Solano County Community College District

Technology Plan

2002-2003

Developed by:

Technology Task Force

November 2001
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Solano County Community College

Technology Plan

~~2001~~2005-~~2005~~2009

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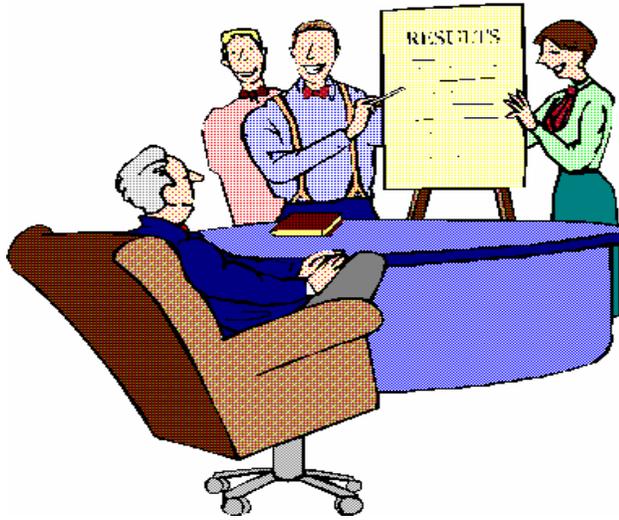
As it enters the new millennium, Solano Community College District faces major challenges:

- the explosively increasing use of the Internet makes information competency a required occupational and citizenship skill.

- bridging the Digital Divide.

- the necessity of integrating new technology into teaching and learning.

- the increasing demand for access to educational opportunities that are independent of place and time.

- making technology accessible to everyone. [1]

"I think there is a world market for maybe five computers."
- Thomas Watson, chairman of IBM, 1943

It is Solano Community College District's vision to "be a premier educational institution for academic development, workforce preparation and lifelong learning. To achieve our vision, Solano Community College is committed to excellence, innovative teaching and learning, and student success through the unified efforts of the campus community." [2]

"Computers in the future may have only 1,000 vacuum tubes and perhaps only weigh one-and-a-half tons."
- Popular Mechanics, 1949

Its *Strategic Plan* acknowledges that Solano's students must attain technology and media literacy to

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[1] "Technology Challenges Facing the California Community Colleges" pp. 1-4; California Community Colleges Technology II Strategic Plan 2000-2005; Board of Governors, California Community Colleges, Sept., 2000
http://www.cccco.edu/divisions/esed/irt/telecom/techII/Technology_Challenges.doc
[2] Solano Community College Strategic Plan (1998)

function successfully in today's knowledge-based society.

As it attempts to maximize the return on its investment in technology Solano Community College District must answer several important and difficult questions:

▪ What should we be doing to help our students achieve their academic and career goals?

▪ What sort of facilities should we be creating to enable the "subject centered" educational exchanges we want to promote?

▪ What mix of traditional and nontraditional activities should our technologies be designed to support?

▪ How should we organize and support the technical staff assigned to manage and maintain our technical infrastructure?

▪ Given the reality of an unstable fiscal environment, how can we keep our technologies current?

▪ What technologies will we need in five years; in ten years; and what impact will these technologies have on our academic and administrative business practices?

In addition to internal factors, Solano's *Technology Plan* must accommodate technology plans issued by the California Community Colleges Chancellor's Office. Since 1996, the Chancellor's staff has been working with the State Legislature, local community colleges and the California State University system to construct 4CNet, a state-wide, high speed, voice-video-data network.

What began as the Telecommunications Technology Infrastructure Program (TTIP) has been expanded into the *Technology II Strategic Plan* as prepared by the Gartner Group and adopted in 2000 by the Board of Governors, California Community Colleges. This plan utilizes a Total Cost of Ownership (TCO) model to estimate the cost of technology hardware, software, and related components such as support staffing and staff development. Several goals and objectives articulated in Solano's *Technology Plan* are dependent upon the State Legislature augmenting the base technology fund to maintain 4CNet and enable the system to implement the TCO model. [3]

In its deliberations, the Technology Task Force was aware of the State *Technology II Strategic Plan*. Indeed, the committee members had draft copies of the plan and, therefore, sought to extend it to the local level in detail that was appropriate for Solano Community College District. However, while the committee deliberated, it became obvious that the *Technology II Strategic Plan* would remain just that, a plan without budget support from the Governor's

Office. When the Governor cut the Instructional Equipment, Library Materials and Scheduled Maintenance fund from the FY 2000-2001 budget and later, all discretionary funding from the

"There is no reason anyone would want a computer in their home."
- Ken Olson, president, chairman and founder of DEC, 1977

> **Comment [jf1]:** Is this still relevant? CO has never funded the TCO model for us.

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[3] "Cost to Implement the Technology II Strategic Plan," pp. 21-28; California Community Colleges, Technology II Strategic Plan 2000-2005; Board of Governors, California Community Colleges, Sept., 2000. http://www.cccco.edu/divisions/esed/irt/telecom/techII/Cost_to_Implement.doc

Telecommunications Technology Infrastructure Program budget, FY 2001-2002 as well, the committee reluctantly decided to base its action and implementation recommendations on what could be achieved with existing sources of funding. Therefore, implementation of this plan will occur in phases with the most urgent needs addressed first.

Solano's *Technology Plan* focuses on five major goals:

- Enhance Learning for Student Success – *Promote students' success in their educational goals.*

- Expand Student Access – *Promote student access to instruction and student services.*

- Link all Members of the Campus Community – *Promote highly effective access to a variety of communications hardware and software.*

- Strengthen Institutional Perspectives – *Promote system-wide coordination of decisions about technology.*

- Provide Resources – *Promote efficient allocation of resources.*

Solano's *Technology Plan* goals, objectives and related activities assume a set of conditions:

First, all instructional hardware and software must adhere to established network standards and protocols. Compatibility is required to exploit fully the resources of the new technology infrastructure and to minimize the time and effort required to install and maintain software systems.reliability of service as is.

Second, our instructional networks should run as a "utility," where users expect and receive the same characteristic of

other utility services such as electrical power and telephone companies.

**Third**, all teaching facilities sh

Third, all teaching facilities should adhere to the INTRANET standards of the District. This compatibility will enable teachers and students to move freely across the district and obtain access to the same set of software products and network utilities.

Fourth, all software systems should be state-of-the-art and consistent with the environment students are likely to experience after they leave Solano to enter the work force or to continue their education at another institution.

While the future is uncertain, this *Technology Plan* represents a valid statement of the direction in which the District should proceed.

TECHNOLOGY
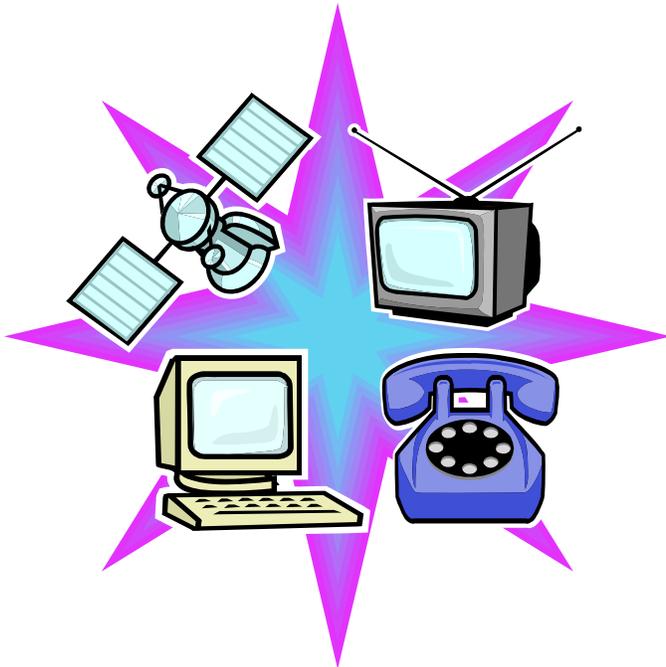
INFRASTRUCTURE

Solano Community College District has expended considerable time, energy and resources to extend its technology infrastructure throughout the district. With few exceptions, the Solano Campus is completely wired. Buildings are interconnected with fiber optic cable. Category 5 twisted pair cable has been installed in all classrooms and most offices and labs. Category 6 twisted pair cable is being installed in Measure G projects in order to position the District to take advantage of future technologies such as Voice Over IP (VOIP). The data network conforms to a "Fast Ethernet" protocol with "switched" speeds of 100 Mbs to the desktop and 1000 Mbs Gbs between the switches and hubs. Both the Vacaville and Vallejo JFK Centers have local area networks that connect to the Solano Campus via dedicated T1 service (each T1 delivers network and phone service over a shared bandwidth of 1.5 Mbs). All networks converge to a single server farm located in Building 100. It is here that network traffic is monitored and routed throughout the District.

Comment [jf2]: Not all?

It is also at this location that the connection to the state 4CNet occursCENIC. 4CNet CENIC provides Internet access. Currently, the District connects to 4CNet CENIC at 3 megabits per second via two T1 circuits. In 1998, the District's connection to the Internet cloud was moved from California State University Hayward to Quest – Sunnyvale. Since the switch over, 4CNet CENIC has been able to provide extremely reliable services.

Solano's network infrastructure provides five main services; access to the Internet, access to internal and external ~~e-mail~~mail, and access to the District's legacy data

via dumb terminal emulation software, print sharing, network storage and file serving. With few exceptions,

application software runs on individual clients. Over the years, the District has installed "fat" clients at the desktop and "thin" servers at the network core. Technology Services and Support staff has installed uninterruptible power supplies that protect the network from transients and other forms of "dirty power." There is a system of tape backup for the network. Mainframe legacy data is backed up daily and weekly, but is not being stored off campus. The backup media are taken to Building 600 and placed in the District's vault.

The District has tended to purchase Tier 1 PC workstations for all sectors; academic labs, faculty, staff and administrators. Dell is the exclusive ~~vendor and the District purchases under the Western States Contracting Alliance~~. Occasionally volume discounts are negotiated directly with Dell. All warranty repairs are performed by Solano technical staff; Dell provides parts within 24 hours of the request.

Academic computing has expanded into nearly every building. Most classrooms can function as "smart classrooms" where an instructor can connect a computer to the network and project the computer screen display. In addition, 20 dedicated computer labs have been installed in the District; 5 in Building 300 serving the Sciences, 5 in Building 500 serving CIS and Business programs, 1

in Building 700 serving Humanities, 2 in Building 800 serving Criminal Justice and Nursing, 1 in Building 1100 serving DSPS students, 1 in Building 1200 serving the Music program, 1 in Building 1500 serving

Mathematics, and 1 in Building 1300 and 3 in Building 1800 serving Trade & Technology, Fine Arts and Photography. The Vacaville and Vallejo Centers each have one dedicated computer lab.

The Library has been automated since 1996 when it became part of the Solano, Napa and Partners Library Consortium (SNAP). Patrons can access the online catalogs of every public and community college library in Solano and Napa Counties. Interlibrary Library Loan is an important service of the consortium; the collection circulates daily during the week such that requests are usually filled in two or three days. Solano Community College District also belongs to the North Bay Cooperative Library System (NBCLS), the Golden Gateway Library Network, and the Library of California. These associations provide Solano students with access to a wide range of digital databases and serial publications at greatly reduced rates. In addition, the District has licensed full digital academic serials in business, the humanities, sciences and medicine.

ACTION PLAN
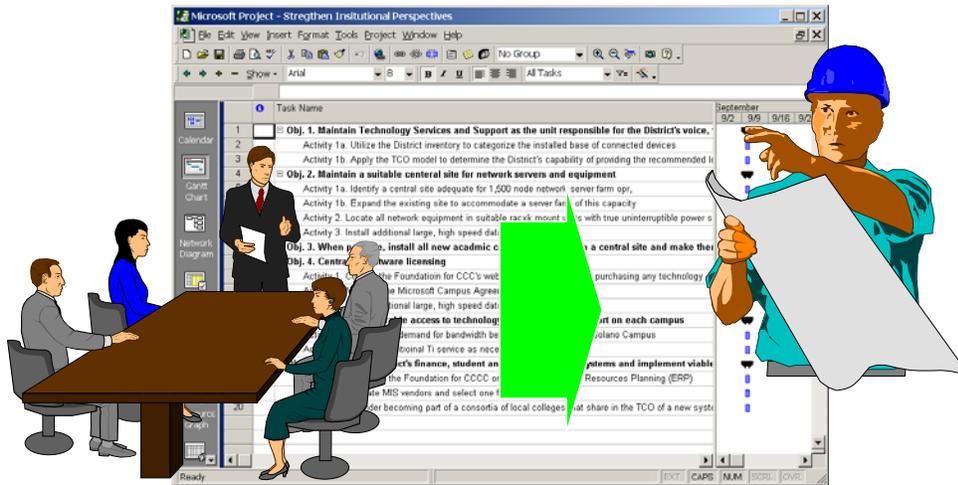
The Action Plan articulates the five goals of the plan. The first goal enhances learning for student success in their educational and career goals. The second goal expands student access to the California Community Colleges, including access to instruction and student support services. The third goal links all members of the campus community through comprehensive communications systems. The fourth goal strengthens institutional perspectives by coordinating decisions about technologies. The fifth goal points to the resources required to implement the plan and to renew the District's technologies so they remain current.

Each individual goal articulates objectives and each objective specifies one or more activities. Each activity is expanded in an implementation plan containing information about how an activity can be implemented, what it costs, who is responsible for the implementation, and when the activity will be scheduled.

Each year, the Strategic Technology Advisory Committee should meet to review the *Technology Plan* and related implementation schedule for the upcoming year. Recommendations, time lines and cost estimates should be forwarded to the Executive Council for review and comment.

Enhance Learning

Student Access

Link Members of the Community

Strengthen Institutional Perspectives

Provide Resources

GOAL 1.

ENHANCE LEARNING

FOR ALL STUDENTS

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The purpose of this goal is to provide state-of-the-art technology to students, faculty, staff and administrators wherever they work in the system; whether in classrooms, laboratories, the library, offices, on and off campus. It requires that faculty will be supported by qualified technical staff and receive the requisite training to use technology effectively. The outcome of this goal is to improve the quality of instruction by the creative application of technology to increase the variety of learning options and provide greater access to information.

Student success is one of two goals upon which the State's *Technology II Strategic Plan* is based. To assist in achieving this goal, the State's plan identifies seven objectives:

- Improve faculty and staff technology training,

- Create additional smart classrooms,

- Increase student access to open computer labs,

- Automate library and information resources,

- Centralize web-based materials and resources that support best practices in curriculum and instruction,

- Expand and upgrade the state wide high speed voice, video and data network,

- Establish the Office of Vice Chancellor in the Community College Chancellor's Office.

Objective 1.1   **Provide all students with opportunities to learn using technology.**

The Internet is a tremendous resource for information retrieval and communication. However, it can be an insurmountable barrier to those who lack the knowledge and/or the means to tap its vast reservoir of information. Traditionally, colleges have tried to help students by installing computer laboratories at various campus locations. These labs were usually installed in their own dedicated space, physically separated from library and computer support facilities. Until recently, colleges were unaware that the separation of these service areas posed a barrier for the students, most of whom know how to surf the Internet, send and receive ~~e-mail~~email, and perform basic word processing, spreadsheet and graphics functions. It is the integration of these activities in the context of productive academic course work that poses a problem for many students.

Objective 1.2   **Have <u>all</u> classrooms be "smart" classrooms, where possible *(Reference ISCI Plan Obj. 1)*.**

A "smart" classroom is an instructional space in which a faculty member or a student can make a presentation developed on a computer using a software package such as PowerPoint, access a site on the Internet, demonstrate software, or play all or part of a video. The "smart" classroom is a minimum platform upon which the academic divisions can build.

Its basic configuration is a ceiling-mounted ~~video~~ data projector, networked computer, full multimedia with amplifier and speakers, and ~~standard setup~~media

control panel, such as the ones the District currently purchases from SP Controls..

Solano is committed to maintaining all classrooms as "smart" classrooms where possible. This commitment

reflects the *Strategic Plan* goal of increasing instructional support of expanding technology, specifically the provision which seeks to increase the percentage of courses which incorporate current/emerging technologies in the teaching/learning process.

Activity 1.2.1. Conduct an inventory of all equipment installed in the "smart" classrooms and review it with the Division Deans.
The District has 33 fixed and 11 portable "smart" classrooms, but an accurate inventory of hardware and software does not exist. As part of the general, district-wide inventory, these rooms should be documented as a first step in the upgrade and expansion of the "smart" classroom concept.

Activity 1.2.2. Create a computer equipment replacement and upgrade schedule.
Each year, the District receives obligated funds for Instructional Equipment, Library Materials and Scheduled Maintenance. It is an established policy that a percentage of these funds are set aside for instructional equipment repair and replacement. Traditionally, technology staff have assumed that

Activity 1.2.1. Conduct an inventory of all Smart Classrooms.

Comment [jf3]: Accurate still?

Activity 1.2.2. Create a computer equipment replacement and upgrade schedule.

these funds can used to repair computers but not to replace them. They argue that to replace a computer almost always results in an upgrade. Regardless of how the debate resolves itself, the Technology

Committee should draft an aggressive equipment replacement schedule that includes computer

hardware. As the District moves aggressively to establish hybrid instruction, it will be important to provide access to standard, up-to-date equipment throughout the District.

**Activity 1.2.3.
Budget to
install five new
"smart"
classrooms a
year.**

Activity 1.2.3. ~~Budget to install five new "smart" classrooms a year beginning in fiscal year 2002-2003.~~Create Smart Classrooms using Measure G funding, where appropriate.
As the District upgrades ~~and standardizes its existing "smart" classrooms, where possible, it should begin converting all classrooms to "smart" status.~~the campus using Measure G funds, each building committee should evaluate the appropriateness of turning that building's classromms into Smart Classrooms.   ~~The recommendation of five per year is arbitrary and is dependent upon the District's ability to budget for the expansion. As the faculty begins creating full and hybrid online courses, they and their students can be expected to require more sophisticated technology in the traditional classroom.~~

**Activity 1.2.4.
Budget to replace
"smart"
classroom PCs
every 3 years and
video projectors
every 6 years.**

Activity 1.2.4. Budget to replace "smart" classroom PCs every 3 years and video projectors every 6 years.
Hardware and software systems must be renewed on a regular basis in order for users to feel confident that they

have access to current technology. Such confidence is the product of a replacement schedule that is predictable. To be predictable, the replacement date must be scheduled at the time the new equipment is installed. The schedule should be budgeted and published.

Objective 1.3   Enhance the use of online technology to create new and diverse ways of teaching and learning both in the traditional classroom and in distance education *(Reference ISCI Plan Obj. 5)*.

In the spring 2000 semester, the College launched full online instruction when the Business Division offered Introduction to Business and Introduction to Computers, and two the Criminal Justice Department offered sections of Community Relations. Eighty-one students successfully completed these courses. By the fall 2001 semester, seven full-time faculty were teaching 8 courses, 12 sections with 448 students enrolled. Online courses has become very popular; students enroll early and the retention rate is high. Preliminary evidence is clear; learners and their teachers accept the online experience as being a legitimate educational alternative. Solano Community College District should build upon this success, expand its online course offerings and begin offering a general studies degree program that may be completed entirely online. The District should also move aggressively to create hybrid online courses that move a substantial portion of the instructional experience from the classroom to the Internet. Hybrid

courses are desirable because they reduce the total "seat time" students spend in the traditional classroom, thereby enabling the District to offer more sections in the same time period and more efficiently utilize classroom space.

Activity 1.3.1. Review and expand the District's Distance Learning Program.

Activity 1.3.1. Review and expand the District's ~~Distance Learning~~Online Program with ~~special emphasis on increasing the number of TeleWeb,~~both f~~F~~ully o~~O~~nline ~~,~~and h and Hybrid ~~Online C~~courses.~~ses offered~~.
There has been considerable discussion regarding the District's distance learning goals with respect to full online and hybrid online instruction. At issue is the rate at which the District's budget can support an expanding online program. eCollege is the District's online course development and hosting vendor. Its contract requires the district to pay $~~37 ~~50 per student for full online courses ~~and $30 per student for hybrid online courses~~. There is no doubt that online courses are popular; they fill rapidly and generate enormous waiting lists. Both students and faculty report that the online experience is rich, demanding and rewarding. However, the number of courses offered is dependent upon the District's capability to pay the per pupil enrollment fees in advance of receiving FTES subvention.

The District may wish to investigate other online course management systems (CMS) in an effort to either find a more efficient and cost-effective means of providing this service or to ascertain that eCollege remains the best provider. The CMS market has undergone a great deal of growth and recent consolidation since eCollege was selected to provide the District's CMS.

~~The following schedule is being proposed as reasonable, based on an assumption that state budgets will not decline precipitously. Its goal is that by fall 2007, 10% of the District's instruction will be delivered online in the following implementation schedule:~~

- ~~Fall 2002 - General Education Degree Fully Online Courses)~~
- ~~Fall 2002 – All Telecourses converted to TeleWeb Courses (8 Courses)~~
- ~~Fall 2004 – Hybrid Online Courses in every Division (20 Courses)~~
- ~~Spring 2005 - Three Majors Fully Online (30 Courses)~~
- ~~Spring 2007 – 30 Additional Online Courses~~

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Activity 1.3.2. Develop Online Student Services

Educators know that student academic success is directly dependent on student services. When asked to rate a course in the first half of the semester, most students base their evaluation of the quality of services they are receiving rather than the quality of instruction they are getting in the course. They decide if the course is any good much later in the semester. Initially, students base their judgments on the ease with which they were able to register and enroll and how quickly and how accurately their questions were answered. Moreover, students enrolled in full and hybrid online courses look for student services to be online, and they have demonstrated that they have very low pain thresholds for traditional student services; "I'm online," they say. "Why aren't you?"

Activity 1.3.2. Develop Online Student Services.

As it migrates courses to the Internet, the District should plan an aggressive schedule for creating online student services. Technology staff should monitor bandwidth and server load to ensure adequate response time. Clusters of networked workstations should be deployed during peak registration and enrollment periods, with the goal of

reducing and perhaps even eliminating lines at the registration windows in Building 100.

Activity 1.3.3. Develop library services that support the Distance/Online experience.

Activity 1.3.3. Develop library services that support the ~~Distance/Oo~~nline experience, including pathfinders/webliographies, and virtual reference including ~~e-mail~~email reference, and real-time online reference.

Distance Education programs have had an enormous impact on the Library. Services, policies and procedures are all changing to meet the needs of the digital native (for footnote: Digital Natives, Digital Immigrants By Marc Prensky From On the Horizon (NCB University Press, Vol. 9 No. 5, October 2001) © 2001 Marc Prensky) and distance learner. ~~Rather than evaluate new items on how well they "fit" into the collection, collection development policies are now being developed to stress that if journals and reference materials exist in more than one format and one of the formats is electronic, the electronic version~~

~~should be purchased. [4]~~ Solano's library should work with Solano and Napa Partners consortium (SNAP) and Technology Services and Support to ~~set up a proxy~~

~~server that~~ allow~~s~~ online students to have access to all of our electronic resources. Several databases, including Lexis-Nexis~~, CountryWatch, Facts.com, College Resource and the Psychlit Abstracts,~~ are currently only available from within the bricks and mortar library, and would be very useful to our online students. Our library should also plan to implement

online reference assistance, especially for our online students. It should also plan to improve inter-library

loan services by putting the forms on the website so our off-site students can submit requests. Librarians are discovering that as traditional students find out about these new services, they want off-site access as well. [5] Consequently, services originally intended to benefit distance learners ultimately benefit all students, on-campus as well as off-campus.

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[4] Developing an electronic information resources collection development policy, White, G. W. & Crawford, G. A., Collection Building, 16 (2), 53-57. (1997).

[5] "Remote library users--needs and expectations;" Cooper, R. & Dempsey, P. R.. *Library Trends*, 42-65, *47* (1), 1998.. Retrieved February 8, 2000 from EBSCO database (Academic Search Elite) on the World Wide Web: http://ebhostvgw9.epnet.com

Accordingly, the District's library should investigate technologies to facilitate e-reference services, both live and asynchronous.

Objective 1.4   **Provide students with a basic set of information competencies that will enable them to utilize Solano's technologies. (*Reference ISCI Plan Ob.* 6).**

A revolution is underway on campus. In a marriage made in cyber-heaven, new technologies are combining to diversify and enrich the academic experience.   Four widespread and inexpensive technologies (the inexpensive personal computer, the Internet, web browser software and ~~e-mail~~email) are fundamentally changing the way teachers and students interact with each other

and with the subject matter. Understanding how to use these technologies productively, within the

structure of an academic course, is paramount to both student access and success.

Activity 1.4.1. Provide an online tutorial/orientation to Solano.edu for every student using the Information Commons.

Activity 1.4.1. Provide an online tutorial/orientation to Solano.edu, the Web, ~~e-mail~~email and a basic set of applications programs for every student using the Information Commons.

Information competency; the ability to search, find, judge and extract information from the web; is as fundamental to the instructional process as is the ability to manipulate a word processor or spreadsheet program. The Information Commons exists as a means of providing structured

exposure to these information technologies and their manipulation in an

academic context. Both traditional and non-traditional students need to develop these skills.

Activity 1.4.2. Offer the Library's 1 hour for credit course in Information Competency both traditionally and online.

Activity 1.4.2. Offer the Library's 1hour for credit course in Information Competency both traditionally and online. Information Competency, LR50 should be required and offered in multiple formats. It focuses on when and how to integrate technology tools and information resources within the structure of academic course work. This issue should be visited by the Curriculum Committee of the Academic Senate.

Objective 1.5   Provide greater access to general purpose computing facilities throughout the District *(Reference ISCI Plan Obj. 3).*
As recently as early 1999, students had guaranteed access to a computer lab only if they were enrolled in a course that required the use of lab facilities. While academic divisions often make a lab available as an open lab when no class is scheduled, the available time is shrinking as more instructional use is made of the labs. The College needs more open lab space that is available to all students a minimum of 14 hours daily, Monday through Thursday, and a somewhat shorter number of hours on weekends at each of its campuses. The 60 workstation Information Commons, which opened in the Library in late

Objective 1.5 Provide greater access to general purpose computing facilities throughout the District.

September 2001 was filling to capacity each day less than five weeks after it opened. It now registers at capacity during most morning and early afternoon hours with between 250 and 500 registrations a week. Obviously, our students will use as much open computing access as we can create.

Activity 1.5.1. Create open computing facilities at the Centers, and create open computing facilities in the Student Center at Solano College.

Students in all disciplines need access to general purpose computing facilities. Initially, the academic divisions erected decentralized, content specific computer labs open primarily to students enrolled in courses supported by the host Division. However, by encouraging faculty to design online and hybrid courses, and to otherwise inject technology into the instructional experience, the College has created a need for large, centralized, general-purpose computer labs. In addition to implementing the Information Commons, activities 2-5 of this section outline other ways in which the District could expand access.

Activity 1.5.2. Create an "Internet Café" in the Student Center.

Activity 1.5.2. Create an "Internet Café" in the Library and Student Center.

The District should develop additional service areas that enable students to access the District's technology and information services. Wireless networking ~~is sufficiently~~should be provided ~~established that we should consider developing wireless study areas~~ in the Library and the Student Center. Students are already studying in groups and

learning to work as members of a team. We need to provide study areas that will allow students to enhance their teamwork and computer skills to create projects and complete assignments. A plan should be drafted to deploy wireless network service throughout the building. Low cost, "Internet" laptops, charging cabinets and security systems should be considered for short-term checkout for use within the Library and Student Center if proper staffing resources can be established for this new service..

Activity 1.5.3. Upgrade the existing computer lab at the Vallejo Center.

The Vallejo Center has a single computer lab equipped with 27 – Student Workstations, 1– Disabled Workstation, 1 – Instructor Workstation, 1 – Staff Workstation, 1 – Server, 1 – Image Workstation, and 1 – Sharp Notevision PG-C45X Projector. The Workstations are redistributed Gateway computers with Pentium 4 processors, 256MB of RAM, 40 GB 31 Pentium II computers that have 128 meg of RAM memory and 8.1 gig hard drives. The

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center lab should be upgraded and expanded, as soon as possible.

Activity 1.5.4. Provide staff support to expand computer lab hours to equal the hours the Centers are open.
Computer labs that are closed during regular business hours can be a source of enormous frustration to students wanting access. Both the Vallejo Center and Vacaville Center should add at

Activity 1.5.4. Provide staff support to expand computer lab hours to equal the hours the Centers are open.

Activity 1.5.5. Install one general purpose computer lab at each of the Vacaville and

least one additional full-time staff position and expand their hours of operation as much as possible.

Activity 1.5.5. Install one general-purpose, open computer lab at each of the Vacaville and Vallejo Centers.
All students need access to general-purpose technology and information resources wherever they

are studying in the district. The Information Commons model should be expanded to the Centers as soon as possible.

Objective 1.6   Increase usage of existing, dedicated computer labs (*Reference ISCI Plan Obj. 2*).
There are limitations inherent in the decentralized, dedicated computer lab. While such facilities are convenient for the faculty and students who use them, they are generally under-utilized and expensive to support. Moreover, usage can be uneven; during some periods of the day they are filled with users

Objective 1.6. Increase usage of existing dedicated computer labs.

while at other times they are empty and dark. The 2002 Technology Task Force felt that as

a corollary to its recommendation for additional large, general access computer labs it should recommend that the District strive to help the Divisions better utilize their existing, dedicated computer labs. There was general agreement that, despite the shortage of qualified technical support staff, the District could do a better job of providing increased access to these

resources by implementing the activities outlined below.

Activity 1.6.1 Create a central, online lab calendar.

Activity 1.6.1 Create a central, online lab calendar.

~~Shared, web accessible calendaring is supported in the Microsoft Suite of Office products and should be used by t~~The District's Lab Coordinators ~~to~~ should create a shared, unified, and web accessible calendar showing hours of operation. Individual, student portal pages should be linked to this calendar. Students should also be able to reserve short term seating during open lab hours.

Activity 1.6.2. Explore consolidation of existing support staff.

Activity 1.6.2. Explore consolidation of existing support staff.

Dedicated, decentralized labs usually require more staff support than most institutions can afford to provide. In its initial reorganization plan, the District explored ways of consolidating its computer lab support staff. It wanted the technical staff to be able to work together on major projects. In discussion, it became obvious that the lab technicians are performing two different functions. Most of the time, they work as Instructional Aides, helping faculty deliver instruction and working directly the students. When classes are not in session, they function as computer technicians, troubleshooting network devices and performing routine maintenance.

Activity 1.6.3. Establish a central maintenance budget.

All of the dedicated computer labs are funded at the department level. Hardware maintenance and supplies, such as printer paper and toner are being purchased with department account codes. This approach creates some unevenness across the District because not every the department is able to provide the same level of support. As the 2002 Technology Task Force discussed ways to support the decentralized, dedicated lab, a move to a central maintenance budget seemed to be a natural extension of central calendaring . As a first step, those departments operating dedicated labs should review their budgets and project actual operating costs. Findings should be discussed and submitted to the District's Executive Council for review and inclusion in the annual budget-building cycle.

Activity 1.6.3. Establish a central maintenance budget.

GOAL 2.

EXPAND STUDENT ACCESS

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The underlying assumption of this goal is that students able to access information technology readily and easily will find their college experience more pleasant and productive. It also assumes that emerging technology and learning experiences can be used to meet the educational needs of potential students existing in both our un-served and underserved populations. This goal emphasizes the importance of using technology to provide access to online college admissions, support services, instruction and library information resources for all students in the system.

To assist in achieving this goal, the State *Technology II Strategic Plan* has identified three objectives. The first objective is to establish a technology replacement program for the entire system with a target that guarantees no student computer lab is more than 3 years old. The second objective is to support the development of technology-based student services applications with system wide impact. Projects such as online tutorial support, universal Internet access, online counseling and advisement, remote access to library information and electronic transcript exchange, are already being developed. The third objective, stemming

from the second, is a basic suite of student systems and services available to each college in the system. **[6]**

Solano's *Technology Plan* for achieving expanded student access parallels the State *Technology II Strategic Plan* by emphasizing enhanced student services, adopting such state-wide technology projects as seem appropriate for Solano, and implementing standards articulated in the Americans with Disabilities Act (ADA) system-wide.

**Use
enhance
student**

Objective 2.1.   Use technology to enhance the delivery of student services including: registration and enrollment; degree audit; refunding; counseling; tuition assistance; transfer to 4 year institutions; and work force development.

Solano Community College District began automating student services several years ago when it implemented the EPOS Touch Tone Registration System. Students have been registering and enrolling via telephone since 1992. The District opened its EPOS Online Services system in January 2002 and began using it for spring 2002 registration. There is agreement throughout the District that every student service should have a technology alternative that provides access to every student, anytime and anywhere.

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[6] Technology II Goals, Student Access and Student Success." pp. 14-15 California Community Colleges, Technology II Strategic Plan 2000-2005; Board of Governors, California Community Colleges, Sept., 2000.
http://www.cccco.edu/divisions/esed/irt/telecom/techII/Technology_II_Goals.doc

Activity 2.1.1. Make information about student enrollment and academic performance more easily available.

Traditionally, students have relied on student services to obtain enrollment, grade and transcript information. This activity usually begins when the student submits a request, either in person or by mail. In response, the institution produces paper records that are mailed either to the student or to other institutions. Since 1996, the State of California Community Colleges Chancellor's Office has been supporting various Technology Model Application Projects (TMAP) in an attempt to automate student services throughout the system.[7] Electronic transcripts are high on the list of projects being undertaken. As it launches its own electronic grade and transcript project, Solano Community College District should continue to closely monitor these projects. Ultimately, students should be able to use web browsing software to obtain unofficial copies of their class schedules, grades and transcripts. They should also be able to obtain on-demand degree audits online.

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[7] Technology Model Application Pilot Project Web Site. © 2000 State of California http://www.cccco.edu/divisions/esed/irt/telecom/tmapp.htm

**.2. Enforce
ulations.**

Activity 2.1.2. Enforce privacy regulations.

Title 5 Regulations impose strict standards regarding the student's right to privacy.[8] The District chose to grant individual access to student records ~~and the~~and the process is a secure one. At a minimum, access to the data should be protected by a rigorous authentication process that requires a logon and password. The electronic transfer should be encrypted at the highest level possible. This capability should be incorporated into the software and guaranteed by the vendor.

**.3.
lent**

Activity 2.1.3. Create student eServices.

For the distance learner, student eServices are a direct counterpart of the online educational experience; one complements the other. As with all services launched in support of the distance learner, once traditional students find out about them, they want access as well. As it develops new online student services, the District should integrate them into a single, web-based suite of services, and offer them to students in a "one-stop-shop" approach.

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[8] Education Code Section, 70900-70902; Part 43. The California Community Colleges. http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection%3dedc

Objective 2.2. Participate selectively in Chancellor's Office State-wide technology projects aimed at improving student access by pooling resources, reducing duplication and leveraging investments.
Since passage of the 1995 Budget Change Proposal to fund the construction of a state-wide high-speed voice,

video and data network, the Office of the California Community College Chancellor has focused on system-wide, pilot projects to encourage utilization of the new network.[9] Collectively, these projects are called the Technology Model Application Projects (TMAP). Examples of TMAPs already funded include @ONE, a state-wide resource for training faculty and support staff in technology and distance education,[10] and the California Virtual Campus, which funded five regions to facilitate distance education at the local level.[11] Other projects seek to provide students and administrators with direct access to enrollment and transcript data, online counseling and tutoring services, and library services integrated into a state-wide system of information retrieval and resource sharing. Colleges willing to experiment with new approaches will receive access to these model projects. This plan recommends that the District participate when appropriate.

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[9] "Technology II Strategic Plan," p 7-9; California Community Colleges, Technology II Strategic Plan 2000-2005; Board of Governors, California Community Colleges, Sept., 2000.http://www.cccco.edu/divisions/esed/irt/telecom/techII/Technology_II_Strategic_Plan.doc

[10] http://one.cvc.edu

[11] http://www.cvc.edu

Activity 2.2.1. Participate in meetings of state technology groups.

The State Chancellor's Office relies on a variety of formal and informal bodies to guide the development

of the technology infrastructure and the developing base of application programs. The Telecommunications Technology Advisory Council (TTAC) works with the Chancellor's staff on issues related to infrastructure standards.**12** The Distance Technology Advisory Council (DTAC) develops standards and works with the colleges on issues of quality in distance education. The Solano Community College District should maintain a seat on both of these councils.

Activity 2.2.2. Volunteer to beta-test technology TMAP projects of potential benefit to Solano Community College District.

The District should monitor closely TTAC's activities and review the TMAPs for potential benefit to the District. The District should also be sensitive to creating and joining consortia of other colleges that begin utilizing the TMAPs.

Activity 2.2.3. Review TMAP project evaluations and reports.

TMAP reviews and evaluations are published regularly. The Technology Committee should make a

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IAP

eview

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12 Telecommunications and Technical Advisory Committee (TTAC), http://www.cccco.edu/divisions/esed/irt/telecom/ttac.htm

discussion of those findings of a regular item on its agenda.

Objective 2.3. Implement ADA standards.

Last year a Budget Change Proposal (BCP) funded the State Chancellor's Office to establish a High-Tech Center to serve as a training facility and clearinghouse for best practices in dealing with ADA issues. The BCP also provided funds for equipment and staff at every college in the system. The District moved aggressively to recruit an Alternative Media Specialist and establish an office of compliance.

Activity 2.3.1. Work with the faculty and staff on issues of ADA compliance.

Activity 2.3.2. Inventory all existing non-print materials to determine ADA compliance and for those materials that do not comply, search and acquire alternative media that does.

Activity 2.3.3. Integrate the activities of the Alternate Media Specialist with the Teaching and Learning Center.

GOAL 3.

LINK ALL MEMBERS

OF THE COMMUNITY

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Everyone at Solano Community College District, some members of the local community, and appropriate collaborating organizations need easy access to a variety of communications hardware and software. The major themes of this goal are network reliability, bandwidth, adequacy of installed hardware and software, information competency, and ease of access to information resources. The purpose of this goal is to enable users to become highly effective in the utilization of networked information and communication tools.

Objective 3.1.   Provide Local Area and Wide Area Network services at a 95% standard of reliability.
Solano Community College District's reliance on networked information has increased dramatically over the last five years as evidenced by the number of connected devices. Before the District received its Title 3 Grant, access to information was limited to data on the District's mainframe. Connections were dedicated twisted pair cable links to mainframe data via dumb terminals. Title 3 launched the new local area network backbone and PC workstations began to replace dumb terminals. From an initial count of a few hundred connected devices, the District currently supports over a thousand connections and the number continues to grow each year.

While Solano was developing and expanding its information network infrastructure, the Internet and Web browsing software opened the way for mass access to an

enormous variety of information resources. Reliable, fast network service is now a necessity in the work place.

Activity 3.1.1. Establish the philosophy of planning and operating the District Network as a "Utility".

As the Internet expands, network users assume the continuous availability of the entire system, from the desktop to the Internet cloud. The distinction between PC workstation, network connection and information resource is gradually blurring into a single "utility". As with telephone and electrical services, people expect an active network connection. This "service as a utility" attitude should permeate the District's network standards, policies, procedures, organization and institutional support resources.

Activity 3.1.2. Contract with a company that provides pickup and remote storage of all mainframe and network data.

Every enterprise accumulates legacy data. It is a "best practice" to backup legacy data at regular intervals and store it in safe, secure off-site locations. While the first concern is recovery from an unplanned event that resulted in the loss of all or part of the facility, data loss due to human error and/or sabotage account for most service disruptions. As a prudent precaution against all contingencies, Solano Community College District should incorporate a formal, backup procedure in its *Disaster Recovery Plan.*

Activity 3.1.3. Install a diesel-power generator capable of running the mainframe and the server farm for at least 4 hours.

Rolling "blackouts" have become a common occurrence in California during much of the year. Although considerable expense is involved, the District should investigate the cost of providing power generation equipment with sufficient capacity to maintain full site operation for several hours in the event of a complete power outage. As more online services, such as Web-Registration, migrate to Solano's side of the Internet wall, service disruptions will become increasingly expensive.

Activity 3.1.4. Install remote network management software capable of pager notification and off-site trouble shooting including full system reboot.

Great advances have occurred in network management hardware and software systems.[13] Whereas in the past, technicians had to intervene directly to fix problems, most network devices now utilize internal backup systems that are self-correcting. When they sense problems, these devices can switch to backup systems and "call for help" over cell phone pagers to notify technicians of trouble. In turn, technicians are now using ~~Palm Pilots~~PDA's and remote PCs to resolve network

Activity 3.1.4. Install remote network management software capable of pager notification and off-site trouble shooting including full system reboot.

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[13] For more information, see Internetwork Design Guide, Cisco Systems, Inc. © 1992--2002 http://www.cisco.com/univercd/cc/td/doc/cisintwk/idg4/index.htm

problems. It is even possible to launch a cold system reboot remotely.

The District should make remote network management a high priority. Funding needs to be secured for cell phones for network technicians.

Objective 3.2.

Internet/Intranet access to all faculty, staff and students.

Activity 3.1.5 Secure components of the data network infrastructure from accidental or intentional disruption by establishing, as per standards, appropriate Intermediate Distribution Frame (IDF) "closets" within each building.

The least secure component in the total path of connectivity is the level at which overall security must be evaluated. Each link in that path must be provided with the level of security desired to prevent accidental or intentional disruption.

Reduce physical accessibility to data network infrastructure by establishing, within each building, a standard IDF closet dedicated solely to the purpose of distributing Information Services, protecting all components (including cabling) from unauthorized access.

Within each IDF, reduce interference from high-voltage electrical equipment

Provide appropriate environmentals for all network equipment

Provide appropriate fire protection for all network equipment

Activity 3.1.6 Establish standards and documentation for an infrastructure that enables the integration of voice, data A/V, surveillance, building management systems, and other applicable environments.

Converged and integrated environments will enable a higher level of overall effectiveness. Before any application can be evaluated for inclusion in a commingled environment, the infrastructure upon which it would function must first be established.

Establish a physical layer infrastructure (e.g., data network cabling and supporting electronics) that is capable of supporting a converged environment.

Establish a logical layer infrastructure (i.e., V-LAN's) applicable to the converged topology

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Objective 3.2.   Provide high-speed, on campus Internet/Intranet access to all faculty, staff, and students (*Reference ISCI Plan Obj. 4*).

The District's first *Technology Plan* acknowledged the value of the Internet as a teaching and learning tool. However, it discussed commercial Internet Service Providers (ISPs) and the variability of service within this sector. Meanwhile, in 1996, 4CNet became the District's Internet Service Provider. Since 1999 when the State signed a contract with Quest to provide concentration services into the cloud for 4CNet subscribers, network services have been very stable across the entire sector.

Today, Solano's connection to ~~4CNet~~ CENIC is supported in the base budget for technology. Bandwidth allocation between the College and the Internet cloud is determined by California State University system in consultation with the Office of the California Community College Chancellor. As the number of connected devices in the District has increased, bandwidth has been increased from single T1 service to dual T1 service providing 3 megabits per second. ~~CSU/ 4CNet~~CENIC ~~have announced plans to~~ increase~~d~~ Solano's network bandwidth to 45 megabits per second. ~~However, given California's ongoing budget crisis, it is not clear when this will happen. However, even if funding becomes available, t~~The District must expand and upgrade its server farm to meet state and PacBell standards. Currently, we do not comply. See Goal 4, Objective 2, Activity 1 for details.

Comment [jf5]: Accurate?

Objective 3.3.   Evaluate the acquisition, maintenance and replacement of technology hardware (*Reference ISCI Plan Obj. 11*).

The College's first *Technology Plan* called for a "spares" program that would deposit computers and peripherals in a spares closet in every building. Users whose machine had failed would get an "exchange" from the spares closet, call for help and then return to work. Support services staff would proceed to repair the machine and return it to the spares closet for the next trouble incident. This program was good in theory but difficult to implement. First, using categorical funds to purchase technology equipment restricts allocation to instructional applications. Purchases may be made for students and faculty are covered but not staff. Second, in a fiscal environment where technology funds are unstable and shrinking, the District did not feel it could afford to purchase machines that would sit idle.

While the "spares" concept receded, technical staff began dealing with the more complex and contentious issue of how to deal with computers that are functional, but no longer useful. PCs are wonderful, enduring

commodities. They last far beyond their useful life. Because PC technology evolves so rapidly, if the machine breaks, repair parts are usually no longer available. Consequently, the repair becomes a replacement that is, in effect, an upgrade.

**Maintain
nventory
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use it to
s to
replace**

***Activity 3.3.1. Maintain an accurate inventory of
all hardware and software and use it to guide
decisions to upgrade and replace technology.***
An accurate inventory of hardware and software is
central to effective decision making about when and
how to replace and upgrade technology systems.
Many schools operate purchasing systems capable of
generating automated inventory records. Solano
Community College District does not. Its purchasing
system is manual. When they have time, warehouse
staff enter inventory data by hand into a stand-alone
database. Since there are no data standards, staff
members only record information that is significant to
them.

The District should develop the purchasing module in
the financial system it currently uses.

**Develop

review it
ory at
ear.**

***Activity 3.3.2. Develop a Statement of Standards
and review it and the inventory at least once a
year.***
Given the extremely rapid pace of change in
technology, PC standards are fleeting and often exist
in the eye of the beholder. Nevertheless, an attempt

should be made to establish a Statement of
Standards, beginning with the network and extending
as far out to the individual PC workstations as
possible. Moreover, the group discussing standards
should very clearly define what they are talking about.
The implementation of the standards will have
important budget ramifications. Standards should

also address the balance between the security of the infrastructure and the functionality of the desktop PC. Because the results will affect everyone, the discussion should be public and the findings published in a readily accessible format. Finally, standards should be reviewed and revise a regular intervals.

Activity 3.3.3. Use the Statement of Standards to drive policies and procedures regarding technology equipment repair, replacement and upgrade.
Solano has been allocating a percentage of its Instructional Equipment, Library Materials and Scheduled Maintenance funds for the repair and replacement of instructional equipment. PC workstations have been designated ineligible because to replace is nearly always to "upgrade" and that is not the intent of the fund. "Functional" and "useful" should be defined in the context of what the Instructional Equipment fund will and will not support. Many people in the district have machines that are functional, but not necessarily useful. What draws the

distinction and how it is determined should be discussed in the *Statement of Standards*.

. Provide
and staff
a PC or
meets
campus

Objective 3.4.   Provide each faculty and staff member with a PC or laptop which meets agreed-upon campus standards (*Reference ISCI Plan Obj. 8*).
Faculty, staff and students work in a "connected" environment in which academic, administrative and

student services exist partially, and in some cases entirely online. ~~PCs have replaced typewriters; on-screen reports are replacing green-bar paper. Solano's first *Technology Plan* discussed strategies for maintaining current technology at the desktop level. It proposed PC standards at what it called Tier 2 or Tier 3, which it defined as one or two levels below the highest capability being manufactured at any point in time. It rationalized this recommendation by stating that only "power users" require the "latest and greatest", and that if the institution purchased lesser models it could save substantial sums of money and not sacrifice functionality.~~

~~Thus the plan proposed an upgrade strategy. It recommended that PCs that required a connection to the Internet be replaced every three years. It also recommended that the District establish a budget to replace one fourth of its PCs every year.~~

~~Today, virtually all the District's PCs are connected to the Internet. Moreover, IL~~imited local budgets have forced the District to rely on categorical funding to repair and replace desktop computers. We are struggling to deal with the harsh implications of one very simple fact; some

PC users are eligible for categorical funds, other users are not. PCs installed in student computer labs easily meet the criteria that makes them eligible for categorical funding. An argument can be made for using these funds to acquire and replace faculty PCs. Staff and management are simply not eligible. We can reassign student and faculty machines to them, but the District

cannot use categorical funds to keep these users current. As a result there is a great unevenness in PC capability across the District that needs to be addressed.

> ***Activity 3.4 1. Prepare budget estimates for the repair, replacement and upgrade of academic PCs, in computer labs and faculty offices.***
> Each year, the District receives an Instructional Equipment, Library Materials, and Scheduled Maintenance Block Grant. The Divisions have developed a "competitive" process through which these funds are distributed. They have also designated a percentage set aside for the repair and replacement of instructional equipment. Working from an accurate inventory of PC workstations and peripherals, the District should prepare a schedule to replace one third of all student lab workstations each year. The goal is to ensure that no student workstation anywhere in the District is older than 3 years. The upgrade replacement date should be calculated and scheduled on the day the new machine is delivered. This upgrade should be funded by the Instructional Equipment, Library Materials, and

> Scheduled Maintenance Block Grant and budgeted before competition for the remaining funds begins.

> ***Activity 3.4 2. Establish a plan, procedure, and budget estimates for upgrading both faculty and staff/management PCs at regular intervals.***
> There are over 400 faculty, staff and management PCs connected to the District's infrastructure. The

**Establish
ure, and
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 faculty
agement
intervals.**

Technology Task Force acknowledged that remaining current has enormous budget implications. Nevertheless, the Technology Committee should be charged to explore alternatives and make recommendations for what it would cost to replace PCs for these users at regular intervals sufficient to insure the utility of the desktop machine.

Objective 3.5.　　　Where appropriate, support mobile computing technologies

Mobile computing within a pervasive computing environment holds enormous promise for Solano Community College's faculty, staff, and students. Teaching and learning become unbound from specific locations and often, from specific times. So too does the ability of the staff to connect to important and relevant resources to do their jobs. Mobile access to digital resources can be an enabling use of technology.

Activity 3.5 1. Provide appropriate mobile computing devices such as notebooks, PDA's tablets.

The district should continue to make notebook computers available as one option for faculty and staff. Personal digital assistants (PDA's) should also be standard technology equipment for many employees. As new mobile computing devices become more common, they should be investigated for relevance. These might include tablet PC's and smart phones.

Activity 3.5 2. Enable an overlapping wireless network across the campus and at the off-site centers.

As part of the Measure G bond program, an overlapping wireless network should be created. This network should provide for security, authentication, and authorization. Guest access should not be allowed to pose a security threat to the campus network and its resources. Faculty and staff should be able to authenticate and then be authorized to access the resources normally used from the wired network.

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Objective 3.5.   Charge the library with responsibility for providing access to information in all forms, whether held locally or elsewhere (Reference ISCI Plan Obj. 15).

Solano's first *Technology Plan* recognized the role the Library should play in the new "age of information." It declared electronic information retrieval and information competency to be important tools in the modern, digital academic experience. The plan suggested that the Library should undertake an active role in helping faculty and students master the skills necessary to use these tools productively.

Since then, the Library has come to occupy an even more central position in the District's information infrastructure. Initially, to meet the needs of the Distance Learner and now to serve all students, the library and the role of the librarian has changed dramatically. The activities outlined below illustrate how library services are becoming more online and less inline. Library staff are involving themselves in the technology of the Internet as

well as the information it makes available. They are able to answer computer and network questions with the same degree of knowledge and experience that they bring to reference questions.

These new skills have become a core component of the "one-stop-shop" Information Commons concept providing student access to library, computer, and media services. It is also important to recognize that as students begin experiencing these services in the Library, they come to expect access anywhere, on-campus and at home. Students working off-campus on term papers are as likely to request remote reference help as are online students. Moreover, as we begin offering hybrid online courses, we should expect a dramatic increase in the demand for access to these new, remote library services.

Activity 3.5.1. Develop library services for remote users.

Beginning with the online students, the Library should launch an Inter-Library Loan (ILL) program to bring materials into the Library from other libraries who are not part of the SNAP Consortium. A budget should be created to underwrite the cost of acquiring and mailing these materials to the online patron. An eReference service should also be undertaken.

Initially, this service could be offered asynchronously either via ~~e-mail~~mail or with an electronic form students fill out on the Library's web site. Finally, the Library should investigate online reference via instant messaging and live chat that connects both online

Acquire

and on-campus students with a live reference librarian.

Activity 3.5.2. Acquire information in electronic form and make it available to all users, on-campus and off.

As with library services, library policies have also been affected by the District's distance learning activities. For example, in the past, collection development policies emphasized that new materials be judged on the basis of "best fit" with the collection. Librarians considered format less important than fit. With more and more students and faculty working remotely, the emphasis is now on format. ~~Library collection development policies now suggest that if new materials exist in more than one format, and if one of the formats is electronic, then electronic versions should be added to the collection.~~

~~The Library should adopt this new policy and continue developing its electronic collection and the web-based links that provide access.~~ Library collection development efforts should carefully weigh the benefits of acquiring electronic formats and where it best suits the needs of the campus community, those formats should be purchased. In some instances, the benefits of access can outweigh the challenges of not having traditional print media. The librarians should work closely with each other and their respective divisions in order to make the best, informed choice.

credit
rmation

Activity 3.5.3. Develop a 1 - 3 credit course on Information Competency.

Faculty are beginning to revise their courses to include assignments that require students to utilize

the Internet. Increasingly, students are expected to know how to use web technology to obtain and utilize course-related information to complete assignments and prepare term papers. The State Academic Senate has recommended that the California Community Colleges offer a required 3-hour credit course on Information Competency.[14] This course should be available online as well as in the classroom.

Activity 3.5.4. Develop information competency seminars and training sessions for faculty and staff.

In 1997, the Library received TTIP funding for a Bibliographic Instruction Lab. Solano was able to use these funds to create a 17-seat computer lab. In summer 2001 the room was expanded by an additional 11 seats. In 2004-2005, the lab was upgraded. Librarians are using this space to conduct short orientation sessions for faculty. They should expand the program to include staff. Educational and governmental agencies throughout the country are

Activity 3.5.4.
Activity 3.5.4.
Develop information
competency
seminars and
training sessions for
faculty and staff.

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[14] "Information Competency," Linda Collins, ,Consultation Digest 916.445.4753," May 10, 2001.

"Title 5 Regulations on Information Competency": Victoria Morrow, Vice Chancellor Educational Services and Economic Development, Consultation Digest, 916.322.6881, April 2, 2002

creating web sites for information that is now electronically available. The Chancellor's Office has a comprehensive site it expects the colleges to use. Faculty and staff should be assisted

in discovering the rich wealth of online resources and encouraged to use them regularly.

Objective 3.6.   Implement Web-based access to District Information Resources in order to provide faculty, staff, and students with a common mechanism for communication and information retrieval and utilization (*Reference ISCI Plan Obj. 18*). This objective deals with how best to organize and provide access to Solano's information resources. We are challenged to address the specific information needs of an ever growing and complex group of constituents who now expect instant access to information and data resources. We need to get the right information to the right people, but we are dealing with a hodge-podge of decentralized, disparate legacy and web/server data and information systems. We have been mandated to deliver distance learning and student services in a secure, online environment, but we are working with inadequate staff and funding.

Solano College is an un-unified, digital campus challenged to deliver information resources to anyone, anywhere, whenever they are needed. Solano College needs to become a unified, digital campus, able to unite disparate technology systems into a coherent whole and make them available from a single, centralized location.

Being unified and digital creates a connected campus experience that is more productive and convenient for all users. Everyone, including students, should find the

experience productive and enjoyable, and consequently, display increased loyalty toward the institution.[15]

The following activities lead the way toward unifying Solano's digital campus:

Activity 3.6.1. Implement web-based portal access to a faculty/staff/student information system.

Comment [jf6]: Needs updating?

At the heart of the INTRANET is a suite of software called "groupware." [16] Groupware tends to be narrowly identified with three products: Lotus Notes, Novell GroupWise, and Microsoft Exchange. Functionality is roughly synonymous with "collaborative computing" and embraces the following:

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- Document Sharing
- Collaborative Authoring
- Versioning
- Messaging
- Secure Access
- Search/Retrieval
- Discussion Forums

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[15] For a guided tour of a "Unified Digital Campus," Campus Pipeline, Inc, © Copyright 2002
http://www.campuspipeline.com/products/demo.html

[16] "Usability First," Diamond Bullet Design, Inc, © 2001，An online guide to usability resources that explains the concept of "groupware" and give examples. http://www.usabilityfirst.com/groupware/

~~•Database Integration~~

~~The District should accelerate installation of the Exchange Server and develop student, faculty and staff information portals.~~

Activity 3.6.2. Install middleware tools that provide web-based, portal access to the District's legacy databases.

The dumb terminal – mainframe connection has long been the predominant configuration in data processing operations. As PCs were being introduced in the 1980s, emulation software appeared which mapped the PC keyboard over the dumb terminal keyboard rearranging the PC keyboard so it corresponded to the dumb terminal keyboard layout. Client-servers exist as an option to this configuration. However, the heavy iron mainframe computing is making a comeback due in part to the development of web-based middleware and the superior data processing capabilities compared to client-server systems. Middleware enables the client to manipulate legacy, mainframe databases using simple web browser tools.[17] Such capability simplifies user interaction with the data and allows for access on-campus and off, via an Internet connection.

Activity 3.6.3. Install middleware tools that provide web-based, portal access to the District's legacy databases.

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[17] The University Corporation for Advanced Internet Development (UCAID) is a non-profit consortium, led by university members working in partnership with corporate and affiliate members, to provide leadership and direction for advanced networking development. Their middleware site explains the concept and how it relates to the advanced networking applications envisioned in Internet2; UCAID, © 1997-2002 http://middleware.internet2.edu/

LINK ALL MEMBERS OF THE CAMPUS COMMUNITY

Regardless of how the District develops its MIS data systems, it should investigate the feasibility of installing middleware tools to increase the Functionality of and the ease of access to its legacy information resources.

GOAL 4.

STRENGTHEN INSITUTIONAL PERSEPCTIVES

The main theme of this goal is coordination. A systems view of organization behavior considers the relationships among people, activities, and other components of an organization. The management of technology lends itself especially to a systems view. Effective and efficient use of technology – doing the right things well, at minimum cost – requires personnel who bring to their work a systems approach, an understanding of how interrelated actions affect the well-being of the organization and its ability to serve students. [18]

This systems view encourages us to coordinate decisions about how we allocate, use, and support technology across the District. We also need to integrate these activities into a single, consistent approach that reflects our district-wide perspectives.

Objective 4.1.   Maintain Technology Services and Support as the unit responsible for the District's voice, video and data services and staff and fund it at a level of the TCO model recommended in the *Chancellor's Technology II Strategic Plan.* **(***Reference ISCI Plan Obj.* **10)**

The District has already established Technology Services and Support as the lead department responsible for the

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[18]   Carter McNamara, PhD, Copyright 1999, The Management Assistance Program for Nonprofits, 2233 University Avenue West, Suite 360, St. Paul, Minnesota 55114 (651) 647-1216 http://www.mapnp.org/library/systems/systems.htm;

"Making a virtual organization work," Stephenson, Karen and Steve Haeckel; IBM Executive Strategy Report; Reprinted from Focus no. 21 by permission of Zurich Insurance Group; http://www-1.ibm.com/services/strategy/e_strategy/print_virtual.html

voice, video, and data infrastructure. The next step is to develop a model for funding software, maintenance and training necessary to fully exploit the installed base. In 1999-2000, the State's *Technology II Strategic Plan* introduced the concept of Total Cost of Ownership (TCO) as a model for assessing the true cost of a PC/network.[19] The District should apply the TCO model in its decisions about when and how to upgrade and expand its technology infrastructure.

> *Activity 4.1.1. Utilize the District inventory to categorize the installed base of connected devices (PCs and other network devices) and apply the Total Cost of Ownership (TCO) model to determine the District's capability of providing the recommended level of support.* **(Goal 4, Objective 2)**

When educational institutions acquire hardware and software, they generally do so without factoring in the costs to support the equipment and infrastructure. There is often a resulting lack of support to maintain, repair and improve performance of the equipment as well as a lack of technical staff to train faculty and other staff in the use of the equipment. The TCO funding model assumes a relationship between

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[19] The TCO is explained in detail at a "First Annual Forum" workshop held on April 9, 2002, at the Annual Chancellor's Office Conference in Burlingame, California.
http://www.ccco.edu/divisions/esed/irt/telecom/tcoforum.htm

computer hardware/software and support. It is a method of determining the full cost associated with owning and using computers in an educational environment. The District should be guided by the TCO formula and recommended guidelines in determining budgetary requirements.

The cost estimate for the technology using the TCO model devised in the State's *Technology II Strategic Plan* is $3,506 per PC over the three-year life of the machine.[20] Given that the TCO model also declares every PC should be replaced every three years, the District would have to establish an annual budget of $1,168,666 to function at the level recommended in the State's *Technology II Strategic Plan.*

> Comment [jf7]: Needs current figures

Objective 4.2.   Maintain a suitable central site for servers and network equipment. (*Reference ISCI Plan Obj. 14*)

As the District has expanded its Student Services it has been forced to assign support staff to temporary facilities. When the Computing Services Department began downsizing its legacy mainframe hardware, its machine room space was also downsized and redesigned for Student Services. This was necessary, but unfortunate. Although hardware is migrating from a large mainframe

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[20] "Cost to Implement the Technology II Strategic Plan," p 21-28, California Community Colleges, Technology II Strategic Plan 2000-2005; Board of Governors, California Community Colleges, Sept., 2000 http://www.cccco.edu/divisions/esed/irt/telecom/techII/Cost_to_Implement.doc

system to a server farm populated by smaller legacy computing systems and integrated network servers performing similar functions, the space requirements remain the same now as before the change.

An adequate server room and network operations center needs to be planned into the remodel of Building 100, one of the Measure G projects.

Activity 4.2.1. Identify a central site adequate for a 1,500 node network server farm or expand the existing site to accommodate a server farm this size

~~The Chancellor's Office is beginning to convert the College connections to 4Cnet from T level service to DS3 service.[21] For Solano Community College District, this would result in a bandwidth expansion from 1.5 megabits per second to 45 megabits per second. As currently configured, the space allocated to the central network server site does not meet PacBell's minimum standards. The best solution may be to re-assign adjacent office space. This issue should be given priority attention because the State may not allow us the luxury of time.~~

Activity 4.2.2. Locate all network equipment in suitable rack mount units with true uninterruptible

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[21] "DS-3 Upgrade Project, Frequently Asked Questions." © 2000 State of California http://www.cccco.edu/divisions/esed/irt/telecom/ds3/DS-3%20FAQrev4.doc

power supplies (UPS), cable management trays and 6 feet of access front and rear.

Technology Services and Support has begun converting to this new standard as it expands the network. However, the original network racks and the

equipment does not conform to the new standard. In the short term, it is probably wisest to leave them alone. However, in the long term, it should all be replaced, particularly if the facility is expanded.

Activity 4.2.3. Install additional high speed, large data storage servers.

The District has tended to install fat clients and thin servers. [22] Consequently, it is very expensive to keep the desktop current. At the same time, the network is under-funded, under-built, and under-utilized. Internet access and ~~e-mail~~email are, for most users, the major, if not the only reason for network connectivity.

Most divisions are just beginning to install networked printers for their workgroup clusters. Many users are using the network to back up their data files and few users are using the network for application serving; both activities that are considered to be basic staples of LAN/WAN operations.

Activity 4.2.3. Install additional high speed, large data storage servers.

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[22] "Thin-Client vs. Fat-Client TCO, in Decision Framework," Lowber, P.; DF-14-2800, Research Note, Sept. 28, 2001; http://www.keltec.co.uk/technology/sun/Gartner_Fat_v_Thin.pdf

The District provides data storage space for its "power" users, such as the President, Vice Presidents and the Office of Research and Planning. Anyone devoting substantial person-hours producing large data files should have a remote (away from the PC), secure, regular backup storage location.

~~The District should also consider utilizing Microsoft Windows 2000 Server's "remote terminal" features to serve application programs to users unable to migrate from low level Pentium grade PCs.~~

Objective 4.3.   When possible, install all new academic computing facilities in a central site and make them general access in the sense of not being dedicated to any individual curriculum or Division.

The plans for the remodel of Building 100 (or a possible new state-funded Library/Learning Resource Center building) have included an integrated learning lab setup. This integrated lab facility will combine several different labs such as the Writing Lab, Tutorial Center, MAC, and others as a way to provide a one-stop shop for our students. Economies of scale related to maintenance and staffing will also hopefully be realized in this set up.

The first *Technology Plan* recommended installing at least one computer lab in each building and two in the larger buildings. It also recommended installing a general purpose, open access computer on the Solano campus and the Vallejo and Vacaville Centers. The Technology Task Force discussed the pros and cons of this recommendation. Everyone agreed that

decentralized labs require more support staff than the District can afford and cannot always provide as much access time as students need. ~~In the absence of a new, large facility dedicated to technology, the Committee resisted the idea of migrating existing computer labs from their current locations to a central campus location. It is better to keep them where they are and deal with staff and scheduling issues;~~ *see Goal 1, Objectives 5 and 6*

Objective 4.4.   Centralize software licensing (*Reference ISCI Plan Obj. 12*).

When the first Solano *Technology Plan* was written, the divisions and departments of the College were purchasing applications software separate from the PC. Each installation generated separate and additional

license fees. Moreover, because these license fees were documented in separate purchase orders, it was difficult for the District to verify its compliance with copyright laws. With help from the Chancellor's Office and the Foundation for California Community Colleges, it is now much easier to acquire central site licensing.

> *Activity 4.4.1. Consult the Foundation's web site as the first step in purchasing any technology*
> Centralized software licensing has become a reality for most of the common PC applications and operating system programs. The Chancellor's Office has established the Foundation for California Community Colleges and charged it to work with vendors to obtain economies of scale on a variety of technologies for the system. The Foundation's web

Activity 4.4.1. Consult the Foundation's web site as the first step in purchasing any technology.

site, http://www.foundationccc.org/ contains complete information about the vendors, products, and conditions for purchase.

Activity 4.4.2. Maintain the Microsoft Campus Agreement

The Microsoft Campus Agreement was among the first contracts the Foundation for California Community Colleges negotiated. Now in its fifth year, this contract provides site licensing for the Windows operating system, the complete Office suite, and FrontPage, an HTML authoring tool.

Objective 4.5.   Provide comparable access to technology and technology support on each campus (*Reference ISCI Plan Obj. 13*).

In early 1999, there were significant differences in access to technology and technology support at the Vacaville and Vallejo Centers compared with what was available at the Solano campus. PCs installed at the Centers were below the minimum standard. While the Vacaville Center was linked to the Solano Campus with T1 service, Vallejo was not. Vallejo's local area network was also inferior to Vacaville's. Since 1999, the District has made substantial progress in its "commitment to maintain the same level of technology access and support on all campuses". In the summer 2000, the District installed a new local area network with remote dial-up service at the Vallejo Center and switched it over to T1 service.

Activity 4.5.1. Monitor the demand for bandwidth between the Centers and Solano Campus and acquire additional T1 service as necessary. Given adequate funding, the State has indicated a willingness to include Centers in the formula that funds technology for colleges and districts. This will greatly enhance the District's ability to expand its infrastructure to keep pace with growth at the Centers. Meanwhile, because all data traffic, mainframe, network and telephones use the same T1 lines, bandwidth should be monitored closely and expanded as necessary.

Objective 4.6.   ~~Evaluate the District's finance, student, and human resource systems to determine and implement viable options that improve the efficiency and effectiveness of the District's information systems. (*Reference ISCI Plan Obj. 16*).~~**Evaluate, procure and install an integrated Enterprise Resource Planning (ERP) system designed for higher education.**

~~Management Information Systems (MIS)~~Enterprise resource planning systems which enable users to interact directly with the data are more useful and productive than those which do not; administrators who are able to manipulate, evaluate and understand their own data will be able to respond to rapid changes in the environment more effectively than those who cannot.

~~Two thirds of the California Community College sector utilizes database systems that have either been developed locally or purchased from small third party vendors. Many of these systems are being maintained and operated by COBOL programmers. Nation-wide, the ranks of those able to program in COBOL are dwindling and those few remaining programmers can command much higher salaries than community colleges can afford. There is a real concern at the Chancellor's Office that the sector will begin losing its COBOL programmers to retirement over the next three to five years. We can expect a statewide initiative to help community colleges plan a migration toward standard, commercial, off-the-shelf programs this year.~~

When analyzing the cost of installing modern ~~MIS~~ ERP in higher education institutions, three facts emerge.

First, all vendors require the institution to purchase and maintain software modules that may not be installed for

months, maybe even years. As a result, Colleges find themselves confronting enormous, up-front costs.

Second, the new hardware and software systems are not the major cost; the major cost occurs in the hours of consulting and staff time consumed as the institution tries to ~~customize the software to fit local business practices~~ examine its business process~~.~~es with an eye toward reengineering where it is appropriate and customizing the ERP software where it is not.

Cosniderable time will also be spent converting data to move from one system to the other.

Third, it is important to keep in mind the TCO model when purchasing new ~~MIS~~ ERP systems~~software,~~ and to communicate this information to the vendor, in order to minimize or even eliminates cost overruns. A five year TCO model is the minimum that should be used to cost out the move to an ERP.

> ***Activity 4.6.1. Work with*** ~~***the Foundation for California Community Colleges***~~***Strata Information Group to complete our functional requirements and to do an in-depth evbaluation of*** ~~***on a guided***~~ ***Enterprise Resources Planning (ERP) systems and software. Select one for implementation.*** ~~***.***~~

Establishing our base functional requirements as well as understanding (mapping) our business processes is a key step in being able to evaluate systems.   State reporting requirements, compliance with State and Federal laws, functionality, ease of use, and technology support considerations are all important facets, among many others. These need careful evaluation before a choice can be made. ~~Most colleges considering a migration to a different MIS concentrate on the "hurt"; the specific features and functions they wish to change or acquire. A guided ERP process helps districts establish the broad goals that will guide the project. A structured, expert-hosted, network-based, threaded discussion becomes the tool that facilitates a "business re-engineering" study. This study prepares the district for~~

an "off-the-shelf" installation with no changes, thereby greatly reducing the TCO.

Activity 4.6.2. Evaluate MIS vendors and select one for implementation.

Institutions considering a migration to a new MIS usually conduct an internal study first. They evaluate the vendor's compliance with the local business

practices and state MIS requirements. Given the installed base in California of relational databases, it might be possible to visit with other institutions and user groups to determine which vendor might best serve the District while the ERP is being conducted.

Activity 4.6.3. Consider becoming part of a consortia of local colleges that share in the TCO of the new system.

The Chancellor's Office is working with the major MIS vendors to determine the feasibility of creating regional consortia of community colleges. In this arrangement, one college might serve as the lead institution responsible for operating the hardware and maintaining the software. The other participating schools would run their applications remotely over the network and pay a service fee for access. There are cost savings in this arrangement that could greatly reduce the TCO.

Activity 4.6.3. Consider becoming part of a consortia of local colleges that share in the TCO of the new system.

Once a choice is made, Governing Board approval for procurement needs to be obtained and options for funding need to be considered.

Working with Starta, a tentative schedule has been worked out.

Evaluations of SCT Banner and Datatel are scheduled for November 2005. Initial deployment of the first module(s) is being considered for July 1, 2007, the start of the 2007-2008 fiscal year.

GOAL 5.

PROVIDE RESOURCES

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Activity 5.5.3 Establish and publish standards for security of District data, including personal data contained on District systems.

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To provide the Solano Community with technology commensurate with what will be needed to succeed in the new millennium, the District should not base its plans solely on the expectation that the state will provide adequate financial support. Rather, we must form partnerships with individual donors, businesses in the community, private non-profit foundations, and government funding agencies. As we solicit these external funds, we must simultaneously redirect local funds.

Efforts to generate new forms of income, solicit external donations, and redirect internal monies will require collaboration among numerous functions within the College. Various forms of resources, particularly the dedication of staff time, will be required to meet the District's urgent need to increase funding, while managing internal allocations effectively.

Objective 5.1.   Fund Information Technology at a level of the TCO model recommended in the Chancellor's *Technology II Strategic Plan*. (*Reference ISCI Plan Obj. 19*)

Having created 4CNet, and barring a fiscal disaster at the state level, we should anticipate a continuation of the Telecommunications Technology Infrastructure Program (TTIP). Unfortunately, the *Technology II Strategic Plan*, with its TCO model for helping the colleges utilize and renew their technology base, has been rejected in each of the last two state budgets.

Although it remains on the State's legislative agenda, the principle value of the TCO model is to help the District determine the level of external funds required to renew and upgrade its technology infrastructure.

> ***Activity 5.1.1.   Establish a Fund for Learning in the New Millennium.***
> ~~The District should establish a *Fund for Learning in the New Millennium.* The Fund will be supported by private donations, non-profit foundations, businesses, government grant sources, and internal monies that will meet the District's current and future information technology needs. It should also reflect a District-wide perspective about the use of information technology – that we have a history of innovative applications of technology in numerous disciplines and programs and that we have numerous significant proposals in development to meet the diverse needs of our students. The Fund will allow the Superintendent/President, as well as other members of the District, to represent our institution as a leader in the effective use of information technology so that businesses and foundations will view partnerships with the District as desirable and mutually beneficial.~~

Comment [jf9]: Still relevant?

Objective 5.2.   Implement a faculty/staff development center and provide ongoing support (*Reference ISCI Plan Obj. 7*).
Infrastructure means more than just computers, switches, routers and wiring. Institutions must plan for

the support of their technical environments or the result
will be networks and computers that fail, and faculty,
students and staff who do not know how to use them
even when the equipment is working. We know there is
increasing demand for the integration of technology in
teaching. We also know that lack of support is the
primary barrier to the successful adoption of new
technology and new technology-enabled methods in
every professional discipline. A basic support element
for faculty and staff is training in the use of the tools.
This training must not be limited to an initial tutorial, but
must also include ongoing, follow-up training in a site
that supports this activity.

*Activity 5.2.1. Create a Solano Technology Web
Site containing links to self-help technology
training materials, calendars of events and manuals
that can be downloaded.*
The District should encourage the development of a
web site that serves as TLC's public home. This site
should include a variety of self-help resources and
general and specific calendars showing events and
activities into which users can register themselves. At a
minimum the site should include the following:

   Training Packages - Training materials designed to
assist faculty to effectively integrate technology into
classroom instruction. These should be designed for a
local faculty training coordinator to use and modify, but
it should also be possible for individuals to download it
for self-study. Topics include collaborative learning,
simulations, and instructional web sites.

Online Tutorials – Online tutorials designed to assist in effectively planning and integrating technology into classroom instruction. Topics should include collaborative learning, instructional design, and Internet research.

Microsoft Office Material – Guides in the effective use of the current MS Office Suite of applications. Topics include mail merge, grade sheet creation, PowerPoint presentations and working with images.

Training Resource Database – An extensive resources database that includes training and

instructional material available on the Internet. Database categories include accessibility, course management, and assessment.

Automated Events Calendar – All CTL events and activities should be entered in the site calendar with links to more information and a self-registration tool.

Activity 5.2.2. Work with the Staff Development Committee and the divisions and departments to schedule workshops and short courses that meet the immediate needs of specific work group clusters.
The Center should support a variety of trainer-led activities, beginning with a series of short, basic, function-based skill courses that are practical and can be used immediately in the workplace. To motivate users to consider this option, we

Activity 5.2.3. Work with the Staff Development Committee and the divisions and departments to schedule workshops and short courses that meet the immediate needs of specific work group clusters.

should adopt a "Frequent Training Card" that can be stamped after each course and "cashed" in for redeemable incentives.

Building on the short, practical courses, we should look for other ways to deliver more advanced training sessions, particularly in Microsoft PowerPoint, Publisher, and Adobe Photoshop. For instance, The TechED Institute of Multisensory Learning can bring technology and multimedia training directly to a local campus. Sponsored by the Community

College Foundation, TechEd maintains six mobile learning labs equipped with multimedia, computing, Internet and networking technologies. Foundation trainers bring years of professional experience to the delivery of training programs that can be customized to address local needs.[23]

Finally, the Center should schedule intense, project based seminars for faculty. "Website Design and Maintenance" and "Putting Your Course On-line" are examples of subject matter that could be offered in intense, four and five day seminars where the participant comes away with a useful product. @ONE is a resource that sponsors off-campus, week long seminars during the summer. The District

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[23] The Community College Foundation's Mission and Philosophy: http://communitycollege.org/David/found1.html

For information about the TechEd Institute of Multisensory Learning see: http://www.communitycollege.org/Institute/index.htm

may be able to underwrite the cost of sending 4 to 6 faculty for training each summer.

Objective 5.3.   Enforce sound ergonomic practices (*Reference ISCI Plan Obj. 9*).
The College has been struggling with this issue for several years. The first *Technology Plan* called for faculty and staff workspaces to be modified to position the computer monitor and keyboard at levels that could accommodate individual users. The plan suggested that the College physical plant staff might be able to install "kits" that would secure the computer monitor below the desk surface and attach the keyboard to pull-out, adjustable drawers. Instead, the College has incorporated ergonomic issues into general office remodel projects; an approach that most administrative departments can afford, but most academic divisions

cannot. The College's *Facilities Master Plan* contains data about office workspace that could be useful to a systematic review of this problem.

> *Activity 5.3.1. Determine the magnitude of the problem.*
> There is considerable variation across the District regarding ergonomic workstations. Some administrative departments have been able to remodel staff offices by re-deploying salary savings and other general fund resources. Most academic divisions have been unable to fund new office furniture. The District should prepare a report based on information contained in the *Facilities Master*

Plan. It should include an actual count of the offices that need to be upgraded and who is occupying the space.

Activity 5.3.2. Develop alternative solutions and evaluate their feasibility.

The problem to be addressed in the workspace is the relationship between the computer, the monitor, the keyboard, and the user's hands and eyes. Traditional, the only solution has been a complete and rather expensive remodel of the office space. The District should force the vendors into the bid arena and consider allowing for some variation in the design of individual office space. The district should also invite a "shoot out" on the feasibility and cost of modifying existing office furniture. What is

presently viewed as a $6,000 per office cost, might be solvable for a few hundred dollars.

Activity 5.3.3. Include ergonomic recommendations in the Statement of Standards document.

As the Technology Committee reviews and revises the Plan's "*Statement of Standards,*" it should also prepare recommendations on how best to make the workspace more ergonomic. All staff should be made aware of these standards and receive periodic training in them.

Activity 5.3.3. Include ergonomic recommendations in the Statement of Standards document.

Objective 5.4. Prepare a Disaster Recovery Plan and update it annually.

Objective 5.4.   Prepare a Disaster Recovery Plan and update it annually.

Computers and computer-based systems have become so reliable that users tend to take them for granted. Service failures that do occur can normally be diagnosed and repaired promptly. Major service outages caused by disaster and acts of God require specialized responses. In the past, most computer operations were predominantly batch, and reciprocal agreements for computer batch running were often made between users of similar systems. These arrangements have become less feasible because most institutions have installed very complicated, diverse networks operating in an on-line environment.

Activity 5.4.1. Test and revise the Disaster Recovery Plan annually.

As the District's computing systems change and expand, the *Disaster Recovery Plan* should be revised and tested to ensure it can deal with any disaster related occurrences. It is particularly important to test the specific procedures that

document how to restart the major computing and voice systems. Technical staff should be oriented and cross-trained even if they do not have prime responsibility.

Objective 5.5. Review and revise the *Technology Plan* each year (20).

Objective 5.5   Provide appropriate information and network security.

     Activity 5.5.1 Provide appropriate security for server-based and personal computing.

The District should continue to deploy the Cisco Clean Access solution on the Fairfield campus and at the Vallejo and Vacaville Centers. Additionally, as newer technologies emerge to combat spam, viruses, exploits and other security problems, those technologies should be evaluated for integration into our network and personal computing environments.

Steps should be taken to ensure the appropriate level of physical security for District computing systems to protect them from damage, theft, and other physical incidents. Standards should be established for physical security of desktop and mobile computing systems, computing facilities, Smart Classroom resources, and other technology assets.

     Activity 5.5.2 Designate a District-wide Information Security Officer.

In order to ensure consistency of the application and monitoring of security-related items, a single individual should be designated as the District-wide Information Security Officer.

Consistency in the application and monitoring of security-related items within the confines of technology-related arenas is key to attaining an adequate overall level of information security. Leveraging the STAC, establish expectations, a role definition, and reporting structures for the Information Security Officer. If funds permit, hire someone to fill a new position. Otherwise, opportunities for reorganizing workloads should be investigated to see if an existing employee can fill this role.

Activity 5.5.3 Establish and publish standards for security of all District data, including personal data contained on District systems.

Compliance with State and Federal regulations regarding data privacy needs to be maintained. Social security numbers and personal health information are two examples of data covered under these laws.

All District systems should be evaluated as regards their compliance and any new systems need to be compliant in order to be implemented.

Objective 5.5 Review and revise the *Technology Plan* each year (*Reference ISCI Plan Obj. 20*).

The *Technology Plan* exists to guide the College's efforts to implement the various objectives and to measure progress. Any implementation schedule is, of course, dependent upon funding and staff workload. So it is unlikely, and perhaps unwise, to expect that a plan of this magnitude can be implemented in a single year. Some objectives should be designated high priority, some should not; some should be sequenced and phased. Each year the plan should be updated and this information, along with budget estimates, forwarded to the Executive Council.

Activity 5.5.1. The Strategic Technology Advisory Committee reviews progress made in implementing plan objectives.

The District should establish a permanent standing Technology Committee composed of faculty, staff and administrators charged to monitor the District's technology infrastructure. This committee should report to the Executive Council and have a rotating membership. Technology Services and Support staff should serve as a non-voting, ex-officio support resource to the committee.

Activity 5.5.2. Revise the plan, adding and deleting objectives as necessary.

The *Technology Plan* is an "organic" document that guides the upgrade and expansion of the District's technology infrastructure. Monitoring the plan is an important activity. First, because many activities in the plan must be scheduled and budgeted, and second, because technology is evolving and

Revise **g and** **tives as**

changing at an astonishingly rapid pace. Options unimaginable today may be common place tomorrow. Wireless technology is one example. The Strategic Technology Advisory Committee should review and revise the *Technology Plan* annually.

Prepare
related

Activity 5.5.3. Prepare implementation schedule and related budgets.

The Fund for Learning in the New Millennium will provide some support for technology projects. However, the The Strategic Technology Advisory Committee ~~Technology Committee~~ should review pending projects each year and, based on need and fiscal resources, prepare implementation priorities and budget estimates.

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Activity 5.5.4. Submit the final Technology Plan to the Administration.

Each year, the revised *Technology Plan* should be presented to the Executive Council along with an implementation schedule and budget.
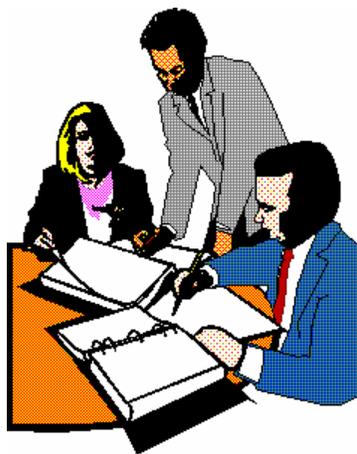
RECOMMENDATIONS

The Technology Plan articulated in this document is the product of a diverse group of faculty, staff and administrators who deliberated as a task force to create a consensus vision of how technology should impact the District's core academic and administrative mission. They are agreed that their work should not end with this plan.

The Executive Council agreed and the Shared Governance Council appointed a standing Strategic Technology Advisory Committee charged to maintain the focus of the original planning effort and prevent, as much as possible, distractions arising from functional disagreements and political agendas.

During its final deliberations, the new Strategic Technology Advisory Committee will submit their individual "top five" recommendations to be undertaken in the Fall 2004-Spring 2005 academic year. Although a detailed implementation schedule must await formal approval of the plan, those who labored to produce this document believe it is appropriate to begin working on the following recommendations, presented below with audits to the pertinent sections of the plan:

Goal 1. Enhance Learning for Student Success
   Objective 3. Enhance the use of online technology to create new and diverse ways of teaching and learning both in the traditional classroom and in distance education(5)

   Expand Hybrid and Online Instruction.

- **Activity 1.3.1.** Review and expand the District's Distance Learning Program with special emphasis on increasing the number of TeleWeb, Full Online, and Hybrid Online Courses offered.

Objective 1.3   Objective 1.5. *Provide greater access to general purpose computing facilities throughout the District* (Reference ISCI Plan Obj. 3).

- **Activity 1.5.1.** Create open computing facilities at the Centers, and create open computing facilities in the Student Center at Solano College.

Goal 2. Expand Student Access.
Objective 2.3. Implement ADA Standards.

- **Activity 2.3.1.** Work with the faculty and staff on issues of ADA compliance.
- **Activity 2.3.2.** Inventory all existing non-print materials to determine ADA compliance and for those materials that do not comply, search and acquire alternative media that does.
- **Activity 2.3.3.** Integrate the activities of the Alternate Media Specialist with the Teaching and Learning Center.

Goal 3. Link All Members of the Community.
Objective 3.1. Provide Local Area and Wide Area Network services at a 95% standard of reliability.

- **Activity 3.1.1.** Establish the philosophy of planning and operating the District Network as a "Utility".
- **Activity 3.1.5.** Install remote network management software capable of pager notification and off-site trouble shooting including full system reboot.

Objective 3.2. Provide high-speed, on campus Internet/Intranet access to all faculty, staff, and students (*Reference ISCI Plan Obj. 4*).

Objective 3.4. Provide each faculty and staff member with a PC or laptop which meets agreed upon campus standards (*Reference ISCI Plan Obj. 8*).

- **Activity 3.3.1.** Maintain an accurate inventory of all hardware and software and use it to guide decisions to upgrade and replace technology.
- **Activity 3.4 1.** Prepare budget estimates for the repair, replacement and upgrade of academic PCs, in computer labs and faculty offices.
- **Activity 3.4 2.** Establish a plan, procedure, and budget estimates for upgrading both faculty and staff/management PCs at regular intervals.

Objective 3.5. Charge the library with responsibility for providing access to information in all forms, whether held locally or elsewhere *(Reference ISCI Plan Obj. 15)*.

- **Activity 3.5.1.** Develop library services for remote users.
- **Activity 3.5.2.** Acquire information in electronic form and make it available to all users, on-campus and off.
- **Activity 3.5.3.** Develop a 1 - 3 credit course on Information Competency.
- **Activity 3.5.4.** Develop information competency seminars and training sessions for faculty, and staff.

Expand Access to Library Resources.

Objective 3.6. Implement Web-based access to District Information Resources in order to provide faculty, staff, and students with a common mechanism for communication and information retrieval and utilization (*Reference ISCI Plan Obj. 18*).

- **Activity 3.6.2.** Implement web-based portal access to a faculty/staff/student information system.

Hire a Full-Time Webmaster.

Install an Intranet.

Install an Exchange Server.

Goal 4. Strengthen Institutional Perspectives
Objective 4.6. Evaluate the District's finance, student, and human resource systems to determine and implement viable options that improve the efficiency and effectiveness of the District's information systems. (*Reference ISCI Plan Obj. 16*)

Conduct Enterprise Resource Planning.

Sources

Goal 5. Provide Resources.
Objective 5.1. Fund Information Technology at a level of the TCO model recommended in the Chancellor's Technology II Strategic Plan. (*Reference ISCI Plan Obj. 19*)

- **Activity 5.1.1.** Establish a Fund for Learning in the New Millennium.

It would be a mistake to assume that this plan can be

implemented and sustained by a single, concerted burst

of institutional activity. Rather the District must commit itself to an ongoing sequence of procedures that continuously seeks to reinvent and renew its technology infrastructure. Faculty, staff and administrators must be encouraged to reexamine continuously how technology can increase the effectiveness and efficiency of the District's academic and administrative activities. Decisions related to new technology products and standards should emanate from organized, participatory deliberations and not be dictated by external events or be delegated to technical experts. The institution's governing bodies must continually ask and expect to receive answers on how these decisions will likely impact on the District's core mission. Only when this vision becomes inculcated in the fabric of the institution's culture will Solano Community College begin to exert its leadership in the delivery of effective education.

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