

Department of Finance

Information Warehouse Data Integrity Review

June 1998

*This document can be made available in
alternative formats, such as large print,
Braille, or audio tape, by calling 296-1727.*

**Financial Audit Division
Office of the Legislative Auditor
State of Minnesota**

98-36



STATE OF MINNESOTA
OFFICE OF THE LEGISLATIVE AUDITOR
JAMES R. NOBLES, LEGISLATIVE AUDITOR

Senator Deanna Wiener, Chair
Legislative Audit Commission


Members of the Legislative Audit Commission


Mr. Wayne Simoneau, Commissioner
Department of Finance

We have audited selected areas related to the Department of Finance's information warehouse, as further explained in Chapter 1. We emphasize that this has not been a complete audit of all aspects of the information warehouse. Our audit scope focused on the integrity of data in the information warehouse. The following Summary highlights the specific audit objectives and our conclusions. We discuss these issues more fully in the individual chapters of this report.

We conducted our audit in accordance with the *Government Auditing Standards*, as issued by the Comptroller General of the United States. These standards require that we obtain an understanding of management controls relevant to the audit. These standards also require that we design the audit to provide reasonable assurance that the Department of Finance complied with the provisions of laws, regulations, contracts, and grants that are significant to the audit. Management of the Department of Finance is responsible for establishing and maintaining the internal control structure and for compliance with applicable laws and regulations.

This report is intended for the information of the Legislative Audit Commission and the management of the Department of Finance. This restriction is not intended to limit the distribution of this report, which was released as a public document on June 4, 1998..


James R. Nobles
Legislative Auditor


Claudia J. Gudvangen, CPA
Deputy Legislative Auditor

End of Fieldwork: March 16, 1998

Report Signed On: May 29, 1998

SUMMARY

State of Minnesota
Office of the Legislative Auditor
1st Floor Centennial Building
658 Cedar Street • St. Paul, MN 55155
(612)296-1727 • FAX (612)296-4712
TDD Relay: 1-800-627-3529
email: auditor@state.mn.us
URL: <http://www.auditor.leg.state.mn.us>

Department of Finance

Information Warehouse Data Integrity Review

Public Release Date: June 4, 1998

No. 98-36

Agency Background

The Department of Finance manages the state's accounting, budgetary, and debt management activities. The department maintains the state's accounting system and monitors controls to prevent unauthorized transactions. The commissioner of Finance, appointed by the Governor, directs the department's operations. Wayne Simoneau was appointed commissioner in October 1996.

Audit Scope and Conclusions

An information warehouse is a comprehensive collection of data that is structured to meet the ad hoc needs of decision makers. The primary goal of an information warehouse is to provide users with timely and flexible access to data. This access, when coupled with a simple reporting tool, gives nearly any decision maker the ability to make information out of vast amounts of data. The state of Minnesota's information warehouse began operations on July 1, 1995, under the direction of the Department of Finance. The information warehouse provides state agency managers with access to a wide array of accounting, procurement, human resource, and payroll data.

Our audit focused on how the Department of Finance controls the integrity of data in the information warehouse. Controlling the integrity of information warehouse data is critical because state agency managers use this data to make strategic and day to day business decisions.

We found that the Department of Finance has controls to ensure the integrity of data in the information warehouse. The department has both manual and computerized procedures to control the movement of data to the information warehouse. The department also has controls to protect information warehouse data from unauthorized changes.

**Department of Finance
Information Warehouse Data Integrity Review**

Table of Contents

	Page
Chapter 1. Introduction	1
Chapter 2. Controlling the Integrity of Information Warehouse Data	4

Audit Participation

The following members of the Office of the Legislative Auditor prepared this report:

Claudia Gudvangen, CPA
Chris Buse, CPA, CISA
Carl Otto, CPA, CISA

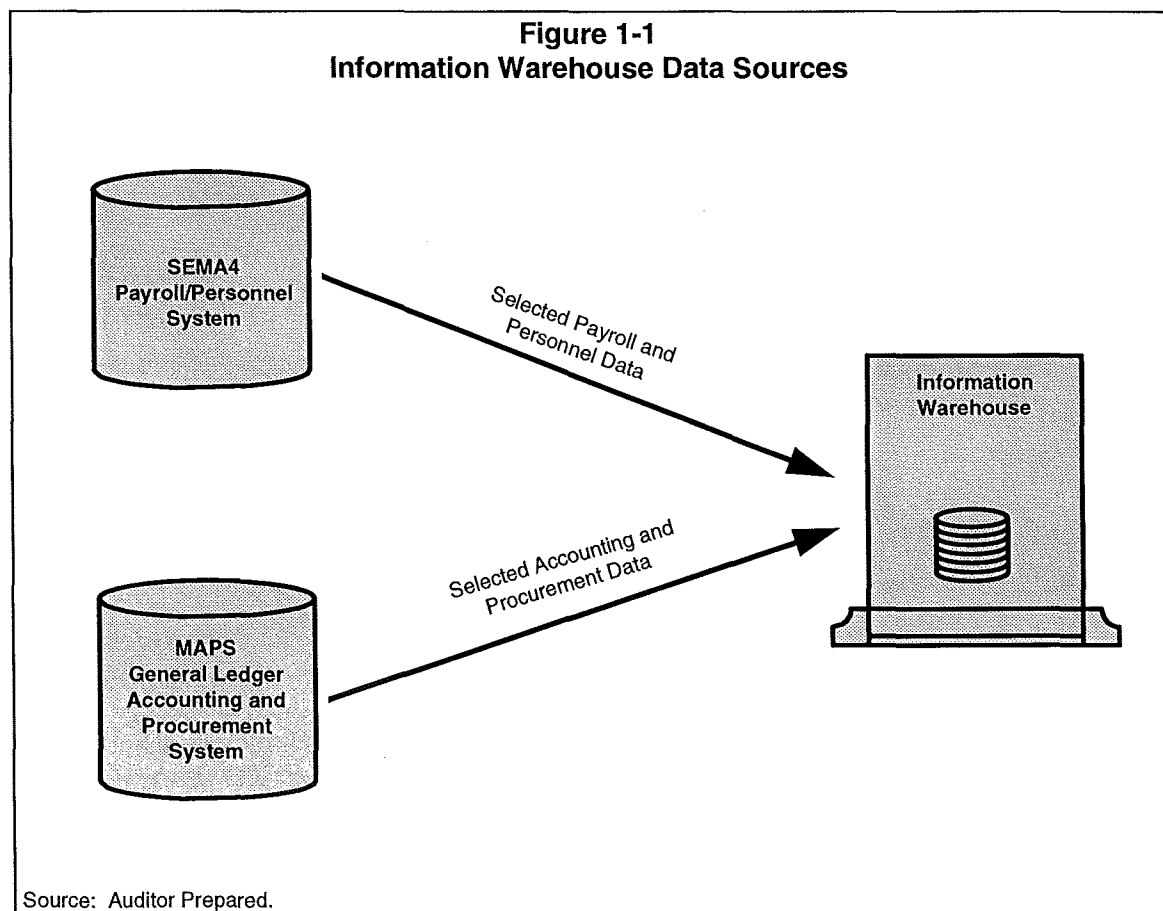
Deputy Legislative Auditor
Information Systems Audit Manager
Team Leader

Department of Finance Information Warehouse Data Integrity Review

Chapter 1. Introduction

An information warehouse is a comprehensive collection of data that is structured to meet the ad hoc needs of decision makers. The primary goal of an information warehouse is to provide users with timely and flexible access to data. This access, when coupled with a simple reporting tool, gives nearly any decision maker the ability to make information out of vast amounts of data.

The state of Minnesota's information warehouse began operations on July 1, 1995, under the direction of the Department of Finance. The information warehouse provides state agency managers with access to a wide array of accounting, procurement, human resource, and payroll data. As illustrated in Figure 1-1, the Department of Finance extracts this data out of different statewide computer systems. The department then converts this data to a common storage format and moves it to the information warehouse.

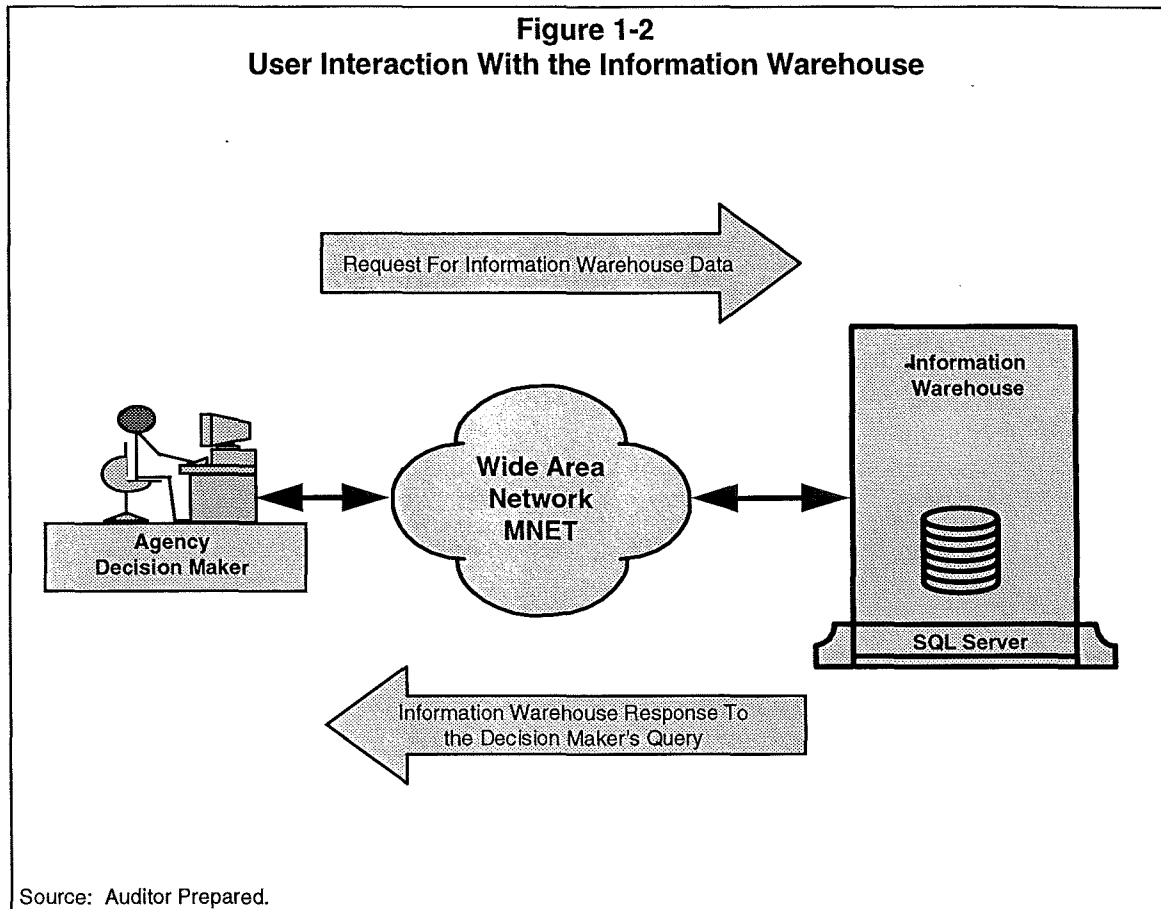


Agency decision makers access information warehouse data with simple reporting tools, such as Crystal Reports or Microsoft Access. This connectivity occurs over the state of Minnesota's wide area network, commonly referred to as MNET. Decision makers use their reporting tool to

Department of Finance

Information Warehouse Data Integrity Review

request detailed or summary data. The database management system underlying the information warehouse, called Microsoft SQL Server, processes these requests and returns the results. Figure 1-2 illustrates how decision makers use MNET and simple reporting tools to interact with the information warehouse.

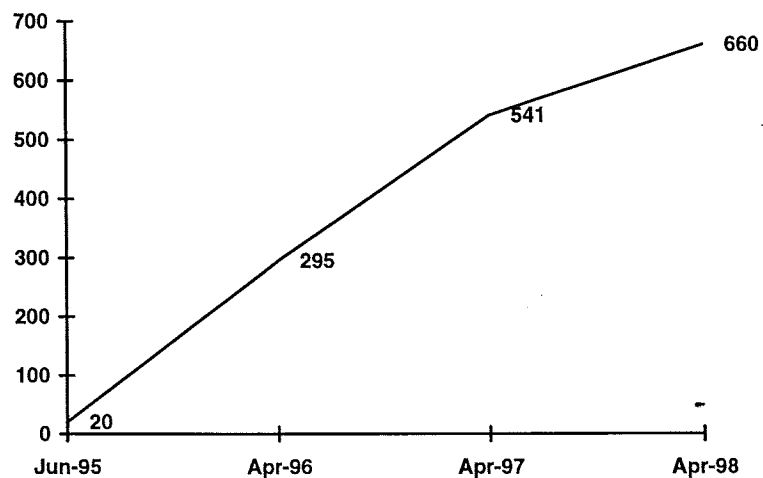


The information warehouse has now evolved into a critical business system for many state agency decision makers. In fact, some standard reports for statewide computer systems have now been eliminated because users can find the same data in the information warehouse. The information warehouse began operations in July 1995 with approximately 20 users. Since that time, 1020 different users have logged on to the information warehouse. Figure 1-3 illustrates the change in the number of information warehouse users from its inception through April 1998.

The volume and diversity of data in the information warehouse is also increasing. At the time of our audit, agency decision makers could access 96 different tables in the information warehouse. These 96 tables contained 2,604 different data elements. This wide variety of data provides agency decision makers with a great deal of flexibility to create their own ad hoc reports. The 96 tables also contained over 125 million rows of information. The largest table in the information warehouse is an accounting table called Balance Sheet Transactions. Agency decision makers can use this 49 million row table to report on 67 different data elements.

Department of Finance
Information Warehouse Data Integrity Review

Figure 1-3
Analysis of Information Warehouse Users
July 1995 Through April 1998



Source: Department of Finance Information Access Division.

Chapter 2. Controlling the Integrity of Warehouse Data

Chapter Conclusions

The Department of Finance has controls to ensure the integrity of data in the information warehouse. The department has both manual and computerized procedures to control the movement of data to the information warehouse. The department also has controls to protect information warehouse data from unauthorized changes.

State agency managers now use the information warehouse to make strategic and day to day business decisions. Therefore, controlling the integrity of this data is critical. State agency decision makers need to be able to rely on the accuracy and completeness of the data in the information warehouse.

Audit Objectives and Methodology

We used the Control Objectives for Information and Related Technology (COBIT) to help design our audit scope. COBIT is a set of generally accepted control objectives for information technology. As a day to day reference, COBIT allows managers and information technology professionals to gain access to control objectives used by organizations around the world.

Our audit focused on how the Department of Finance controls the integrity of data in the information warehouse. Specifically, we designed our work to answer the following questions:

- Does the department have controls to ensure that data transferred to the information warehouse is accurate and complete?
- Does the department have controls to protect warehouse data from unauthorized changes?

To answer these questions, we interviewed employees in the Department of Finance's Information Access Division. We also reviewed security documentation and procedures used to control the transfer of data.

Though this audit focuses specifically on data integrity, it is important to recognize that this is only one control objective that the department must address. The information warehouse contains a large amount of confidential data. Preventing inappropriate access to this confidential data is an important control objective. The department also must strive to minimize the time when the information warehouse is unavailable to users.

Department of Finance

Information Warehouse Data Integrity Review

Conclusions

The Department of Finance has controls to ensure the accuracy and completeness of data transferred to the information warehouse. There are two different approaches used to update information warehouse tables. In some cases, the department appends new data to existing tables. In other cases, the department periodically replaces entire tables with new data from statewide computer systems. We reviewed these procedures and found that the department closely monitors record counts to identify incomplete table updates. The department does not let state agency decision makers access information warehouse tables until all record count discrepancies have been resolved. The department's Information Access employees also work very closely with the information system professionals who support the statewide business systems. This interaction helps the Information Access team identify changes made to the statewide systems that may impact the information warehouse.

The Department of Finance also has controls to protect information warehouse data from unauthorized changes. The department only gives state agency decision makers the ability to view information warehouse data. Additional security clearances needed to change data are limited to only a select few individuals within the department's Information Access Division. These employees need additional clearance to maintain the information warehouse's hardware, software, and data.