

Data Analysis for Banking Business Intelligence Solution in Laos

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Abstract: Business Intelligence (BI) in banking is widely used of analytics to anticipate action plans. Get faster reporting to Banking BI allows user in organizations to visualize access data in real time and more flexible. Now, Business intelligence in banking allows organizations to measure big data on their customers in volume to help increase customer satisfaction. Banks can have a deeper understanding of their customers with banking. In this paper, we propose introduce the Microsoft SQL server Tools analysis Services, Online Analytical Processing (OLAP) analysis fixed account of customer data, make graphs and report result by Power BI provide a decision make business plans of manager. On Online Analytical Processing (OLAP) have more powerfully techniques analyzing data. We can be helpful to better understand performance issues, and to improve the report but at the same time challenging tool for data analysis.

Keywords: Business intelligence, banking, OLAP, Power BI.

I. INTRODUCTION

According to the data information Bank of Laos which comprised 44 licensed banks that is 3 owned commercial banks, 8 private banks, 8 subsidiary bank which include 1 licensed specialized banks in addition to 3 Joint State commercial banks, and 21 branches of foreign banks [1]. Basically, focus to the licensed commercial banks have 5 banks, that using core banking section only one bank of commercial bank for the scope of the study can be identify as core banking systems which are using in licensed commercial banks. Now, the core banking system operate business activities, but it's supporting to working report day-to-day, it's very inflexible have limited to data exploration.

On finance and data warehouse, we make decisions focused on condensation of data multiple dimensions. Data cube [2][7] technology that has been widely used in data and On-Line Analytical Processing (OLAP) [3][5][6][8] analysis data of decision making. In this study, we are proffer develop business intelligence project using Microsoft SQL analysis services take core banking database focused on the fixed deposit account data integrated with Online Analytical Processing (OLAP) [3] technique which may suitable solutions to handle the accumulation data. Further results of our analysis can be applied for the customer service manager access data to forecast and decision business plan.

II. OVERVIEW THE COREBANKING SYSTEM

Core banking system that integrates all transactional banking operation between applications server with client platform [4]. The solution is designed to run either as a centralized independent system or a decentralized instance that can integrate or connect with other third-party core banking systems. However, the later set up is limited to front office transactional processing while relying on external systems for back office operations. Given the open nature of banking proven visual basic platform run on Windows Server 2008R2 64bits, connect to database by Oracle 11g, with create report by Crystal report to user.

Functional model of banking are described in the following figure.

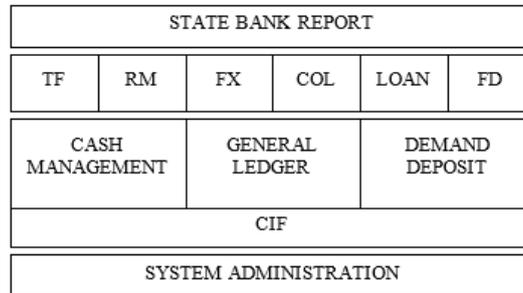


Fig. 1 Banking Architecture

In the Core banking menu, modules are allocated in following order:

Transaction menu: This menu allows the teller to open an account, to perform transactions such as deposit, withdraw money, and other transactions.

- Back-office menu: This menu allows the officer to maintain product types, create and maintain fees.
- Branch administration: This menu allows the branch’s administrator to maintain user list and user access right list and to do other branch’s administration jobs.
- Head office administration: This menu allows the bank’s administrator to setup bank’s working days, holidays and to do other bank’s administration jobs.
- Center administration.

III. RESEACH METHODOLOGY

In this study we used OLAP [3] implement to the multidimensional view of data in database and the multidimensional data view scale a value in multidimensional area of dimension. The OLAP system separated into four parts: star data source, fast table, dimension tables, and relational:

- Data source: all data is management and compile into the database.
- Fast table: include FDMAST_FAST get connect CUSTOMER_DIMENSION, BANK_DIMENSION, FDTYPE_DIMENSION, TIME_DIMENSION and CURRENCY_DIMENSION, its attributes the primary key of ER_diagram.
- Dimension tables: all tables have relations with fast table by key.
- Relational: is ER_diagram have Fast table connect to with Dimension tables.

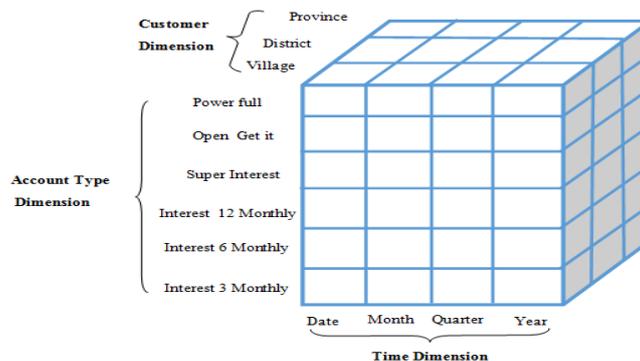


Fig. 2 Concept OLAP cube

OLAP system is a powerful method analysis data, which are in testing topic models are among the strongest method analysis patterns. We extended the standard data cube [2]. This concept of OLAP cubes was used to get more understand and practicable data to the users, prepare up way and down way data, and to provide faster slice way. On Fig. 2. We present data account of the customer consists of one column for dimension and special column is amount of account. The value the first dimension is X & the second dimension is Y were selected as time and customer dimension.

IV. DATA IMPLMENTATION

The system banking solution had two parts:

- The Oracle database was used in the main core banking which import database and transform into the SQL database.

We used Microsoft technology and export database into Microsoft SQL Server 2016 consists of SQL server analysis services (SSAS), SQL Server Integration Services (SSIS) and SQL Server Reporting Services (SSRS). The information provided SSAS project and consists of OLAP cube which can be access by the end user get report by Power BI visualization as shown in Fig. 3.

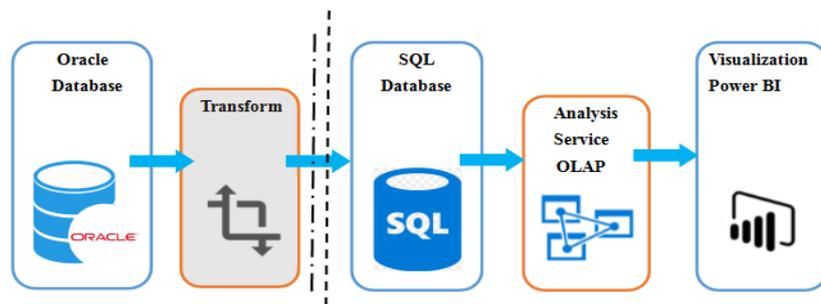


Fig. 3 Implement System Architecture

V. OLAP ANALYSIS AND RESULTS

The results of OLAP analysis is shown in “Fig. 4”. We selected data of number account from January 01, 2015 to December 12, 2019 and totally was 5,201 accounts. Account number was found higher in 2015 and 2016, while a slightly less in 2017 to 2019. The highest number was found in July 2015 and 2016, while in May 2018 was lower account compared to other months in 2017 and 2019. We also made comparison with other currencies such LAK for Lao (LAK), Bath for Thailand (THB), and Dollar America for the United State (US\$).

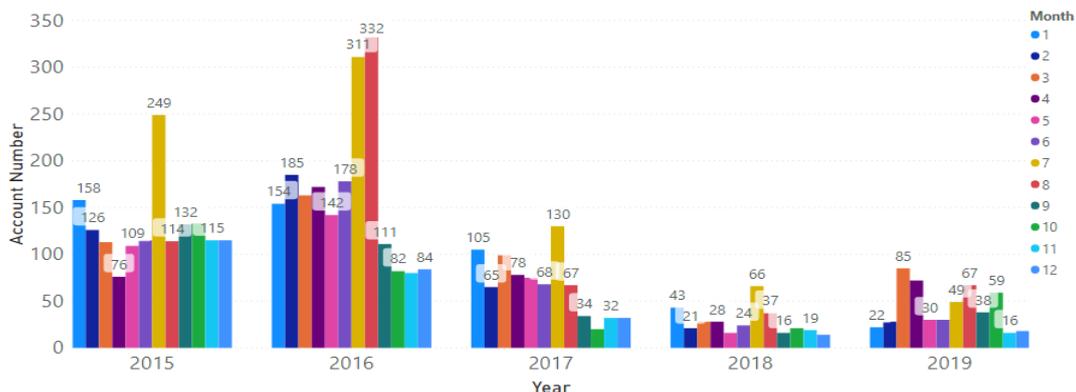


Fig. 4 Account number resulted by OLAP analysis from 2015 to 2019. Color legend denote month

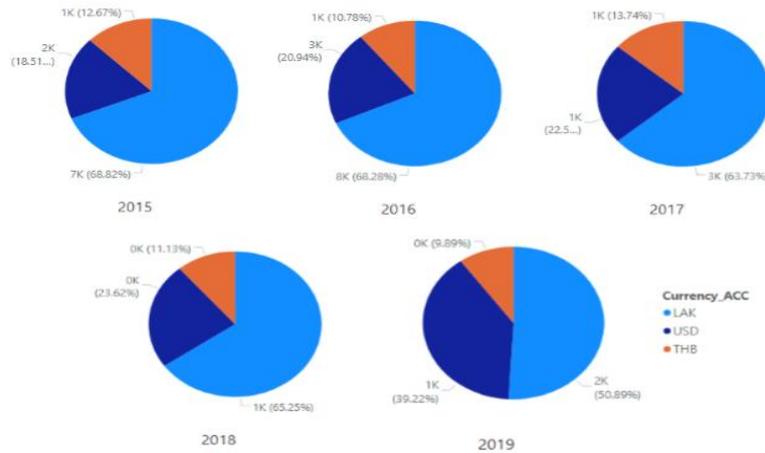


Fig. 5 Pie Chart showing account number different currencies of LAK, BATH and US\$ from 2015 to 2019

From total accounts, we divided into three currency money of LAK: 3,477 accounts, THB: 597 accounts and USD: 1,127 accounts. LAK was major currency compare to US\$ and BATH. The proportion of US\$ and BATH was similar from 2015 to 2018, but was different in 2019 where about 39% US\$ were found.

VI. CONCLUSIONS

We examined OLAP system and topic models and extend to the table dimension which allows an analyst is more flexible with other standard dimensions in a multidimensional database. Using OLAP and combined with Microsoft SQL Server tools, the end user was simple to use and allows the user to create analyzes following by account type, time, and customer. Additionally, the analysis becomes more automatically in the analysis process by the end user. This study is one step ahead to solve the difficulties such as safe cost budget payment for add new plug in the BI function for core banking.

ACKNOWLEDGEMENT

S.K thanks to Lao construct Bank to provide data in this study.

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