Dollar project.

[0034] Dealing with costs of tasks within a project in one locale, where the tasks may have costs in different currencies due to their nature. For example, in a project managed in the US, a task may involve a fixed cost accrued Euros, because the task includes services imported from the EU.

[0035] Some resources used in the project may not specify their rates in the project currency. For example, a company that hires foreign workers and pays them in their regional

currency may not be able to specify the rate in the workers currency but may have to use a manually-converted rate in the project currency.

[0036] Embodiments of the present invention are directed to making a project management system aware of monetary currencies. Tasks within a project are allowed to have costs in currencies different than the project currency. Resources in a project are allowed to maintain cost-rates in different currencies. As a result, project-costs in multiple currencies may be managed accurately within a project management application (e.g. Microsoft Project®) and/or on a Project Server installation. A mechanism is provided to convert between currencies based on currency and date, to support a time-phased cost accrual. Furthermore, use of multiple sets (series) of exchange rates between two currencies is supported, enabling customers to choose which type of exchange rate is applicable between currencies.

[0037] FIG. **3** includes conceptual diagram **300** illustrating an architecture of a project management system using multiple currencies.

[0038] In the example architecture, individual projects P**1** and P**2** are managed locally at sites **304** and **306**. Sites **304** and **306** may be client devices, client applications running on client devices, client applications running on a central server, and the like. In one embodiment, projects P**1** and P**2** may be managed partially or completely by project server **302**. In another embodiment, client devices **304** and **306** may provide information to project server **302** for project roll-ups and enterprise level management tasks.

[0039] In the example, project P**1**'s project currency is Euro. The project currency of P**2** is US Dollar. Diagram **300** shows tasks T**1** and T**2** in each project accruing in their respective currencies, which may not necessarily be the project currency. In one embodiment, individual tasks within the projects may accrue in other currencies. For example, a technology company that has its manufacturing plant in Japan, but design center in the US, may track costs associated with both types of operations in the local currencies until project level roll-up's are performed.

[0040] Project reports such as summary task cost calculations, schedules, cost accruals, and the like are published to a Published Store (**312**), from where they are forwarded to Report Store **314**. Published Store **312** stores project and related cost data with strong currency definition (i.e. cost data includes a type information and sufficient decimals associated with the value of the cost in addition to the actual value).

[0041] Cost data may be provided from Report Store **314** to third party rate store, which tapped for preparing Third Party Reports **320**. In another embodiment, data may be forwarded from Report Store **314** to a multi-dimensional data storage such as On-Line Analytical Processing (OLAP) Cube **318**.

[0042] Project Center **308** and Report Center **310** are services that are provided by project server **302** or by another system using data provided by project server **302**. Project Center **308** and Report Center **310** collect, coordinate, present, and perform other actions associated with project reports such as cost accruals, etc.

[0043] Some of the data for multiple currency support in project management applications such as exchange rates may be provided manually by a user, retrieved from a database, or retrieved from an online service (not shown). Retrieval and processing of exchange rates may be performed by project server **302** or locally at projects sites **304** and **306** on a client device.

[0044] In one embodiment, the project management system may determine the cost associated with a project task in the local currency, select an applicable conversion rate based on the local currency, the project currency, and the predetermined exchange series. The project management system may then speculate a future conversion rate based on the applicable conversion rate and a scheduled future date associated with the task.

[0045] FIG. **4** illustrates screen shot **400** of a user interface for defining an exchange rate within a multiple currency project management application.

[0046] Each project is enabled to define a project currency. Calculations performed by the scheduling component of the project management system use this currency to calculate the cost of tasks and assignments within the project. Costs in the project that are specified in a currency other than this project currency are converted to the project currency prior to the calculation.

[0047] In one embodiment, the project management system may load and store currency exchange information to facilitate the conversion of costs between currencies. The exchange data for the conversion may include source currency, destination currency, effective date, exchange rate, and type name. This data may be retrieved from a project server or from the stand-alone client application.

[0048] The parameters of the exchange data may be defined, in one embodiment, as follows:

[0049] The source currency as a three letter ISO-code of the currency being converted

[0050] The destination currency as a three letter ISO-code of the currency which the conversion results in

[0051] The effective date as a date after which this exchange data is valid

[0052] The exchange rate as a multiplier by which the amount in the source currency is multiplied to get the equivalent amount in the destination currency

[0053] The type name as the name of an exchange series that this exchange data is defined for

[0054] The type name enables the project management system to provide more than one exchange rate for any point in time, and together with the currency names, define an exchange series. Using the exchange series provides flexibility to organizations with separate agreements on exchange rates with different partners, as well as full fidelity conversions in transactions with each other. The exchange series provides the ability to convert from one currency to another on any date defined by the series.

[0055] As a result, resources may define their currency and series, and rates specified by the resource are in that currency. To enable a scheduler to determine a resource cost, the rates are converted to the project currency using the exchange rate defined by the exchange series, the project currency, and the date of the resources usage.

[0056] Screen shot **400** represents a user interface (UI) for setting parameters of the exchange rate in a multiple currency project management application. Currencies portion **402** of the UI prompts a user to enter the source currency and the destination currency. Typically, the destination currency is the project currency itself. However, there may be cases, where multiple conversions may be needed, or reverse conversion to determine costs in local currency. So, the UI is sufficiently flexible to enable both currencies to be determined.

[0057] If a project management system simply assigns a variable with decimal value to a cost, not only is the currency information lost, but performing conversions using independent tools may also be difficult especially with large exchange rate variations. For example, currencies such as US Dollar ($) and Euro (€) do not have a significantly different exchange rate. Therefore, they can be converted to each other using a similar variable assigned to the cost.

[0058] On the other hand, the exchange rate between some currencies may be relatively high (e.g. Turkish Lira and US Dollar have an exchange rate of 1,400,000). If a user attempts to use the same variable to reflect both currencies and perform the conversion independently, the results may not be useful, due to the high exchange rate.

[0059] Accordingly, one embodiment provides for assigning a strong definition to the cost variable that includes the currency type information provided in boxes **404** of the UI.

[0060] Exchange type section **406** prompts the user to select from a list of available exchange types. Exchange types define how an exchange rate is to be applied in conjunction with the project. For example, exchange type may define a frequency of an exchange rate update such as daily, monthly, or quarterly (**408**). The exchange type may also define different exchanges depending on resource and/or task type. For example, a project administrator may use a subsidiary exchange type that uses quarterly updates of exchange rates for tasks involving a subsidiary. At the same time, a spot rate that uses daily exchange rate updates may be applied for tasks involving customers or vendors without a subsidiary relationship.

[0061] Effective Date section **410** prompts the user to enter an effective date for the exchange rate to be applied. The effective date, entered in box **412**, is used in conjunction with a frequency of updates defined by the exchange type. The exchange rate may also be presented in a textbox (**414**) in this section and the user given the opportunity to modify it.

[0062] The exchange rate may be retrieved from other sources, such as databases, online services, user inputs, and the like, in other embodiments. When performing a conversion, the project management system may determine a most recent effective date and use the exchange rate for that date in the conversion. In a further embodiment, the project management system may determine a closest effective date to the date(s) of the task and use the associated exchange rate.

[0063] Time-phased currency conversion, according to one embodiment, is based on an accrual method where each assignment within a task has a cost-contour. Each segment of the cost-contour accrual (daily or fraction of a day) is performed in local currency, then converted to the project currency using the exchange series parameters described above.

[0064] For fixed cost tasks, the accrual may be performed at the beginning of the task, at the end of the task, or in a prorated manner. For fixed costs, the conversion may use an effective date that is closest to the accrual date of the cost.

[0065] The invention is not limited to these parameters, and other parameters such as issuing agency (country, government, etc.) may be implemented using the principles described herein.

[0066] FIG. **5** illustrates screen shot **500** of currency management portion of the multiple currency project management application of FIG. **4**.

[0067] Screen shots **500**, **600**, and **700** of FIGS. **5**, **6**, and **7** show another UI for managing exchange series that lists parameters associated with multiple exchange series. In screen shot **500** the currency management portion of that UI is shown under "Currencies" tab **502**.

[0068] Listed parameters include currency name **504**, currency symbol **506**, currency code **508**, decimal digits **510** to be assigned to the currency variable, and issuing agency (country, government, etc.) **512**. These parameters are part of the strong definition cost variable in the project management system. They may be used to perform conversions at various levels and present costs in reports, etc.

[0069] FIG. **6** illustrates screen shot **600** of exchange types management portion of the multiple currency project management application of FIG. **4**.

[0070] "Exchange Types" tab **602** is another screen of the UI for management of exchange series. The screen provides available exchange types **604** and their respective descriptions **606** for managing definitions of various exchange types between currencies.

[0071] Example exchange types listed on screen shot **600** include spot exchange rate, internal exchange rate, and external exchange rate. A described previously, the spot exchange rate uses daily exchange rate updates. The internal exchange rate is used for charges and chargebacks between parent organizations and subsidiaries. It may include different rates and update periods for intra-organizational transactions.

[0072] The external exchange rate is used for non-chargeback projects such as those between a company and its customers, and the like.

[0073] FIG. **7** illustrates screen shot **700** of exchange rates management portion of the multiple currency project management application of FIG. **8**.

[0074] Screen shot **700** is the third tab of the exchange series management UI, "Exchange Rates" tab **702**. A user, such as a project administrator, may define the source and destination currencies on this screen using drop down menus **704** and **706**. The user may further select the applicable exchange type using drop down menu **708**. In one example, the exchange types shown by drop down menu **708** are those listed in tab **602** of FIG. **6**.

[0075] Column **710** of the exchange table in FIG. **7** lists different exchange rate with their effective dates listed in

column **712**. As explained before, the project management system determines the most accurate rate based on a frequency of update from the exchange type and the effective dates available in column **712**. The determined exchange rate is then used to convert local currencies of cost items to project currency.

[**0076**] FIG. **8** illustrates screen shot **800** of a multiple currency project management application showing a listing of tasks.

[**0077**] Project management systems may provide different views of tasks in tabular or graphical format. Screen shot **800** shows a partial table format listing of tasks. As illustrated in the figure, Task**1802** has fixed cost **804** associated with it. The fixed cost is in US Dollars (project currency). Multi-Currency Cost **806** is the local cost for the task with the exchange rate shown in the next column as Multi-Currency Exchange Rate **808**. The effective date is listed under Multi-Currency Transaction Date **810**.

[**0078**] In this example, a fixed cost is used with default values for exchange series. This is reflected in the "Default" value shown in the Multi-Currency Series column next to Multi-Currency Transaction Date **810**.

[**0079**] Following the Multi-Currency Series column are three columns typically associated with tasks in project management systems: duration, start date, and finish date. The values in these columns may also be used in the conversion operation. Depending on which accrual method is selected for the fixed cost resource, the conversion may be performed using the exchange rate as of the finish date, the start date, or a prorated value.

[**0080**] The user interfaces shown in FIGS. **4-8** are for illustration purposes. Similar user interfaces may be implemented in a web application, client application, server application, and the like.

[**0081**] FIG. **9** illustrates screen shot **900** of project server administration portion of a multiple currency project management application.

[**0082**] A project server may interact with client devices and applications, execute project management operations for the client devices and applications, provide reports and data such as exchange rates to the client devices and applications, and the like.

[**0083**] A project server may also collect information from a plurality of locally executed project management applications and manage multiple projects at an enterprise level. In managing multiple projects, the project server may receive project reports in different currencies and convert them to an enterprise currency, or receive reports in a single currency that is different from the enterprise currency, and still convert to the enterprise currency.

[**0084**] By introducing a strong definition of each project's currency, a project server may convert project summary cost data into a single reporting currency. The project server converts project cost information from each project into a common reporting currency.

[**0085**] The project server administration screen (**902**) shown in the figure includes source currency **904**, destination currency **906**, exchange rate currency **908**, and effective date **910** for enterprise level conversions. Example currencies on screen **902** are all from US Dollars to Euros, but different currencies, exchange rates, and effective dates may be selected for the individual projects that are to be rolled-up into an enterprise report. While this conversion is not time-phased, it does facilitate more-accurate roll-up conversion. In other embodiments, the enterprise level conversion may also be time-phased.

[**0086**] FIG. **10** illustrates a logic flow diagram for process **1000** of managing multiple currencies in a project management system.

[**0087**] Process **1000** begins at operation **1002**, where a cost associated with a task within a project is received by the project management application. The project management application may be executed in a client device locally, in a project server at enterprise headquarters, and the like. Processing proceeds to operation **1004**.

[**0088**] At operation **1004**, exchange series information is received. Exchange series information comprises parameters for cost conversion such as exchange rates, exchange types, effective dates, frequency of updates, and the like. As described before, multiple exchange series may be defined for different transactions, but also a default set of parameters may be used when no exchange series is specified. Processing advances to decision operation **1006** from operation **1004**.

[**0089**] At decision operation **1006**, a determination is made whether one or more parameters of the exchange series are to be changed. If this manual override operation is selected, the user provides exchange rate information. Thus, if the exchange series is to be changed, processing moves to operation **1008**, where a user is prompted to modify the parameter(s). Processing then moves to decision operation **1010**. If no change is to be made, processing advances to decision operation **1010** directly.

[**0090**] At decision operation **1010**, a determination is made whether the cost is variable. If the cost is variable, processing advances to operation **1012**. Otherwise, the cost is fixed and processing moves to decision operation **1016**.

[**0091**] At operation **1012** a cost accrual at each segment of a cost-contour associated with the task is determined. Time-phased tasks with variable cost have cost-contours defined in project management systems. In one embodiment, cost accruals are converted at each segment of the cost-contour. Accordingly, a conversion rate based on the selected exchange series parameters is determined at operation **1014** following operation **1012**. Processing then proceeds to decision operation **1015**.

[**0092**] At decision operation **1015**, a determination is made whether there are additional segments to be processed. If there are more segments, processing returns to operation **1012** for determining the cost accrual of another segment. Otherwise, processing continues to operation **1024**.

[**0093**] At decision operation **1016**, a determination is made whether the fixed cost is to be converted at the beginning of the task, at the end of the task, or prorated to another time point along the task. If the beginning is to be used, processing moves to operation **1018**, where the conversion rate is determined based on the selected exchange series parameters and processing advances to operation **1024**.

[0094] If the end of the task is to be used for conversion of the fixed cost, the conversion rate is determined at operation **1020** based on the selected exchange series parameters at that time point and processing advances to operation **1024**. If a prorated point is to be used, the conversion rate is determined at operation **1022** for the prorated point and processing advances to operation **1024**.

[0095] At operation **1024**, the local currency cost is converted to the project levels cost using the conversion rate determined in one of operations **1014**, **1018**, **1020**, and **1022**. Processing then moves to optional operation **1026**.

[0096] At optional operation **1026**, other actions associated with project management are performed. Such actions may include, but are not limited to, preparing a cost report based on the converted costs, publishing a report to a data store, providing a report to a project server, and the like.

[0097] After optional operation **1026**, processing moves to a calling process for further actions.

[0098] FIG. **11** illustrates a logic flow diagram for process **1100** of managing multiple currencies by a project server in a project management system.

[0099] Process **1100** begins at operation **1102**, where a project plan is received from a client device or application running a project management application. The project report may be based on multiple local currencies that have been converted to a project currency as described above. Processing moves from operation **1102** to operation **1104**.

[0100] At operation **1104**, the project server determines the project currency used in the report. In some embodiments, the project server may interact with multiple project clients and receive a plurality of plans using different project currencies. In other embodiments, multiple project servers may share enterprise level project management and work with a single enterprise level currency that may be different from some of the project level currencies. Processing moves from operation **1104** to decision operation **1106**.

[0101] At operation **1106**, a determination is made whether currency conversion is needed for the received project report. If conversion is needed, processing advances to operation **1108**. If conversion is not needed, processing moves to decision operation **1110**.

[0102] At operation **1108**, the report is converted from project currency to enterprise currency. While this conversion is not time-phased, it may facilitate more-accurate roll-up conversion using exchange series parameters. Processing moves from operation **1108** to decision operation **1110**.

[0103] At decision operation **1110**, a determination is made whether additional reports are received. In some embodiments, the project server may be tasked with providing summary reports based on multiple project reports. If the determination is affirmative, processing returns to operation **1106**. Otherwise, processing advances to decision operation **1112**.

[0104] At decision operation **1112**, a determination is made whether a summary report is to be prepared. If a summary report is requested, processing moves to operation **1114**. Otherwise, processing skips operation **1114** and advances to optional operation **1116**.

[0105] At operation **1114**, a summary report is prepared based on converted costs from different project reports. Processing moves from operation **1114** to operation **1116**.

[0106] At optional operation **1116**, other actions associated with project management are performed. Such actions may include, but are not limited to, publishing the report to a data store, analyzing report results, interacting with other applications, and the like.

[0107] After optional operation **1116**, processing moves to a calling process for further actions.

[0108] The operations included in processes **1000** and **1100** are for illustration purposes. Managing multiple currencies in a project management system may be implemented by a similar process with fewer or additional steps.

[0109] The above specification, examples and data provide a complete description of the manufacture and use of the composition of the embodiments. Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims and embodiments.

What is claimed is:

**1**. A computer-implemented method for managing multiple currencies within a project management system, comprising:

determining a time-phased cost associated with a project task in a local currency;

selecting an applicable conversion rate based on the local currency, a project currency, and a predetermined exchange series, wherein the exchange series includes an exchange rate, an exchange type, and an effective date; and

converting the local currency of the time-phased cost to the project currency using the applicable conversion rate.

**2**. The computer-implemented method of claim 1, further comprising providing a report based on a roll-up of costs associated with selected tasks within a project using the project currency.

**3**. The computer-implemented method of claim 2, wherein the report is provided to at least one of a Report Store, a project server, and a third party store.

**4**. The computer-implemented method of claim 1, wherein the time-phased cost is one of a variable cost and a fixed cost.

**5**. The computer-implemented method of claim 4, wherein an accrual of the cost in the local currency is converted to the project currency at each segment of a cost-contour associated with the task, if the cost is variable; and wherein the cost in the local currency is converted to the project currency at one of a beginning, an end, and a prorated point of the task, if the cost is fixed.

**6**. The computer-implemented method of claim 1, wherein a string defining the cost within the project management system includes at least one of a currency name, a currency symbol, a currency code, a number of assigned decimal digits, and a name of an issuing agency.

**7**. The computer-implemented method of claim 1, wherein the exchange type is employed to determine an applicable exchange rate based on a transaction type, and the exchange type includes one of spot type for daily exchange rate updates, an internal type for chargeback transactions, and an external type for non-chargeback transactions.

**8**. The computer-implemented method of claim 1, wherein the exchange series further includes a frequency of exchange rate updates.

**9**. The computer-implemented method of claim 8, wherein the exchange rate updates are provided by at least one of a user input, a database, and an online service.

**10**. The computer-implemented method of claim 8, wherein the effective date is arranged to determine a beginning of each period of the exchange rate updates as specified by the frequency.

**11**. The computer-implemented method of claim 10, wherein the closest effective date to a conversion date is used to determine the conversion rate for converting the local currency to the project currency.

**12**. A computer-readable medium having computer instructions for managing multiple currencies in a project management system, the instructions comprising:

determining a cost associated with a project task in a local currency;

selecting an applicable conversion rate based on the local currency, a project currency, and a predetermined exchange series, wherein the exchange series includes an exchange rate, an exchange type, and an effective date;

speculating a future conversion rate based on the applicable conversion rate and a scheduled future date associated with the task; and

converting the local currency of the cost to the project currency using the speculated conversion rate.

**13**. The computer-readable medium of claim 12, wherein the exchange series further includes a frequency of exchange rate updates, and the effective date is arranged to determine a beginning of each period of the exchange rate updates as specified by the frequency.

**14**. The computer-readable medium of claim 13, wherein at least a most recent effective date is used to speculate the conversion rate for converting the local currency to the project currency.

**15**. The computer-readable medium of claim 12, wherein the instructions further comprise providing a user the opportunity to override the speculated conversion rate.

**16**. A system for integrating multiple currency conversion into a project scheduling and costing engine, the system comprising:

a project client configured to:

determine a cost associated with a project task in a local currency;

select an applicable conversion rate based on the local currency, a project currency, and a predetermined exchange series, wherein the exchange series includes an exchange rate, an exchange type, a frequency, and an effective date;

convert the local currency of the cost to the project currency using the applicable conversion rate; and

provide a report based on a roll-up of costs associated with selected tasks within a project using the project currency; and

a project server configured to:

receive the report from the project client; and

manage consumption of the report by at least one of an analysis application, a publishing application, and a scheduling application.

**17**. The system of claim 16, wherein the project server is further configured to provide the project client data including at least one of the exchange rate, the exchange type, the frequency, and the effective date.

**18**. The system of claim 16, wherein the project server is further configured to receive reports from a plurality of project clients, convert the project currencies of the reports to an enterprise currency, and provide a multiple project report.

**19**. The system of claim 16, further comprising at least one additional project server, so that the projects servers manage projects within an enterprise in a shared manner.

**20**. The system of claim 16, further comprising a data store configured to store at least one of the report, and data associated with the exchange rate, the exchange type, the frequency, and the effective date.

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