

# THE COMPUTERWORLD HONORS PROGRAM

## CASE STUDY

LOCATION:  
*Pittsburgh, Pennsylvania,  
United States*

YEAR:  
*2006*

STATUS:  
*Laureate*

CATEGORY:  
*Business and Related Services*

NOMINATING COMPANY:  
*Microsoft*

### ORGANIZATION:

University of Pittsburgh

### PROJECT NAME:

Business Intelligence Dashboards

### Summary

The University of Pittsburgh established itself as a leader among higher education institutions by replacing its legacy student administrative information system with a PeopleSoft implementation on time and on budget. During the late 1990's, the University successfully replaced its legacy financial computing system with a suite of Oracle applications. The University's central computing unit, Computing Services and Systems Development (CSSD), developed a data warehouse and related data marts including financial and student administrative data in order to provide improved access to the data collected and significantly streamline the decision making process from unit-level management through the University's executive staff.

The capstone of this entire set of projects was the development of a set of dashboards that provide easy access to critical data from the user's desktop computer. These dashboards were developed using the Cognos business intelligence suite of tools. In addition to providing quick snapshots of how University financial and academic processes are performing against predefined performance indicators, the user can quickly "drill down" into the data to view details and create customized trend analyses. Ultimately, these tools will provide the standard reporting platform for academic and financial data, eliminating the need for the development of standard and customized reports, "shadow systems" containing data of possibly suspect validity, and the laborious and time-intensive processes that were once required to provide answers to pressing management questions.

### Introductory Overview

The University set four long-term goals for the project.

- Develop a University-wide data warehouse for student administrative and financial information.
- Develop a secure method for users to access, view, and analyze student and financial data.
- Ensure that analyses can be performed using student and financial data even though the source for each area is different.



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- Provide a high-availability service that is easy to use and accessible from any location.

The initial phase of the project was to create the data warehouse and receive data from the University's new Student Information System. Part of this initial phase involved developing and delivering a set of executive reports containing admissions statistics, course credit consumption and production by each of the University's schools, and tuition dollar analysis and budgeting comparisons.

The second phase of the project is to extend the data warehouse to include financial, human resources, and payroll data from the University's Oracle-based financial systems. When all phases of the implementation are complete, users will have the ability to access complete sets of reports that apply to all functional areas within the University. Advanced query and reporting tools will extend the basic reporting capabilities much further. Ultimately, authorized University administrators, faculty, and staff will have all available student and financial data available at their fingertips with a powerful set of query and reporting tools. Users will have the ability to analyze trends across multiple fiscal, calendar, and academic years without any need to develop shadow systems, request data feeds, or enlist the assistance of CSSD to write custom reports and queries on their behalf.

### Benefits

Prior to the implementation of the data warehouse, academic departments and support units at the University had to request the development of custom reports and queries based on the student information or financial systems. This was time consuming for the unit and CSSD. CSSD had to understand the detailed requirements of the users, code the queries and reports, schedule the appropriate jobs, and deliver the results electronically or on paper. If an error occurred, the process had to be followed again until the customer received the necessary information.

Because the production student information and financial systems were limited to one year's worth of data, the request process had to be repeated at least annually. Many departments simply requested data feeds to update their own "shadow systems." The number and types of shadow systems existing in academic and administrative areas cast doubt on the validity of the analyses being performed. The elimination of multiple requests and comparisons resulted in more consistent and accurate reports, as well as a significant reduction in the amount of staff time required for these reports.

The self-sufficiency in gathering and analyzing data will fundamentally change the way the University does business in the coming years. Users will have the ability to analyze information and drill down into the data. This gives the users the ability to interpret data on demand, eliminating the need to request multiple reports for comparisons.

### The Importance of Technology

Digital dashboards drawing from the wealth of information available in the University data warehouse provide virtually instantaneous views of vital benchmarking data for executive, academic, and business staff. The ability to make management decisions on the basis of sound information is paramount. Additionally, the University is committed to providing tools to its key decision makers that relieve them from any need to be concerned with the underlying technology.



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The Dashboard product utilizes Microsoft server technology and business intelligence tools from Cognos, Inc. to provide the most effortless querying and reporting system that the University can offer. Prior to the implementation of this project, the University printed hundreds of copies of standard reports each month at considerable expense. Users can now access only the information they need in a useful format with tools available at their fingertips. Results can be saved electronically and printed if the user wishes to have paper copies on file.

The Cognos tools are the capstone of the enterprise data warehouse effort. They have greatly simplified the process of developing, securing, and deploying reports and analyses. The data warehouse and associated data marts provide the actual data needed for these analyses including historical data not available on the production financial and student information systems. The data warehouse also ensures that data analysis operations do not jeopardize the integrity of the data on the production financial and student administrative systems and entirely eliminate the need for shadow systems in individual units. The importance of the Cognos business intelligence technology is that the user does not need a detailed understanding of the structure of the underlying database systems in order to analyze and report on information.

### Originality

Digital Dashboards are a key component of an overall technology strategy to provide seamless integrated applications and services to meet the needs of the University of Pittsburgh community. The dashboards provide access to useful information at any time and from any location while ensuring that identifiable and sensitive information remain secure.

Business intelligence tools are increasingly used in the corporate and academic communities. The originality of the University of Pittsburgh's project is that the Digital Dashboard system is entirely integrated into the enterprise Web portal. The portal brings all of the enterprise information technology applications and services needed by University students, administrators, faculty, and staff to one convenient location. Authorization to access specific applications and services is enabled through the University's Central Directory Service, which provides authoritative information on the identity and role of any individual affiliated with the University. Only those individuals authorized to access the Digital Dashboard system are able to find it in the Web portal. Additionally, access to the actual data mirrors the level of access that the user has within either the financial or student information systems, or both.

### Success

Building on the successes of the University's state-of-the-art financial and student information systems and capitalizing on the resources provided by the Central Directory Service and enterprise data warehouse systems, the Digital Dashboard service has already proven to be successful in fulfilling the goal of placing complex and critical results of data analyses immediately at the fingertips of executive staff and senior administrators. The need to wait for database experts to mine disparate systems for critical information has been successfully eliminated. Over time, access to the system will be expanded to administrators within the University's academic and business units to provide management information relevant to their programs and operations. The early successes of the system have made it clear that the correct approach has been taken and that these systems will serve as models for other institutions.



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University users with access to the system have embraced it quickly because the dashboard system offers immediate access to vital data in an easy to use format. We anticipate that utilization of the system will continue to grow quickly as individual academic and business units are relieved of the need to submit data requests, develop shadow database applications, and write custom queries and reports.

### Difficulty

Digital dashboard applications seem at first glance to be straightforward to produce. Like most institutions, the University is well aware of where the necessary data can be found. Until modern financial and student information applications were in place, however, these data were housed in separate systems and the development of the underlying data warehouse application was virtually impossible. In the past year, a new student information system was put in place that allowed the implementation of a comprehensive data warehouse that draws from both the financial and student information applications.

Further difficulty would certainly have been encountered if the University had not also developed its Central Directory Service. The ability to link data warehouse security to the authentication and authorization capabilities of the Central Directory was critical. The need to ensure that data is made available only to authorized users could not be overlooked. Further, it was essential that any individual user can only access data through the Digital Dashboard system that is available through direct, authenticated access to the financial and/or student administrative systems.

Implementation of the Digital Dashboard system was made considerably less difficult because the project team and key stakeholders were able to focus on the types of queries, reports, and analyses that were needed without being concerned with developing the underlying technology infrastructure.

Little or no resistance was encountered in the planning and implementation of this project because the need to access reliable data quickly has existed for many years. This system provides a solution to a long-standing problem and has been in high demand from executive, academic, and business units.