

CASE STUDY AUDITING IN AN ODBC ENVIRONMENT: USING NORTHWIND DATA FOR IT AUDITING

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I. INTRODUCTION AND NEED FOR A LARGE DATABASES

One of the toughest issues in teaching an *Information Technology Audit* course is to find a large enough database to analyze in a vendor neutral environment. The difficulty is caused by the reluctance to release the actual data due to privacy and confidentiality concerns.

The instructor has two alternatives. One alternative is to create a small database with few records (usually, less than one hundred) and analyze this limited database. Since this data can be printed on one or two pages, any unusual transaction hidden inside this data can be seen by visual examination. What we are searching for can be observed without any query or computer assisted audit tool (CAAT). Therefore, the student rarely understands the power of query languages or popular Computer Assisted Audit Tools (CAATs), such as ACL and IDEA.

The second alternative is to employ a tutorial database provided by the Microsoft Corporation for its database products SQL Server and MS Access. This database includes data for a hypothetical retailer (Northwind Traders Inc.) with more than 2,000 records with hundreds of transactions. Though the Northwind data size is not comparable to actual databases of real life firms (thousands vs. millions), in our opinion, it is still large enough to give students advantages of computer based auditing.

II. HETEREGENOUS DBMS PRODUCTS AND THE ADVANTAGES OF ODBC

Auditing accounting data in a computerized environment often requires accessing databases in heterogeneous environments. The IT Auditor cannot determine which database environment he/she is going to deal with before an audit engagement is taken. Each audit client may have a completely different database product, such as Oracle, DB2, SQL Server, Informix, SyBase and Microsoft Access. Accessing, viewing, and analyzing databases from different vendors on different hardware and operating system platforms become a challenging task. Unfortunately, very few IT auditors are equipped with such a heterogeneous knowledge base.

Fortunately, *de-facto* DBMS industry standards SQL (Structured Query Language) and ODBC alleviates this difficult task.

SQL is a specially designed programming language for relational database management systems. Currently, any DBMS claiming to be "relational" can be analyzed, modified and queried with

SQL. Though there are numerous dialects of SQL, the standard SQL (SQL:1992, SQL-1999, SQL:2003 and SQL:2005), includes programming tools for Data Definition (DDL), Data Security (DSL), Data Manipulation (DML), and Data Querying Language. For an IT auditor, the most commonly used tool is the Query Language. The following provides an example to the English like structure of the SQL to identify the customers with a receivable of more than \$10,000.

```
SELECT *  
FROM customer  
WHERE receivable > 10000;
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Clearly, a structure is not difficult to learn. Any English speaking person may start querying any relational database in a very short period of time. Therefore, the Northwind database can be queried with SQL without difficulty.

Open Data Base Connectivity (ODBC) is the second reason why MS Access based databases may be used for instructional purposes. ODBC standard was originally developed by Microsoft in 1990s. It provides a universal vendor neutral data access to data stored in a variety of proprietary personal computers and mainframes. It is compatible with most popular operating systems. ODBC standards provide the possibility of porting data from one platform to others with few changes. Currently, almost all commercial DBMSs in Unix, Windows and Apple platforms support the ODBC standard and provide an ODBC driver. An ODBC driver is analogous to a printer or other hardware drivers, providing a standard set of functions for the application to use, and implementing DBMS specific functionality. An application that can use ODBC is referred to as "ODBC-compliant". Any ODBC-compliant application can access any DBMS for which a driver is installed.

III. AUDIT ASSIGNMENT USING THE NORTHWIND DATA

As mentioned above the Northwind data includes more than 2,000 transactions in 9 tables..The relations are shown in the appendix.

The database may be employed for a variety of purposes in an IT Audit class. Instructors can easily modify those tables to enter additional information which was not in the original Northwind database. For instance, in some years to create a payroll fraud a fictitious employee was added to the employee table. Students were expected to find this employee and the commissions associated with that person.

The following is a list of the audit assignments employed using the Northwind data:

- The calculation of sales revenue for a given period (e.g. during the fiscal year of 1997),
- Bad debt (by creating a list of aged receivables) ,
- Sales commissions and salaries received by salesman,
- The value of inventory , and
- Payables to different suppliers.
- Discovering fictitious employees
- Payroll fraud
- Misstated inventory valuation
- Misstated sales revenue.

An example of an audit assignment is included in the appendix.

NORTHWIND TRADERS AUDIT ASSIGNMENT (I)**BACKGROUND**

You are assigned to the Internal Audit Team of Northwind Traders, Inc. to verify the figures for sales revenue, account receivables, payroll and inventory figures for the fiscal year 1997. (The fiscal year covers transactions between **1/1/1997** and **12/31/1997**)

The Company

The company is located at One Portals Way, Twin Points, WA 9815. It was established in 1996 by Mr. Jack Twinhead. A copy of the Fall 1997 Catalog for Northwind is provided as **Attachment 1**. The product line includes 77 different food items in 8 different categories.

There are 9 employees who are paid a fixed salary plus a commission based on the orders processed.

At Northwind, orders are taken by a salesperson on the phone and entered into the system manually. At that time, there were no Internet sales. A sample copy of an order form is presented as **Attachment 2**.

Shipments are handled by three different companies, including Speedy Express, a wholly owned subsidiary. Freight costs are paid by the buyer. Because of the volatility of the market prices for these products, there are no fixed prices for the products. Salesmen are authorized to specify the prices when they take an order over the phone.

Northwind Traders, Inc. uses an accounting package, based on an **ODBC (Open Data Base Connectivity)** compliant Database Management System. This data can be analyzed independent of the accounting package with MS Access. **Attachment 3** shows 8 tables used in the revenue cycle and their relationships.

The Data

On May 10, 1998, the company headquarters was flooded after a powerful hurricane, leaving no paper document behind. Fortunately, a copy of an earlier backup dated May 6, 1998 was available for the period of **May 1996 through May 1998**. A copy of this back up is posted on the shared server disk (*For your analysis please make a copy of this database on your hard disk, otherwise you will have difficulty in saving your results*)

The accounting department has already determined the revenue for the fiscal year of 1997 as 691,261.24. The value of the inventory was \$63,499.50 as of 12/31/1997. Commissions paid were recorded as \$42,510.25.

Since you were the only audit team member with some knowledge of MS Access, you (were) volunteered to help the audit team in determining the sales, payroll, receivables and inventory figures.

Additional Findings:

During your interviews with the controller and other accounting staff, you became aware of the following information.

- Each salesperson received a commission based on sales orders he or she processed. The COMMISSION RATES are listed in the EMPLOYEES table.
- Based on the long term relationship with some of the customers, some customers received additional discounts during the year.
- Each salesperson is authorized to determine the amount of discount given to each item they sell. The actual DISCOUNT given on each item is determined on *ad hoc* basis, and was recorded in ORDER_DETAILS table.
- The UNITSINSTOCK field in the PRODUCTS table reflected the actual quantities of the items on hand as of December 31, 1997 (These are the results of physical counts),
- Inventory is valued using lower of the cost or market.
- Some products were discontinued because of lack of demand for those products (shown with DISCONTINUED = "Yes" field in the PRODUCTS table). Since these items have been on the shelf for a long time and closed to the expiration date, the firm is planning to sell these items. Northwind is expecting to recover $\frac{1}{4}$ of the original cost of these items.
- Any order shipped before October 1, 1997 and still not paid is considered to be bad debt and is written off. The firm is expecting 75% recovery for unpaid shipments in October. 85 per cent of unpaid shipments in November, and 95% of unpaid shipments in December are expected to be collected, respectively. The remaining balances are considered to be bad debt.