E-GOVERNMENT MONITORING INVOLVED DATA AND INFORMATION FOR META-DATA AND DATA MART SOLUTIONS

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ABSTRACT - *This paper is used metadata to illustrate data terms and structure data depend of term of groups to obtain more understandable for eGovMon data, also to give high details about their data. As well as data mart is used as independent sub storage to keep eGovMon' department information in one small repository with high mining and analyzed. Therefore, data mart has stored summary information and details information which will be apply to swift access for eGovMon data and information with rapidly respond for their staff inquiries. However, decision making one of the big gaps in egovernment departments. Because it gives government's staff difficult to make a good decision. Additionally, till now there is no use for one of data warehouse tool to solve this issue. Thus we suggest as future studies, using decision support system like a data warehouse tool to fix this problem.*

Keywords: E-government, eGovMon, Data warehouse, Metadata, Data mart and OLAP, DM andOLAM.

1. INTRODUCTION

E-Government Monitor provides e-government's online services with effectively address to real needs of the citizens, businesses and governmental agencies. Therefore monitor system can give a better understanding of how to build good online service for citizens and enterprises by using open source tools to help to improve the quality of public web sites (eGovernment Monitor, 2012). E-government provides online service to citizen in anytime and anywhere through information communication technology (ICT) communication technique, information technology (IT) interface technique and internet website technique (Al-Hashmi and Darem, 2009). E-Gov has four such as Presence, interaction, transaction and transformation. E-Government goals to make the sharing among government and citizens (G2C), government and business enterprises (G2B), government and employees (G2E) and interagency relationships (G2G) more open, well-located, transparent, bi-directional, and less expensive (e-Government Primer, 2009). According to Inmon, he is father of data warehouse. That he said data warehouse is a subject-oriented, non-volatile, integrated, timevariant repository which collect all data and information from different source and save it in common warehouse (Inmon, 2001). Data warehouse compare of e-Government services quality and stored the results in four observatories: Accessibility, Transparency, Efficiency and Impact (ATEI). This way helps governments provide better services to citizens and improve interactions with business and industry with better government management. Business Intelligence (DWBI) is collection of technologies, applications and practices that use to gather combine and analyze huge of data and information from data warehouse and get useful knowledge and information from it. BI has many tools and techniques for business which use improve their works such as:

ETL: There are many companies develop ETL tools, such as Oracle and SAP. ETL is extract, transformand load that mean first the data extracts from multi databases, storage and documents then transfer this data into suitable form for new common warehouse by using special rules and tables. Finally the fit data will be load to the warehouse to be saved. ETL has not only these pervious benefits but it can take out clean and meaningful data from data sources then load it up to ROLAP or MOLAP in the data warehouse (Liu and Luo, 2010).

DBMS: It's one of the technologies that need to support present and future as well. Moreover, it is themain method for other techniques that uses for making decisions. DBMS in data warehouse it stores the data structurally inside warehouse by using many way of structure such as star schema structure with de-normalized dimension tables and snowflake schema structure with normalized dimension tables. These kinds of structure give the ability to make multidimensional view for information. The proper structure help to access to data easily and fast respond for queries (McKnight, 2002).

Metadata: It's the way to structure the information to provide explanation and description to create moreflexible use or manage for an information resource. Data about data is the second name for metadata because it gives illustrates the data from the data itself (Yang, and Liu, 2008). There are many types of metadata but the main three types. First descriptive metadata explains major resource such as title, author, abstract, keywords and references. Second structural metadata shows ability to use the aims with each other to, for example, how pages are used to write a book. Third administrative metadata manages a resource by using benefits of information, such as when and how file was made and which person allow to access this file (Understanding Metadata. 2004).

Data Mart: according to Inmon data mart is subset of repository receives its data and information from common warehouse but it is dependent from it (INMON, 2005). In other way data mart is small storage of data build to save the data and information for similar departments. The reason of data mart is to provide easier access of data and fast respond for queries. Moreover, data mart increases the departments' performance (Paulraj and Sivaprakasam, 2012).

OLAP, DM & OLAM: Online analytical process is one of DW tools use to analyze the information with multidimensional view in OLAP cube. Therefore it gives information three dimensions. (Christanto *et al.*, 2012). on the other hand data mining (DM) tool uses to mining the data by extract knowledge from amount of data (Sair *et al.*, 2012). Online Analytical mining is tool created by using OLAP and DM techniques for obtain on information which will be suitable for decision support system (Han, 1997).

DSS: Decision support system uses to choose the better decision for company, which depends on its information, knowledge, reports and analytic data that comes from OLAP, DM and OLAM. This system helps decision maker to get better understand of available decisions (Liu and Luo, 2010). Moreover DSS makes qualitative and quantitative for data by apply many of its models and techniques, therefore provides decision makers with useful information and solves unstructured and semistructured information (Margaritopoulus *et al.*, 2008). Thus, all of these tools give the ability for eGovMon to get high quality of data and information to provide better understand for egovernment online services. Moreover it make suitable structure for information and right way of distribute data depend on government's departments.

2. PREVIOUS WORKS DONE BY DIFFERENT AUTHORS

2.1 Data Warehouse Solution

The E-government monitor task will enhance large-scale web to standard of eGov services to the citizen. Therefore eGov services of ATEI going to be evaluated in automat way, in which a large amount of evaluation data will be produced. The constructed data warehouse needs to be met the increasing data storage demand while providing a high performance for the analysis of ATEI. Thus, it proposed a distributed data warehouse architecture which is outlined in
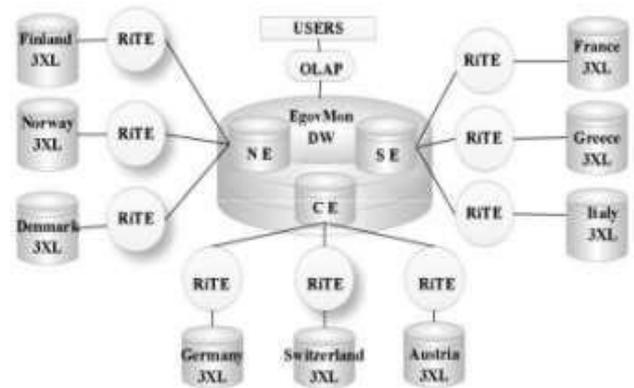
Figure 1.

Figure 1: eGovMon Data Warehouse

Egov Mon DW is data warehouse located in the center, which has different storages of data, such as the repository for Northern Europe (NE), Central Europe (CE) and Southern Europe (SE) and so on, and each repository can be physically distributed on different servers and geographically in different places, but these separate data repositories function as one logical data warehouse by queries. For resources Right Time ETL (RiTE) collect and extract the data from several databases of different countries, such as France, Greece, Italy, Germany and so on. Nevertheless, there is one ETL for each country's database even if the country is big or small (Liu and Luo, 2010).

On one hand data governance depend on the trust and on the other hand metadata is often exploited measure data quality to allow combination of services that government provided online for citizen and to guarantee compliance to system. E-government metadata Governments start use e-government services to provide public with better services and to share public data. But this both succeed depend on data governance and data quality (Margaritopoulus *et al.*, 2008). Metadata inside e-government repository has many different levels, such as term level uses to explain the meaning of a term, structure level uses to save groups of terms and reused it later and implementation level which has containing terms and structure implemented in e-services that works individually. The metadata model for e-governance depends on governmental function as an individual domain for example (name, person, and address). This domain has implemented within three structured layers (term-structure and implementation) which usually going to be developed in bottom-up or top-down (Myrseth *et al.*, 2011).

Recently a lot of countries start to give more attention about information sharing technique and try to improve it in there eGov system (Lü, 2007). Metadata for information sharing in E-government Sharing government's data and information between agencies leads to enhance the e-services by getting knowledge from this information. But still

all of this cares there is a weakness in information sharing and interaction among egovernment agencies in several types of G2G, G2E and G2C (Jing and Pengzhu, 2009). Even if there are high quality of information sharing there is difficult to understand what they shared from other departments. Thus metadata gives ability to get better understand from data or information itself by structure them in the right place then discover the hidden information inside the data (Coleman *et al.*, 2009).

2.2 Data Warehouse Tool for Egovernment Online Services

Recently, analyzed and processed information use to achieve a high level of matching of user needs. Because it's difficult to the user to deal with huge of data and to get better knowledge and understand for it. Therefore it leads us to the biggest gap in traditional database technologies because database can't be suitable for user requirement from information. Thus, it's so important to create e-government online services supported by data warehouse techniques and tools, as shown in figure2.
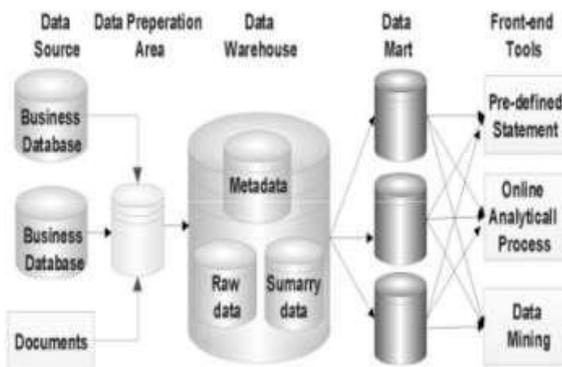

Figure2 Architecture of e-government data

Important part in data warehouse system of egovernment is that front-end tool layer, because it provides e-government with great analysis and application tools. These tools are worth for egovernment's information. Thus, data warehouse is not only huge storage of data. Inside the frontend tools many of reporting tools, analysis tools, mining tools, data warehouse application market development tools, as well as query tools. All of these tools run by the users to provide multidimensional data query to them also make analysis operations available in order to create decisions easily. Data warehouse techniques with e-government can achieve staff requirements fast with easy analysis for their complex of queries and show the understand result. Therefore, that will create strong decision making for egovernment staff (Cahen and Yin, 2001).

In aim to compare between data warehouse and database depend on analysis feature, it's obvious that data warehouse has good ability to deal with huge of integrated information,

analysis and will be extracted inherent, in order to excavate from deep level information (Liu and Li, 2009). Also data warehouse has huge space of repository can use to develop information services for e-government. In the data warehouse e-government system, by the data warehouse and data mart further extracted provide users with data analysis and data mining functions, where the data warehouse has many subjects of detailed time data and summarized data, these data has collected from different government sources. In general data mart saves the summarized information and detailed information for one subject domain for each government department, where the data might be a subset of one data warehouse (Liu and Li, 2009).

2.3 Metadata and data mart techniques for eGovMon data warehouse system Metadata technique

The government data and information in data warehouse repository are clean and clear because of right time ETL. E-government monitor data and information extracted then loaded into common warehouse by RiTE for each database. There are two ways to structure data inside warehouse tables, such as denormalized dimension tables by star schema or normalized dimension tables through snowflake schema. Data structure in tables give the ablity for easier access for data and fast respond for user queries. But the eGovMon data will be store randomly in the data warehouse. Therefore, metadata uses to give perfect structure for e-government data and information by gives details about term of e-government monitor data and save this data as group of terms then containing and structure this information. Thus, Metadata techniques will increase data quality for eGovMon data and it will give better understand and explanation for the data itself.

2.4 Data Mart technique

Data mart technique uses subset of storage store the data depend on eGovMon's departments. Data warehouse repository is very huge storage; it can save all current e-government monitor data and information with historical data in one common place. Thus, that will make some of delay for answer staff queries from whole of this among of data, information, documents and reports. Moreover, data mart store summarized information and derails information for one subject in eGov Mon. that make easy analyzing and manning for data also with high-speed of reply for inquiries and high performance by using data warehouse front-end tools, such as OLAP, DM & OLAM. This shows in Figure3.
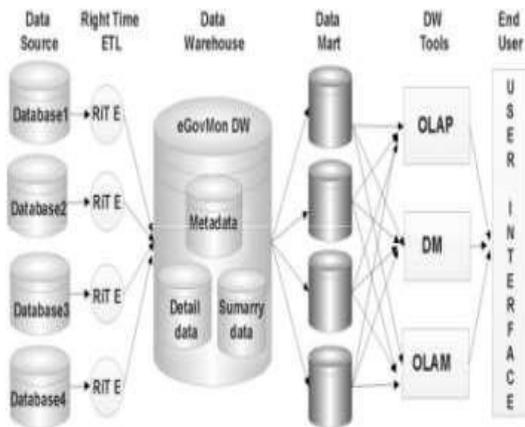
Figure3 Architecture of eGovMon data

3. CONCLUSION:

Data warehouse is replacing database in a lot of computer science technologies not only because of data warehouse tools and the huge storage, but also because of analysis, understandable, mining and fast access for government data. Therefore, our paper created architecture for e-government monitor supported with data warehouse tools and technologies. It needs better understand for e-government's data and information with quick respond for their queries. But still there are more issues such as distributed data, structure data and design data. However, Meta Data in data warehouse (DW) uses to explain the data from itself because of that it called data about data. This paper proposes data warehouse eGovMon architecture to get better realize of data by using data warehouse techniques and business intelligence (BI) tools such as ETL, DBMS, OLAP, DM and OLAM. eGovMon with BI tools make the information more understandable with good quality of data to improve the performance for e-government service system. Also metadata technique and data mart small storages technique are structured and distributed e-government information properly.

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