

East Carolina University – Data Warehouse Implementation

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The Data Warehouse implemented at ECU provides employees with easy access to the University's financial data. Previously, when users were confronted with FRS screens they did not understand or when more than 4 months of historical data was required, they had no alternative but to request information in hard-copy reports or electronic files from the Systems Coordination Office. Now, simple data structures store financial information in a DB2 relational database. Employees access the Data Warehouse with Excel or other ODBC compliant software they have on their workstations. Data is returned in standard spreadsheet format. Desktop formatting tools are then used to enhance the presentation of the data. With seven years of data loaded in the warehouse, users are finding that they can retrieve meaningful management information at their own workstation. Users are empowered to do inquiries that previously would have required Information Technology programming resources. Employees say the Data Warehouse is a "cool tool" and "one of the most worthwhile projects" they have seen. With limited resources, this Data Warehouse project focused in the financial area. In the future, all systems of the university will be represented as we include Human Resources, Students, Facilities and other data.

East Carolina University was established in 1907 as East Carolina Teachers Training School. It became East Carolina Teachers College in 1921, East Carolina College in 1951, and East Carolina University in 1967. Today ECU is a doctoral and research public institution, and with over 20,000 students it is the third largest university in the 16-campus University of North Carolina system. Degree programs are offered at the baccalaureate, master's, intermediate, first professional (medicine) and doctoral levels. ECU is located in Greenville, North Carolina, 90 miles east of Raleigh.

Years of rapid growth and development at ECU led to the purchase of a variety of systems to support the administrative processes of the university. Data from these systems has been stored in a variety of operating systems, data base formats, flat files, and magnetic tapes. In the Financial Records System (FRS), only 4 months of data is

available online. Older data is stored on flat files or tapes. Until recently, when users needed more than the 4 months of history, they had no alternative but to request information in hardcopy reports or electronic files from the Systems Coordination Office. These highly skilled professionals were juggling their time between these information requests and the important projects they had ongoing. ECU needed a solution that would streamline users' access to historical data.

Though many software products offer cost savings and efficiencies, many times a sizable capital investment must be made before these products can be implemented and begin to return any cost savings. Data Warehousing was investigated as a possible solution for ECU because it enables its users to have easy access to more information than has previously been possible. After a year of study, a committee determined that Data Warehousing on a university wide level was too much of an investment when all of North Carolina was in a financial crisis. Still the urgent need for the administrative staff to have easier and faster access to the financial data they needed remained, so an effort at creating a Data Warehouse for the financial information began.

Having learned to focus our efforts and do large projects with limited resources, ECU is known for "finding a way when there seems to be no way." This project was made feasible by using tools, hardware, and even human knowledge that was already available. In October 2000, a recently retired Information Technology and Computing Services (ITCS) employee was hired part time by the Financial Services division to create a Data Warehouse beginning with the financial data area. When implementation began we used

existing resources whenever possible. The ITCS department had purchased a modeling tool called CA-Erwin as a data modeling tool to model the data warehouse. The university has a mainframe processor utilizing the IBM DB2 relational data base platform. Tools needed to monitor performance for this system and database already existed. A data warehouse model was created and simple data structures were defined using the IBM DB2 relational database platform. 5 Years of data were loaded from the magnetic tapes, flat files, and the IDMS (non-relational database) operational files to create the Financial Data Mart as the beginning of a Data Warehouse. The mainframe also provides security through Resource Access Control Facility (RACF) and the users can request access to the warehouse through the existing ITCS group that enforces security for all production applications. Data in the Data Warehouse is backed up on a production schedule along with other production operating systems. Microsoft Office software is used in most areas since ECU has a university –wide site license. We did purchase copies of Brio Query software, for the “power users” who have more complex requirements and require very large data sets. Excel is limited to just over 65,000 lines in a worksheet, which is inadequate for some users. Brio is a graphical interface tool that is rather easy to use and has a more robust database interface.

Now employees are given access to the Data Warehouse with Excel or other Open Database Connectivity (ODBC) compliant software. Data is returned to their desktop in simple spreadsheet format. Seven years of financial transactions and account balance data have been loaded into the financial data mart. As each month is closed in FRS, the transactions and balances are captured and moved to the warehouse. New users to the

data warehouse must request ODBC services be installed on their workstation. The ITCS workstation support group performs this task. Users are invited to attend a one and a half hour class, where they learn about the data warehouse, how to use Excel to retrieve data, and how to use pivot tables to enhance the presentation of data. Spreadsheets for common tasks have been created with parameters. These templates allow users to retrieve data within moments by simply changing the account numbers or dates. Over 150 ECU employees now have access to the data with Excel or Brio Query.

Prior to the Data Warehouse, users were confronted with FRS screens they did not understand and they were limited to the 4 months of history available in the online system. Other inquiries would previously have required efforts of Systems Coordination staff or Information Technology programming resources. Now our warehouse data is well indexed and organized so that most queries run in less than a minute. As users are introduced to the Data Warehouse, the Systems Coordination staff's role continues to change from producing administrative reports to providing users with production support services such as training on the Data Warehouse and consulting for process improvements. The direct and indirect results of the change have been increased efficiencies and effectiveness in performing administrative tasks.

Because of limited resources, this Data Warehouse Project focused first in the financial area with the creation of a Financial Data Mart. Now student loan data has been moved from Virtual Storage Access Method (VSAM) files to the relational data base technology. Data from our campus procurement card system has been added to the Data Warehouse allowing improved analysis and the ability to delegate audit tasks such as travel to other

administrative units. Our current project is to expand the Data Warehouse to include human resource and position management data.

Existing personnel, software and hardware have been used to reduce the costs of implementation. The Data Warehouse in conjunction with relational database, spreadsheet, and query software provides end users with increased flexibility in accessing and formatting data and producing meaningful management reports without needing programming resources. ECU employees say the Data Warehouse is a “cool tool” and “one of the most worthwhile projects” they have seen. Time saved searching for data can now be spent on valuable new projects.