ISSN (Online) : 2278-1021
ISSN (Print) : 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering
Vol. 3, Issue 3, March 2014

Data Warehouse Architecture for Financial Institutes to Become Robust Integrated Core Financial System using BUID

Vaibhav R. Bhedi[1], Shrinivas P. Deshpande[2], Ujwal A. Lanjewar[3]

Assistant Professor, MCA, VMV Commerce, JMT Arts and JJP Science College, Nagpur, India [1]

Associate Professor, P.G.D.C.S.T, D.C.P.E, H.V.P.M, Amravati, India [2]

Assistant Professor, MCA, VMV Commerce, JMT Arts and JJP Science College, Nagpur, India [3]

Abstract: This paper offers the concept of BUID (Bank unique Identification) code to unhide customer details and transactions from income tax department, government accountant and auditors, Government legal regulatory authority, all tax department and overall financial system using proposed data warehouse architecture for financial institutes. The proposed data warehouse architecture for financial institute will be well-built to execute a position to augment the present financial core system with BUID. The major advantage of this proposed architecture is that, the architecture will be identify customer various transactions and different accounts detail in different branches of different banks and financial institutions. We have tried to focus to remove the drawback by introducing the data warehouse architecture for financial institutes to maintain the Bank unique identification code (BUID code). This proposed data warehouse architecture for financial institute will help in decision making process by using OLAP and OLTP tools. The main advantage of this architecture is that the model with BUID can easily blend with current finance system. Thus the proposed data warehouse architecture for financial institute will become a robust to perform a role to enhance the present financial system.

Keywords: BUID, OLAP, OLTP

I. INTRODUCTION

Financial system uses core applications to support their operations where CORE stands for "centralized online real-time exchange". Core banking solutions is new jargon frequently used in banking circles. This basically means that the entire financial institute branches access applications from centralized data centers.[1] These applications now also have the capability to address the needs of corporate customers, providing a comprehensive banking solution but still core banking solution have some limitation that the system cannot identify the customer accounts transactions of different bank's branches. [2] The data warehouse architecture for financial institute is designed for transaction process using overall financial system and the data of customer is stored in Data Warehouse through data mart with BUID. Banks will make available all transactions across multiple channels like ATMs, Kiosk, Funds, Call center, Internet, Portal and Mobile using customer BUID. Bank unique identification code of customer to enhance the current financial core System using data warehouse architecture for financial institute and the core system has radically changed the way in which financial system functions. This new concept of BUID has changed the way of working and defines a core banking system as a back-end system that processes daily banking transactions and posts updates to accounts and other financial records using data warehouse for financial institute model. The greatest advantage of having a Core Bank System is that new features and functionalities can be easily added to the proposed system. Using BUID card of proposed system, the customers can manages his financial needs and transactions using data warehouse architecture for financial institute. The government authorities like Income Tax department, Financial Industry Regulatory Authority, Financial Services Authority, Reserve Bank of India (RBI), Securities and Exchange Board of India (SEBI), Forward Markets Commission (India) (FMC), Insurance Regulatory and Development Authority (IRDA), etc can easily centralized managed and overall control on all financial system through maintaining data warehouse of either individual or a group. All facilities of financial institutes have made available to customers using the proposed data warehouse architecture for financial institute.

II. FLAWS IN PRESENT FINANCIAL SYSTEM

The advancement in technology, especially Internet and information technology has led to new ways of doing business in financial system. Though we have often benefits from today financial sector and IT but in present core financial transaction scenario the customer's first real contact with channel like ATM, Kiosk, Funds, Call Center, Internet, Portal and Mobile to request intuitive perception transaction will be happened.[6] Thus after doing numerous transactions, entries are made in their own self system. Such transactions are not sense with other financial system or other financial institutes and therefore government authorities like Income Tax department, Financial Industry Regulatory Authority, Financial

ISSN (Online) : 2278-1021
ISSN (Print) : 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering
Vol. 3, Issue 3, March 2014

Services Authority, Reserve Bank of India (RBI), Securities and Exchange Board of India (SEBI), Forward Markets Commission (India) (FMC), Insurance Regulatory and Development Authority (IRDA), etc cannot collect customer's transactions information from one core financial system. The present core banking system doesn't provide the bank universal unique identification code and cannot identify the customer transaction of different accounts at one place or under one roof using present data warehouse architecture of financial system. The current system cannot investigate turnover of customer from different account in present data warehouse architecture of financial system.

In present account opening scenario the customer's first real contact with financial system to request to open the account and customer will get new account number within few days and the entry will be stored in retail account system i.e. the final step of account opening process. Further customer will receive checks, cards etc from the bank. In present core financial system, while making transaction, no records are verified, that whether the customer have any previous accounts or transaction in the same branch/bank or in overall financial system.[3]

The present system is account centric but not customer's transaction centric. Here, it doesn't give any details about the customer in sense of, how many type of transaction performed in different account in overall financial system and how many accounts are there in different banks in different locations and its historical data. In present financial system, it doesn't provide transaction using bank universal unique identification code under one roof of financial system. In current core system the financial system cannot identify the customer transaction of different accounts at one place. The current system cannot investigate turnover of money from different account of same customer in self system. The current financial system cannot easily detect the defaulter and cannot able to take suitable action. So this paper introduced proposed data warehouse architecture for financial institute to avoid the above flaws.

III. DATA WAREHOUSE ARCHITECTURE FOR FINANCIAL INSTITUTES

The proposed data warehouse architecture for financial institute has become a robust to perform a role to enhance the present in financial core system. The data warehouse architecture for financial institute has seven vertical layers and different process to complete the task. This architecture will help to control and monitor the Income details, Transaction details, tax department and other details of the customers. The architecture will overcome all the drawbacks and will provide the complete solution over the present system. Here the data warehouse architecture for financial institute is designed to connect all financial institutes in a network and the data of customers are stored in Data Warehouse through data mart. As we are maintaining Data Warehouse, the data will be stored in a centralized form and can maintain historical data. Due to Data Warehouse, The Online transaction processing (OLTP) and Online Analytical Processing (OLAP) can be used for efficient decision making process. The main advantage of data warehouse architecture for financial institute with BUID will become dynamic to perform a role to boost up the present financial system.

A. Architecture Description

The architecture has seven vertical layers, these are BUID, Data Sources, Extraction and Transformation, Data Storage, OLAP Engine, Front End Tools, defined in well manner and process pursues exactly each and every one steps.

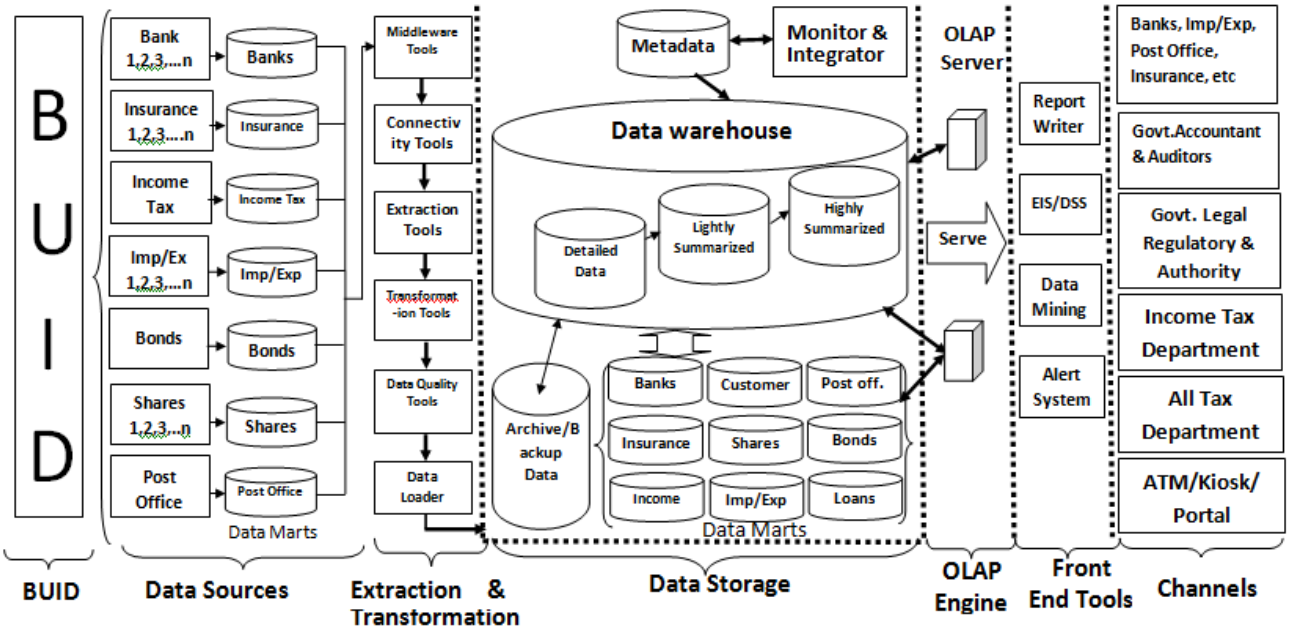

Figure: Data warehouse Architecture for Financial Institutes.

ISSN (Online) : 2278-1021
ISSN (Print) : 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering
Vol. 3, Issue 3, March 2014

BUID:
Focus to remove the drawback of current financial system by introducing the data warehouse architecture for financial institute will be worked through customer's BUID ((Bank unique Identification) coded card. The BUID can be easily unified in current financial system. ATM, Kiosk, Funds, Call Center, Internet, Portal and Mobile with BUID will be used to make transaction using data warehouse architecture for financial institute in overall financial system. The BUID will be well-built to execute a position to augment the present financial core system for Bank, Insurance, Shares, Bonds, Post Office, Income tax, Import/Export and loans through several channels.[7]

Data Sources:
The structure of financial institute like Banks, Insurance, Shares, Bonds, Post Office, Income tax, Import/Export, Loan etc in financial transaction model will have branches. As shown in figure Financial transaction model, Bank has branches like B1, B2, B3….Bn. The branch B1 have sub branches like Sub B1.1, Sub B1.2, Sub B1.3……Sub B1.n. The structure will be same for B2, B3 and Bn. The branch B2 will have sub branches like Sub B2.1, Sub B2.2, Sub B2.3……Sub B2.n, branch B3 will have Sub B3.1, Sub B3.2, Sub B3.3……Sub B3.n and branch Bn will have Sub Bn.1, Sub Bn.2, Sub Bn.3……Sub Bn.n. [4] The remaining financial institute like Insurance, Shares, Bonds, Post Office, Import/Export etc in financial transaction model will also be followed the same above said structure of branches to maintain the transparency and financial transaction of particular financial institute.

In this layer data source become included Bank, Insurance, Shares, Bonds, Post Office, Income tax, and Import/Export with respective data marts. Bank, Insurance, Shares, Bonds, Post Office, Income tax, and Import/Export data marts are further followed by extraction and transformation layer.

Extraction and Transformation:
It includes with Middleware tools and Connectivity, Extraction Tools, Transformation Tools, Data Quality Tools and data Loader.

a) Middleware tools and connectivity tools
Middleware and Connectivity tools provide transparent access to data source systems in heterogeneous computing environments. It is often prove to be invaluable because they provide transparent access to databases of different types, residing on different platforms.

b) Extraction tools
Extraction process involves extracting the data from the data source systems in this architecture. It is extracting data correctly sets the stage for how subsequent processes go further. Data warehousing consolidate data from different source systems. In general, the goal of the extraction phase is to convert the data into a single format appropriate for transformation processing. It will take data from one or more operational systems mentioned in data storage stage in proposed architecture needs to be extracted and copied into the data warehouse. The challenge in data warehouse environments is to integrate, rearrange and consolidate large volumes of data over many systems show in architecture, thereby providing a new unified information base for financial business intelligence. The process of extracting data from source systems and bringing it into the data warehouse is commonly called ETL, which stands for extraction, transformation, and loading.

c) Transformation tools
After data is extracted, it has to be physically transported to the target system or to an intermediate system for further processing. Depending on the chosen way of transportation, some transformations can be done during this process, too. Transform extracted data into appropriate formats and data structures. Provide default values as specified.

d) Data quality tool
It is Assist in locating and correcting data errors. Help resolve data inconsistencies in all aspect of data. Data quality tools assist warehousing teams with the task of locating and correcting data errors that exist in the data source in proposed architecture.

e) Data Loader
It is a last stage of extraction and transformation layer. Data loaders load transformed data into the data warehouse.

Data Storage:
It includes with Datawarehouse, Detailed Data, Lightly and Highly Summarized Data, Archive/Backup Data, Metadata, Data Mart and Monitor and Integrator.

a) Data warehouse
A data warehouse is a repository of subjectively selected and adapted operational data, which can successfully answer any ad hoc, complex, statistical or analytical queries regarding financial institutes. It is situated at the centre of a decision support system of an all financial institutes mentioned in data sources of proposed architecture and contains integrated historical data, both summarized and detailed information. [5]

b) Detailed Data
It will be Stores all the detailed data in the database schema. On a regular basis, detailed data is added to the warehouse to supplement the aggregated data.

c) Lightly and Highly Summarized Data
It will be Stores all the pre-defined lightly and highly aggregated data generated by the warehouse manager. Transient as it will be subject to change on an on-going basis in order to respond to changing query profiles. The purpose of summary information is to speed up the performance of queries. The summary data is updated continuously as new data is loaded into the warehouse.

d) Archive/Backup Data

ISSN (Online) : 2278-1021
ISSN (Print) : 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering
Vol. 3, Issue 3, March 2014

It will be Store detailed and summarized data for the purposes of archiving and backup. It will be necessary to backup online summary data if this data is kept beyond the retention period for detailed data. The data is transferred to storage archives such as magnetic tape, optical disk, etc.

e) Metadata

Metadata is defined as "data about data" or "data describing the meaning of data". In proposed architecture a metadata management component is responsible for the management, definition and access of all different types of metadata.[9] This area of proposed architecture will stores all the metadata definitions used by all the processes in the warehouse. In proposed architecture data warehousing, there are various types of metadata, e.g., information about the all data sources, the structure and semantics of the data, the tasks performed during the construction, the maintenance and access of a proposed DWH, etc.

f) Data Mart

In this architecture Data Mart is a subset of a data warehouse that supports the requirements of particular financial institutes. From a data Warehouse, data flows to various financial institutes for their customised Decision Support System (DSS) usage. These individual financial institute components are called Data Mart.[5] The term Data mart in data storage is different things to different peoples. In other words, a data mart in data storage of proposed architecture is a segment of a data warehouse that can provide data for reporting and analysis in the financial institutes. Data marts in data storage are sometimes complete individual data warehouses which are usually smaller than the proposed data warehouse for financial institutes.

g) Monitor and Integrator

Integrator will involve combining data residing in different sources and providing users with a unified view of these data. The integrator component integrates the information retrieved from information sources. The integrator will also maintain the consistency between the information sources and the data warehouse system. Monitor will detect the modification applied to the information source. These modifications will be passed to integrator module.[11]

OLAP Engine:

It is a fifth layer of data warehouse for financial institutes. OLAP applications share a set of user of all financial institutes. An OLAP server provides functionality and performance that leverages the proposed data warehouse for reporting, analysis, modelling and planning requirements.[10] These processes mandate that the financial institute looks not only at past performance, but more importantly, at the future performance of the business. It is essential to create operational scenarios that are shaped by the past yet also include planned and potential changes that will impact tomorrow's financial institute performance.

Front End Tool:

It is a sixth layer of architecture included report writer, EIS/DSS, data miming and alert system. Data query and reporting tools used for deliver warehouse-wide data access through simple interfaces that hide the SQL language from all financial institute end users. These tools are designed for list-oriented queries, basic drill-down analysis and report generation. EIS and Decision support systems (DSS) are packaged applications that run against warehouse data. EIS and DSS are development tools that enable the rapid development and maintenance of custom-made decisional system. Data mining tools search for inconspicuous patters in transaction-grained data to shed new light on the operations of the financial institute. Alert system provides alerts from the data warehouse database to support strategic decisions. It will also highlight and get user's attention based on defined exceptions.

Channels:

It is a seventh layer of data warehouse architecture for financial institute. It included with Government accountant and auditors, government legal regulatory and authority, income tax department, all tax department, atm/kiosk/portal and all data sources of mentioned architecture. They are end users of proposed data warehouse architecture for financial institute.

IV. ADVANTAGES OF BUID USING DATA WAREHOUSE FOR FINANCIAL INSTITUTES

Following are the advantages of BUID and data warehouse for financial institutes –

1. The proposed data warehouse for financial institutes and BUID code can easily blend with present system, so that the present system can be easily changed into new one.

2. The concept of BUID will help to maintain and monitor the complete transactions of a customer accounts (individual/group/society) using data warehouse for financial institutes.

3. The data warehouse for financial institutes will maintain transparence in account opening system and its transactions.

4. The government can monitor and can easily make decisions regarding financial crises.

5. The Income Tax department need not worry to maintain and control individual details and transactions of customer accounts for Income Tax purpose.

6. The BUID card will be better alternative than the PAN card, since the BUID card maintains biometric detail and his income details.

7. Under this architecture, all financial sectors, including Government, Private, and Public will work under one roof.

8. The Financial system can easily detect the defaulter and can take suitable action using data warehouse architecture for financial institute.

9. As we maintaining Data Warehouse, The Online transaction processing (OLTP) and Online Analytical Processing (OLAP) can be used for efficient decision making process.

10. Government accountant and auditors, government legal regulatory and authority, income tax department, all tax department and atm/kiosk/portal becomes the end users of proposed data warehouse architecture for financial institute.
11. Data warehouse architecture for financial institute of finance system will monitor and manage the customer's transactions in assorted banks or other finance institute under one roof.

V. CONCLUSION

There are many advantages after implementing the data warehouse architecture for financial institute. Here we have explored only architecture for all financial institutes. The paper is focused on BUID code based data warehouse architecture for financial institute. Data warehouse architecture for financial institute shows how transparency can be maintained while generating account number and BUID code. BUID has proposed core financial system by offering powerful way to work under a roof. The BUID will be tightly integrated with the banking, CRM and transaction processing etc. of overall core financial system using data warehouse architecture for financial institute. Data warehouse architecture for financial institute will be help Core banking system to monitor and manage the customers opened number of accounts in assorted banks under one roof. The data warehouse architecture for financial institute will help in decision making process by using OLAP and OLTP tools. The BUID has become a robust to perform a role to enhance the financial core system by using data warehouse architecture for financial institute.

REFERENCES

[1]. Scott Simmons, "Modernizing banking core systems" online available:http://www.ibm.com/developerworks/websphere/techjournal/0809_col_simmons/0809_col_simmons.html
[2]. Finacus Solution Pvt. Ltd. Finacus powered by innovation. "FINcore core banking system". Online Available: http://www.finacus.co.in/fincore.html
[3]. Vaibhav R Bhedi, Ujwal A Lanjewar and Shrinivas P Deshpande, "Design and Study of 7 - Tier Architecture Model for Opening Account in Present Financial System". International Journal of Computer Applications (0975 – 8887) 37(3):25-29, January 2012. Published by Foundation of Computer Science, New York, USA.
[4]. Vaibhav R Bhedi. "Design and Study of Financial Transaction Model for BUID". International Journal of Computer Applications (0975 – 8887) ISBN: 973-93-80870-28-7, 57(13):12-15, November 2012. Published by Foundation of Computer Science, New York, USA.
[5]. C.S.R. Prabhu, "Data warehousing concepts, Techniques, Product & Application", Third Edition, April 2011, PHI publication pp. 8-28.
[6]. IBM Global Business Services. "IBM Institute for business value". Online available: http://www-05.ibm.com/de/financialservices/pdf/ibv_soa_banking.pdf
[7]. Vaibhav R Bhedi, Ujwal A Lanjewar and Shrinivas P Deshpande, "BUID: A Virtual Agent to Become Robust Integrated Core Financial System". International Journal of Advanced Research in Computer Science Volume 3, No. 3, May-June 2012.
[8]. M/S S. Sathnanakrishanan, 2005. Information System for Banks, 2005, M/S/, Taxman publication, Pvt. Ltd.
[9]. Thomas Vetterliy, Anca Vaduvaz, Martin Staudty. "Metadata Standards for Data Warehousing: Open Information Model vs. Common Warehouse Metamodel" Online available: www.sigmod.org/record/issues/0009/**standards**.pdf
[10]. "The Role of the OLAP Server in a Data Warehousing Solution" Online available on: http://www.oracle.com/technetwork/middleware/bi-foundation/olap-in-a-data-warehousing-solution-128690.pdf
[11]. J. T. Horng and J. Lu, "Modularized design for wrappers/monitors in data warehouse systems," J. Syst. Softw., vol. 3, pp. 185–199, 2000.