Recommendations of the Academic Technology Council's Subcommittee on

Goals and Organization for Research and Instructional Technological Support

http://fmwww.bc.edu/ATC/GORITS/

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Submitted to the Academic Vice President

GORITS Subcommittee

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Executive Summary

Process. The ATC charged the Subcommittee on Goals and Organization for Research and Instructional Technological Support (GORITS) to 1) identify the goals of an academic technology service organization that would support the academic mission of Boston College with regard to teaching, scholarship and research, and 2) propose a structure for this organization that would integrate well with existing services.

The GORITS subcommittee consisted of a cross section of faculty and staff from across the university. The subcommittee met five times between November 15 and December 15. The subcommittee was aware of the evolution of technological services at Boston College and a number of prior reports and studies regarding these services. The subcommittee also investigated the organization and effectiveness of similar services at thirteen other colleges and universities.

In general, the subcommittee focused on providing technological services that would specifically enhance the academic mission rather than merely provide technological utilities and infrastructure. Organizational areas were outlined to address: 1) Research and scholarship, 2) Learning and instructional technologies, 3) Media services, and 4) Bibliographic services. The GORITS subcommittee envisioned these within a responsive organization that allows for direct interaction between faculty and technology experts. The subcommittee invited representatives from leadership positions in IT as well as the offices of the AVP and the EVP to discuss optimal ways for an academic technology support organization to interact with existing BC organizations that provide technology infrastructure and support.

Goals. Academic technology support services should reside within a single synergistic unit, with a central contact point for inquiries, but sufficiently decentralized to provide discipline-specific responses. The Research and Instructional Technology Services (RITS) organization should excel in communicating with the faculty to determine their needs, be expert in determining the best technology available to meet these needs and be flexible in evolving to meet future needs. In order to optimize utilization of the limited resources available, the new organization must also develop effective and efficient interfaces with IT, the Library and other technology-support organizations.

Recommendations. The subcommittee determined the "Reference Librarian Model"[1] in which faculty quickly attain direct contact with technology experts, who are cognizant of their fields of research and instructional endeavors, to be the most responsive and effective. At other institutions, these models seemed to work best when under an academic aegis.[2,3] In adapting existing technology support services the GORITS subcommittee recommends:

- Organizing all academic Research and Instructional Technology Services[4] under a new position, the Associate Academic Vice President for Academic Technology, in the AVP office.[5,6] This should be done as soon as possible, perhaps via an interim appointment.
- Incorporating the existing ARS, IML,[7] the GSAs and the FMRC and several additional IT support positions into a new organization for Research and Instructional Technology Support under a single director reporting to the AAVPAT.
- Moving 16 TCs now serving academic departments to work under a lead TC under the AAVPAT.
- Renaming AV as the Center for Media and Instructional Technology and providing it with a new position, the Technology Coordinator for Academic Facilities.
- Enhancing linkages for learning and instructional technologies between RITS, CMIT and the Library.

Endnotes to the Executive Summary (Also, see all endnotes are at the end of the document.)

[1.] The "Library Model" is instructive from several viewpoints. The organization of the O'Neill library into area collections with their own reference librarian has served academic areas well over many years. System wide technological improvements within the Library system have been accomplished with fairly short transition periods. One of the BC successes in technological support has been in the Law School, which centers its support services are within the Law Library. While this derives from the priority of legal citation searches, the system works well partly because of the organization of technological help services within the academic unit, as well as the quality and dedication of those providing these services. Changes in both the Law School and the Library have been partially driven by accreditation standards that serve to focus resources on mission related technology within these academic units.

[2.] The generic models in other institutions seem to be organized variously under: 1) the provost, 2) the business vice president, or 3) an independent technology officer (CIO).

[3.] In reviewing models from other institutions that work best common denominators were: 1) knowledgeable and dedicated personnel who liked working in the university environment, 2) an organizational structure containing a substantial component dedicated to research and instructional support and academic infrastructure, 3) rapid response providing a point of personal contact with a knowledgeable support person. Another commonality was that technology support organizations at individual institutions have evolved in ways idiosyncratic to their institutions and dependent both upon the institutional culture and the personalities involved during an organizational change. Consequently, even ones that work are not necessarily good models for another institution with a different culture. The Michigan and other models suggest that ongoing evaluative instruments be included at the end of online support access points so that feedback is ongoing and easily obtained in order to determine what is working well and where new pressures might be expected.

[4.] In general infrastructure utilities such as network wiring, e-mail servers, site licenses for general applications, such as MS Office, telephony, *etc*. are not included under Research and Instructional Technical Support. These technological infrastructure utilities are normally considered as part of generic IT support services.

[5.] See Appendix 3, Draft "Associate Vice President for Academic Technology". The original draft document from the AVP's office has been modified in light of changes since its drafting and discussions in the committee. Involvement by a high-level person in the AVP's office is also expected to induce necessary decanal leadership in understanding and prioritizing technology utilization. There was some feeling among the GORITS subcommittee that the responsibilities assigned to the AAVPATF were too broad, so that herein we have eliminated "Facilities" from the title. RSC would be directly under the AAVPAT, who would be advised by the ATC and the Dean's Technology Council (DTC). The Media Center would also be directly under the AAVPAT. Since one of t he goals is to provide for flexibility, adaptation, and evolution of RITS, the AAVPAT would organize *ad hoc* Teams from across all university technology services to address emerging RITS issues. These may become permanent crosscutting Teams that may presage evolution in the RITS structure or even the overall university technology support structure. For example, LIT will need strong linkages to MC/AV, the Library, outside vendors such as WebCT and Eduprise, and the TC's. Specific teams for planning for the technology needs in new academic buildings and renovations of existing academic Facilities would also be organized by the AAVPAT office.

[6.] The AAVPAT would be advised from several sources: The ATC and presumably a Dean's Technology Committee. Some models that seemed to work well had strong decanal involvement. On the other hand, there is often an age gradient in the use of technology, which may not change with time. Consequently, the AAVPAT should particularly endeavor to solicit advice from junior faculty.

[7.] The committee discussed whether to place the present IML within RITS or CMIT, which offers advanced technology services for media presentation and is increasing its role in instructional technology. While this may be a future evolution, the majority felt that the LIT should remain within RITS as a faculty-orientated center for innovation in media presentations.

Preamble

Organizations providing support for modern technologies in many institutions have undergone transformations almost as rapid as the technologies themselves. This has been the case at Boston College and many other academic institutions that the ATC GORITS subcommittee investigated. While the rate of change in technology is highest in advanced research, the perception of many faculty at Boston College is that resources for research and instructional technologies have often been supplanted by the growing demands of technological infrastructure, enrollment management, business and administrative needs. In considering an optimal organization for technological support of academic needs, the ATC charged the GORITS subcommittee with 1) identifying the goals of an academic technology service organization that would support the academic mission of Boston College with regard to teaching, scholarship and research, and 2) proposing a structure for this organization that would integrate well with existing services.

Process

In a series of five weekly meetings, each generally over two hours, between November 15 and December 15, 2000, the subcommittee undertook a systematic study of the problem. Some on the subcommittee were aware of the evolution in BC's technological services over the past 25 years while others brought fresh perspectives from other institutions. The results and recommendations of a number of prior reports, such as the technology section of *Advancing the Legacy: The Next Millennium,* the *University Research Council IT Recommendations* (1997), *Local Technology Support at Boston College* (2000) and the *Recommendations for Academic Media Support Services* (2000) were considered. The subcommittee also investigated the organization and effectiveness of similar services at thirteen other colleges and universities. These included both major research institutions, other Catholic institutions of comparable stature, and some smaller private colleges of outstanding reputation (see Appendix 1).[2,3] The subcommittee also invited representatives from the leadership positions in Information Technology as well as the offices of the Academic Vice President and the Executive Vice President to discuss optimal ways for the academic technology support organization to interact with existing BC organizations providing technology infrastructure and support.

Goals

The goals foreseen by the subcommittee for Research and Instructional Technology Services include:

- Academic technology support services organized into a single synergistic unit
- Central contact point for first-time inquiries
- Decentralization in discipline specific responses
- Responsiveness to the academic community (research, scholarship and instruction)
- Communication in determining faculty needs
- Flexibility to change to meet future needs
- Antenna to sense best technology available for changing needs
- Cost effectiveness, efficiency of use of limited personnel
- Effectively interfacing with IT, the Library, CMIT and the TC organization

Organization

In general, the subcommittee focused on developing a technological service organization that would specifically enhance the academic mission of Boston College, rather than simply providing technological utilities, infrastructure and basic support. Organizational areas were outlined to

address: 1) Research and scholarship, 2) Learning and instructional technologies, 3) Media services, and 4) Bibliographic services. These are envisioned in an organization within the office of the AVP that would provide a single point of both real and online access (see Appendix 2), but would also allow for direct interaction between faculty and technology experts.[8]

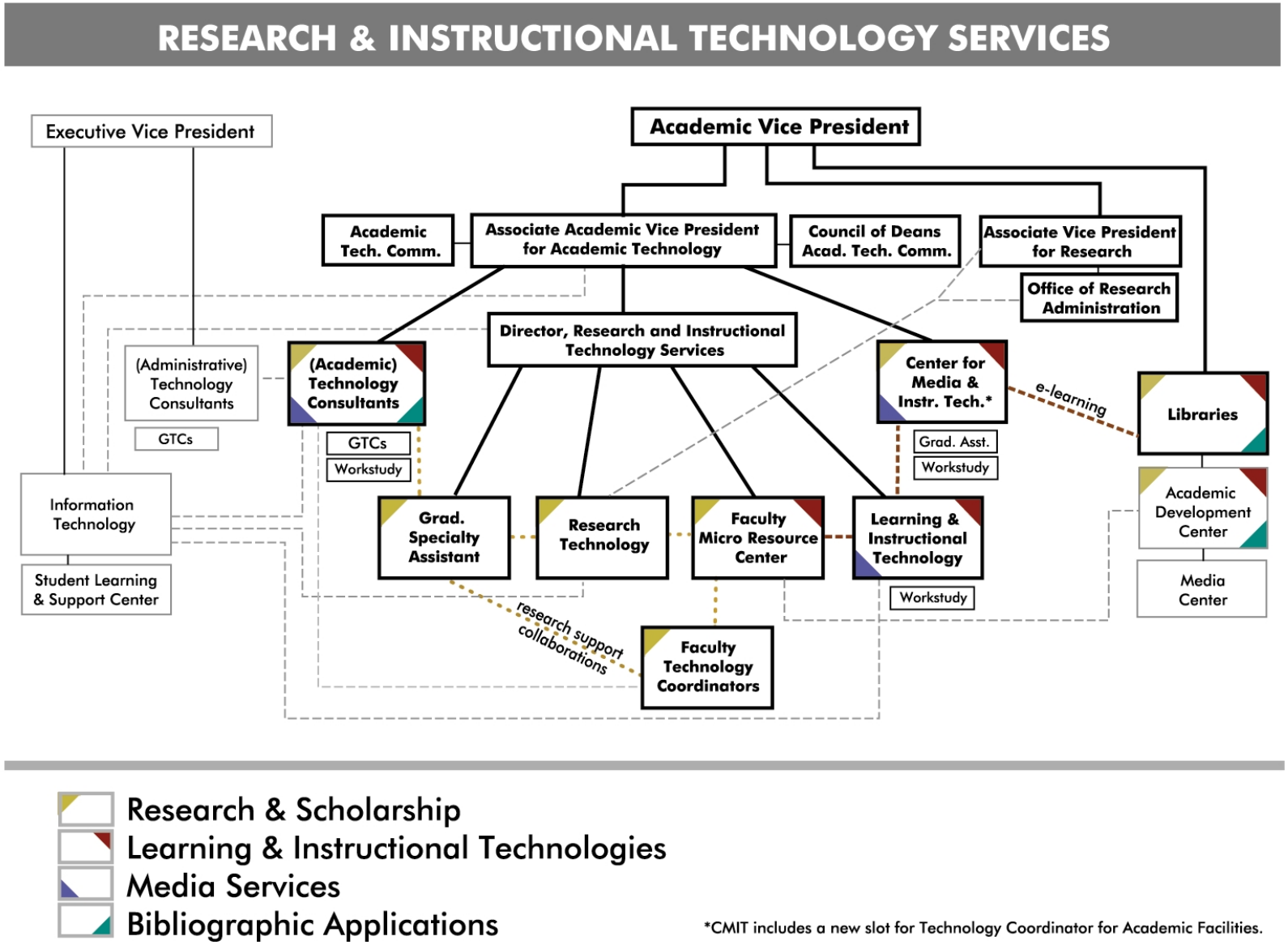
Aspects of the four general organizational areas are:

- **Research and Scholarship Technology**
  - statistics
  - scientific computing
  - databases (data mining)
  - development of discipline-specific tools and programming
  - Unix and Linux systems [9]
  - collaborative communication applications
  - technological needs assessments for new research, new faculty and academic departments
- **Learning and Instructional Technologies**
  - courseware websites
  - courseware development
  - testing
  - instructional materials, copyrights
  - assessment of classroom needs and setting classroom technology standards
  - coordinating planning with classroom technology standards
- **Media Services**
  - data visualization
  - computer generated artwork
  - video, animation, photography, and audio
  - advisory role in equipment purchases and lecture room renovations
  - presentation equipment
  - facilitation of learning and instructional technologies
- **Bibliographic Services**
  - literature and database searches
  - article delivery
  - bibliographic applications
  - metadata[10] (structured data about data)

Many of the envisioned goals would be best accomplished by having consultants with area expertise (humanities, social sciences, GSSW, CSOM, SON, LSOE, law school, life and physical sciences, and the Library). This "Reference Librarian Model"[1] would maintain Level-II personnel in a centralized location with each with specific areas of expertise, which may overlap for back up purposes as in the Local Service Center (LSC) model. Level-I response remains with the TC's, but with strengthened liaisons between the TC's and the Level II personnel.

In order to manage the new Research and Instructional Technology Services organization and to coordinate related activities of the TCs, CMIT and technological aspects of the University Library a new position, the Associate Vice President for Academic Technology, would be created in the AVP's office (see Appendix 3).[5,6] Since coordinating the updating of presentation equipment in classrooms, auditoriums, computer laboratories, science laboratories, *etc*. is now a major endeavor, a Technology Coordinator for Academic Facilities is needed within CMIT to coordinate these efforts among academic departments, IT, and Facilities Management.

Organizational Chart



Recommendations

In order to form the new RITS organization the following reallocations of existing personnel is recommended (see the Organization Chart above):[11]

- The reorganization of academic technology services under the proposed new position of AAVPAT should be done as soon as possible.
- ARS, IML[7] together with several other existing positions in IT, the GSAs and the FMRC should be incorporated into RITS under a single director.[12]
    - ARS personnel would be largely incorporated into Research and Scholarship Technologies (RST)
    - IML and related personnel form the nucleus of Learning and Instructional Technology (LIT). LIT serves as the main entry point for courseware, on line testing and surveys, multimedia presentations *etc*. LIT should have strong linkages to the library and the Center for Media and Instructional Technologies.
    - FMRC retains its present function and coordinates the Faculty Technology Coordinators (FTCs) within departments and schools. FTCs should be designated as an official position to provide departmental input and feedback on current and proposed RITS policies.
    - The Graduate Statistical Assistants are renamed as Graduate Specialty Assistants (GSAs), incorporating other areas that graduate students could assist in (such as Unix computing). The GSA's are incorporated into RITS as first-tier statistical or specialty support, coordinating their efforts with Academic TC's and RITS professionals.
    - Coordination between RITS and the ORA for grant proposals for planning and purchase of technology equipment and with the CD-ATC for the purchase of academic technology equipment through the AVP academic technology capital fund.

- The 16 Academic TC's and GTCs remain as an organization within the earlier LSC model, but would be transferred to RITS.[13,14] Their training and periodic meetings would remain in common with all TCs. However, some training, such as that for e-Learning applications (WebCT, *etc*.) and discipline specific support would be within RITS or academic departments. TCs would remain housed within the academic buildings that they serve.
    - Some GTCs should also receive discipline-specific training in software, Unix systems, *etc*.
- Academic Development Center (ADC) would remain within the Library or Student Services.

- AV, which is renamed as the Center for Media and Instructional Technology, remains as a separate organization but would report to the AAVPAT with increased linkages with respect to Learning and Instructional Technologies and the Libraries.

- The SLSC remains within IT.

- The AAVPAT appoints cross-cutting teams as needed to determine the technology needs of new faculty, new and ongoing research projects, academic departments, emerging instructional technologies, etc. and to address other technology issues affecting the academic mission.

Glossary

ADC	Academic Development Center
ARS	Academic and Research Services (presently within IT)
AVP	Academic Vice President
AAVPAT	Associate Academic Vice President for Academic Technology
ATC	Academic Technology Committee articulates technological goals, objectives, problems, concerns and needs of the academic sector, serving as a liaison to IT, and advisory to the Academic Vice President. Its membership, comprised primarily of faculty members from the various schools, is flexible.
CD-ATC	Council of Deans Academic Technology Committee
CMIT	Center for Media and Instructional Technology (presently AV)
FMRC	Faculty Microcomputer Research Center. The FMRC aims to have examples of the latest technology available on a 24x7 basis for faculty to become acquainted with, appraise, use for jobs and projects, and ultimately to import into their home departments.
FTC	Faculty Technology Coordinators (to be re-instituted under the FMRC).
GSA	Graduate Specialty Assistants (presently all Graduate Statistical Assistants). Graduate students hired to provide specialized support to faculty and advanced graduate students on a discipline- and application-specific basis.
GTC	Graduate Technology Coordinators
IT	Information Technology
IML	The Interactive Multimedia Laboratory is a multimedia facility that was designed for both teachers and learners. Its mission is to help people use technology, video, computers and multimedia to enhance the teaching and learning process.
LIT	Learning and Instructional Technology (would incorporate IML)
LSC	Local Service Center
RST	Research and Scholarship Technology
SLSC	Student Learning Support Center (formerly O'Neill Computer Facility) BC's main computer laboratory with 156 workstations and auxiliary peripherals. Users have access to a wide variety of software applications and high-speed access to the internet and the VMS/Alpha. Location of the student computer help desk.
SC	Specialty Consultant. These would be new positions in RITS requiring knowledge of a wide range of computer technologies coupled with teaching experience. SCs would be the first point of contact for faculty in discipline-specific instructional design support. An SC would provide assistance in: 1) current research related to pedagogy and the integration of electronic discussion groups or listservers into a course; 2) the design of electronic course material and electronic evaluation (quizzes and tests) instruments; 3) the incorporation of technologies into classroom presentations/lectures; 4) assessing the professor's ability to maintain the technology; 5) developing an architectural overview for a project. SCs would not be responsible

for "doing" the work as much as consulting in how to accomplish the objectives and assembling the necessary resources.

TC — Technology Consultant. TCs, who are assisted by GTCs, provide first-level computing and communications support for faculty, staff and administrators and work collaboratively with their departments and Information Technology to design, develop and implement technology solutions. Located within the departments they serve, yet operating as a cross-functional team whose collective skill and knowledge is available to all users on campus, the TCs provide the highest possible level of personal service and support. The TC organization also acts as a liaison between Information Technology and the individual departments, balancing the technology needs of the department with University standards.

TCAS — Technology Coordinator for Academic Facilities (new position, would coordinate with CMIT, academic departments, IT, and Facilities Management)

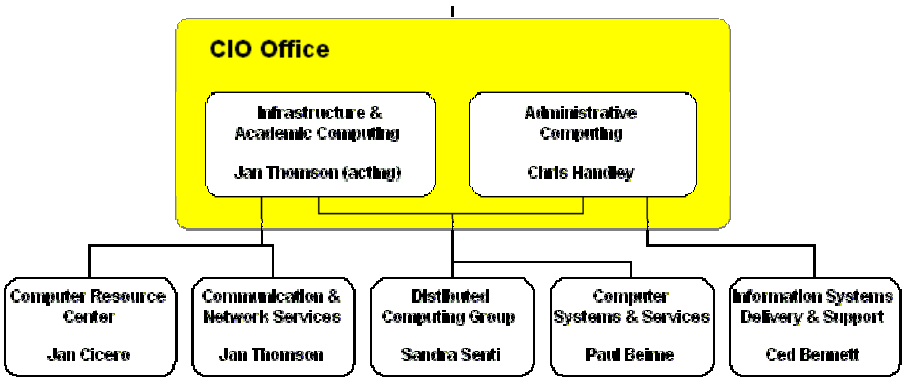
Appendix 1. Summaries of Institutional Models

Stanford University. Stanford's Information Technology Systems and Services (ITSS) is under the Business VP, but is divided into Infrastructure and Academic Computing and Administrative Computing with some overlapping subdivisions. There was a feeling among those contacted that the business side tends to drain resources from academic side. Also, since the needs of the business side are fairly predictable, it is relatively easy to plan for; on the other hand, since the academic side is always cutting edge, planning is more difficult. ITSS is constantly evolving and it (and predecessors) have undergone six reorganizations in the last 25 years. It will probably change again, as there is a feeling that the academic division belongs under the provost. ITSS works because the people are good, dedicated to Stanford's mission, like to work with each other, and like being at Stanford. Some have come from dot.coms, but prefer the Stanford environment.

The Computer Resource Center (CRC) handles student/faculty instruction and support programs and computer-based teaching. Stanford is unique in that much new technology has been generated at Stanford. Its Information Technology Systems and Services (ITSS) is very high quality, which is at least in part due to Stanford's stature in new technologies and its location in Silicon Valley. An interesting part of Stanford's ITSS is that users (PI's, Departments or even schools) may contract with ITSS ($88,700/FTE) to receive a higher priority for specific help services. On the other hand, while those under contract receive help more rapidly, all members of the community receive responses, usually within a few days. Getting help is a fairly efficient process that does (eventually) put you in contact with someone (very) knowledgeable.

The CRC fields any type of question with referral to level-II consultants. Instructional Programs (IP), which provides basic instruction in systems, applications, computer based teaching, etc. The student system is Unix based. Students can take courses in Unix, etc at the beginning of the quarter. Routine (standard software) instruction is online. After getting started, students don't seem to need much help.

Faculty (and staff) generally use desktop PC or Macs and (after initial training) are more likely to use the help desk than students. ITSS has contract personnel in discipline-specific areas. In some areas, such as Chemistry, individual research groups contract with ITSS, but many use their own contact networks for very discipline-specific technical. Faculty, staff, students and administration all use the same help services. Library services are one place that has made a real difference in saving time for faculty in that pdf copies of articles from almost any journal are immediately available.



The success of the Stanford ITSS/HelpSU is largely due to the quality of the technical support personnel. At Stanford, engineering and computer science have been strong driving forces not only in the University but also in Silicon Valley. Not only has much of the infrastructure evolved under these strong academic influences, but also the University no doubt realizes their strong role in its own economic strength. Consequently, Stanford has a strong incentive to strongly support instruction and particularly research to the same extent it supports its administrative functions. Michael Clarke, Chemistry

Yale University. Yale describes itself as an 'information technology-intensive' university. A central computing and communications services organization, ITS, provides academic computing, administrative services, data/voice/video networking, education and training, data center operations, reprographics and printing, and audiovisual, media, and other support services. ITS utilizes professional staff and student employees to provide direct first-tier support to the Faculty of Arts and Sciences and more technical second-tier support to professional schools and departments who have their own support staff. Most of the professional schools have their own I/T organizations, in particular ITS/Med, supporting the School of Medicine.

The Academic Media and Technology unit provides support services for students and faculty in Arts and Sciences. It operates computer clusters, manages student computing assistants and provides consultation and support for faculty research, applications of technology in teaching, and proposal writing. The AM&T unit includes Media Services, the Instructional Technology Group, the Faculty Support Program, scientific computing support, the Social Science Statistical Laboratory, the Workstation Support Program and technical support for Yale's website.

Most direct support for faculty is at the school, departmental, and research group level, with assistance provided by full-time professionals, graduate and undergraduate students. ITS provides a variety of services for Arts and Sciences faculty members, including technology-enhanced classrooms, class web pages and communication with students. Hundreds of classes are online on their class web page server.

The Faculty of Arts and Sciences IT Support Program provides "baseline access and support" to teaching faculty in academic departments for computing related issues, including support to departments and individuals for planning, purchase, and installation of computer equipment, and ongoing computing support to faculty within the department's plan. The FAS IT Support Program is a distributed system comprised of three tiers. This system is intended to provide faculty with appropriate access to IT support utilizing a team of Departmental Computing Consultants (DCCs), library liaisons, and IT professionals. In this model the first, second, and third tier staff work closely together and their skills complement one another.

The first level of support is provided by a group of local Departmental Computing Consultants. The DCCs appear to work for one or two departments at most. As trained part-time staff, DCCs provide the first line of support, assist faculty in learning new applications, and basic hardware/software troubleshooting within the scope of the departmental computing plan. The service goal is for DCCs to provide support for 60-80% of user questions. When the DCC encounters a problem beyond their scope it is referred to Tier II personnel.

Tier II support is provided by AM&T/FSP staff, who assist departments in developing an IT plan, arrange purchase, and installation of new equipment. AM&T/FSP staff also recruit and train DCC staff and coordinate resolution of hardware/software problems beyond the scope of the

departmental computing plan. Library Liaisons support faculty in their use of electronic library services, search strategies, discipline-specific collections, and related information services. Also provide training to DCCs.

Tier III support for departments by senior ITS professionals provides deep technical support for hardware, software, and networks. These individuals may be called upon to develop solutions and/or support for problems common across the institution that have been identified by Tiers I and II.

Support for administrators in academic departments is provided by a separate network of Distributed Support Providers. These individuals have responsibilities across units. There is a formal contractual relationship between departments and the ITS Support Services unit. DSP's are contracted at the rate of $67,000 per full-time DSP per year.

Yale makes use of a Remote Authentication Proxy Server to provide secure off-campus access to library databases, statistical data, etc. This is not a VPN service, but the more common Proxy Server technology, using a NetID given to each user. It may be used without any special software on the client workstation, merely configuring applications (such as Netscape) to make use of the proxy server. Yale ITS does not support Internet Explorer.

Yale College does not have a student ownership requirement nor operating system preference. Over 90% of students own computers, with Windows:Mac about 4:1. Professional schools are free to set their own requirements. Computer clusters across campus provide both Windows and Macintosh systems. A cadre of about 50 Computing Assistants provide general purpose computing and networking assistance to students living in Yale dormitories. Students are provided with access to "The Pantheon," a group of UNIX computers equipped for programming, math and science tools, and personal Web publishing. Heavy use is made of Linux systems; for instance, most of the systems used by economics graduate students are Linux-based.

In 1998, an ITS Advisory Committee was established to provide advice and serve as a sounding board for the ITS Director. It is chaired by a faculty member, and all of its members appear to be academics, librarians, or academic administrators (including IT professionals).

Kit Baum, Economics

Wellesley College. www.wellesley.edu
Independent 4 year college, Wellesley, MA . Women only (2,333 undergraduate students). Named Kaplan College Web Site of the Week, May 25, 1998. For the fourth year, designated one of "America's 100 "Most Wired Colleges" by Yahoo! Internet Life magazine. Among the top 5% of all web sites named by Point Communications Corporation.

Information Services, The Library and Digital Technologies constitute the organizational structure responsible for all information services on campus. The IS/Library/Digital Technologies Group is responsible for the organizational structure of the CWIS. Planning and policy are the responsibility of the same group, informed by the CWIS Advisory Group.

CWIS (Campus-wide Information System) is a local information system intended to present an integrated view of the College to the members of the Wellesley College community, as well as to alumnae, prospective students and others with an interest. Within the menu hierarchy, a broad array of local and Internet resources are made available.

The local information offered in the CWIS is created and updated by a wide variety of units and organizations within the college, as such it is definitely a distributed system operating around a hub similar to the U of Michigan model.

Summary

This is an excellent example of integrated systems. Of course Wellesley is a whole lot smaller than we are. Many of our examples have been from much larger Universities.

Of special note is the effort made to offer online tutorials for students and faculty. Self-Assessment is available for most courses to help the user decide where to start and how to get the most out of the training. A full-text technical reference library is provided with access, 24 hours a day, to full electronic versions of top technical books from leading technology publishers such as MIT Press, O'Reilly, Que, Sams, Sybex and Wiley.

"Deskside Coaching" is another feature from which we could benefit. Faculty and Staff are invited to get individualized training on the following topics:

Microsoft Word, Excel, and PowerPoint
FirstClass mail and conferencing
Browsing the World Wide Web
Navigating the Macintosh and Windows environments
Backing up and managing your files
Updating your virus-protection software

Each "Deskside Coaching" session is up to one hour long and is taught in faculty offices by IS professional staff. This is a feature that many TC's currently do on an informal basis. I think it would engender enormous good will on the part of faculty if this were framed as a service available to all.

A quote from David O'Steen on cross platform support: "...the crosser the better!"

Margaret Murphy, SON

Carleton College in Northfield, Minnesota has 1,858 undergraduates, 174 full-time (23 part-time) faculty. Carleton is a highly selective, liberal arts college and ranks first overall among 4 year, liberal arts colleges in number of students who go on to earn the Ph.D. in the natural sciences and mathematics. It is nationally recognized for commitment to teaching. Its network connects over 30 buildings & 2500 computers, including access in residence halls. Information Technology Services operates on a budget of $1.7 million and is further supported by Mellon Foundation grants supporting curricular and classroom facilities innovation

IT organization. Carleton College's stated mission to excel in teaching led to a major reorganization of their IT organization in 1993 with a primary goal being to increase curricular use of technology. The process and success of that model is described in a paper presented at CAUSE98 titled *"Discipline Focused Support at Carleton College: Let the Pedagogy Find the Tool."*[15]

That model effectively split the former organization, the Computer Center, in two, creating two separate organizations, Administrative Computing and Academic Computing and Networking Services (ACNS), each headed by a director. ACNS was set up to provide support to academic departments and other departments supporting the academic needs of students. ACNS was further divided into three divisions organized around the categories Natural Sciences; Social Sciences and Performing Arts; and Languages and Humanities. Each of these divisions was assigned an Academic Computing coordinator and a Faculty Advisor. The Computing Coordinators must have academic degrees relevant to their support areas in addition to technical expertise. Faculty Advisors were tenured faculty who had demonstrated leadership in integrating technology into the curriculum and were given release time to reflect the time and commitment required of this role.

Despite apparent success, there is clear evidence that in Carleton has abandoned some compelling aspects of this model, most interestingly, by merging ACNS and Administrative Computing, which will now both report to a new position, Director of Information Technology Services. The new ITS organization will include Academic Computing, Network Services and Administrative Computing, led by three associate directors. ITS has a staff of 25 and works with the entire College to provide assessment, planning and implementation. It seems that the ITS director reports to associate dean of the college.

In 1993 Carleton initiated a rigorous and comprehensive process that delineated critical functional and support needs. The process invested heavily in gathering information and feedback from faculty members, those who were skilled in technology use, and those who were not. This work still appears to guide and inform the new organization's priorities and focus, which continues to emphasize collegial communication, discipline-focused distributed support and incentives by way of Curricular Computing Grants. These Grants are designed to enable faculty to explore, experiment with, and pilot the use of information technologies to enhance their teaching. These are reviewed and granted by Academic Computing within ITS.

Support is delivered through an ITS Academic Computing Coordinator, a professional technology support staff who also has division-applicable academic background and experience in teaching and research. Each Academic Computing Coordinator works with a number of student Academic Computing Assistants and the ITS Faculty Support Intern. The Computing Coordinator is the faculty member's first line of support, and is there to work one-on-one to explore training needs, and computer support needs. This includes determining what platform or software needed for a particular faculty's application, Carleton does not impose a top down suite of standard software, but is very much committed to getting what's best for a needed application. In addition, three faculty members a year are assigned to serve as Faculty Advisors for ITS. A Faculty Advisor is an advocate and counselor for other faculty wishing to make further use of information technologies in their teaching. A Faculty Advisor is not a "technology super person", but rather someone who is comfortable with technology, uses technology in the classroom, and is enthusiastic about talking with peers regarding the costs, benefits, and pedagogical issues of curricular computing.

Facilities. The Center for Mathematics and Computing is where the majority of computing labs are located, including labs for general student computing equipped with Mac/PC/Unix machines, an electronic classroom lab, a multimedia production lab, and the student computing help facility. The facilities are configured specifically to support the uses of computers and networks within the curriculum.

Conclusion. While it is unclear what prompted Carleton to reorganize academic and administrative computing functions under a single director, the advances still in place are real. I suspect Carleton's small

size, very focussed mission, and collegial and community-based planning and approach have much to do with their success in supporting technology needs of the academic areas. Kathleen Carney, Library

University of Michigan www.cio.umich.edu/itum Contact: Katie Bower, BC ATC/GORITS; Institutional Models

Information Technology Survey. University of Michigan (U-M) is a large research institution with a stated commitment to provide Information Technology (IT) resources to enable faculty and students to work at the leading edge in their disciplines." The importance of IT to U-M is reflected in student and faculty survey responses. Of entering freshmen, 80% believe that IT resources are either critical or one of several equal factors in their decision about which university to attend. Sixty-six percent of the faculty believe that IT is important to their students' success. Approximately 80% of faculty believe that IT helps them increase their impact or productivity. For 23% of the faculty, U-M's IT resources are a factor for remaining at the University. However, there are ongoing problems for the University. Forty two per cent of users consider the "reliability of technology" (e.g., downtime, crashes, etc.) to be their greatest concern when using IT to do their work . Twenty six percent of faculty do not seem to know where to go to get help and 44% report problems with the centralized phone consulting service. Sixty six per cent of faculty report using PC's, 40% report using MACs, and 15% report using Unix. The Institute for Social Research helps survey student and faculty on alternate years about their views on IT at U-M.

Organizational Structure. The U-M Chief Information Officer is charged with the overall responsibility for all aspects of information technology at U-M. She is executive director of the Information Technology Division, a professor in the School of Information and is a member of the U.S. National Commission on Libraries and Information Science. She holds a B.Sc. in physics and a Ph.D. in information science. The CIO reports to the Office of the Provost.
The CIO announced the formation of a new "federation" of U-M information technology organizations in 1999. The federation assists the CIO in identifying the threats and opportunities that information technology poses for the endeavors of an academic community and how best to manage this critical University resource. To this end, the Provost meets regularly with the Executive

Committee of Deans and University Executives regarding IT. The CIO oversees the U-M IT Strategic Directions Group, the U-M IT Federation, the coalition of U-M IT service providers, and the IT User Advisory Committee.

U-M IT Strategic Directions Group The Information Technology Strategic Directions Group was formed by the Office of the CIO in January 1998 to provide University wide strategic direction for information technology plans, services, and policies to the University executive officers and all U-M information technology service providers. Made up of high-level university representatives from across the university (e.g., libraries, CLSA, Media Union, Research Computing Advisory Committee, the professional schools, Office of VP for Research, etc.), this group recommended the formation of an Information Technology Federation.

The Information Technology Federation Executive Committee (ITFX) works with the CIO and the IT Strategic Directions Group to ensure that the University has a coherent and functional information technology environment, and is able to leverage its investment in IT. The Federation includes all IT service providers at the University.

U-M IT Service Providers There are many U-M Information Technology Service Providers across the campus, many school or discipline specific. Here are just a few examples that may work for BC:

Information Technology Division (ITD). The Information Technology Division (ITD) provides the U-M community with a broad range of computing, telephone, video and data networking services. This site provides information about obtaining and using these services as well as news about service changes and information technology on campus.

Institute for Social Research (ISR). The nation's longest-standing laboratory for interdisciplinary research in the social sciences and the world's largest university-based social research unit. The research staff represents the disciplines of psychology, political science, economics, and sociology among others. Most senior staff hold professorial appointments at U-M. Much of social science's significant data are gathered and archived there. Its surveys are a national resource and have set the standard for research design across the country. ISR comprises four centers: the Survey Research Center, The Research Center for Group Dynamics, The Center for Political Studies, and Populations Studies Center. Findings from ISR studies have contributed to policy and practice on issues ranging form racial prejudice and drug abuse to health, retirement and welfare.

Media Union The new Media Union (MU) has a wide range of computing resources available to facilitate its mission of bringing together the creative aspects of all campus disciplines ranging from art, architecture, and music to medicine, engineering, and the humanities. MU maintains an electronic media production and post-production facility; provides multimedia creation stations for students; increases the capacity of the student walk-in multimedia site and classroom; upgrades faculty multimedia development systems with Mac AVs or Power PCs; expands media devices and concurrent users of UM's VIDS multimedia network; and establishes a digital media network server and pilot instructional applications. MU is affiliated with ITFX. Media Consultants provide support, training and consultation for UM-Course Tools web course applications. Developed by MU and UM faculty members, the use of Course Tools increased to include use in 9000 classes during the1999-2000 academic year.

Guide to Computing in LS&A. Because faculty and staff in U-M's College of Literature, Science, and the Arts (LS&A) obtain computing resources and services from several different campus and external sources, the LS&A Information Technology Computing Services Group provides this online guide to help its faculty and staff find what they need.

IT User Advisory Council. The CIO meets periodically with professors who serve as liaisons to the academic community and her Assistant meets monthly with student groups about IT issues.

Pauline Collins, GSSW

University of North Carolina. UNC is a large research university with 24,180 students (undergraduate 15,400; graduate/professional 8,780) and a faculty of 2,420. It has 29 residence halls with Internet/CATV access and a laptop requirement beginning with the class of 2004

Information Technology Organizational Model

The model at UNC-CH is a traditional, centralized one, with all campus computing falling under the Information Technology Services organization (ITS). ITS is headed by the Vice Chancellor for IT, who reports to the University chancellor. Within ITS are two primary divisions, Administrative Information Services (AIS), a customer service organization that provides computer information systems for administrative applications at UNC-Chapel Hill, and Academic Technology & Networks (ATN) which offers central data, voice, and video networks, e-mail, and Internet/Web services. ATN also supports help desk activities, training classes, and other programs for students, staff, and faculty.

In addition, ATN provides academic computing, network and telecommunications services for the UNC-Chapel Hill campus. ATN provides access to and support for information services such as e-mail, the Web, and newsgroups as well as general UNIX login services and computing facilities for large-scale, numerically intensive research computing. ATN also manages 46 electronic classrooms and 17 computing labs on campus.

Also within ITS are two other divisions, MetaLab and Systems and Procedures. MetaLab is an outgrowth of the UNC-CH SunSITE, an archive and information sharing environment designed to be contributor driven and content managed. The collections and tools available on MetaLab are wide-ranging, and serve as a user driven digital library. Also integral to MetaLab's mission is their involvement in Open Source projects, Internet2, and the Linux Documentation Project. Systems and Procedures provides management consulting services to the University's departments and organizations, including consultation on technology planning and design and project management.

The primary support organization for academic computing, ATN, is further divided into seven departments, which cover a wide range of activities such as instructional technology, computer repair, desktop services, financial services, research services, etc. While all these structural divisions present a seemingly dizzying array for users to navigate, ATN has done a fairly good job of letting the organization be subordinate to how they present their services. They have done this by promoting three basic areas, Online Help Desk, Research Computing, and Instructional Technology in a prominent way on their main Web site.

Auxiliary Organizations & Other Key Players

UNC-CH is a vast and complex institution with a strongly expressed commitment to integrating technology into the research and teaching mission of the campus. Supplementing the formal IT organization's efforts in accomplishing this are several other initiatives and groups:

Carolina Technology Consultants: The CTC is a voluntary, cooperative effort aimed at professional computer support providers at UNC-CH and is backed by the resources of the office of Academic Technology and Networks (ATN). It was established in January, 1997. The CTCs main purposes include facilitating information sharing among computer support professionals, providing access to centralized support tools and training and development activities, and by providing support

professionals with more effective means for problem escalation and resolution. Schools and departments designate who serves as their CTC volunteer.

Faculty Information Technology Advisory Committee: FITAC is a standing committee of the Faculty Council. Its charge is to consider issues pertaining to the use of technology in teaching and other professional activities at UNC-CH. The Committee also advises the Technology in Context Consortium on faculty needs and interests.

Technology in Context is a support consortium comprised of faculty and staff from many organizations at the University of North Carolina at Chapel Hill. The consortium coordinates efforts to support faculty, staff and teaching assistants who are using or want to use information technologies in their teaching and research. Participating organizations in TIC include the Libraries, other technology centers on campus, and several schools and colleges. A primary resource is COMPASS, a portal, or directory for users to find information on all manner of technology support and access issues. See: http://compass.unc.edu/index.cfm

Conclusion

In reviewing the vast array of technology support and access resources available at UNC-CH, it seems clear that the University is struggling with issues of effective integration within the academic areas. While much is available, there is still expressed concern about strategic planning and actions in what they refer to as the "2nd dimension" integration. The FITAC is playing a prominent role in analyzing and advising what steps and models are needed to advance overall IT planning in ways that better serve research, teaching and learning. While they feel strongly that the "1st dimension" efforts, namely implementing infrastructure, have been handled well by ITS, it is clear that despite having what appears to be a pretty extensive support network in place, the academic areas of the University feel much work is needed to more effectively utilize the technology resources. Specific areas they have documented include: Faculty rewards (incentives and inducements); Professional development; Academic uses (identifying and responding to pedagogical needs); Resource utilization (assessment and priorities—who, what, when, and how; Funding (how will academic units be affected by funding decisions).

Kathleen Carney, University Library

Harvard: Harvard's IT organization is very decentralized, almost certainly more than BC would be comfortable with. However, they have several interesting ways of unifying each group's efforts and maintaining a common direction:

All technology groups (academic and non-academic) report to an Assistant Provost for Technology, whose job is to keep everyone moving together.

The Assistant Provost runs two committees, one for academic concerns and one for university concerns, that faculty have representation on.

The university supports numerous informal groups, which serve to promote community and communication among the different parts of the university.

Apart from this, many departments have their own research support staff.

The IT function at Harvard is organized into 3 areas: Academic Computing, Central Administrative Computing, and Infrastructure. Interestingly, Harvard is just finishing a reorganization that places *all* of these area under the direction of an Assistant Provost. (In BC terminology, all of IT reports to the AVP!) The reason for this new organization is given in a letter from the provost, and is accessible via the URL www.provost.harvard.edu/cait/transition/final_annc.html . In brief, it states that:

While we need to continue the excellent service that departments now enjoy, we also would benefit from a greater level of coordination and consistency across our IT enterprise. Specifically, we need to:

Establish technical, architectural, and procedural standards so that systems will work better together in the future and be easier to support.

Set priorities and allocate resources for IT across the whole of the Central Administration and not merely on a department-by-department basis.

Unify and enhance career, professional growth and training opportunities for IT staff.

Streamline server and support operations.

Clarify accountability and ownership for IT initiatives and services.

Academic Computing support is decentralized. Each school has its own support group (see www.uis.harvard.edu/it/itgroups.html), which is intended to be the first point of contact for any problem. The advantage of decentralization is that each group can be organized to best support the needs of its constituents. One point of commonality is that each group has its own instructional computing subgroup (see http://www.uis.harvard.edu/it/acadcomp.html).

As a representative sample, I took a look at the group for the A&S school. The group has over 50 staff members (see http://www.fas.harvard.edu/computing/hascs/staff.html). The group manages their version of the SLSC and their UNIX servers, and most of the staff is devoted to administrative (non-support) tasks. There are 12 first-level support people, analogous to TC's. There is also a "Faculty and Staff Computer Support" group of 3 members.

The instructional support subgroup in A&S consists of 7 staff members, which includes one specialist for the humanities and one for the sciences. This support is concerned primarily with how to put course materials on web pages.

In addition to the above two groups (hardware/software and instructional support), A&S manages support groups in several departments. For example, there are 4-5 people in Biology, 2-3 in Chemistry, 1 in Math, 2 in Economics, etc. These support personnel manage specialized labs and

software. Slots are allocated to departments according to perceived need. Departments essentially do the hiring, and the personnel are sited in the department. I spoke with a manager in the A&S support group, and he told me that they found this to be a much cheaper arrangement than outsourcing, which they were doing up until a few years ago.

Harvard has two formal committees, each with faculty representation (see http://www.uis.harvard.edu/it/oversight.html). The *Harvard Academic Computing Committee* coordinates the sharing of academic IT strategies, and develops cross Faculty programs and priorities. It is similar to BC's ATC. The *University Technology Architecture Group* evaluates emerging technologies, identifies appropriate pilot applications, and develops technology standards and architecture. It consists of knowledgeable faculty and IT staff.

There are also several informal committees, which serve to maintain communication between different parts of the university (see http://www.uis.harvard.edu/it/forum.html). Of particular interest are the ABCD committee and the IT forum. The ABCD committee consists of faculty, staff, alumni, and vendors, and meets monthly (a free lunch is served). The committee has many interest groups that meet regularly. The IT forum has regular presentations on cutting-edge topics of interest to IT professionals.

Ed Sciore, Computer Science

McGill University. CUTL reports to the VP-Academic, while ICC reports to the VP-Information Systems Technology. CUTL is actually not affiliated officially with the Faculty of Education; we report directly to the VP-Academic. However, CUTLs faculty are cross-appointed with the Dept. of Educational and Counseling Psychology, and we are physically located in the Education Building and hence use their server. This group has a University-wide mandate.)

They do not have a cost recovery model; we do not bill for our time. ICC teaches faculty about WebCT, *etc*.; CUTL consults however on the design and planning of their training program, and will work on specific projects. Research support is provided by the individual professor's department and/or Faculty.

Faculty computer desktop issues are resolved by the different departments. There is an Educational Media Center that is basically a mini-ICC dedicated to the Education Faculty; some more specialized services are only offered by ICC.

McGill's technology support is a mixture of distributed and centralized. The administrative uses (e.g., finance, accounting, student records) as well as telecommunication uses are all centralized under the VP-IST. However, each Faculty has its own LAN and system administrator, and local support, in addition to the support furnished by ICC.

Source: Laura Winer, Asst. Professor, Centre for University Teaching and Learning
Ted Gaiser Information Technology and Candice Gleim, Audiovisual Services

Rice University is a good example of a small private university with a strong emphasis on research. Since a restructuring at the end of November 2000, Information Technology at Rice is headed by the CIO and Vice-President for IT. Before then IT reported to the Provost. Information Technology comprises five Departments, namely IT Business Services, New Media and Student Computing, Networking and Telecommunications, Systems and LAN Management and User Services.

IT has a very strong commitment to research and educational computational support. Fully one third of IT staff is devoted to teams assigned to assist with computing questions and problems in different fields. The majority of support staff have graduate degrees in technical fields, in Engineering or in Computer Science. In addition to these support teams, a Consulting Center and an extensive on-line database provide alternative support to faculty, staff and students. Beyond IT support, Rice University also funds student and staff positions in many departments dealing with day-to-day operations in these departments.

The expertise and support in IT is roughly evenly balanced between Unix, IBM-PC and Mac platforms. With IT directly administering many unix-based machines in technical departments -- whether or not these machines were purchased through university funds or external grants.

An interesting, approach is that each team has a very knowledgeable central team dispatcher, who receives all support questions, and either answers them directly or re-directs them to the appropriate team member. For faculty the first point of contact is a highly qualified expert. The support teams appear to be very dedicated with an appreciation and sensitivity to the deadlines that faculty are often faced with and team members will often provide faculty with home telephone numbers and assist after hours when the need arises.

Faculty are reasonably happy with IT support and felt that high priority computing problems were dealt with efficiently -- even when the problems were quite technical.

Jan Engelbrecht, Physics

Georgetown University

GU has a division within IT called Academic & Information Technology Services headed by an Assoc. VP with the additional title of Director of AIT. It is organized around three specific groups: Technical Support Services(TSS), Users Services(US), and Research, Curriculum, and Development (RCD) Group. They have recently added Advanced Research Computing (ARC).

RCDs primary responsibility is faculty support. The group is composed of 11 staff and a Director. Staff members consist of 6 PhDs, one JD, 2 MAs, 1 MS, and 2 non-degreed web developers. They are focused on faculty support, web development, and medical center support. The other areas of IT provide generalized support to the community. RCD is focused more on direct faculty support by providing hands-on guidance, office visits, consulting that offers strategies for taking advantage of Georgetown s infrastructure, and so forth. RCD also offers specialized training oriented toward faculty needs.

TSS handles all desktop support for voice, data, and video for the entire GU community. For example, TSS is currently helping install the client software and RCD is helping faculty sort out the logistical issues of folder structure, archiving strategy, etc. User Services does generic support such as helpdesk, documentation, training, student technology service for the entire community. The differentiation with RCD is that RCD offers specialized courses within their training program, and visit faculty on-site. ARC is a product of a reorganization that merged a small support staff from their medical division into IT consulting group. The distinction between ARC and RCD is that ARC will provide support for the hardware used for computing-intensive research, both at the Med Center and for the main campus, while RCD supports statistical research. All four groups report to the same director, whose units deliver all the services to the campus community; the other 2 main units of UIS are Information Systems (legacy data) and Network and Computing Systems (network and server infrastructure).

One other feature of the RCD group is that they are collaborating closely with the library (actually both Main Campus and Med Center libraries). The university has opened a new pedagogically oriented center called the Center for New Designs in Learning and Scholarship. Working the libraries, RCD and this new center working together, they hope to provide one-stop shopping for services that link teaching and technology. (Michael explained the concept as follows: helping faculty adopt Blackboard involves learning the software, adding additional resources, and learning sound pedagogical strategies.)

The Advanced Research Computing group handles Solaris, Linux, *etc*., with assistance from the server team of NCS. RCD consulting includes grant proposals, letters of support for tenure and promotion, software selection, and so forth. They manage specialized software for statistical and mathematical support (which is paid for centrally), and broker deals for other specialized software. If it's of use to one dept, that dept pays; if it's of use to several depts., UIS pays at least a share. However, departments that pay for their specialized software, turn around and ask a Dean for reimbursement. Like BC, there are pockets of funding for technological items outside UIS.

Source: Michael Neuman, Director, RCD
Ted Gaiser Information Technology and Candice Gleim, Audiovisual Services

Notre Dame has a centralized IT department. Research support is not centralized, nor is it associated with IT. Each college in the university is responsible for its own research support. There is no centralized instructional design support. The instructional design that exists has been a source of frustration for faculty, although staffing includes a small number of discipline-specific MAs and PhDs. The standard complaint is that IT designs "for" rather than "with" faculty. The general sense of the problem is that the graduate level support staff work for IT and not an organization focused on instruction design under an academic department.

Local support is coordinated through the Departmental Computer Consultants (DCC). Each department identifies up to 2 people that will support their local computer needs—something like the Tech Partner concept. Centralized IT provides training and support to the DCCs. DCC are often administrative support staff in a department, but do not have to be. The DCC program provides guidelines for departments to reassess work load and responsibilities for DCCs. There is no external support for faculty and staff—only what is available through their DCC.

One of the largest research support groups is the Laboratory for Social Research. The senior staff is tenure track faculty with a 1-1 teaching load. In addition, they have graduate and undergraduate assistants. They offer a variety of research support services to the faculty in their college. Certain types of support are available on a first come-first serve basis. When more extensive support is warranted or requested, a charge back system pays for the assistance. The strategy is carefully applied:

to enable self-sufficiency for the unit by providing needed revenue

to ration support services in an environment that could have unlimited demand

to ensure that support is equally accessible to all

to ensure that the charge-back structure is in compliance with regulations regarding federal funding

The research support units do not have direct control over the purchase of analytical software. All software is purchased centrally and this has created tensions with IT. Currently, the research units on campus are forming a coalition and demanding a more democratic process for the purchase of analytical tools. One of the ways that they supplement data and software purchases is through revenue generation through research support beyond their core services and survey work.

The Laboratory has a data librarian and they are currently adding an additional position with a joint appointment in the library. Their service is primarily statistical and research design consulting with 4 tenure track faculty (sociology, economics, psychology, and political science) and 6 graduate students. Due to their issues with IT, they have hired their own technical support person through an external consulting agency.

In addition to the few instructional design staff inside IT, there are strategic consultants. This team is organizationally inside IT and consists of graduate educated staff led by an Assoc. Prof. In theory, the group provides strategic planning and development for departments and colleges. In other words, they work with Vice Presidents, Deans and Dept. Chairs. The initial concept was that they would be the academic advocates within IT. Unfortunately, the general sense is that they are ineffective because they report to IT. (The Director of the Strategic Consultants never responded to my inquiries. *Source*: Felicia LeClere, Director, Laboratory for Social Research

The Office of Information Technology (OIT) is divided into Applications Systems Integration, Applications Technology, Business Office, Consultancy, Coordinator Services, Customer Service, Education and Communication, End User Computing, IT Services, Knowledge Management and Platforms.

Under Education and Communication are Multi Media Services and Education Services. Education Services runs the Ed Tech Center and also provides education to Alumni, Faculty and TAs, Students and technical training programs such as the Departmental Computer Consultants and Continuing Education. The Department Computer Consultants provide "training to staff and faculty who provide front-line computer support to their departments." Cost recovery is implemented for many services.

WebCT training is offered under Education Services. Other classes in Research Techniques, etc. are found under the Library, and additional education and support for faculty can be found under the Educational Technology Program initiative which is shared between the Ed. Tech Center and the Kaneb Center for Teaching and Learning (which is under the Provost).

This source indicated that the OIT takes a tool-based training approach whereas the Kaneb Center approaches training from a functional perspective.

Source: Dr. Larry Rapagnani, Head of the Office of Information Technology
Ted Gaiser Information Technology and Candice Gleim, Audiovisual Services

Wake Forest University. Three groups exist outside IS at Wake Forest.

1. In each department there is an Academic Computer Assistant. These are people with a Ph.D. or Master's in the discipline who spend full time advising faculty in the department on how best to use technology in their teaching and research. They are paid slightly less than a beginning assistant professor, even though their contracts are for 12 months. These people are hired by the department and have a formal reporting line to the Dean of their college.

2. The entire library staff has been trained in technology. They are responsible for freshmen orientation to the computer, for multimedia support of instruction, and for "group classes" for both students and faculty. They are not responsible for staff training (which is done in IS).

3. ICCEL is best viewed as an auxiliary enterprise that sponsors workshops for faculty and staff from other campuses (and encourages Wake Forest people to enroll in these workshops without charge).

Two committees exist outside IS:

1. The Committee on Information Technology is an elected faculty committee with the IS Director and Library Director serving as voting ex-officio members. This group determines how monies are distributed for annual computer purchases (e.g. what software will be loaded on all machines) and worries about matters such as the career paths of ACSs.

2. The Computer Enhanced Learning Initiative is a group of faculty who work with the Teaching and Learning Center to sponsor special programs for our faculty. They recruit ACSs to conduct the programs. This is a committee appointed by the provost. In the early days, this effort was grant supported and one member of the committee (a different member) was released each semester to serve as CELI director and advise the provost on technology matters.

Source: Dr. David G. Brown, Vice President and Dean ICCEL.
Ted Gaiser Information Technology and Candice Gleim, Audiovisual Services

Duke University
For the past two years Duke has had a separate Center for Instructional Technology (CIT), located within and reporting to the Library. The role of this center is to advocate for instructional technology innovation across all disciplines. Prior to this effort, some disciplines offered some level of fee-based service, while other disciplines offered no services.

The CIT is expanding in disciplines-specific ways by hiring a specialist for a given area, such as languages (faculty rank), using resources provided by the department discipline. Other concerns, such as interactive testing, are shared by all disciplines. Any experience in these shared areas will theoretically be generalized to all areas.

New CIT innovations and services are disseminated through an Advisory Board for the Center for Instructional Technology, which includes representatives from diverse disciplines. The head of CIT is a member of a campus-wide Information Technology Advisory Council representing technology areas' top management, including the Vice-Provost for Information Technology and CIO.

Research computing support is mostly a function of departments or even individual researchers at this point. Duke is in the midst of a strategic planning process that includes planning for research computing support. The Vice Provost for Academic Affairs is heading this effort.

Digital media support is decentralized. The CIT offers support for pilot projects related to instruction through a grant process. Some departments have projects, servers, etc. The business, medical and nursing schools have media production centers. No organized or campus-wide support services are available.

Blackboard has been adopted on campus but is not the enterprise product. Full integration will be slated in the future integrating Blackboard's enterprise product with PeopleSoft student system.

The library is in the midst of planning for digital library initiatives and has done some pilot projects on campus and with other research universities in our area.
(http://www.lib.duke.edu/dli/report/dli_report.htm)

http://cit.duke.edu/about/advisory-board-meetings-2-24-00-notes-trends.html

Source: Lynne O'Brien, Director of Center for Instructional Technology, Duke University
Ted Gaiser Information Technology and Candice Gleim, Audiovisual Services

Observations

Ted Gaiser Information Technology and Candice Gleim, Audiovisual Services

Most institutions have some kind of decentralized local support model (like the TCs), with varying degrees of success. At Notre Dame staff in the departments (with department specific job titles) are trained to troubleshoot technology-based problems.

Teaching and Learning Technology Roundtables (part of national TLT Group). are implemented by many educational institutions (www.tltgroup.org)

Research support that is discipline-specific is more successful (MA, Ph.D.)

Research and instructional design support focused on a consulting model is more effective

Support groups that are under IT and those that are not have different missions (example: when in IT, the mission is more focused around providing guidance that works within current infrastructure; when outside IT the focus is more on the research or instruction and provides an advocacy role for the academic community)

Institutions struggle with the same issues with regard to providing pedagogically oriented instructional design support and technical advisement

Research and instructional design tend to be supported together—when not, typically instructional design support doesn't exist.

Institutions often deliver instructional technology support outside of IT. The unit may be situated in the Library or with another academic discipline such as education. Grant initiatives that are either discipline specific or faculty specific are available to motivate innovation. Staff complain that production services are not readily available.

Research support typically has strong linkages with campus libraries

Advisory groups are often used to guide and disseminate new service introduction

Appendix 2. The Electronic Athenaeum

Boston College Libraries |

The Electronic Athenaeum

The Electronic Athenaeum conceptually unifies the Boston College digital services and collections available for scholarly research and communication. As a collaboration among Boston College academic support units, the Electronic Athenaeum delivers services in five areas: scholarly computing, electronic journal and reference collections, a virtual data center, instructional technology and media services, and electronic publishing. The Electronic Athenaeum is a virtual organization of Boston College research support and service agencies, including the Libraries, the Faculty Microcomputer Resource Center, Audiovisual Services, the Interactive Multimedia Lab, and Academic and Research Services of the Office of Information Technology. Boston College faculty, students, and researchers are invited to explore the Electronic Athenaeum, to locate and use the resources and support that will further their research, teaching and learning:

Scholarly Computing

Computing and telecommunications are essential to the University for teaching and learning, and for the creation and dissemination of new knowledge. The Electronic Athenaeum offers Boston College facilities and services in the Faculty Microcomputer Resource Lab, the Interactive Multimedia Lab, and Academic and Research Services of the Office of Information Technology.

Electronic Collections: The Boston College Digital Library

The Libraries of Boston College offer access to over 200 scholarly electronic indexes and databases and to over 1,000 electronic journals. Information is brought to the user's desktop via the World Wide Web not only as text but also as images, video and sound. Library collections total 1.8 million volumes, 21,000 paper subscriptions, and 3.4 million microforms. Library staff use Ariel software to scan and make these accessible digitally for email delivery as page images. The Library provides intellectual control over these expanding collections and provides tools for systematic, automated access and retrieval.

Virtual Data Center: The Boston College Data Archives

Large data sets are important to research in many disciplines. The Electronic Athenaeum includes a virtual data center for access to numerical, textual and image data in the social sciences, arts, and humanities. The Boston College Digital Archives in the Library acquire data and work with the Faculty Microcomputer Resource Lab and Academic and Research Services of the Office of Information Technology to offer tools, resources, and services. These help users apply data in their research and teaching, and support the creation of new data sets that can benefit the broader research community. This virtual data center strengthens the University's research infrastructure by making available new data; tools for data manipulation, analysis and display; and services to introduce new users to data resources.

Instructional Media Services

Advances in instructional technology offer institutions of higher education myriad opportunities to enhance and even transform teaching and learning. Electronic classrooms, digital media laboratories, and state-of-the-art networking and networked resources are some of the instructional technology tools available to advance the University's teaching mission. The Electronic Athenaeum addresses support for instructional technology and related media services through Audiovisual Services and the Interactive Multimedia Lab. Faculty can use the services and facilities of these organizations to design and create course Web sites, to prepare graphic presentations for classroom or conference, and to ensure that onsite classroom technology needs are met.

Electronic Publishing: The Boston College EPress

The Internet is transforming scholarly communication through more timely dissemination, flexible and powerful multimedia capability, integration of research, writing and distribution tools, and network links that allow research collaboration across institutions and geographic boundaries. The Electronic Athenaeum provides infrastructure support and technical expertise to Boston College scholars who want to publish electronically. The Library, Interactive Multimedia Lab, and Audiovisual Services have facilities and staff to assist with digitization, design and graphic presentation for research, information and experimental Web sites. These sites might be used in conjunction with classes, but would be distinct from course sites. Instead, they would be expressions of scholarly creativity exploiting the power and potential of the Internet for communicating art and knowledge.

Appendix 3. Associate Academic Vice President for Academic Technology

The Associate Academic Vice President for Technology (AAVPAT) would report to the Academic Vice President and Dean of Faculties and be a member of the Academic Vice President's staff. He or she will be the principal academic officer working with Information Technology to support the academic mission of Boston College. In that capacity, this Associate Vice President would both ensure excellence in scholarly computing and communication support and provide leadership in the application of network technology to research and learning. The AAVPAT office would set standards and oversee the university-wide the coordination of the construction or renovation of academic facilities.

Responsibilities:

- Improve intellectual productivity university-wide by planning and coordinating all aspects of technology that support the instructional and research goals of Boston College and by assuring that appropriate software and hardware support are in place for students, faculty and academic staff.
- Advance the practice of learning and scholarship by coordinating the development of distributed learning and course presentation through the internet.
- Foster the development of distributed learning environments by exploring, coordinating and supporting distance education opportunities and facilities. Promote collaborations and partnerships among faculty and staff of IT, Libraries, CMIT and other departments in the development of networked learning resources. Advance faculty capabilities for creating new learning modes through a faculty development plan focused on the use of state of the art technology in pedagogy.
- Outcome assessment and evaluation of organizations and technologies put in place with regard to the academic mission of Boston College.
- Work with Information Technology to insure that the necessary and appropriate University information technology resources are available to undergraduate and graduate students, and to on campus as well as off campus students and faculty.
- Chair the Council of Deans Academic Technology Committee, which determines capital equipment funding for departmental computing needs.
- Participate in the Academic Technology Committee's meetings to determine the strengths and weaknesses of current technology practices and to envision best practices and directions for research and instructional technology for the future
- Through the services of a new Technology Coordinator for Academic Facilities, enhance teaching and learning through the university-wide coordination of technological resources that should be incorporated into classrooms and laboratories in new construction and renovation by working with the appropriate deans, department chairpersons and with the Director of Space Management
- Organize crosscutting teams to address emerging issues
- Assess technological needs and determine costs for new research, new faculty and academic departments
- Advocate for the appropriate technological resources for research

Reporting Relationships:
The following units will report to the AAVPAT:

- Media Center/Audiovisual Services
- Learning and Instruction Technology Services
- Faculty Microcomputer Resource Center
- Technology Coordinator for Academic Facilities
- Faculty academic technology advisory groups such as the Academic Technology Committee
- Council of Deans Academic Technology Committee

Qualifications:

Experience as a faculty member with a technological background and experience.

An ability to achieve the responsibilities listed below, preferably with a record of success in the same or similar areas.

- Envisioning how emerging technologies will change scholarly activity both on and off campus and develop practical plans to effect changes in technologies;
- Facilitating the effective application of communications and computing technologies to teaching and research;
- Overseeing the activities of the Technology Coordinator for Academic Facilities and upon consultation with the ATC and CD-ATC set standards for designing classrooms and laboratories. These efforts should incorporate state-of-the-art technology; increase significantly the number of faculty who adapt and use technology to improve effectiveness in teaching and learning, in research, in service activities; coordinate and manage academic technology resources and services within the AVP's jurisdiction;
- Developing long-range capital projections for academic information technology expenditures;
- Effectively advocating, in consultation with faculty and academic administrators, for the primacy of academic goals in setting strategic and tactical directions for information technology university-wide; coordinate from the AVP level academic input into all academic construction projects;
- Planning for the University's involvement in distance education;
- Developing consensus within the academic area on priorities for scarce information technology resources;
- Effectively bridge between the Information Technology and the AVP
- Representing the AVP in information technology planning as determined by the AVP;
- Advising the AVP on major information technology issues and decisions;
- Working effectively with academic technology advisory committees.

Endnotes.

[1] The "Reference Librarian Model" is instructive from several viewpoints. The organization of the O'Neill library into area collections with their own reference librarian has served academic areas well over many years. System wide technological improvements within the Library system have been accomplished with fairly short transition periods. One of the BC successes in technological support has been in the Law School, which centers its support services are within the Law Library. While this derives from the priority of legal citation searches, the system works well partly because of the organization of technological help services within the academic unit, as well as the quality and dedication of those providing these services. Changes in both the Law School and the Library have been partially driven by accreditation standards that serve to focus resources on mission related technology within these academic units.

[2] The generic models in other institutions seem to be organized variously under: 1) the provost, 2) the business vice president, or 3) an independent technology officer (CIO).

[3] In reviewing models from other institutions that work best common denominators were: 1) knowledgeable and dedicated personnel who liked working in the university environment, 2) an organizational structure containing a substantial component dedicated to research and instructional support and academic infrastructure, 3) rapid response providing a point of personal contact with a knowledgeable support person. Another commonality was that technology support organizations at individual institutions have evolved in ways idiosyncratic to their institutions and dependent both upon the institutional culture and the personalities involved during an organizational change. Consequently, even ones that work are not necessarily good models for another institution with a different culture. The Michigan and other models suggest that ongoing evaluative instruments be included at the end of online support access points so that feedback is ongoing and easily obtained in order to determine what is working well and where new pressures might be expected.

[4] In general infrastructure utilities such as network wiring, e-mail servers, site licenses for general applications, such as MS Office, telephony, *etc*. are not included under Research and Instructional Technical Support. These technological infrastructure utilities are normally considered as part of generic IT support services.

[5] See Appendix 1, "Associate Vice President for Academic Technology". The original draft document from the AVP's office has been modified in light of changes since its drafting and discussions in the committee. Involvement by a high-level person in the AVP's office is also expected to induce necessary decanal leadership in understanding and prioritizing technology utilization. There was some feeling among the GORITS subcommittee that the responsibilities assigned to the AAVPATF in the original draft from the AVP's office were too broad, so that herein we have eliminated "Facilities" from the title. RITS would be directly under the AAVPAT, who would be advised by the ATC and the CD-ATC. CMIT would also be directly under the AAVPAT. Since one of t he goals is to provide for flexibility, adaptation, and evolution of RITS, the AAVPAT would organize *ad hoc* teams from across all university technology services to address emerging RITS issues. These could become permanent crosscutting teams that may presage evolution in the RITS structure or even the overall university technology support structure. For example, LIT will need strong linkages to CMIT, the Library, outside vendors such as WebCT and Eduprise, and the TC's. Specific teams for planning for the technology needs in new academic buildings and renovations of existing academic facilities would also be organized by the AAVPAT office with the help of the TCAS.

[6] The AAVPAT would be advised from several sources: The ATC and the CD-ATC. Some models that seemed to work well had strong decanal involvement. On the other hand, there is often an age gradient in the use of technology, which may not change with time. Consequently, the AAVPAT should particularly endeavor to solicit advice from junior faculty.

[7] The committee discussed whether to place the present IML within RITS or CMIT, which offers advanced technology services for media presentation and is increasing its role in instructional technology. While this may be a future evolution, the majority felt that the LIT should remain within RITS as a faculty-orientated center for innovation in media presentations.

[8] This would be facilitated by the location of the Research Technology, Learning and Instruction Technology, Graduate Specialty Assistants and the Faculty Microcomputer Resource Center in a single building (Gasson) and under a single

director. The director would assign responsibility for fielding phone queries on an expanded time frame, such as 8 am to 9 pm.

[9] At several institutions (Yale, Michigan, Stanford) the clusters that support much of the student activity (e-mail, websites, e-learning) are Unix based. Unix systems are also heavily used in a number of research areas in Physics, Chemistry and Biology at BC.

[10] Metadata is structured data about data and ranges from textual descriptions of a resource to machine-generated data useful only to software applications. Metadata supports computer resource searching and is commonly stored in HTML, XML, RDF and relational databases. It provides a basis for cross-referencing data. See: http://purl.org/dc/education/index.htm

[11] Many technological resources at BC are now handled as infrastructure utilities, such as network and phone connections, MS applications and e-mail. Aside from basic frontline support provided for these by the TC's, they are largely regarded as supplied from existing infrastructure units in IT.

[12] The personnel to be incorporated from IT include: Director, Academic and Research Services (1); Research Consultants (5); Manager, IML (1); Staff Assistant, IML (1) plus approximately three additional staff from the 7 ITC's, 3 "departmental" staff, and 3 system support personnel. The total number of personnel to be moved from IT is 8-11.

[13] Academic TC's will be more responsive to academic needs if aligned with the AVP's office. On the other hand, most of their time would still be spent on basic infrastructure (desktop installation, networking, telephony, printers, etc.) Consequently, their basic training and knowledge updating would remain with the larger TC organization. By remaining within academic buildings and departments, the academic TC's focus will remain decentralized on their service units. By having their salaries and positions controlled by the AAVPAT, their resources are unlikely to be siphoned off as auxiliary secretaries, receptionists, stockroom clerks etc by departments as happened sometimes in the previous GTA support system. Centralization in the LSC model also allows for the TCs to be utilized in times of need outside their specific service unit. The existing TC organization has developed its own esprit de corps, which provides for a large pool of knowledge, rapid transfer of information, identification of generic problems and advocacy for solving problems. Consequently, these qualities should be preserved upon integrating the academic TCs within the auspices of the AAVPAT.

[14] Wherever possible, online help, instruction and facilitation are envisioned at every level. This is expected to free TC's from some routine activities. In particular, telephony changes (moving of phone locations, etc.) should be done online.

[15] http://www.educause.edu/ir/library/html/cnc9837/cnc9837.html