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# Database and Data Warehouse Status for e-Government System in Different Ministries of Nepal

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**Abstract--** *The e-Government Data Warehouse (eGovMon DW) is built as a data repository in different ministries for e-Government System in Nepal. We propose Data Warehouse (DW) architecture for e-Govt system to implement effective e-Gov system in Nepal by analysis current status of DW system and its implementation and effectiveness. A promising new star on the IT horizon, Data Warehousing overcomes many of the shortcomings of early Decision Support System (DSS) and Executive Information System(EIS). A key to successful Data Warehousing though is to understand that a Data Warehouse is not just a collection of technologies but architecture. This study explains the status and effectiveness of Database Management System (DBMS) and DW in all ministries for e-Gov system in Nepal. This DW architecture uses DBMS, e-Government operational system as the data source, and a right-time ETL tool to populate the data. Through this proposal, we give the potential research interests and issues for our future work for successful e-Gov system in Nepal.*

**Keywords--** *eGovMon, DW, ETL, DSS, EIS*

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## I. INTRODUCTION

A data warehouse is a centralized repository that stores data from multiple information sources and transforms them into a common, multidimensional data model for efficient querying and analysis. According to William H. Inmon, a data warehouse is a “subject-oriented, integrated, time varying, non-volatile collection of data in support of the management’s decision-making process” (Inmon, 1996).

Data warehouse provides an excellent approach for transforming the huge amounts of data that exist in the organizations into useful and reliable information for getting answers to the questions and to support the decision making process. Organizations have huge amounts of data but have found it increasingly difficult to access it and make use of it. This is because, it is in many different formats, exists on many different platforms, and resides in many different file and database structures developed by different vendors. Complex queries can be conducted through the data warehouse to analyze this huge information. When a user query is submitted to the warehouse, all relevant historical data addressing that query is readily available to support in the

decision-making. A data warehouse is storage of convenient, consistent, complete and consolidated data, which is collected for the purpose of making quick analysis for the end users who take place in Decision Support Systems (DSS). These data is obtained from different operational sources and kept in separate physical store. A data warehouse is not only a relational database that contains historical data derived from transactional data but also it is an environment that includes all the operations and applications to manage the process of gathering data, and delivering it to business users such as extraction, transportation, transformation, and loading (ETL) solution, an online analytical processing (OLAP) engine, and client analysis tools.

## II. OBJECTIVE

This study focuses on how governmental ministry organizations can implement data warehouse for e-Gov system that can help to predict overall organisation performance and activity for making healthier decision for government activities through ICT. At the same time, the study will also focus on different theoretical and implemented architectures, which architecture suits the best for e-Gov system in Nepal. Thus, the main objectives of the thesis are-

- To identify how many ministries in in Nepal implements the data warehouse and database concept.
- To develop architecture of the data warehouse being implemented in the different ministries.
- To identify the supplementary benefits acquired by the different Ministries by implementing DBMS and DW.
- To identify the success factors of different architecture of the DW.
- To find e-government ranking and status of Nepal in asia and all over the world.

## III. COMMON ARCHITECTURE OF DATA WAREHOUSE SYSTEMS

Data warehouses and their architectures may vary depending upon the specifics of an organization's situation. Different data warehousing systems have different structures. Some may have an ODS (operational data store), while others may have multiple data marts. Some may have a small number of data sources, while others may have dozens of data sources. So, it is more reasonable to present the different layers of data warehouse architecture rather than discussing the specifics of any one system. Three common architectures are:

- Data Warehouse Architecture (Basic)
- Data Warehouse Architecture (with a Staging Area)
- Data Warehouse Architecture (with a Staging Area and Data Marts)

## IV. GENERAL DATA WAREHOUSE ARCHITECTURE

One of the data warehouse requisites is to be able to answer to fast queries. For this, data warehouse must have an architecture that allows gathering, manipulation and presentation of data quickly and efficiently. One of the most general architecture of Data Warehouse is shown below.

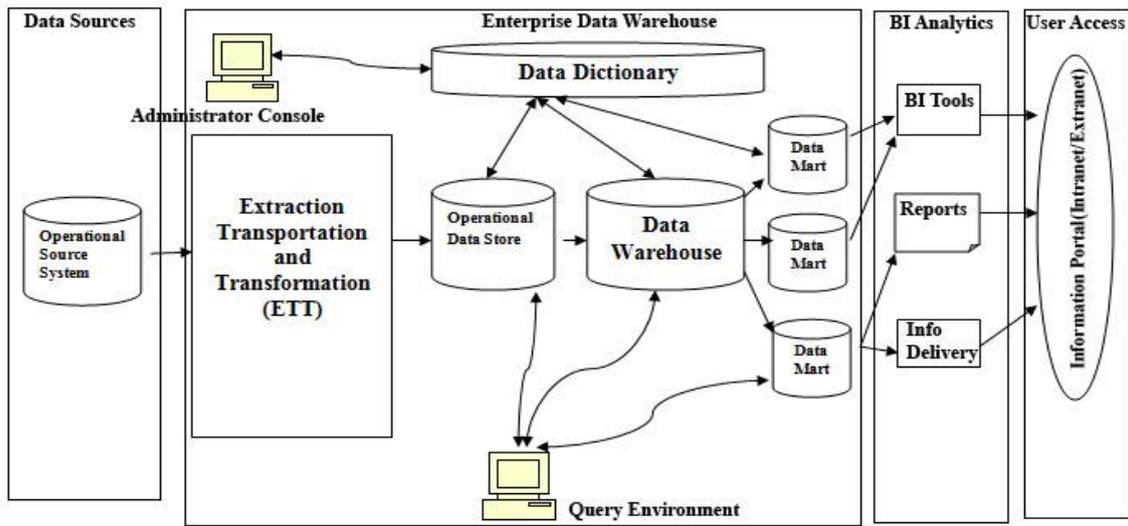


Figure 1 : Data Warehouse Architecture

### V. PROPOSED DATA WAREHOUSE ARCHITECTURE FOR E-GOVERNMENT SYSTEM IN NEPAL

This architecture is best suited for e-government system in Nepal. Main concept of this architecture is to provide e-government platform to GOV of Nepal. Architecture is developed with help of succeed e-government architecture, which is used to store different government related data and activities in common repository for analysis and effective decision making.

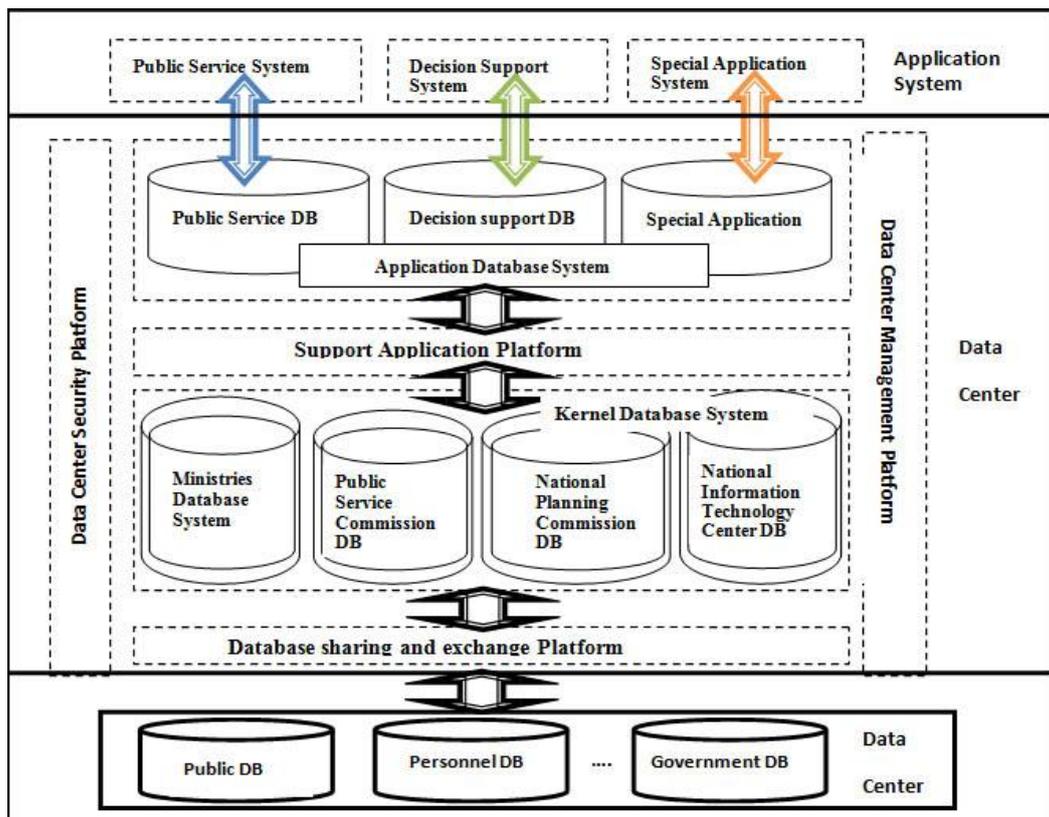


Figure 2: Proposed Architecture of Data Warehouse Center for e-Government system in Nepal

## VI. EXISTING DATABASE AND DATA WAREHOUSE STATUS IN NEPAL

Data warehouse implementation in Nepal is not implemented to a great extent. Only few of the large corporate organizations have implanted the data warehouse concept. Most of the organizations claim that they have implemented the data warehouse but, minute study has shown that they have used simple database system to for organizing and analyzing the data. In Nepal, big corporate organizations like Data Centers of Singh durbar, Agriculture Bank Development, Nepal Telecom, Ncell mobile telecommunication, Ministry of finance, Nepal Stock Exchange etc. have been seen to make extensive use of data warehouse. They have used this technology to make analysis of their business and then generate information and reports for the sound decision making process by the top level of management.

In fact, the giant organization like Nepal telecommunication have used data warehouse to keep track of all its customers , their billing system , their mobile customers and have kept track of their business performance. It has used the reports and data generated by the data warehouse to make important decision for their business progress.

However, considering the importance of the data in the different organizations, Nepal government has tried to make an attempt to implement this technology for the fast and efficient official works. Tasks are being done to set up the system in different governmental organizations to provide easy access of the information to Nepalese people all around the country. Never the less, the task is still in the verge of competition and has not been fully complete. Not much of the organization has understood the importance of the data warehouse at Nepal. They are still using the flat database system in their organizations for keeping track of the important information. However, the government of Nepal has realized the important of ICT and had made sound decision to make good implementation of ICT. So, it believed that most of the governmental organizations together with the private organizations will be implementing the data warehouse in the near future. This would definitely help the organizations accomplish their sound mission and establish professional relationship with the commercial community the public and other state organizations.

## VII. IMPEMETATION OF DATABASE AND DATA WAREHOUSE IN MINISTRIES OF NEPAL

The analysis starts from the survey of all the governmental organizations that have implemented the DBMS/data warehouse especially located at Singh Durbar. This gives us the foundation of how many of the Ministries in Nepal have made use of the data warehouse or DBMS technology. This in turn will help us to derive how much benefit the Ministry has obtained by using such system.

The table below lists out the total number of ministries of Nepal and that has been chosen for the analysis purpose.

TABLE1

LIST OF MINISTRIES WITH CONTACT DETAILED [4]

S.N	Name of Ministry	Address	Contact Detailed	Web Address
1	Ministry of Home Affairs	Singha Durbar	4211208, 4211214, homegon@wlink.com.np	www.moha.gov.np
2	Ministry of Education	Singha Durbar	1-4200340,4200390 infomoe@most.gov.np	www.moe.gov.np
3	Ministry of Finance	Singha Durbar	1-4211338 admindivision@mof.gov.np	www.mof.gov.np
4	Ministry of Foreign Affairs	Singha Durbar	1-4200182, 4200183 adm@mofa.gov.np	www.mofa.gov.np

5	Ministry of Peace and Reconstruction	Singha Durbar	1-4211550, 4211089 nfo@peace.gov.np	www.peace.gov.np
6	Ministry of Federal Affairs and Local Development	Singha Durbar	1-4200000,4200309 admindiv@mld.gov.np	www.mofald.gov.np
7	Ministry of Physical Infrastructure and Transport	Singha Durbar	1-4211782,4211931 moppwnp@ntc.net.np	www.mopit.gov.np
8	Ministry of Agriculture Development	Singha Durbar	1-4200046,4211961 memoac@moac.gov.np	www.moad.gov.np
9	Ministry of Information & Communications	Singha Durbar	1-4211556,4211647 moichmg@ntc.net.np	www.moic.gov.np
10	Ministry of Urban Development	Singha Durbar	1-4211673 info@moud.gov.np	www.moud.gov.np
11	Ministry of Law, Justice, Constituent Assembly & Parliamentary Affairs	Singha Durbar	1-4211987 molaw@wlink.com.np	www.moljpa.gov.np
12	Ministry of Forests and Soil Conservation	Singha Durbar	1-4211567 mfscmed@ntc.net.np	www.mfsc.gov.np
13	Ministry of Culture, Tourism and Civil Aviation	Singha Durbar	4211846, 4211711 motca@ntc.net.np	www.tourism.gov.np
14	Ministry of Land Reform and Management	Singha Durbar	1-4211666 lrm@most.gov.np	www.molrm.gov.np
15	Ministry of Science, Technology and Environment	Singha Durbar	1-4211661,4211641 info@most.gov.np	www.moste.gov.np
16	Ministry of General Administration	Singha Durbar	1-4200367,4200368 info@moga.gov.np	www.moga.gov.np
17	Ministry of Health and Population	Singha Durbar	1-4262802, 4262543	www.mohp.gov.np
18	Ministry of Women, Children and Social Welfare	Singha Durbar	1- 4241728 mowcsw@ntc.net.np	www.mowcsw.gov.np
19	Ministry of Labour & Employment	Singha Durbar	1-4211889,4211991 info@moltm.gov.np	www.mole.gov.np
20	Ministry of Industry	Singha Durbar	1-4211579 info@moi.gov.np	www.moi.gov.np
21	Ministry of Irrigation	Singha Durbar	1-4211426 info@moir.gov.np	www.moir.gov.np
22	Ministry of Youth and Sports	Kamlal Pokhari	1 4416788 info@moys.gov.np	www.moys.gov.np
23	Ministry of Energy	Singha Durbar	1-4211516 info@moen.gov.np	
24	Ministry of Cooperatives & Poverty Alleviation	Singha Durbar	4211860, 4211690, 4211576	www.mocpa.gov.np
25	Ministry of Defense	Singha Durbar	4211289, 4211294 info@mod.gov.np	www.mod.gov.np

26	Ministry of Commerce and Supplies	Singha Durbar	1-4211631 moc@wlink.com.np	www.mocs.gov.np
27	Office of the prime Minister and Council of Ministers	Singha Durbar	4211000 info@opmcm.gov.np	http://www.opmcm.gov.np/en/

The parameters that were taken into the consideration for the analysis of the thesis are the presence of DW in different Ministries, the different tools used for the implementation of DW and DBMS, purpose of such system in the different Ministries, performance analysis and individuals level of satisfactions, difficulty faced for not implementing such system, expected technical benefits, importance of implementing the data warehouse system over coming years.

### VIII. STATUS OF THE DATABASE AND DATAWARE HOUSE SYSTEM

Most of the Ministries have recognized the analytical power that a DBMS and data warehouse foundation can provide, but the technology has been hardly used across the Ministries as it should be. Data warehouse has not been served as the primary foundations for the data storage. Only about two or three of the governmental organization have been using its simple concept but not actually the system. However, many of the Ministries have been thinking of using the GIDC for this purpose. The chart below shows the presence of IT department at all the Ministries of Nepal.

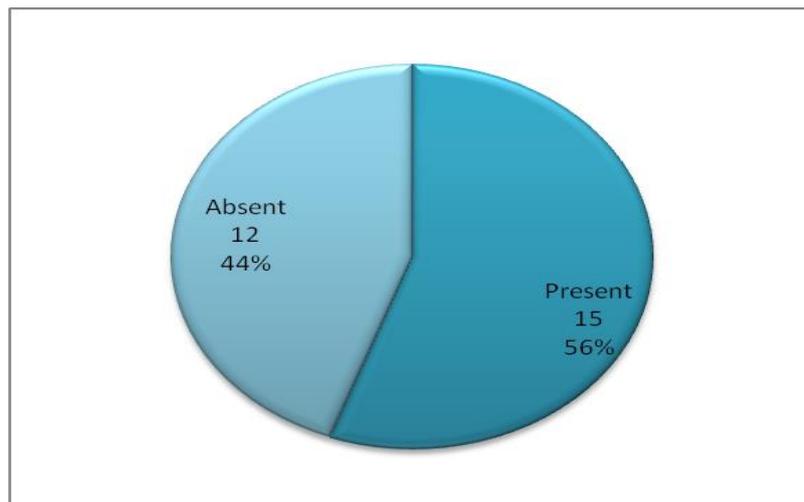


Figure 3: Presence of IT department at Ministries of Nepal

Most of the organizations have in-house customized systems mainly used for the information storage and analysis purpose. It is not that the data warehouse is under utilized to reach the ministries. In fact, 56% of the Ministries in this survey have deployed the concept of DBMS /DW concept for managing the data and information storage and the analysis purpose. Remaining 44% of the government Ministries have not reached the use of even simple DBMS. All of the other Ministries use the paper based system for storing and analysis of the data. Many of the Ministries of Nepal have not realized the importance of organizing the data and keep them in the organized form in the computer system. However, few of them have to deal with a

large volume so as to extract useful information for the future planning. Understanding, its importance about 16% of the present Ministries are planning for the implementation of the Data Warehouse in the near future.

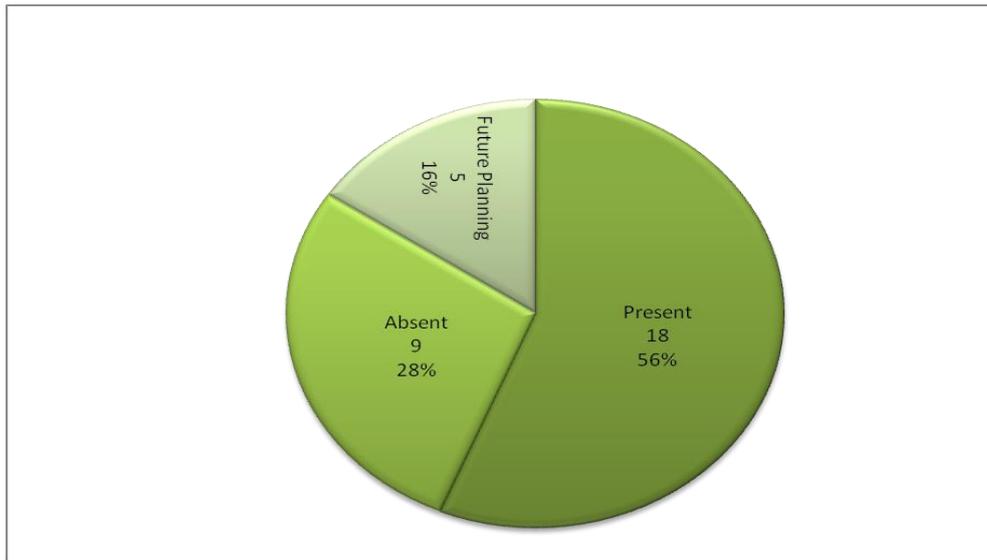


Figure 4: Status of Data Warehouse/DBMS in different Ministries of Nepal

### The Primary Data Source

Most of the Ministries use different data sources for keeping the records of the different sectors. However, majority of them have not made the implementation of the DBMS /DW. Most of them at present have been using paper based documents for keeping the information and records of the different sectors. Only few of the Ministries have made use of the computer system for the storage of the information in the digital format. According to the survey, it has been seen that few of the Ministries have not even realized the importance of the DBMS/DW. They have being using the paper based documents for storing the important official documents. Majority of them i.e. 34% of the total ministries can be seen to use Ms Excel and about 33% Ms Word for the keeping the information. The primary sources of the data are taken and then stored in the different formats by the different Ministries of the Nepal are in the format shown in the chart.

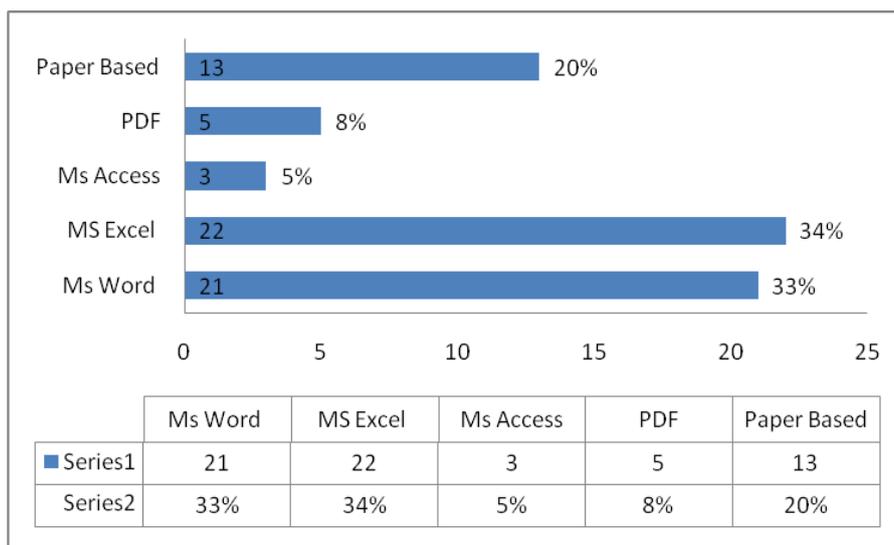


Figure 5: Primary Data Sources Used By Different Ministries of Nepal

**Purpose of the Database and Data Warehouse**

It is seen from the survey that not all of the ministries have implemented the DW / DBMS system for the warehousing purpose. But however, there are most the ministries that have realized the importance of the DW system and have tried their best to implement it and use for the different purpose. The different purpose for which the DW/DBMS system have been implemented and used is shown in the given chart. According to all the surveyed ministries, about 22% of them have not used DW system for any purpose. This is because the Ministry has not implemented the system. About 22% of the total Ministry 22% of them uses DW/DBMS for just data reporting purpose. 15% of the total ministries use the system for records keeping where as about 11% of them uses for planning and presenting the information in the web for the visitor's access of information.

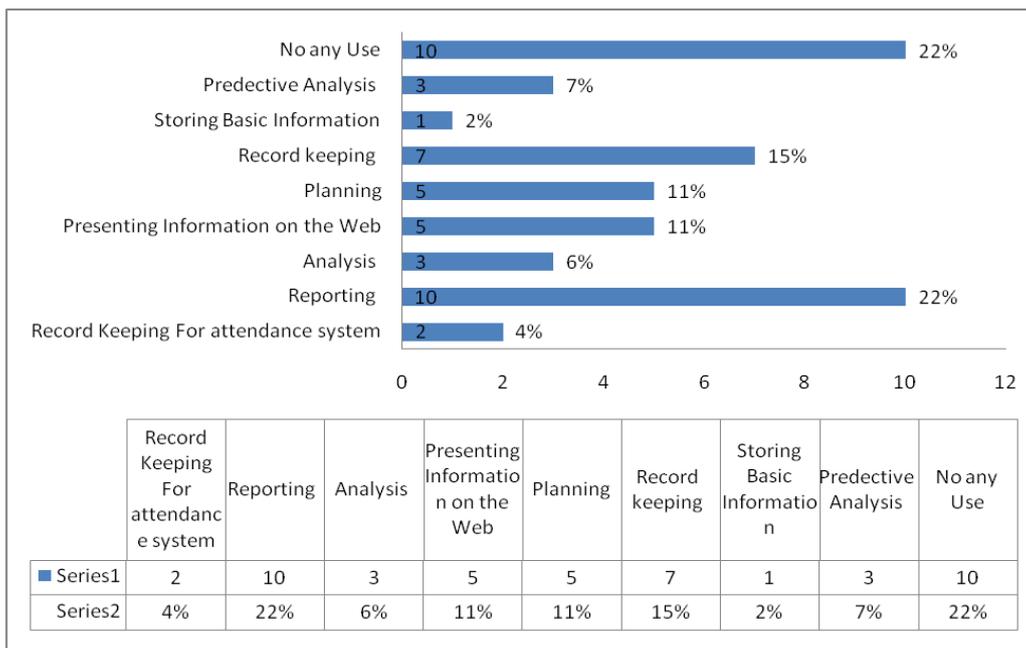


Figure 6: Purpose of DW/DBMS

**IX. CONCLUSIONS**

In this study the primary task was to investigate the DBMS and DW system of different Ministries uses for the storage of data, their designing and their implementation and effectiveness in different governmental organizations of Nepal. Many of the governmental organization (Ministries) have not made the proper use of the DW for the storage of the information. Few of them are still implementing the use of the paper based system for storing the official records and the important data. This is has led into inefficiency of drawing the results for the generating the important reports and making comparative study for the planning process. Besides the problems and advantages, the use of a DW/DBMS system presents several potential advantages for the different Ministries of Nepal, including timely access to evaluate data. The use of a DW allows the Ministries executives and the top level personals to use information in making appropriate decisions making process, planning process and deriving the compared results. At present, most of the ministries have realized the importance of ICT and planning to empower each of the departments of the Ministries with DW/ DBMS system. About 16% of the total ministries are planning to implement the warehousing system in the future for e-Gov system.

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### REFERENCES

- [1] Corey, M. J. (1997). *Oracle Data Warehousing*.
- [2] Data Warehousing – Backup [http://www.tutorialspoint.com/dwh/dwh\\_backup.htm](http://www.tutorialspoint.com/dwh/dwh_backup.htm)
- Xuanzi Hu, *Data Warehouse Technology and Application in Data Centre Design for E-government*.
- [3] <http://www.sap.com/solutions/sapbusinessobjects/sme/reporting/crystalreportserver/index.epx>
- [4] <http://www.nepal.gov.np>
- [5] <http://www.aurora-consult.com.au>
- [6] <http://unpan3.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2014>
- [7] <http://www.intechopen.com>