WAREHOUSE-BASED FOREIGN TRADE INFORMATION SYSTEM

Myo Lin Tun, Aye Thida
University of Computer Studies, Mandalay
Kolatt1382@gmail.com

ABSTRACT

The demands of analytical processing for decision support may exceed the capabilities of systems processing daily transaction. OLAP (On-Line Analytical Processing) is used to trends, statistics and interesting rules behind data that can help in decision making. Data warehouse is integrated, subjective-oriented, time variant, and nonvolatile data repository for data analysis and decision making. This paper describes the Warehouse-Based Foreign Trade Information System. The goal is to report the Foreign Trade transactions in data Warehouse .The system is based licence, update, report, location, item, cost and type of export. The system will process the corresponding OLAP operation and display to the administrator. The final result of this system is displayed by using data and report process region on graph.

Keywords: On-Line Analytical Processing, multi-dimension data model.

1. INTRODUCTION

Nowadays, all over the world, people use Internet as a communication media. At the same time Web sites creation is very popular and people use Web sites to advertise their businesses and to expand their marketing. This thesis address the problem of in foreign trade data collected .The objective is to identify the transaction and analysis that are most likely to contain report. The goal is to report most of error using the less possible manual work. The data warehouse supports on-line analytical processing (OLAP), the functional and performance requirements of which are quite different type from those of the on-line transaction processing (OLTP) applications traditionally supported by the operational database. Data warehouse and related OLAP (On-Line Analytical Processing) technologies continue to receive strong interest from the research community as well as from industry. A data warehouse is a repository of information collected from multiple sources, stored under a unified schema, and which usually resides at a single site. Data warehouses are constructed via a process of data cleaning, data transformation, data integration, data loading, and periodic data refreshing. A data warehousing and OLAP are essential elements of decision support, which has increasingly become a focus of the database industry. OLAP applications typically automate clerical data processing tasks such as order entry and banking transactions that are day-to-day operations of an organization [6]. The transactions require detailed, up-to-date data, and read or update a few (tens of) records accessed typically on their primary keys. Operational databases tend to be hundreds of megabytes to gigabytes in size. Consequently, the database is designed to reflect the operational semantics of known applications and to minimize concurrency conflicts. Data warehouses might be implemented on standard or extended relational DBMSs, called Relational OLAP servers. In contrast, multidimensional OLAP (MOLAP) servers are servers that directly store multidimensional data in special data structures (e.g., arrays) and implement the OLAP operations over these special data structures.

2. RELATED WORK

This paper is represented the OLAP processing result on data warehouse. A data warehouse is a database that stores information oriented to satisfy decision-making request [1]. Export is an important part of international trade Myanmar has

been implementing the obligations relating to trade facilitation where each and every group has adopted and negotiated with it's own way to facilitate trade [5]. OLAP is one of the reporting implementations in most data warehouse solutions [3]. An OLAP solution is sometimes misleadingly called a data warehouse. Data warehousing provides architecture and tools for business executives to systematically organize, understand and use their data to make strategic decisions [6]. An overview of the data warehouse design concepts that are part of automating schema creation [8]. Decision support places some rather different requirements on database technology compared to traditional on-line transaction processing applications.

3. DATA WAREHOUSE

The construction of data warehouse, which involves data cleaning and data integration, can be viewed as an important preprocessing step for data mining. Moreover, data warehouses provide on-line analytical processing (OLAP) tools for the interactive analysis of multidimensional data of varied granularities, which facilitates effective data mining. Furthermore, many other data mining functions, such as classification, prediction, association, and clustering, can be integrates with OLAP operations to enhance interactive mining of knowledge at multiple levels of abstraction. The data warehouse has become an increasingly important platform for data analysis and on-line analytical and will provide an effective platform for data mining. Data warehousing provides architectures and tools for business executives to systematically organize, understand, and use their data to make strategic decisions. A large number of organizations have found that data warehouse systems are valuable tools in today's competitive, fast-evolving world. In the last several years, many firms have spent millions of dollars in building enterprise-wide data warehouses. Data warehousing is the latest must-have marketing weapon- a way to keep customers by learning more about their needs. Data warehouses have been defined in many ways,

making it difficult to formulate a rigorous definition.

3.1. On-Line Transaction Processing (OLTP)

The major task of on-line operational database systems is to perform on-line transaction and query processing. These systems are called on-line transaction processing (OLTP) systems. They cover most of the day-to-day operations of an organization, such as purchasing, manufacturing, banking, payroll, registration, and accounting.

3.2. On-line Analytical Processing (OLAP)

OLAP is a process completed by people using tools facilitates the analysis of dimensionally structured business information. OLAP allows users to navigate data by drilling down to lower- level detail, drilling up to higher-level summaries, and pivoting. OLAP tools support some level of calculation. Data in a data warehouse has several attributes that differentiate it from data.

.
 (1)Roll-up
Table 1 describes roll-up dimension of export transaction. The roll-up operation performs aggregation on a data cube, either by climbing up a concept hierarchy for a dimension or by dimension reduction. It is challenging to efficiently implement such operations since it is both time and space consuming to compute spatial merge or overlay and save the merged or overlaid spatial objects. Roll-up corresponds to taking the current data object and doing a further group-by on one of the dimensions It is possible to roll-up the sales data, aggregated on city, additionally by product.

Table 1. Roll-up on time dimension

Licence No.	2008		
	Price ($)	Transport	Item Group
China	400,000	Air	Forest
Thai	532,000	Pipeline	Energy
India	350,000	Road	Animal
Bangladesh	284.20	Sea	Energy
⇧	Roll-up Dimension Time		⇧
Licence No.	Price ($)		

	Jan	Feb	March	April
China	4000	2000	3500	4800
Thai	3000	2500	4000	4000
India	4500	2200	3800	5000
Bangladesh	1800	2900	1700	3000

(2) Drill-down

Table 2 describes the drill-down of export transaction. Drill -down is the reverse of roll-up. It navigates from less detailed data to more detailed data. Drill-down can be realized by either stepping down a concept hierarchy for a dimension or introducing additional dimensions. The slice operation performs a selection on one dimension of the give cube, resulting in a sub cube. It can be viewed as a reverse operation of roll-up and can often be implemented by saving low-level cuboids, presenting it, or it performing appropriate.

Table 2. Drill-down dimension

Trade Zone		2008		
		License No.	Quantity	Item ID
Border Trade	China	443	1111	422180
	Thai	356	850	16667
	India	350	1000	22992
	Bangladesh	284	2222	46602

Drill-down Dimension

Post		2008		
		License No.	Quantity	Item ID
Thai	Tachileik	805	234	00442
	Myawaddy	934	781	05667
	Kawthaung	456	204	22962
	Myeik	108	452	22452

3.3. Star schema

The most common modeling is the star in which the data warehouse contains a large table. The data, with no redundancy and a set of smaller attendant tables one for each dimension. Fact table primary key has only one key column per dimension and each key is generated data efficiency. The benefits of star schema is easy to understand, reduces the number of physical joins and low maintenance. Drawbacks of the star schema are not explicitly providing support for attribute hierarchies. In Figure (1) has time

dimension, item dimension, branch dimension and location dimension. In time dimension has include day of weak, month, quarter and year. City, post gate and country are included in location table.
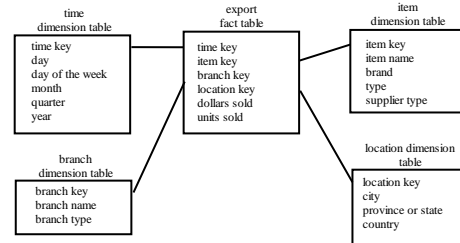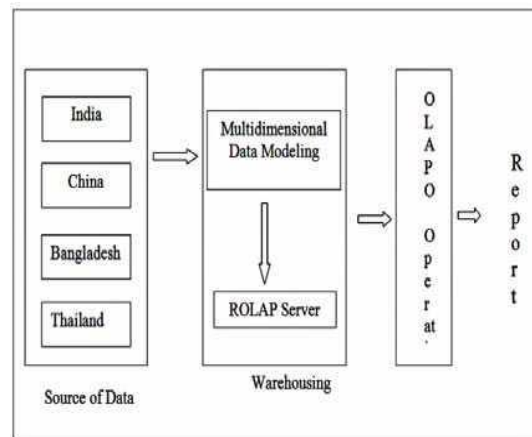

Figure 1. Star Schema of a data warehouse

4. WAREHOUSE-BASED DESIGN

Figure 2 describes how to develop a data warehouse and Online Analytical Processing. Firstly, what the main source of data is described. Then, show the detail transport process of data into a database to be created and how to report information using OLAP. Three main components in system definition are collection of data, Warehousing creation and OLAP operation. Once the data is extracted from the source systems, it is then loaded into a temporary store. The system work step by step processing. Data warehouse Administrator used OLAP to get the transaction data analysis. Administrator report analysis data for Foreign Trade Transaction present by detail

summary report. User can be see summary report ,day to day.

Figure 2. System design

5. EXPORT

Our motherland, Myanmar have been connected Foreign Trade (border trade) with four country border trade area, India, China, Bangladesh and Thailand. The following is the same data explain about the principal of trade have export. In economics, an export is any good or commodity, transported from one country to another country in a legitimate fashion, typically for use in trade. Export goods or services are provided to foreign consumers by domestic producers. Export is an important part of international trade Export of commercial quantities of goods normally requires involvement of the customs authorities in both the country of export [4].

5.1. Historical background of Foreign trade statistics

In Myanmar, compilation of foreign trade statistics was made before independence of Myanmar (1948). They are organized according to the Trade Classification List (TCL) and published annually by Customs Department by the name of "Seaborne Trade and Navigation of Burma (Myanmar)". The last issue of the publication was for the final year, 1948-49.

5.2. Foreign trade transaction's form

Eleven attributes of foreign trade transaction's form are,

    (1)Item id,
    (2)Licence no,
    (3)Weight of trade goods,
    (4)Total cost,
    (5)Form id,
    (6)Company id,
    (7)Quantity,
    (8)Month/ Year

    (9)Post/Place
    (10)Type of Export and
    (11)Stock number

5.3. Mode of transport

Compile trade statistics by mode of transport based on Export declaration form [4],
    (1) Air
    (2) Sea
    (3) Road
    (4) Pipeline

6. MULTI-DIMENSION DATA MODEL

A multidimensional database or a multidimensional database management system (MDDBMS) implies the ability to rapidly process the data in the database so that answers can be generated quickly. A multidimensional database (MDB) is a type of database that is optimized for data warehouse and online analytical processing (OLAP) applications. Multidimensional databases are frequently created using input from existing relational database. relationship between them. Such a data model is appropriate for on-line transaction processing. The data warehouse, however, requires a concise, subject-oriented schema that facilities on-line data analysis. OLAP services provide a wide variety of possible views or a multidimensional conceptual view of the data by supporting a dimensional aggregation path. OLAP is one of the reporting implementations in most data warehouse solutions. An OLAP solution is sometimes called a data warehouse solution.

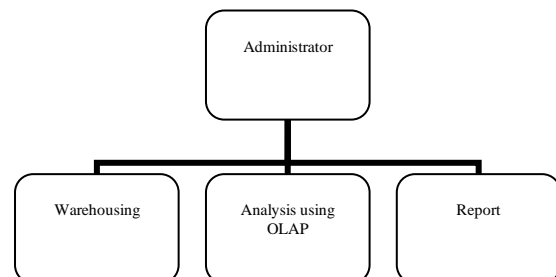### 6.1. Administrator process design

Figure 3. Administrator process

Figure 3 described how to work Administrator to describe process and show analysis of the result report. First, Administrator checked the type of export (place, country, product company id and licence) to load from the data warehousing. Administrator load data from warehouse using OLAP process and then get the transaction of report data analysis.
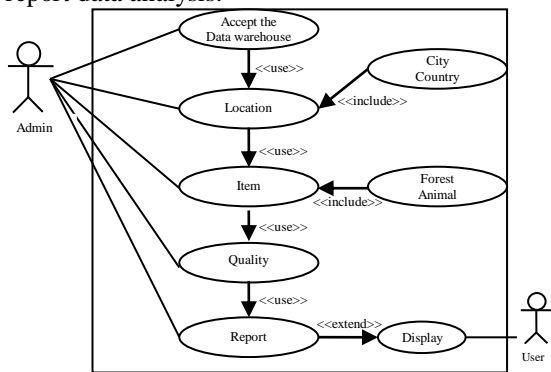

Figure 4. Use case diagram for system

In Figure 4, there are two actors. These actors are administrator and user. Administrator can review and load data from source database to OLAP process. User can review and summary report data and conclusion foreign trade.

7. IMPLEMENTATION RESULT

7.1. Choosing detail data for processing

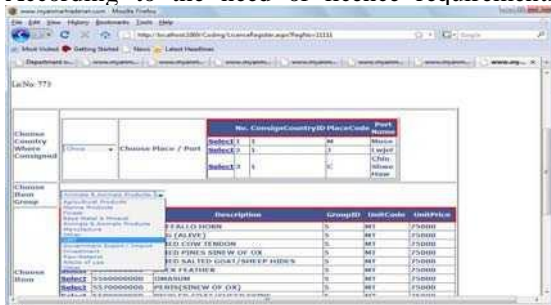According to the need of licence requirements

Figure 5.Choose the consign country and port

7.2. Choosing quantity and mode of transport

After choosing a group of type administrator or user can be choose export quantity and then

Figure 6.Choosing quantity and mode of transport

7.3. Report process

Figure 7.Report process

CONCLUSION

This paper enables the analysis and transaction process foreign trade transaction Report from the Administrator OLAP processes to summary Report using OLAP. It must be noted that the management has a very active role to play in ensuring. This requires careful analysis of the aids currently on the market. Central Strategic Organization (CSO) has always been trying to accelerate the foreign trade sector.. According to structural changes of Gross Domestic Product (GDP) by sector, trade sector occupies the second place in the national accounts except Agriculture sector. Now trade of export has been presenting summary report for daily, weekly, monthly and yearly of foreign trade transaction. In finally a good source of reference on data warehousing and OLAP is the data warehousing information center.

REFERENCES

[1] Alejandro Gutierrez, Adriana Marotta. '' An overview of Data Warehouse Design Approaches and Techniques.'' October 2000
.
[2] Embassy of Union of Myanmar-Islamabad ''Export Oriented Industries'' Myanmar in benefit. http://www.

Administrator. This system gives how to work Warehouse and support OLAP. And then

Border trade.com/ export in Myanmar.
[3] Leon Gong, Donna Venditti ''DB2 Data Warehouse OLAP services, part1: Starting out with OLAP services''22-June 2006.

[4] Mr.San Myint "Country Paper" Internaional workshop on country practices in compilation of intrtnational merchandise trade statistics, Bangkok,Thailand,12-15 December 2006.

[5] Mr. Myo Oo'' National Paper   Experience: Myanmar ''Expert Meeting on Trade Facilitation as an Engine for Development. Geneva, 21-23 Sep 2005.

[6] Surajit Chaudhuri and Umershwar Dayal, "An Overview of Data Warehousing and OLAP(On-Line Analytical Processing)Technology," 26:1, pp. 65-74, 1997.

[7] Wu, M-C., A.P. Buchmann''Research Issues in the Data Warehousing.'' Submitted public.

[8] Widom, J. ''Research Problems in Data Warehousing.'' *Proc.4 Intl. CIKM Conf.*,21-25,June 1995.