

**Information Technology Services Division
Application, Networking, and Technical Services Departments
Program Review
2008-2009**

I Overview of the Division

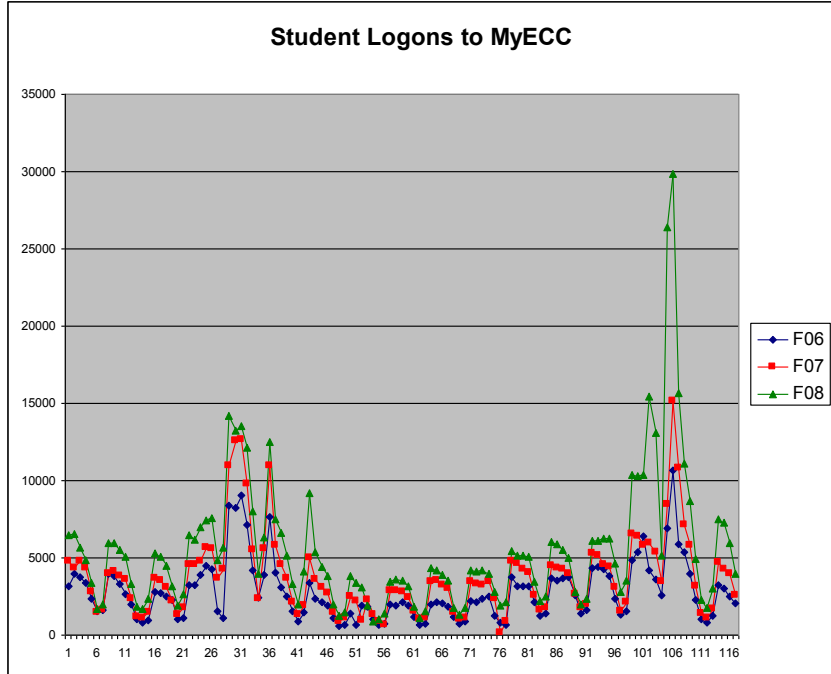
Information Technology Services helps El Camino College utilize technology to provide students with the greatest opportunity for achieving their educational goals; faculty with the resources and support necessary for continued excellence in instruction; administrators and staff with the most efficient and effective work environment for overseeing daily institutional operations; and the community with effective, efficient, and timely responses to their needs for information, training, and instruction.

The unit (1) maintains and operates the college's telephony and data infrastructure, (2) maintains and operates the college's data systems, including Datatel Colleague, and (3) acquires and distributes new computing equipment including PCs and Printers.

All academic, administrative, and student support functions of the college are increasingly dependent on very complex computer networking and data systems that interconnect departments across the District, with state and federal governments and the college with higher education institutions across the country and throughout the world.

The unit provides an enormous volume of services:

The number of students using the MyECC portal has increased every semester since the site was launched; from 145,877 in fall 2005 to 421,829 in fall 2007. During a two and a half month period from July 1, 2008 through September 13th, the portal recorded over 450,000 logins.



The unit processes 2,639 help desk calls from March, 2007 through March, 2007, and closed 2,577 (98%).

The chart below shows ECC’s network percentage of uptime for the period Monday September 29 through Sunday October 5, 2008. Over the period of a year, the percentage of uptime averages 99,967%.

Uptime Report for 09/29 – 10/05/2008

Respectively

ECC ITS Service Log

Total hours for the period: 168

Total hours and percentage of non-maintenance: 0 Min or 0%

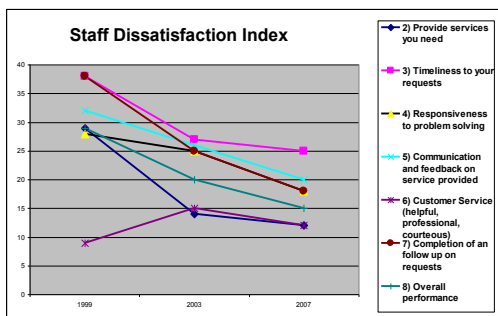
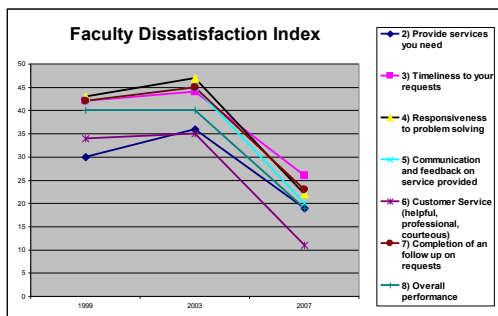
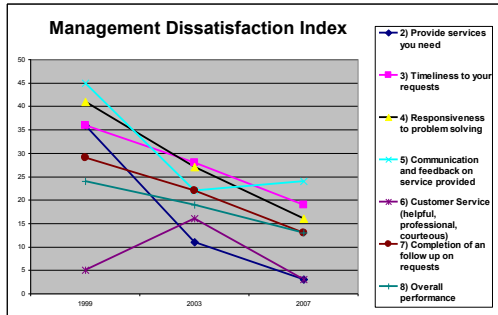
Total hours and percentage of maintenance: 0 Min or 0%

Overall hours and percentage of down time: 0 Min or 0%

Total Service Up-Time: 168 Hr or 100%

II Analysis of Institutional Research Data & Student Services Outcomes (SSOs)

The unit was evaluated in 1999, 2003, and 2006. Each evaluation period used the same survey form which consisted of 7 measures; services provided, timeliness of response, responsiveness to problem solving, communication, customer service, completion and follow up, and overall performance. Faculty, Staff, and Managers responded to the survey and were grouped. The charts below show the responses



The survey instrument utilized a five item Lickert scale of “outstanding” “very good” “good” “marginal” and “poor”. The dissatisfaction index consists of the percentage of respondents selecting “marginal” and “poor”.

The charts show that the dissatisfaction index has been dropping significantly in each successive survey. Faculty have been the most dissatisfied, followed by staff and managers. All but two measures of dissatisfaction remain double digit. Timeliness, communication, and responsiveness to problem solving have the highest dissatisfaction index.

During the period covered by the surveys ITS migrated the college from a popular custom written management information system to Datatel Colleague, a commercial ERP written for small private four year colleges enrolling 2,500 to 4,000 students. As initially deployed, Colleague lacked the full functionality of the college’s legacy MIS system. Many users were upset and unhappy over what they were required to give up. At the same time, the college created an administrative local area network that coexisted with a much older academic local area network which many faculty regarded as their

own.

The drop in the dissatisfaction index may be the result of several events. By the time of the 2006 survey, ITS had created customized programs that restored many of the features and functions that the staff had enjoyed in the old legacy MIS system. An online help desk and job request system had been deployed. Users had the power to input and monitor their own work requests. The college merged the academic and administrative technical support staffs into a single unit. The faculty, in particular, identified with the academic technology support staff and so reacted in a dramatically reduced dissatisfaction index.

III Facilities and Equipment

Technical Services is located in the Communications building. Programming and Network Services is located in the Math Computer Science (MCS) building. Neither facility is suited to the mission of the unit. Both units are located in the midst of the most densely populated area of the campus. Technical Services operates many academic file servers in a rack facility that is not concealed open and not earth quake proof. MSC 105 comprises a complex that houses the unit's main offices as well as programming and network services. The facility is located on the first floor of the building adjacent to a corridor that experiences heavy student traffic. Its main entrance is an unlocked double wooden door that allows access before intruders can be identified. Network equipment and mission critical data servers and storage devices have been installed in rooms designed for main frame computing. The air condition system is over 50 years old, not redundant, and failing. The raised floor has never been re-leveled. There is no fire suppression system. Like the main entrance, the doors are wooden.

The college approved and deployed many improvements in 2007-2008. The college upgraded and expanded its ERP system to include a new production server and a repurposed test server. It expanded the data storage from 6 to 35 terabytes and replaced all 135 non-Cisco data switches. Cisco and AT&T deployed a new Internet Protocol (IP) telephony phone system in summer 2008. Staff workstations are current and have standard software images. There is adequate UPS and backup power generation. ITS has deployed remote management tools. Network servers are redundant, auto fault detecting, self-correcting, and able to call out for help. Network performance is monitored and has an average work-day up-time reliability of 99.969. The data server equipment room is getting a new air conditioning system to replace the fifty year old system. The new HVAC system is scheduled to come online in spring 2009.

The college can expect requests for network services to double every year for the next three to five years. In the first two years since going live in fall 2005 student logons to the portal have increased from 150,000 to over 500,000 in fall 2007. Thus far, the total number of all logons to the portal for the period July 1, 2008 to September 14, 2008 is nearly 460,000. ITS has migrated an enormous number of manual process to the online environment. Student application and enrollment process are almost completely online. Faculty are submitting grades and student "no shows" online and printing their class rosters themselves. A wide variety of student services are online including admission and enrollment, payment, buying parking stickers, account summary, test scores, financial aid status and award letter, educational plans, grades, the bookstore, scholarship application and unofficial transcript requests.

The college expects the unit to keep pace with increased requests for service and reliability. There are two concerns which should be addressed as soon as possible. The first is security. During the last facility remodel two doors, which had opened directly from the server room to the outside of the building, were removed and replaced with ¾" sheets of plywood. These plywood "doors" are the security issue because they could

easily be breached. The second concern is lack of a fire suppression system. These issues should be addressed in the very short term.

The college maintains a position of “benign acquiescence” in the rapid growth of academic and administrative computer systems. Opening the humanities building and the LRC addition caused the number of PC workstations to increase by over 600 units. There has been no corresponding increase in budgets and support staff. Indeed, proposed budget reductions will probably result in the layoff of all student workers and casual staff. The academic computer labs will be hard hit by these reductions. Software licensing and hardware acquisition budgets are either greatly reduced or nonexistent. The college faces an annual software licensing obligation of \$1,150,000 (\$900,000 administrative and \$250,000 academic). Keeping the inventory of 3,500 PC workstations current will cost the college \$1,050,000 a year forever (700 PCs a year at \$1,500 each).

ITS must move aggressively to research and deploy alternative strategies to deliver services and maintain the installed base of technology.

First, the unit must help the college become more “green” by replacing physical data servers and at least 2/3s of PC workstations with virtual machine server ware” and virtual desktop technology. The annual savings in PC deployment alone could equal \$465,000. In addition to lowering the cost of keeping the technology sector current, virtualization will reduce the College’s carbon footprint, thereby lowering energy consumption and qualifying the college for rebates that will help cover the cost of deploying additional “green” technology.

Second, the unit must find a way to provide adequate technical support services without adding more staff. Remote monitoring and management tools can reduce the time spent resolving service issues by alerting staff to issues before they become critical and, in many instances, eliminating the need for hands-on touch to repair. The unit must find a way to lower physical touch and increase virtual touch.

Third, the college’s academic computer laboratories must be reconfigured to conform to best practice standards. With the exception of the new humanities building and the LRC addition, none of the academic labs are connected the college’s domain and active directory services. This does not represent a security risk because the labs are on a separate, student only network. However, it complicates tracking student activity and renders management and problem resolution much more difficult and time consuming.

IV Staffing

Technical support functions have shifted dramatically in the last three years and will shift even more in the next five years. The technology is causing a “blurring” of the distinction between the responsibilities and duties of the Help Desk Technicians, the Computer Systems Support Technicians, and the Network and Telecommunications Technicians in the following:

Help desk technicians are doing much more than documenting problems and issuing trouble tickets. They are performing immediate resolutions on 80% of incoming calls. They are utilizing Windows Remote Desktop Connection to take over desktops in the field and make repairs from their workspace in the MCS building. They perform some of the tasks that have been performed by the Computer Systems Support Technicians. Overall, both groups are engaging in far less physical touch and far more virtual touch thereby reducing the time to problem resolution from hours and days to minutes and hours.

Computer Systems Support Technicians have evolved beyond insuring that individual PC operating systems function properly and are connected to the local printer. The emphasis has shifted to maintaining the PC’s presence in the network, resolving active directory and domain issues, “pushing” patches, updates and software images to workstations, and deploying and maintaining virtual machine ware servers and desktops. This shift will continue in the next five years. As virtualization of 2/3s of the college’s PC workstations continues to occur, there will be fewer work station issues to resolve. Instead, these technicians will work with the virtual servers installing patches and “images” accessed by remote clusters of virtual desktops. They will trade in their electric carts for ergonomic desks and chairs where they will sit before banks of visual displays manipulating remote management and monitoring tools.

The college is aggressively constructing “smart” classrooms equipped with network attached computer workstations, video projectors, VHS and DVD players, and document cameras. The total number exceeds 200. Since the retirement of the unit’s only technician qualified to perform preventive maintenance and repairs to the video projectors, the “smart” classrooms have become “orphans.” Attempts to outsource the maintenance of these rooms have failed. The college needs to reopen this position and fill the vacancy.

Network Technicians

The migration of the telephone system to IP Telephony will require the cross training of the Network and Telecommunications Technicians. Traditionally, the Telecommunications Technicians dealt with user requests for “moves, adds, and changes” in Centrex telephone service. With the exception of editing “911” location information, the technicians are performing more sophisticated tasks associated with Unified Messaging, Unified Meeting Place Express, IP Communicator, Emergency Messaging, and Visual Voicemail. All of this

technology resides on the same devices that carry the college's data traffic. Increasingly over the next five years, the Telecommunications and Network Technicians will work side by side with the same equipment and doing many of the same tasks. Finally, at least one of the Telecommunications Technicians will retire in 2009. The college will probably vigorously oppose their replacement.

User Support Technicians are experiencing equally dramatic shifts in the volume of assigned work because ITS has automated many of the paper reports users have requested in the past. This trend will continue. The Accreditation Self Study process, Program Review, and the Accountability Report for California Community Colleges are placing enormous pressure on schools to provide data in the decision-making process. There will not be time to wait for reports. Decision makers will want real time, graphically displayed data that answer "on-the-fly" second, third and fourth level questions. Some of these technicians can be reassigned within the unit; those remaining will need to be retrained in the next 2-5 years.

V Planning

Changes and Trends

1. New technology will enable ITS to utilize remote management to monitor and service many of the computers and other devices attached to the network. As a result, technology maintenance and upgrade procedures will migrate from high touch low online to low touch high online.
2. Virtualization technologies that make it possible to create and consolidate “electronic” network servers on a single physical server and to create “dumb” terminal PC desktops that provide full desktop services at a fraction of the cost of a dedicated PC workstation.
3. Technology that enables an increasing amount of work to be migrated to an online environment where the end users enter and manipulate the data.
4. Increasing functionality will migrate to the Internet Protocol (IP) network. This will make the college increasingly reliant on technology and result in high expectations for network reliability and availability. Malfunction and system failures will cost the college money, enrollment, and create high anxiety.
5. The state will continue to support the centrally funded high speed bandwidth interconnection of the K-20 sector. Bandwidth rates will continue to increase, making the college targets for spamming, phishing, and other malicious hacking and high jacking. The college will need to become more serious about defending itself. An increasing percentage of the technology budget will be spent on security appliances and campaigns to increase user awareness.
6. The college will acquiesce in the continued expansion of the number of academic computer laboratories while withholding adequate funding and support staff to keep them operational, secure, and productive.
7. The desktop PC, the telephone, and mobile devices will converge onto a single platform that provides anything, anytime, anywhere information services to everyone. This will give rise to the mobile student and put pressure on the college to create networks to service this population.
8. Web 2.2 will connect users to distributed computing and social networking so as to revolutionize academic and administrative business practices by incorporating personalized services with grouped human interaction. This technology, along with virtualization, will give rise to the mobile student which will profoundly alter the instructional interaction of students and faculty.
9. The rapidly changing technology sector will exert pressure on the college to keep the job descriptions of the support staff current. The college’s policies of prohibiting revisions to existing job descriptions while penalizing managers who allow staff to work out of class will jeopardize unit services and increase user discontent. The college will blame the unit for the decline in services and the resulting unrest.

Goals and Objectives

1. Apply the Total Cost of Ownership model to create a ratio that balances the requirements of the technology infrastructure with the college's ability to allocate funding and staff support.
2. Create security policies and procedures that protect the district's infrastructure from internal and external attack.
3. Deploy virtualization technology to reduce technology costs, streamline maintenance and reduce the time required to deploy technology upgrades.
4. Continuously reduce the time required to close a help desk ticket by becoming low touch and high online.
5. Empower end users to access Colleague data electronically to run their own reports.
6. Increase network availability and reliability by using remote management and monitoring tools to prevent network services outages.
7. Continuously expand portal based services.
8. Continuously expand the college's portal to accommodate an annual doubling of the number of logons.
9. Work with Facilities and the MAAS Group to ensure that the data infrastructure deployed in all new and renovated buildings meets published college standards.
10. Institutionalize inventory policies and procedures that result in accurate data the college can use to make decisions about technology investments.

VI Conclusion

In 1996, the State of California began the construction of a system-wide high speed data network that today interconnects the K-12 sector, the community colleges, the state university and the university of California systems, and Cal Poly, Stanford University, and Lawrence Livermore. Recurring economic vicissitudes have not dissuaded the state legislature from extending continuous support for this infrastructure. Indeed, the System Office continues to various legislative bodies to expand and enhance services. The college has reciprocated by embracing the integration of technology into the it's academic and administrative business practices to such a high degree that work virtually ceases when rare services outages occur. Unfortunately the college lacks the fiscal and staff recourses to support its dependency on technology. As a result, a general aura of discontent has permeated the institution for over 25 years.

Recommendations

Engage in a continuous review of all ITS job descriptions to ensure their alignment with the technical support requirements of a continuously expanding and increasingly sophisticated and vulnerable technology infrastructure.

Focus on changes that affect the responsibilities and duties of the Computer Systems Support Technicians, the Help Desk Consultants, and the User Support Technicians.

Fill the Computer Systems Support Technician vacancy created when Chong Yi retired in 2006 and assign this position to support the college's smart classrooms.

Replace 2/3s of the installed CPU desktop workstations with virtual desktop computing devices in 5 years. There are an estimated 3,500 PC workstations deployed on the ECC campus. If the college replaces these machines on a five year cycle coinciding with their warranty period, the district must look for over \$1,000,000 a year, forever. If 2/3s of these machines can be migrated to virtual desktop technology, the replacement costs will be reduced by more than \$500,000 and the replacement cycle extended by seven to ten years.

In two years replace 50% of the single function network servers with "virtual server" technology. Virtual machine server ware is the key to reducing costs and extending the life of the desktop computing device. Because the server farm has been expanding in recent years, there is no baseline of potential savings other than reduced energy costs.

Replace all CTR monitors with energy efficient LCD monitors in 2 years. This will be accomplished by attrition as desktop PCs are migrated to the virtual environment.

Increase the functionality of Datatel Colleague by auditing the college's business practices against its deployment of Colleague. (\$70,000 over 2 years)

Deploy tools and systems that enable the college to improve its communication processes.

Deploy a fire suppression system in the main ITS server room.