

DATA AGGREGATION AND ANALYSIS SYSTEM

TECHNICAL FIELD

The invention relates to a system and method for providing data aggregation and analysis.

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Background

Data repositoring, the creation of an enterprise wide data source, is the first step towards managing the large volumes of customer related data. The data warehousing is becoming an integral part of many information delivery systems because it provides a single, central
10 location where a reconciled version of data extracted from a wide variety of operational source is stored for performing analyses. There are a number of existing solutions that provide generic data repository and analytical capabilities. Current solutions do not provide an industry specific prebuilt analytics that are pre-integrated with a data repository and a data services solution. This pre-integrated solution can cater to end to end business intelligence
15 (BI) needs of the organizations in collating information across the enterprise to provide analytics and at the same time provide real time access of these analytics to operational systems. Current solutions also do not provide such pre-integrated analytics in the business areas of subscriber network experience, product portfolio performance, churn-out analytics, retail store performance, dynamic brand sentiment measurement, etc. In absence of such pre-
20 integrated solutions, organizations currently are incurring additional costs and time in building similar functionalities.

Therefore, there is a need of a system which is capable of providing support for business analyses and intelligent operations through integration with rules engine and operational
25 processes. The system should also be flexible in terms of service model implementation and maintenance.

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Summary

In accordance with a first aspect of the invention, there is disclosed a data aggregation and analysis system comprising a module for extracting the data from the plurality of disparate databases; a staging database configured for correlating the data with a plurality of dimensions associated to a customer, wherein the data is correlated by using a pre-defined table structure stored in the staging database, and an extraction transformation and load routine, the plurality of dimensions comprise product usage patterns, billing trends, preferred locations, and a quality of service, and a plurality of data models for performing analyses of the data, wherein the plurality of data models includes a sales model, a marketing model, a customer model or a combination thereof.

The present invention also provides a method for flexibly integrating a data repository with a plurality of operational database in real-time such that first node communicatively accesses a plurality of data elements from a plurality of disparate databases installed at a plurality of disparate computing environment. The method comprises of a processor implemented steps of extracting a plurality of data element of a customer from a plurality of disparate databases, correlating and accumulating the data for supporting a mining of a transactional data out of the data and processing the data through extraction transformation and load routine for loading it onto the data repository for obtaining the data in a summarized form. The method further comprises of flexibly integrating the data repository with the plurality of operational system and an enterprise process and supporting real-time sharing of the data from a data repository to the connected operational system and enterprise process and connecting a plurality of disparate databases and computing environments by instantaneously invoking a plurality of web services from a plurality of data elements. The method further comprises of providing an insight into a customer's behavior and business performance of a plurality of industries by enabling a comparative analyses with respect to the said query data.

Brief Description of the Drawings

FIG. 1 illustrates the architectural view of the system in accordance with an embodiment of the invention; and

FIG. 2 illustrates the plurality of system components and the flow of process in accordance
5 with an alternate embodiment of the invention.

Detailed Description

An exemplary embodiment of the present invention, a system 100 is described hereinafter with reference to FIG. 1 and FIG 2.

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10 of extracting a plurality of data element of a customer from a plurality of disparate databases, correlating and accumulating the data for supporting a mining of a transactional data out of the data and processing the data through extraction transformation and load routine for loading it onto the data repository for obtaining the data in a summarized form. The method further comprises of flexibly integrating the data repository with the plurality of operational
15 system and an enterprise process and supporting real-time sharing of the data from a data repository to the connected operational system and enterprise process and connecting a plurality of disparate databases and computing environments by instantaneously invoking a plurality of web services from a plurality of data elements. The method further comprises of providing an insight into a customer's behavior and business performance of a plurality of
20 industries by enabling a comparative analyses with respect to the said query data.

Some embodiments of this invention, illustrating its features, will now be discussed:

The words “comprising”, “having”, “containing”, and “including”, and other forms thereof,
25 are intended to be equivalent in meaning and be open ended in an item or items following any one of these words is not meant to be an exhaustive listing of such item or items, or meant to be limited to only the listed item or items.

It must also be noted herein and in appended claims, the singular forms “a”, “an”, and “the”
30 include plural references unless the context clearly dictates otherwise. Although any systems, methods, apparatuses, and devices similar or equivalent to those described herein can be used

in the practice or testing of embodiments of the present invention, the preferred, systems and parts are now described. In the following description for the purpose of explanation and understanding reference has been made to numerous embodiments for which the intent is not to limit the scope of the invention.

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A plurality of components of the invention are described as module for the understanding of the specification. For example, a module may include self-contained component in a hardware circuit comprising of logical gate, semiconductor device, integrated circuits or any other discrete component. The module may also be a part of any software programme
10 executed by any hardware entity for example processor. The implementation of module as a software programme may include a set of logical instructions to be executed by the processor or any other hardware entity. Further a module may be incorporated with the set of instructions or a programme by means of an interface.

15 The disclosed embodiments are merely exemplary of the invention, which may be embodied in various forms.

The present invention provides a system and method for enabling a flexible integration of a data repository with a plurality of operational database in real-time. The system and method
20 consists of a first node communicatively accessing a plurality of data elements from a plurality of disparate databases installed at a plurality of disparate computing environment. The system and method extracts data from a plurality of disparate databases and performs an intelligent operation in order to provide an insight into a customer's behavior and business performance of a plurality of industries by enabling a comparison with respect to the query.

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In accordance with an aspect, referring to FIG. 1, the system 100 provides a flexible integration of a data repository 102 with a plurality of operational database 104. The system 100 comprises of a disparate database 106 from which data is extracted. This data may be in a form of a query of a customer. The system 100 further comprises of an extraction module
30 108 which is adapted to extract data from a plurality of disparate databases 106, a staging

data base 110 for correlating and accumulating the data, a networking module 112 for enabling a flexible integration, a plurality of analytical module 114 for performing a comparative analyses and a designing and implementing module 116 for enabling a flexible deployment of the system 100 on any related technology platform and tools.

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The plurality of disparate databases 106 provide customer related data. These disparate databases 106 may be corporate systems or operational system or a combination thereof and provide data which may include and is not limited to a customer relationship management data, data related to orders, billing data, network performance data, mediation data or a combination thereof.

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The extraction module 108 is a load module and processes the data for performing an analysis. The first layer is a staging layer. In this layer, the data extracted from the disparate databases 106 is passed to the staging database 110. The staging database 110 stores predefined table structures in a predefined format. The table structures of the staging database 110 guides the development of routines for extraction, transformation and loading of data from multiple disparate databases 106. The staging database 110 also performs a validation check of the data extracted from the disparate databases 106.

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The staging database 110 is further configured to correlate and accumulate the data. Out of the data of the customer, a transactional data is extracted. The staging database 110 supports a mining of the transactional data. The correlated data is then extracted by the extraction module 108 and is loaded onto the data repository 102. This data repository 102 may be an enterprise data repository.

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Referring to FIG. 2, the data repository 102 is constructed in the form of a plurality of layers. The extraction module 108 passes the validated data to the integration layer 120. Here the data is integrated with a plurality of dimensions. These dimensions may include and is not limited to products, customers, subscribers, devices, billing and usage details or a combination thereof. The integrating layer provides an operational reporting. By way of a

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specific example, this integration layer 120 is provided with a plurality of data model integrated with pre-built analytics.

The extraction module 108 further passes this integrated data to a dimensional layer 122.

5 Various dimensional data like customers, subscriptions, towers, products, recharges, vendors, campaign, call centers or a combination thereof is loaded in this layer. This layer consists of confirmed and non-confirmed dimensions. The integrated data is loaded separately for each subject area. The subject area includes product usage, customer churn, network subscriber experience etc. All the necessary calculations are performed under the dimensional layer 122.

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The data from dimensional layer 122 is further aggregated and loaded into a summary layer 124. The loading is performed by the extraction module 108. The data is aggregated with respect to the granularity of various dimensions like customer, product, subscript, tower etc. The aggregation is performed for a predetermined time period which may be a day, a month
15 etc. The summary layer 124 performs the calculations related to the reporting as per the timely requirement.

In accordance with an embodiment, referring to FIG. 1, the system 100 further comprises of the networking module 112 configured to enable the flexible integration of the data
20 repository 102 with a plurality of operational databases 104. The networking module 102 enables the flexible integration by invoking a plurality of web services from a plurality of business enterprise. The web services support a real-time sharing of the data repository 102 to the connected operational system and the enterprise processes. These web services are also capable of sending an alert in case any of the service crosses a prebuilt reference standard.

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The system 100 further comprises of a service storage unit 113) for storing a plurality of data services which are used to enable the integration of the data repository 102 to the operational database 104. The data services are written on open technology like XML, web services or combination thereof. The operational database 104 further comprises of a plurality of
30 modules for enabling service operation analyses, financial performance and strategy

management analyses, sales and revenue management analyses, network experience analyses, enterprise performance analyses or a combination thereof. By way of specific example, the operational database 104 also provides retail store performance, supply chain, telecom operations, finance and revenue assurance or a combination thereof.

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When the data is summarized it will be further used for analysis. A plurality of analytical modules 114 are configured for performing analyses of the data. This analytical module 114 will store prebuilt dashboards, reference standard (key performance indicators), reports etc for doing analyses of the data. This analysis is performed under modeling layer. Analytical modules 114 includes a plurality of data models for performing analyses which include and are not limited to sales model, marketing model, customer model or a combination thereof. Analytical module 114 is flexible in accepting a plurality of new business rules or reference standard (key performance indicators).

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15 In accordance with an embodiment, by way of specific example, analytical module 114 may perform analyses related to communication industry. These analyses may be on subscriber's network experience, product performance correlating subscriber profile with usage, churn-out patterns against subscriber profiles etc.

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In accordance with an embodiment, additional analytical areas may include and are not limited to device analytics, machine-to-machine analyses, LBS (location based analyses), video analyses or a combination thereof. Also, by way of another example, analyses may be extended to prepaid analyses which provide results for prepaid services in communication industry.

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In accordance with an embodiment, referring to FIG. 2, the system further comprises of a plurality of report generating module 130 configured for generating a plurality of analytical reports with respect to analysis performed by analytical module 114. By way of a specific example, the generated report may be a mining report, campaign management report, adhoc report, standard reports analytics report etc. The reports are generated under the report layer.

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Also, the report generating module 130 is flexible in adding new business rules and/or reference standard's. The generated report will also provide also provide a comparison of performance with respect to the benchmarked reference standard's (key performance indicators) in a plurality of industry.

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Again referring to FIG. 2, the system 100 further comprises of a data mart 128 which stores the historical data for carrying out the predictive analyses which include and is not limited to customer insight, social analytics, and content analytics location based analytics, device analytics or a combination thereof.

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Referring to FIG. 2, the system 100 further comprises of a designing and implementing module 116 configured for enabling deployment of the system 100 or a plurality of components of the system 100 on any related technology and platform tools such that the system 100 can be integrated with any of the data base for providing overall analyses of a plurality of industries. The system is adaptive in nature so that it can add or accept new service tools to address the current requirements of a plurality of industries. Also, the system 100 can operate by using any of the technology for example oracle. The system is modular in nature and provides flexibility to the customer to access any service or component from the system as per the requirement of the customer.

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The process illustrated for a flexible integration of the data repository with the plurality of operational database may be illustrated by a working example showed in the following paragraph; the process is not restricted to the said example only:

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In a call center scenario, a plurality of agent may receive a call from a plurality of customers for seeking some information. While responding to the query of the customer, agent may need to know about the quality of the customer whether the customer is a privileged customer or a paying customer etc. and also refer to some detailed information like the customer's service usage patterns, billing trend, most preferred locations, quality of services, etc. Some of the information may be stored in agent's database while for obtaining the detailed

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information; agent can retrieve the data in real time from the data repository by invoking the web services where the correlated data from multiple sources is available in a refined and summarized form. Agent may also refer to the prebuilt analytical reports on the refined data from the data repository to obtain the best possible information about the customer. These reports may also be shared with the customers through the integration of the data repository with email systems of the call center. Similar integration through web services for real time inputs and other modes like batch extracts, reports caching etc. for offline data referral may also be made available to the customer self-service websites or sent proactively to customers for availing detailed information on the relevant data as required.

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The preceding description has been presented with reference to various embodiments. Persons skilled in art and technology to which this invention pertains will appreciate alterations and changes in the described structures and methods of operation can be practiced without meaningfully departing from the principle and scope.

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Aspects of particular embodiments of the present disclosure address at least one aspect, problem, limitation, and/or disadvantage associated with existing order processing systems. While features, aspects, and/or advantages associated with certain embodiments have been described in the disclosure, other embodiments may also exhibit such features, aspects, and/or advantages, and not all embodiments need necessarily exhibit such features, aspects, and/or advantages to fall within the scope of the disclosure. It will be appreciated by a person of ordinary skill in art that several of above-disclosed structures, components, or alternatives thereof, can be desirably combined into alternative structures, components, and/or applications. In addition, various modifications, alterations, and/or improvements may be made to various embodiments that are disclosed by a person of ordinary skill in art within the scope of the present disclosure, which is limited only by the following claims.

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Claims

1. A data aggregation and analysis system comprising:

an extraction module for extracting the data from the plurality of disparate
5 databases;

a staging database configured for correlating the data with a plurality of
dimensions associated to a customer, wherein the data is correlated by using a pre-
defined table structure stored in the staging database, and an extraction transformation
and load routine,

10 and wherein the plurality of dimensions comprise product usage patterns,
billing trends, preferred locations, and a quality of service;

the data repository configured to store the data in a summarized form, wherein
the data repository comprises an integration layer, a dimensional layer, and a
summary layer, and wherein the integration layer integrates the data with the plurality
15 of dimensions being correlated, and wherein the dimensional layer stores the data
being integrated, and wherein the data corresponds to subject areas comprising
product usage, customer churn, and subscriber experience, and wherein the summary
layer stores the data in the summarized form for a predetermined time period; and

a plurality of data models for performing analyses of the data, wherein the
20 plurality of data models includes a sales model, a marketing model, a customer model
or a combination thereof.

2. The system as claimed in claim 1, wherein the extraction module is a load module.

- 25 3. The system as claimed in claim 1, further comprises a networking module configured
to integrate the data repository with a plurality of operational databases and enterprise
processes to support real time sharing of the data, stored in the data repository, to the
plurality of operational databases and enterprise processes.

4. The system as claimed in claim 3, wherein the networking module is further configured to invoke a plurality of web services for integrating the data repository with the plurality of operational databases.
 - 5 5. The system as claimed in claim 1 further comprising a storage unit for storing the plurality of web services.
 6. The system as claimed in claim 3, wherein the networking module is further configured to transmit an alert with respect to the performed analyses when the
10 plurality of web services crosses a prebuilt reference standard.
 7. The system as claimed in claim 1, further comprising prebuilt dashboards, scorecards, benchmarks, reference standard, prebuilt reports specific to the plurality of industries
15 for enabling the comparative analyses of the data.
 8. The system as claimed in claim 1, wherein the system further comprises of a report generating module configured to generate a plurality of analytical report representing the comparative analyses.
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 9. The system as claimed in claim 1, wherein the system further comprises of a data mart for storing a historical data for performing a predictive analyses.
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10. A data aggregation and analysis method comprising a processor implemented steps of:

extracting the data from the plurality of disparate databases;

correlating the data with a plurality of dimensions associated to a customer, wherein the data is correlated by using a pre-defined table structures, stored in a staging database, and an extraction transformation and load routine, the plurality of dimensions comprise product usage patterns, billing trends, preferred locations, and a quality of service;

storing the data in the data repository in a summarized form, wherein the data repository comprises an integration layer, a dimensional layer, and a summary layer, and wherein the integration layer integrates the data with the plurality of dimensions being correlated, and wherein the dimensional layer stores the data being integrated, and wherein the data corresponds to subject areas comprising product usage, customer churn, and subscriber experience, and wherein the summary layer stores the data in the summarized form for a predetermined time period;

generating a plurality of analytical report representing the comparative analyses; and

performing an analytical operation the data thereby providing the insight into the customer's behavior and business performance of the plurality of industries.

11. The method as claimed in claim 10, wherein the data repository is integrated with the plurality of operational databases by invoking a plurality of web services.

12. The method as claimed in claim 10, wherein analyses of the data is performed based on a plurality of data models, wherein the plurality of data models includes a sales model, a marketing model, a customer model or a combination thereof.

13. The method as claimed in claim 10 further comprising integrating the data repository with a plurality of operational databases and an enterprise processes to support real-time sharing of the data, stored in the data repository, to the plurality of operational databases and the enterprise processes.

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14. The method as claimed in claim 10 further comprising transmitting an alert with respect to the performed analyses when the plurality of web services crosses a prebuilt reference standard

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