

Administrative Information Services Annual Report 2003-2004

<http://ais.its.psu.edu>

Introduction.....	2
AIS Production Services.....	2
Strategic Initiatives.....	10
Operational Support.....	12
Software Enhancements.....	14
Hardware Enhancements.....	14
Training & Education Program.....	15

AIS serves as the central University resource responsible for supporting administrative information systems. As a unit of Information Technology Services (ITS), AIS participates in the development, maintenance, and secure operation of the state-of-the-art applications using centralized student, business, and alumni databases.

Administrative Information Services

Senior Management Team

Senior Director, Ron Rash

Deputy Director, Scott Smith

Computer Operations and Facilities,

Clyde LeFevre, Director

Distributed Systems, Marta Miguel, Manager

Enterprise Systems, Mike Kauffman, Manager

Systems & Solutions, Karen Schultz, Director

Snapshot

The Numbers

Angel, Spring 2004

Course Sections..... 3,786
Faculty..... 3,011
Students..... 52,192

eCommerce (Annual)

Transactions.....225,000
Amount.....\$47,000,000+

eDocument Distribution System (eDDS)

User Accounts..... 1,328
Reports..... 548,000
Pages..... 17, 251,360

Data Warehouse

User Accounts..... 1,240
Records..... 200,000,000

Enterprise Server (Annual)

Print Lines.....1.2 billion
Batch Jobs..... 1.33 million

eLion Monthly Student Usage

Avg. trans.964,468
Max. trans.1,764,607
Avg. users..... 62,813
Max users.....72,713

AIS Web Site

(Feb.- June 2004)

Daily Hits..... 3,679
Total Unique Visitors... 39,588

Hardware

Disk Storage..... 16TB
Prod. Servers..... 125

Annual Report 2003-2004

Administrative Information Services

Introduction

In FY 2003-2004, Administrative Information Services (AIS) continued advancements with the University-wide Social Security Number Conversion Project. The project, which will eliminate Social Security numbers as the main faculty, staff, student and alumni identifiers, is scheduled to become effective in late December 2004. AIS also progressed significantly with work on the Disaster Recovery and Business Continuity Planning Project, the implementation of specific actions taken to provide continuity of business operations in the event of disasters and catastrophes. Also, a new strategic plan was submitted in February 2004. The plan provides a framework that encompasses all organizational units having the need to process administrative information at the department, unit, or college level. In addition, both the ANGEL Course Management System and eCommerce Services continued to see dramatic growth in usage during FY 2003-2004.

The following report serves to highlight many of the significant accomplishments of AIS over the past year. Included are key projects that saw completion during the year, and progress on several multi-year projects.

AIS Production Services

AIS Web Site

In February 2004, a revised AIS Web Site was launched to include new visual interface and site structure. Several navigational and functional features were added to enhance ease of use:

1. To enhance formatting and accessibility, Cascading Style Sheets are being used.
2. A print-friendly version is now available for all pages of the site.
3. Essential News boxes are available on the AIS Home page and the main page for every system and service.
4. A Glossary of Terms, Site Index, Help Index and FAQ Index are available from every page.
5. The AIS Web site incorporated and uses the Penn State Google Search Engine.

Consistency in design and voice now delivers accurate, task-oriented information for systems and services represented on the site. The new AIS Web site also improves operational efficiency and enhances the users' experience by communicating services rather than organizational ownership. Standard information is provided for all services offering familiarity and meeting user expectations. In addition an official AIS Intranet was launched, enabling individual AIS units to post and restrict information to their staff members.

The RedDot Solutions Web Content Management System was implemented and integrated with the AIS public and restricted Web sites. This tool and process have enabled and empowered staff to add, manage and maintain AIS Web site content and has transformed a 10-step manual process, to an automated 4-step process. Twenty AIS staff received RedDot training between February and June 2004.

Members of the Web and Communications Team were presenters at Penn State Web 2004 Conference, speaker at KM Brazil Conference, Sao Paulo, Brazil, and members of the WebDevShare 2004 Program Committee.

ANGEL (A New Global Environment for Learning)

Version 6.0 of ANGEL was implemented in May 2004. This version has many new tools and enhancements including: streamlined user interface, milestone feature, improved shared library capabilities, expanded resource repository manager,

recurring calendar events, certified SCORM compliance, and enhanced import and export capabilities.

The new Penn State Grade Book customizes the way grades are handled in ANGEL to fit the needs of the very diverse Penn State instructional community and was released as a pilot in fall 2003. The grade book tool includes Exporting and Importing grades from a spread sheet, Advanced Formula Editor, Weighted Grading, Customized Views and Categories, Locking and Unlocking grades or views based on date, as well as many other custom components requested throughout the development process. One of the main components is the addition of the Manually Scored Assignment (MSA) lesson item, which can be used to score offline items, class attendance, extra credit or any other item that isn't already part of the ANGEL grading system. This allows instructors complete flexibility to organize and prepare final grades within ANGEL. Another custom feature is the ability for instructors to retrieve the final grades directly from ANGEL into the eLion Grade Collection application used by faculty. During spring 2004, the grade book was used in 200 ANGEL courses.

A new Archiving policy was adopted which allows ANGEL courses to be archived one year after the end of the academic semester to which they belong. Specifically, applicable courses will be archived two weeks after each semester's commencement. For example, two weeks following fall 2004 commencement, all courses offered during fall 2003 will be archived. The one-year timeframe is sufficient to resolve any deferred grades and grade changes based on Faculty Senate policies and GURU retention policies. Archived courses will be moved to long-term storage and will no longer be available to faculty and students. However, courses in long-term storage can be recovered by special request with a two-week turnaround time. Archived courses will remain in long-term storage for two years before being permanently deleted. After permanent deletion, recovery will no longer be possible.

Data Warehouse

Several new databases were added to the Data Warehouse this year: a new General database which holds information available to all users; an SSN Change database which allows stewards to track SSN changes; an SSN Conversion database which gives users the ability to convert SSN's to PSU ID's for locally stored tables. In addition, extensive enhancements were made to our training database so that the tables used in Data Warehouse training have a more realistic look and feel for the user. Within existing databases, 15 additional tables were installed bringing the Warehouse record count to over 200 million.

Document Imaging

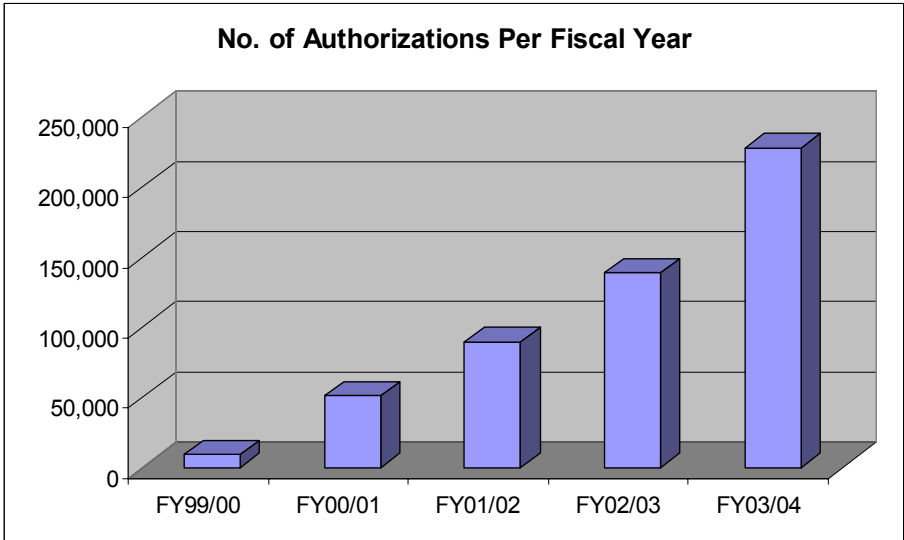
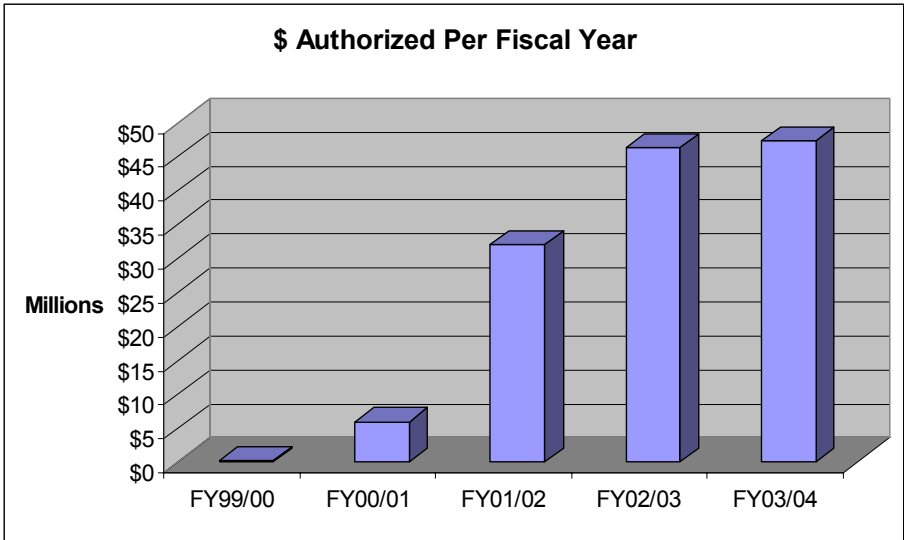
The use of document imaging software cuts down on storage space and makes the retrieval and sharing of documents much quicker and more efficient. Penn State continues to make excellent use of its site-licensed imaging software from Optical Image Technology, Inc. A new imaging application to assist in the processing of IBIS purchase card documents is under development. AIS staff are testing a Web-based prototype for IBIS that will enable easy search and retrieval of imaged receipts and other supporting documents for purchasing cards. Several departments at the university are planning to implement imaging for their various processes, including Student Affairs, ARL, the College of Engineering, and the Eberly College of Science

eCommerce

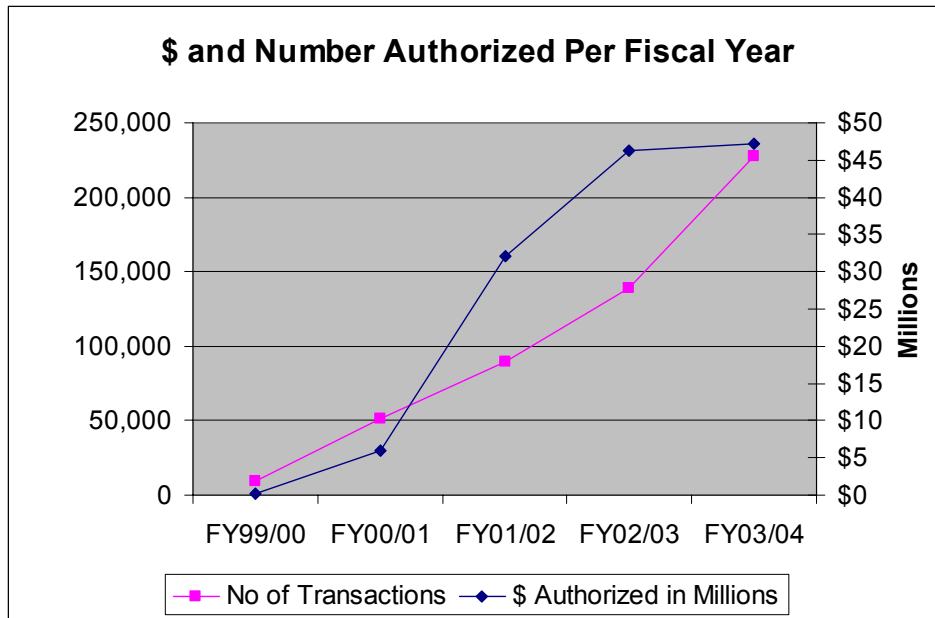
Beginning with its inception in December 1999, AIS's centralized eCommerce infrastructure has provided secure credit card processing and e-Store hosting services to over 100 different units at University Park and other Penn State campus locations. The eCommerce services make life easier and more secure for Penn State departments and their customers by providing services to eCommerce-enable Web applications, complying with the VISA Cardholder Information Security Program, and eliminating the storage of credit card numbers around the University. eCommerce saves its customers time and money!

During Fiscal Year 2003-2004, AIS processed in excess of 225,000 credit card transactions, totaling more than \$47,000,000.

The following two charts depict the "Dollars authorized" and "Number of Authorizations" per Fiscal Year.



The following chart depicts the growth in “Number of Authorizations” and “Dollars Authorized”. The “Number of Authorizations” grew by 65% in FY03-04 vs. the prior year, while the “Dollars Authorized” increased slightly. The stabilization of the “Dollars Authorized” growth is likely attributable to the change in the assessment of the Student Account Convenience fee in FY03-04.



The IBM WebSphere Payment Manager product is the heart of the AIS eCommerce infrastructure. AIS has purchased the latest product in the IBM WebSphere payment processing line, the Commerce Payments product. During the summer of 2004, AIS will upgrade to this fully J2EE-compliant software product. WebSphere Commerce Payments will provide enhanced payment processing performance and increased functionality for our customers.

ePay, AIS’s secure virtual credit card terminal, is one of the most popular eCommerce services. It provides credit card authorization capabilities to over 400 Penn State staff at 75+ locations around University Park and other Penn State locations.

ePay saves time and money on the credit card authorization process. Several enhancements were rolled out during fiscal year 2003-2004:

- Streamlined Statistics Report
- Addition of a Credits (Refund) Report
- Confirmation Page
- Card Swipe Capability
- ‘Location’ Drop Down box

The AIS e-Store now hosts 12 stores for marketing goods, services and event registrations for the Penn State Golf Store, Palmer Art Museum, Behrend College for Kids programs, Ag Sciences Conferences, Eberly College of Science Conferences, Foods Services Gift Basket and PA State Data Center Publications. Campus Photography, Ridge 2000 Conferences, Behrend “Welcome Weekend”, and University Creamery are new clients whose eStores will be opening for business during the summer 2004. Several recent enhancements have made managing the e-Store even easier for store administrators needing to manage email content and generate reports.

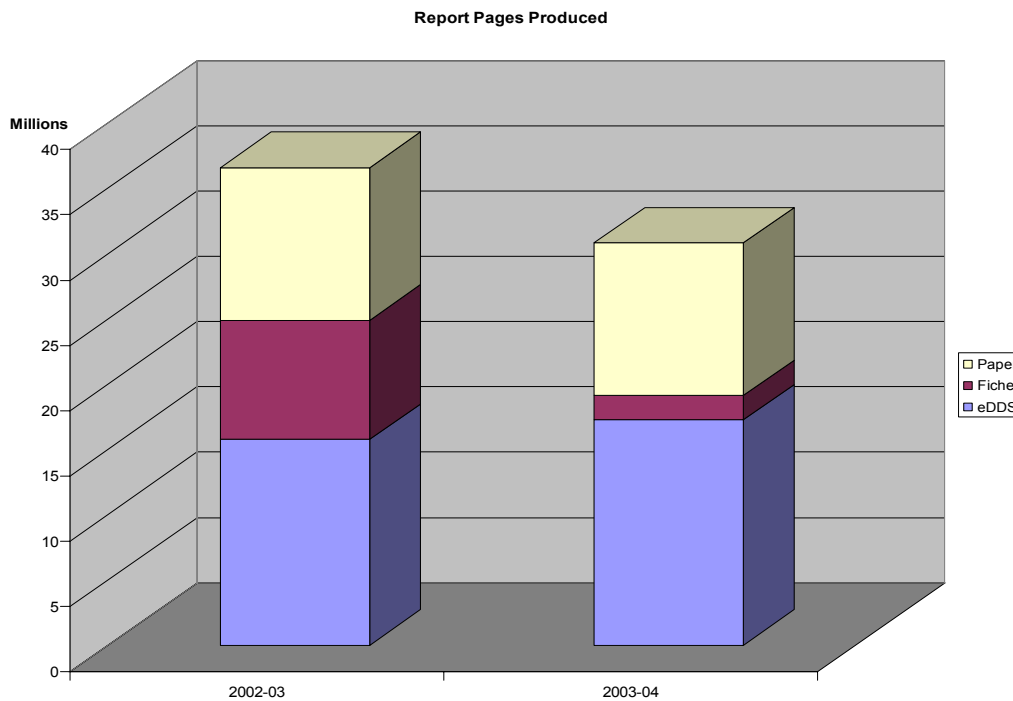
An eCommerce Web-based training viewlet was developed for our e-Pay, e-Pay History and Merchant Administration processes. This new viewlet is available on the AIS eCommerce home page and allows merchant offices to train new employees on ePay and related eCommerce administrative functions.

An eCommerce EIS model was developed that provides reporting statistics to the University Financial Officers and Controllers Office. The eCommerce EIS model provides Dollars Authorized, Number of Transactions Authorized, and Average Dollar per Transaction by month, quarter, year, department and executive unit. This useful tool assists the University Financial Officers in tracking the eCommerce activity within their units.

eDDS - the eDocument Distribution System

The eDocument Distribution System (eDDS) is a Web-based system for the distribution of reports. There are currently a total of 1328 active eDDS users accessing over 548,000 reports housed on the eDDS server. There are over 14,000 distinct reports now being directed to eDDS. Approximately 17,251,360 pages were directed to eDDS in FY 2003-2004 comprising 56% of the AIS enterprise server 'print' output. This is an increase of 13% over the previous fiscal year.

One project successfully completed during FY 2003-2004 was the elimination of all microfiche output from the AIS enterprise server. The majority of that output has been re-directed to eDDS. As part of the microfiche elimination project, a new eDDS environment was created. PeDDS is a highly secure report distribution system created for the Payroll Department. It has a limited user base accessing restricted payroll reports that previously were directed to microfiche output.



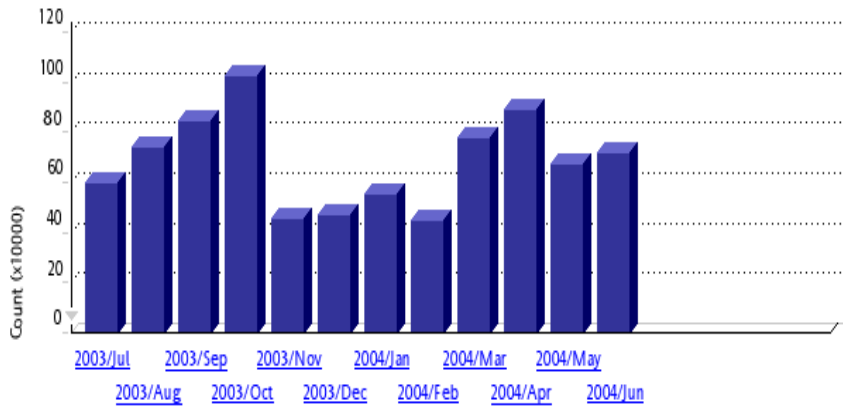
EIS - the Enterprise Information System

The Enterprise Information System (EIS) provides a Web-based information and reporting service. It continues to grow in number of users and improve in ease of use. During the past year, the number of authorized users went up by approximately 12.5% to 1,350. The number of models available for reporting increased by 88% to 99.

EIS provides four services to the developers in 13 units at the University: PowerPlay Modeling (compressed cubes with slicing and dicing capabilities presented in a cross tab format), Impromptu Web Reports (standard reporting via the Web), Cognos Query (Web-based ad-hoc query tool), Visualizer (advanced graphics tool). In addition, NoticeCast software, which acts as an "alert detection service" enabling information to be "pushed" or delivered to the customer based on a predefined event, has been purchased and is ready to be deployed. There are two substantial NoticeCast-related development initiatives in progress.

Customers from 1,795 unique IP addresses hit the system approximately 3.7 million times during the year. Most activity occurred during the mid-fall and mid- spring semesters.

2003-2004 EIS Hits per Month



Count as values	Hits
2003/Jul	558412
2003/Aug	701606
2003/Sep	801997
2003/Oct	971592
2003/Nov	426956
2003/Dec	443769
2004/Jan	521823
2004/Feb	425224
2004/Mar	733946
2004/Apr	831149
2004/May	627832
2004/Jun	675401

Significant improvements in the usability to the EIS were introduced during fiscal year 2003-2004. First, a new software release was made available that incorporated new and exciting features:

1. A new model viewer displays the drill-down items in the left-hand frame, providing a full "tree view" of the drill-downs and measures within a model.
2. The ability to split the screen to display both a chart and graph in the same window.
3. The ability to sort on rows, as well as columns.
4. Two new calculation types: accumulate and exponentiation.
5. A forecasting option.
6. Additional printing options for PDF formatted reports.

Second, in an attempt to make the EIS models easier to find, the EIS NewsIndex was rearranged. The NewsIndex appears when first logging into the EIS and shows all categories of models to which the user has access. The old NewsIndex was arranged organizationally (e.g. Graduate School, Undergraduate Admissions). The new NewsIndex is arranged by information categories. This new arrangement is more intuitive for EIS users and will make adding and finding new models easier as the EIS continues to grow.

eLion

The voice response telephone system that Penn State utilized for course registration was eliminated in December 2003. This system was used by students who did not have an Access Account, and therefore, were unable to schedule courses using eLion. Those affected included students who had withdrawn from the University many years ago and then reenrolled, and new non-degree students. With the telephone system gone, a new process was needed to allow this population of students to register for courses. AIS assisted in modifying eLion to accommodate those students who do not have Access Accounts by allowing them to register using a Friends of Penn State (FPS) account. After registration is complete, the student's FPS account is migrated to the Access Account database and can be activated at a signature station. Once the account is activated, the student can use eLion via their Access Account to take advantage of the full functionality of eLion.

In mid-spring 2004, an eLion upgrade to version 7.2 of VisualWave was completed. This upgrade put us on the newest version of VisualWave, which gives us more technical support from our vendor, fixes problems from previous versions, and gives us access to new features such as XML document processing, thereby allowing VisualWave applications to use Generalized Interface services.

FIT

During fiscal year 2003-2004, FIT underwent extensive analysis to determine future development strategies, with one of the goals being a single FIT client for all users regardless of desktop operating system.

To achieve that goal, a new FIT client was developed that can run on both Windows and Macintosh operating systems. The new client eliminates several problems inherent in the old client on Macintosh machines, including printing problems and the necessity to install a Citrix client on the desktop. In addition, an "auto-update feature" makes the process of keeping up

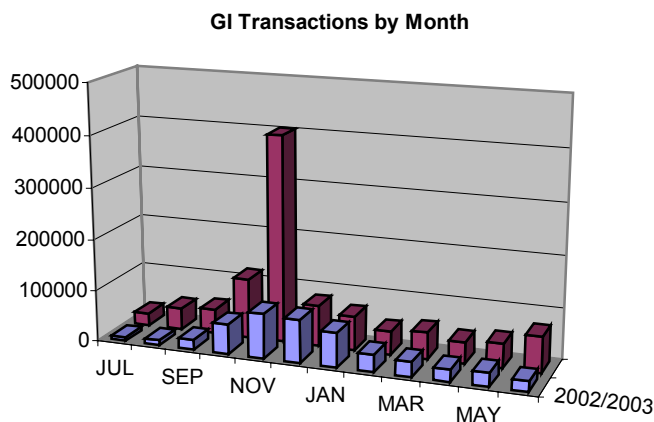
with new versions of FIT much easier. Each time the user logs into FIT, the client checks for updates and, if found, gives the user the option to download and install them immediately.

A pilot version of the new FIT client was first released in December 2003 to 28 users. Expansion of the pilot is scheduled for August 2004 with a full rollout prior to the end of calendar year 2004.

Generalized Interface

During the 2003-2004 fiscal year the Generalized Interface (GI) saw substantial growth. Eight new applications were added, bringing the total number of GI applications to 17. The Office of Human Resources and the Payroll Department implemented the most prominent new applications, which were enhancements to the Employee Self Service Information Center (ESSIC).

The GI processed 1,031,268 transactions from 13,963 unique users in the 2003-2004 fiscal year. These figures represent a 123% increase in transactions and an 83% increase in unique users from the previous year. Heaviest use continues to be in the fall, corresponding both with the Undergraduate Admission cycle and the Employee Benefits Open Enrollment period.



IBIS Enhancements

Library Fine Automation: AIS implemented an automated deduction from an employee's payroll check for library fines. The Library's data processing system determines who is to be fined, and the information is transmitted to AIS where an attempt is made to deduct the fine from an employee's payroll check. AIS then reports back to the Library regarding which fines were deducted and which fines could not be deducted.

HR88 Appointment Policy Changes: The University's HR88 Policy outlines alternatives to full-time, year-round standing and fixed-term I executive, administrator and staff appointments. AIS has implemented the programming changes within IBIS to eliminate the manual effort involved in paying these employees over the proper period of time.

Non-Restricted Budget Amendments (AABA): AIS has implemented a revised budget amendment process that will integrate real time with the IBIS Financial System. The modifications include:

1. Initial operating budget amendments are carried forward into the new fiscal year at the start up of the budget planning period.
2. General salary increase data is posted directly to IBIS as soon as it's approved.

Integration of the Accounts Payable Process with IBIS Financial: The goal of eliminating "Central Accounting" is dependent upon migrating the "Accounts Payable" processes from Central Accounting to the IBIS environment. A major component of the "Accounts Payable" system is the vendors who supply the goods and services to the University. Over the past few years, a number of different vendor databases have been developed across the University community for very justifiable reasons; however, these various databases have a very limited ability to interface with one another and with the IBIS Financial System. Therefore, a major sub-task of the "Accounts Payable" conversion process was to get the University community to agree upon a single Master Vendor Database that could be maintained within IBIS and communicate with the other Vendor Databases that have been designed throughout the University. The University also contracted with Austin Tetra to cleanse the University's vendor data and supply the University with diversity and federal classifications for all

vendors in addition to other useful business indicators used by the University for reporting purposes. This data has been received from Austin Tetra and will become part of the new Master Vendor Database design. The process of populating this new database has begun and when completed will allow for better communication between the various University vendor systems, allow for improved reporting of the vendors used by the University, and ultimately could allow for reduction in manpower required to pay vendors.

2004-2005 IBIS Purchase Order Carryover: This year for the first time, Purchase Order Carryover was done in IBIS for all fund types, general and restricted funds. This information was passed from IBIS directly to Central Accounting for posting, automating a process that had been done manually for years. This is another step in eliminating the Central Accounting System.

All purchase order encumbrances were carried forward into the new fiscal year (2004-2005) if they had a balance greater than zero. This new carryover saves the Purchasing Department about 40 hours of manual processing during their busiest time of year and gives the departments more control over their encumbrances for the start-up of the new fiscal year.

New reports were created and sent to the eDDS server, eliminating paper reports, and allowing areas to download the reports to their PCs for ad hoc analysis.

ISIS Enhancements

Unified ISIS

The Unified ISIS project is in the final year of its 3-year development cycle. The project consists of the following four initiatives:

1. **Certificates**

Coordination of the certificates process has long been a goal of several of the units across the Penn State system. Currently, many departments collect and maintain their own databases for tracking certificates and certificate programs. The new process provides an ISIS tool to create and maintain the certificate programs and to identify and track the students enrolled in or who have completed the requirements for a certificate, including adding the certificate information for completed programs to a student's official transcript. This project has an anticipated completion of Fall 2004.

2. **Cost Center Enhancements**

The NCCR course offering screens were enhanced to automatically create a cost center in IBIS, resulting in a streamlined process and the elimination of a step.

3. **Integration and Automation of Staff Discount**

The integration and automation of NCCR educational privileges for the 75 percent staff tuition reduction was implemented in spring 2004. ISIS now automatically applies the educational privilege discount eliminating the need for World Campus staff to manually adjust numerous accounts.

4. **Reporting**

To improve reporting for the University Budget Office and Enrollment Management and provide more accurate student enrollment counts, changes were implemented to the methods used to report University Park enrollments. This reporting involves using a combination of the student's home campus, the location of the courses they are taking, and the delivery of the course.

MBA Upload

The Smeal College of Business Administration worked with The Princeton Review to streamline the collection of Web-based MBA applications. A batch procedure was implemented to upload the data directly from The Princeton Review into ISIS. This process eliminated the need for the Graduate School to enter this data manually. This process will also be used to upload applications for the iMBA and Executive MBA programs.

Tuition Rates

Due to the volume in tuition differentials and rates, several improvements were made to streamline processes:

1. A procedure was developed to load and update the tuition rates from matrices retrieved from the University Budget Office.
2. Procedures were developed to automatically allocate tuition income. The funds are automatically allocated daily

when any activity occurs for a student with respect to their tuition and fees based on matrices maintained by the University Budget Office.

Strategic Initiatives

Administrative Information Systems Strategic Plan

In February 2004, we submitted a new strategic plan for Administrative Systems. This plan has been in development since early 2003, and was supported by, reviewed and endorsed by the AIS Strategic Planning Steering Committee.

The last two decades have witnessed dramatic changes in the management of administrative computing at Penn State and in the delivery of administrative information technology services. The trend-setting decision in the early 1980s, to have all major administrative processes redesigned and implemented using state-of-the-art information technology, did not subsequently result in the University having ‘legacy’ systems in the 21st century. Rather, Penn State’s decision to be one of the first major institutions to experience a broad ERP-like implementation, long before the term was in general use, positioned Penn State to enjoy a leadership position among its peer institutions in the implementation and use of fully integrated business and student information systems. This position of leadership persists today.

Administrative computing, as it was known in the 1980s, evolved into broad categories of Administrative Information Systems in the 1990s, and is now emerging as administrative information services – the delivery of information any time, anywhere to a requestor, in a form desired by the requestor.

The Administrative Information Systems Strategic Plan was developed to reflect the organizational realities of today at Penn State and provides a framework that encompasses all these organizational units having the need to process administrative information at the department, unit, or college level.

The approach to the development of this Plan was to build a somewhat unique strategic planning process keyed to the active and continual participation of topical subcommittees. A broad AIS Advisory Committee was formed in early CY2003 from which a set of strategic initiatives and areas of interest were identified and subsequently studied by self-appointing subcommittees. This initial process resulted in very active subcommittees that were populated by individuals truly interested in study areas that were of strategic importance to the University Administrative Information Systems community. The results of these subcommittees’ activities in CY2003 framed a major portion of the new recommendations for action and follow-on activities identified in the Strategic Plan. These newly identified strategic recommendations were blended with the need to continue to address ongoing Administrative Information Systems initiatives from previous budget years and with new opportunities identified centrally. This process of continually engaging small focused subcommittees on strategically important topics and issues will be the mechanism by which this Plan will be periodically inspected, updated and renewed.

The amount and quality of work performed by the AIS Advisory Committee members and staff from their organizations was overwhelming. This Committee represented a cross-section of the University’s Administrative Information Systems community, including non-University Park academic and administrative units. The broad message that was heard and understood was, that by working together, a high value Strategic Plan would be created and thereby reflect high value to the participants.

The one message, the theme to be clearly understood in this Plan and related processes, is that Penn State must and can avoid the need to ‘re-build’ its Administrative Information Systems from the ground up. The Administrative Information Systems Strategic Plan of 1999 and the University Web Strategies and Directions Task Force Final Report of 2000 reached this same conclusion. Incremental investments in administrative systems and service delivery, targeted to refresh the underlying technologies of these systems and to match the delivery methodology of administrative information to the form and features desired by the end users, will protect the University from the mammoth Administrative Information Systems related expenses and multi-year efforts being experienced by similar institutions nationally.

The Strategic Plan focused on the following critical areas for the University’s Administrative Information Systems:

- Continued enhancements to existing core services such as ANGEL, eCommerce, and the Degree Audit System
- Disaster Recovery
- Workflow and Imaging
- Data Access – an examination of our business intelligence tools

- Development Toolset – a look at the application development software technology
- eServices – seamless, ‘self-serve’ access to student and business services
- Security

Disaster Recovery and Business Continuity Planning

What was once a fairly stable and predictable centralized production environment has changed into a very complex dynamic distributed environment involving more than 100 servers. To address these challenges, AIS has progressed significantly in the past year, in both the development of a strategic Disaster Recovery plan and the implementation of specific actions taken to provide continuity of business operations in the event of disasters and catastrophes.

The most significant activities include:

1. The Penn State Altoona campus has been designated as the Catastrophic Recovery Site. AIS and several other ITS organizations are storing weekly data recovery tapes in Altoona. Activities are underway to install a “Server Test-Bed” rack to investigate hosting recovery of AIS applications from Altoona. Initial plans are underway to also house a Catastrophic Data Recovery Center at the Altoona campus.
2. A contract is in place to provide a replacement Enterprise Server within 72 hours, and a contract will shortly be signed to provide Mobile Recovery Units (trailers) on a 48-hour notice to arrive at the Altoona Campus in the event of a catastrophe. This will allow AIS to continue to provide operations requiring the Enterprise Server remotely.
3. Using the Living Disaster Recovery Planning Software (LDRPS), numerous AIS employees documented the specific components, resources, and procedures needed to recover critical systems and services in the event of a disaster.

An ITS Disaster Recovery Strategy Manager has been assigned to develop the disaster recovery strategic plan for ITS and eventually to provide consulting and guidance for all of Penn State.

AIS has instituted a requirement for all major services to undergo Recovery Readiness Reviews (RRR’s). The RRR’s detail the procedure to recover the services in the event of a non-catastrophic failure. The use of LDRPS software has played a key role in developing the RRR’s. LDRPS provides a structured format to insure all issues involved in recovery are addressed (dependencies on other systems, documentation, key personnel).

eAIS Project

The eAIS project was established to study the conversion of business and student administrative systems to a Web-based environment. Committees for ISIS and IBIS were established and met during the first half of FY2003-04. The committees determined that a wholesale conversion of the over 800 transactions was not as high a priority as selectively re-engineering transactions for the Web. Re-engineering efforts would possibly combine multiple transactions into one or replace existing transactions with new ones. The ISIS committee developed a priority list for re-engineering projects, which will be prioritized within the student system work plan. The IBIS committee determined that the highest priority was to improve the workflow environment and specifically the process for creating and maintaining approval paths. This effort is being addressed by the workflow project.

The eAIS project also initiated the formation of a design group to develop a prototype and design specifications for a Web site to function as a framework for all Web-based administrative functions. This group has participants from several academic and administrative departments. The proposed framework will be reviewed and approved by the eAIS committees.

SSN Conversion Project

Project Overview: The SSN Conversion Project Team facilitated the efforts of 87 local contacts and their teams of 10-20 individuals in the three phases of planning outlined for identifying changes to local business processes and forms and detailing plans to convert local data and systems to use the new PSU ID. These efforts were complemented by the work of a 32 member Working Group and a Steering Committee. In just one of the busy months of the project, the SSN Project Team met with 375 people to bring them project information and answer questions.

It is an accomplishment to have the entire university aware of the new PSU IDs on the horizon and finalizing action plans for their local activities 5 months prior to the actual conversion from SSNs to the PSU ID. In late December of this year, the project will culminate with central administrative system conversions and the domino effect of change will begin throughout the university.

The Central IDentification Repository (CIDR) contains the Penn State Identification number (PSU ID) that will be used as a unique primary identifier to administrative and academic systems. The repository contains data about the individual assigned to each PSU ID. Data, such as name, address, social security number, and relationships with the university, may be stored.

Web-Based Infrastructure

Since the production debut of our first Web application in March 1997, new technologies and alternative techniques have surfaced for managing Web-based applications. Some of these alternatives hold the promise of streamlining the introduction of new Web-based applications and simplifying the ongoing management of these applications.

The Web-based Infrastructure initiative was charged with exploring opportunities to improve the management efficiency of AIS's Web-based applications. A thorough investigation of these alternative approaches was conducted and a strategy report was provided to senior AIS management. The primary recommendation of this report was that we should purchase and install the Integrated Facility for Linux (IFL) processor on our Enterprise Server, and run Linux under the control of the xVM operating system. The report further recommended that we should move our non-Microsoft specific databases, our eCommerce functions, and our planned WebSphere JAVA infrastructure from the Windows operating system to this new environment.

Workflow Project

The AIS Advisory Committee established a workflow sub-committee in 2003 to make recommendations for improving the workflow environment. While the University has been using an electronic workflow system (EASY) for 17 years, with more than 6.2 million forms being processed with that system, EASY is not Web-based and does not offer the many services of a modern workflow management system. On recommendations from the sub-committee, AIS established a workflow strategist position and engaged a consulting team to conduct an assessment of the University's workflow environment and to identify new requirements. The report from the consulting team recommends that AIS invest in establishing a Service Oriented Architecture (SOA) and purchase a commercial workflow management system. The SOA will provide an environment where multiple application development technologies can integrate with the enterprise databases and workflow management system. It will also enable the re-purposing of 25 years of business logic development. AIS is currently investigating several workflow management systems. Benchmarking trips have been made to discuss workflow strategies with UT Austin and Washington State University. Additional trips are planned for Indiana University, UC Irvine and the Idaho State Government.

Operational Support

Distributed Systems

At the end of April 2004, our Network Integration Services team and a portion of our Database team combined to form *Distributed Systems*. This new organization incorporates both infrastructure and database management for our Windows server environment.

Database Administration: Distributed Systems now supports over fifteen production databases for a total of over 1 TB of data. Database systems supported include SQL, Oracle and DB2, which are used in our ANGEL, eDDS, eCommerce and Alumni client/server systems. ANGEL is an especially complex system due to the sheer size of the database and the large number of users. The DBA team played a key role in tuning the ANGEL database to better meet user needs.

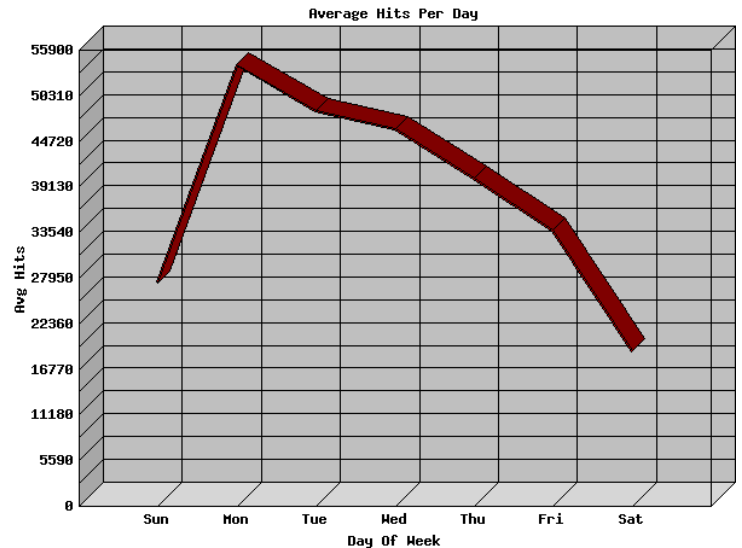
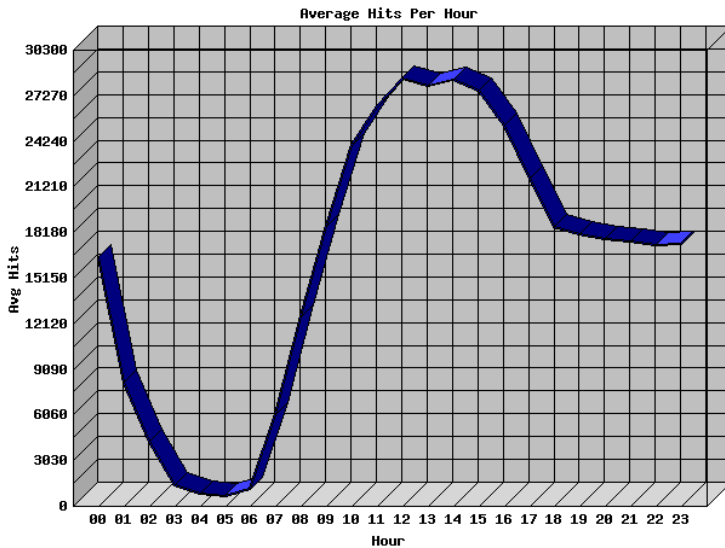
Windows Servers and Network Infrastructure: Distributed Systems now supports over 100 Windows 2000 servers running actual production applications. A majority of these servers are Web servers, however the list also includes several database servers as well as systems administration servers. Some of the key Server Management milestones were:

- Supported two upgrades to the ANGEL Course Management System.
- Converted all Windows NT servers to Windows 2000.

- Deployed all 1 Gbit connections within the production network.
- Developed and deployed the WebStat tool, which monitors the 24x7 availability of all production Windows servers and takes appropriate automated actions and alerts when problems are detected.

Within the first seven months of 2004 the Web sites supported by Distributed Systems received over 8.5 million unique visits, with an average of over 52,000 visits per day.

The Web sites supported by Distributed Systems are now used 24 hours a day and seven days a week.



Distributed Systems has deployed a number of utilities that greatly facilitate the application maintenance process:

1. **File Access Utility** – Allows developers to have immediate and independent access to view and download application logs. The application developers have access to a list of available logs and can select the ones they wish to download.
2. **File Upload Utility** – Allows developers to independently upload application update files into the AIS DFS space, into a directory structure that mirrors production. This eliminates the need for using email attachments or the Penn State DFS space.
3. **Web Analysis Tool** – This application collects Web related measurements like number of visits, Web hits and page views for most of the AIS Web applications. This information is available through a front-end interface that contains both statistical information and graphs. This tool can be of great help to understand the usage of a specific application for application tuning and server sizing purposes.

Enterprise Systems

In April 2004, a portion of our Infrastructure team and a portion of our Database team combined to form Enterprise Systems. This new organization incorporates both infrastructure and database management for our Enterprise Server environment.

Enterprise Server Operations

Batch Workload: More than 1.33 million batch jobs were executed. Of these, 445,000 were degree audit requests. An additional 450,000 jobs were information requests by or to students, and more than 18,000 jobs were student or staff AIDA's requesting labels or general reports.

Printing Workload: More than 10.1 million pages of output were physically printed. Of these, 1.9 million pages were processed on microfiche; 7.4 million pages were printed on the laser printer, and 0.8 million pages were printed on labels.

Change Control: Production Control and Scheduling coordinated the implementation of more than 190 new batch jobs, and changes to more than 600 existing batch jobs, all executed on the Enterprise Server.

Batch Job Processing: In an effort to meet the needs of the AIS user community, Production Control monitored the processing of approximately 235,000 production batch jobs on the Enterprise Server. Approximately 98.75% of the total production batch workload ran to completion without intervention.

Software Enhancements

Adabas 7.4.2 Upgrade

AIS successfully installed, tested and implemented into production the most current version of Adabas, V7.4.2. Adabas, from Software AG, serves as the enterprise database holding University-critical data in support of ISIS, IBIS and ADIS.

APAS, Insight, Protection Log Extract Utility (PLEU) Upgrade

AIS successfully installed, tested and implemented into production the most current version of Adabas Performance Analysis System (APAS), Insight and PLEU, V4.01.01. These products, from Computer Associates (CA), provide tools for monitoring the performance of Adabas and individual Adabas/Natural transactions along with analysis of the Adabas protection logs.

EntireX Broker Gateway

The EntireX broker gateway to Natural was completed, resulting in Natural coding standards that allow for open systems transactions to safely update Adabas data without requiring a rewrite to any online transactions.

EntireX Communicator

AIS successfully installed, tested and implemented into production the most current version of EntireX Communicator, V7.1.1.30. EntireX Communicator, from Software AG, serves as the broker for the Web-based and cross-database transactions and is used as the middleware component of OHR's Employee Self-Service Information Center (ESSIC) application.

Relational and DPS Software

AIS and the Admissions Office purchased these two products, both from Treehouse Software. Both products continue to save time and money and improve AIS's ability to propagate data more frequently. Building on last year's match code application, we worked with Admissions to create SQLServer2000 staging tables from Admission's ISIS data in Adabas. These tables are updated nightly rather than weekly, as in the past. Admissions wrote views of these tables from which they can generate all necessary reports.

z/OS Operating System

The AIS Enterprise Server software environment went through two series of upgrades in the past year. The upgrades resulted in new releases or software maintenance for Roscoe, CA1 (tape management system), CA7 (job scheduling software), ACF2 (system security), MIM (a product used for serializing requests across systems), SAS, XPAF (laser printing environment), and FDR (volume dump and restore), among other products. This was done in preparation for upgrading the operating system from z/OS Version 1.3 to z/OS 1.5, which is planned for Fall 2004.

We also spent significant time learning to install and run an IFL (an Enterprise Server central processor dedicated to the Linux operating system); z/VM V4.3, and Suse's Linux V8. The group is reviewing the potential of this technology as a way to consolidate portions of the Web applications currently running under Windows. As part of this trial, we installed The WebSphere Commerce Business Edition v5.5, which contains a suite of products utilized by our e-commerce group. At the end of the first portion of the trial, the environment looks promising.

Hardware Enhancements

Distributed Systems

Distributed Systems is now in the midst of deploying the largest Windows Servers ever deployed in Administrative Information Services. These new servers are two IBM x445 servers with 8 CPUs and 16 GB of RAM each. These servers will be deployed by fall 2004 as the new ANGEL SQL database servers.

Networking

The Enterprise Server network design was re-engineered to provide redundancy and to remove single points of failure. To this end, "fail-over" routers and switches were fiber-connected between buildings and a redundant TNS router connection was established to provide network connectivity during TNS maintenance windows. Proposals were also submitted for creating an alternate physical fiber path between Shields and the Computer Building.

An unsupported IBM communications controller was removed. Dialup JES2 connections on this control unit were replaced with TCP/IP connections through a VPN.

Disk Storage

Two Terabytes (TB) of disk storage were added to accommodate growth, bringing our total centrally managed disk storage to 16TB.

Tape Storage

We purchased four new IBM 3592-J tape drives that are being used to create backups of our Open Systems databases. Although these tape drives are stand-alone units, we eventually plan to incorporate them into a tape robot.

Our tape library consists of approximately 8,990 files, which contain 3.6 TeraBytes of data. This is approximately 3 times the data residing on disk.

Training & Education Program

Data Warehouse Training Sessions

Starting in May, 2004, monthly data warehouse data base training seminars were scheduled at University Park with the option of videoconferencing from the other campus locations. Topics included:

- Admissions
- Official student
- Student
- Non-credit
- IBISFIN
- HR

Human Resource Development Center Offerings

A total of 51 courses were offered through the Human Resource Development Center, of which, 38 (75%) ran serving 572 attendees and totaling 240 instructor hours. Courses included:

- Introduction to IBIS: Forms Processing
- Introduction to the Mainframe: CCOM
- The Financial Information Tool: FIT
- Unlocking the Data: EIS & the Data Warehouse
- Introduction to the Data Warehouse
- Data Warehouse 1
- Data Warehouse 2
- Data Warehouse 3 (piloted and launched in early 2004)
- EIS
- Introduction to eDDS (piloted and launched in June 2004)

Training On Demand Offerings

A total of 15 courses were offered through the Training On Demand service, of which 14 (93%) ran serving 152 attendees and totaling 56 instructor hours. Courses included:

- Data Warehouse 1
- Data Warehouse 2
- Data Warehouse 3
- EIS
- Introduction to IBIS: Forms Processing
- The Financial Information Tool: FIT

Web-Based Training

A number of Web-based training modules were created and/or launched in 2003-2004 including:

- Security
- e-Pay
- SSN Conversion

Internal AIS Training

Courses in Object-Oriented Programming, ASP.Net and Unix/Linux were offered to AIS technical staff in 2003-04. Web-based training modules were also purchased and incorporated into a long-term blended training initiative for AIS staff covering a range of topics. Management Development courses for AIS staff during 2003-04 included Work/Time Management, Work Style Advantage, Taking the Sting Out of Criticism and Communication Skills. †