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MEMORANDUM

TO: Dr. Sue Legg, Director
Office of Instructional Resources (OIR)

FROM: Arthur J. Zirger Jr., Chair
Video Advisory Committee (VAC)

DATE: July 10, 2000

SUBJECT: Campus Video Infrastructure Report

Attached is the Video Advisory Committee's (VAC) Campus Video Infrastructure report for your consideration. This study finds that a comprehensive and seamless campus video infrastructure does not currently exist, and recommends that the University of Florida take aggressive action to create a state-of-the-art, high-speed, campus digital video system that will have an immediate and positive impact on the university's teaching, research, and service missions. The report includes: a rationale articulating the urgent need for creating a comprehensive digital video infrastructure; a summary of the campus video inventory; a list of recommendations designed to establish or improve video connectivity and interoperability between university academic, research, and service on- and off-campus units; and future directions for campus video.

The University of Florida is an institution of geographically distributed people, institutions and information. There is an immediate need to provide the seamless transport of video, in its many forms, across a number of university functions. The future direction of video development at the University of Florida will involve innovation and evolution in the capture, storage, access, transport and viewing of video. A comprehensive campus video infrastructure that is dynamic, robust, standards-based, and secure will enhance the educational process, support greater interaction between the university and other peer research institutions, and enable the university to increase its service to students and alumni.

Many areas of the university have already integrated video technologies as an intrinsic part of their core activities. There are currently eleven distinct video systems on campus that provide video support for their respective university academic, research, and service units. Permanent connectivity and interoperability between these eleven video systems is limited, and the currently available process to provide this service is complex, time consuming, and costly. The proposed recommendations will provide cost effective and timely technical solutions to the most immediate campus video problems, and also provide a road map for the future development and expansion of the campus video system.

It is further recommended that the university administration should: establish a permanent university campus Video Advisory Committee to coordinate campus-wide video activities, and headed by an

individual with broad authority; develop a planning and budgeting strategy; and establish a technical sub-committee tasked to remain abreast of developments in emerging video technologies, and to evaluate and recommend for adoption selected video systems. The proposed video infrastructure should also serve the needs of the university's distance learning activities.

Please contact me if you have any questions or require additional information regarding the report. I would happy to meet with you to discuss this report in greater detail at your convenience, and I am also available to present these findings to other university committees upon request.

Attachment

cc: Video Advisory Committee Members

Video Advisory Committee
Campus Video Infrastructure Report
July 10, 2000

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Campus Video Infrastructure Report

Executive Summary

INTRODUCTION

This report was prepared by the University of Florida Video Advisory Committee (VAC). The charge to the VAC was to inventory the campus video infrastructure and to make recommendations designed to establish and improve connectivity and interoperability between university academic, research, and service units. The intended result of this study is to outline a strategy that, when implemented, will provide the university with the capability for the high speed transmission of high quality video, with 24/7 reliability and security, between on-campus and off-campus units.

This report: establishes the need for a comprehensive campus video infrastructure; provides a summary of the campus video inventory; and discusses six important video applications, the specific problems that result in the lack of connectivity and interoperability between eleven existing campus video systems, and then recommends effective technology-based solutions.

EXISTING VIDEO INFRASTRUCTURE

A campus video survey was conducted in order to determine the number of existing video capable facilities and/or systems in the following categories: portable; auditorium; classroom; studio; conference room; or other. The survey instrument was sent to 16 university academic and service units representing the colleges and schools, either known or thought to be, engaged in video activities for teaching, research, or service. Nine responses were received to-date. The initial inventory findings indicate that there are a total of 148 video capable facilities or systems on-campus; and of these, 31 (20.9%) are capable of two-way video communication. The eleven existing video systems were developed independently and at different times, and were often equipped with technical components from different manufacturers thereby increasing the barriers to effective connectivity and interoperability.

VIDEO ACTIVITIES

Clearly, the university should plan for the development of a digital video system that will enhance the educational process and improve productivity, while accommodating existing analog systems until such time as they could be converted to a digital format. Representative examples of video applications that are currently in use at UF are included in this report. The difficulties encountered with connectivity and interoperability between these existing systems are described and recommendations providing solutions to these difficulties are provided. If implemented, the digital video solutions recommended would have a significant impact on the availability and uniformity of video related services and provide the following major benefits: high quality point-to-point or multipoint videoconferencing capability between any campus location (including classrooms) via a transportable unit or desktop PC with network access; legacy videoconferencing sites would have seamless connectivity and interoperability with campus location through gateway services; all campus locations would have access to a virtual digital video library made up of media servers across campus; and satellite and commercial TV programming could be accessed from any university location.

Six major video applications issues are addressed, examples of specific barriers to connectivity and interoperability are discussed, and effective recommendations are presented that will remove the barriers and have an immediate and positive impact upon the transport of video between university on- and off-locations. The major campus video application issues are: Content Access and Management; Distribution; Videoconferencing; Information and Technical Training; Content Production; and Organization and Collaboration. A total of 16 recommendations are presented; please refer to the main body of this report (Pages 3-8) or to the Appendix for complete details.

FUTURE DIRECTIONS

The future direction of video development at the University of Florida will involve innovation and evolution in the capture, storage, access, transport and viewing of video. As this process moves forward, it must: maintain the reliability and interoperability of existing systems, preserve the investment in legacy infrastructure, design systems from the application to the most appropriate technology, and provide an affordable introduction or transition to the most current and appropriate video technology.

The application of these tenets will define a process by which the University of Florida continues to integrate the use of video as part of daily practice. The testing and evaluation of video technologies must not interrupt existing operations. Standards must be adopted and implemented in a manner that provides interoperability that is transparent at the client station. Portals to translate digital and analog video must be available for the near future. The digital infrastructure must be expanded and become more robust. However, support for University of Florida associates and clients in technology challenged areas must be maintained and improved.

The future will be built by leveraging existing and new hardware and software resources to build a virtual Video Network Operations Center (VNOC). The VNOC will provide a means of interconnecting all existing resources and integrating new systems. It will provide translation between standards and algorithms. It will provide cross connects between different transport media. It will provide translations between data speeds so each node will operate in an optimized fashion. The VNOC will be the focal point of moving developing technology into an operational environment.

The VNOC will also be the organizational construct that allows an exchange of expertise and support. Units will provide and receive support for and from each other without sacrificing autonomy or control. Interpersonal exchange at the administrative and technical level will provide a means for the greatest return on individual investments. Expenditures can be coordinated to provide the greatest functionality possible by planning for integration and flexibility.

The VNOC will be dynamic. Technology will evolve and governance will be cooperative. This will assure the future of video at the University of Florida as "world class." At a minimum, our vision provides for the following capabilities:

- A standard equipment configuration in classrooms and on mobile carts could provide high-quality videoconferencing and streaming video origination between classrooms on campus. Any PC on the Internet could participate in the videoconferences or access the video.
- Legacy videoconferencing sites would be able to communicate with classrooms through gateway services.
- All locations would be able to access a virtual digital video library made up of media servers across campus.
- Satellite and commercial TV programming could be accessed with the same classrooms and the Internet.
- With the installation of a videoconferencing MCU, more than two participants could join the same videoconferences simultaneously. Off-campus sites could participate over the Internet using existing videoconferencing systems or a PC and camera.

Video Advisory Committee Members

Frank Ahern, News & Public Affairs
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Sharon Blansett, Division of Housing
Mike Conlon, UF Health Science Center
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Video Advisory Committee Status Report and Recommendations

INTRODUCTION

This report was prepared by the University of Florida Video Advisory Committee (VAC). The charge to the VAC was to inventory the campus video infrastructure and to make recommendations designed to establish and improve connectivity and interoperability between university academic, research, and service units. The intended result of this study is to outline a strategy that, when implemented, will provide the university with the capability for the high speed transmission of high quality video, with 24/7 reliability and security, between on-campus and off-campus units.

This report will: establish the need for a comprehensive campus video infrastructure; and provide a summary of the campus video inventory; discuss six important video issues with specific video system examples, present inherent problems related to these issues; and propose technology-based solutions.

EXISTING VIDEO INFRASTRUCTURE

Overview

The university and its various academic, research, and service units have made significant investments in video facilities, equipment and proprietary networks, and are providing considerable staff-hours to operate the existing video systems. This significant investment continues to increase as additional colleges, schools, and departments become engaged in video-related academic support projects for the first time. Many campus units are currently incorporating the use of video segments into their activities, but there are significant barriers to the widespread use of this media, and specifically to any collaborative efforts between university organizations. Permanent connectivity and interoperability between the eleven video systems does not exist, and the process to provide this greatly needed service is complex, time consuming, and costly.

Clearly, the university should plan for the development of a digital video system that will enhance the educational process and improve productivity, while accommodating existing analog systems until such time as they could be converted to a digital format. Representative examples of video applications that are currently in use at UF are included in this report. The difficulties encountered with connectivity and interoperability between these existing systems are described, and recommendations providing solutions to these difficulties are provided. If implemented, the digital video solutions recommended would have a significant impact on the availability and uniformity of video related services, and provide the following major benefits: high quality point-to-point or multipoint videoconferencing capability between any campus location (including classrooms) via a transportable unit or desktop PC with network access; legacy videoconferencing sites would have seamless connectivity and interoperability with campus location through gateway services; all campus locations would have access to a virtual digital video library made up of media servers across campus; and satellite and commercial TV programming could be accessed from any university location.

Campus Video Inventory

The purpose of the VAC-sponsored inventory was to determine the number of existing video-related facilities and/or capabilities on campus in the following categories: portable (system); auditorium; classroom; (television) studio; conference room; or other. The survey instrument was sent to 16 university academic and service units representing the colleges and schools, either known or thought to be, engaged in video activities for teaching, research, or service.

The data from nine units has been received to-date, and the results are summarized as follows: The initial inventory findings indicate that there are a total of 148 video capable facilities or systems; and of these, 31

(20.9%) facilities/systems are capable of two-way video communication. A second effort will be made to contact those units that have not yet responded, and to possibly identify additional UF organizations that are engaged in video activities, but are unknown to the VAC. Periodic surveys will be conducted in order to capture the expected expansion of campus video activities. The data will then be updated, re-tabulated, and the summary will be revised. This information will be extremely useful to the VAC and other university planning committees.

The eleven existing video systems were developed independently and at different times, and were often equipped with technical components from different manufacturers thereby increasing the barriers to effective connectivity and interoperability. Emerging technologies that must be considered include the growth of wireless technology, and fully switched optical networks, and the subject of future system growth must also be addressed.

Campus Video Inventory*

Video Category	Number of Facilities/Systems	One-Way	Two-Way
Portable	8	0	8
Auditoria	45	43	2
Classrooms	40	40	0
Television Studios	5	0	5
Video Conference Rooms	16	0	16
Other	34	34	0
Total:	148	117	31

*Not all campus units have responded to the survey as of the date of this report.

The following discussion provides a summary of the existing video systems and technology, and the challenges regarding system connectivity and interoperability. Specific examples of the methods that are currently being used to interconnect these facilities are presented, the difficulties encountered in attempting to provide interoperability between two or more of the video systems are described, and technology-based solutions are recommended.

Facility/System Connectivity and Interoperability

The existing level of video connectivity between university on-campus and off-campus locations is inadequate. There are currently eleven separate video systems on campus, each with its own infrastructure and support staff. The process required to provide connectivity and interoperability between the eleven systems is complex, time consuming, and costly.

This decentralization and lack of connectivity and interoperability has an adverse impact upon the ability of the university's academic, research, and service units to share critical and expensive resources, and to join in collaborative activities. Existing video content within the various academic units includes: live instruction, video conferencing, streaming video, satellite broadcasting, commercial television cable channels and others.

There are currently two technical processes designed to connect two or more of the eleven individual video systems, and both are complex and unwieldy. The first method is to convert the program format of one system,

and then transfer it to the other system. The second method is to build additional infrastructure at the requester's expense. Both approaches require central coordination and support. There are many areas that are served by only one system, namely, the campus data network. However, this system carries only the smallest fraction of the video programming compared to what is carried by the other video systems.

Current Access to Campus Video Systems

Systems	Operators	Current Access
Cable Television (5)	Campus Video Service	43 Buildings (limited access)
	College of Business	Bryan(1); Matherly (6); Stuzin(2)
	Cox Cable	UAA; Graduate and Family Student Housing; Tigert, Journalism; and UF HSC
	UF Health Science Center	UF HSC
	University Housing	Single Student Housing; UPD; and J. Wayne Reitz Union
Video Over Fiber (3)	Campus Video Service	Norman (3); McCarty (2); Gym (1); UF HSC; UF Auditorium (1); Fifield (3); Microbiology (1); WLUF (1); WUFT (1); Business (1)
	College of Engineering	OEEP (2)
	UF Health Science Center	UF HSC; UFBI; CSE
Satellite (1)	Commercial Provider	News & Public Affairs (uplink); IFAS; Campus Video Service; Journalism; Housing
Videoconferencing Over Telephone Lines (1)	Commercial Provider	Physics; OEEP; UF HSC; Nursing
Data Network (1)	Network Services DHNet HealthNet Internet/Internet2	UF Single Student Housing UF HSC International

VIDEO ACTIVITIES

In the following section, examples are given to illustrate specific issues. Many units not in the examples are using the same technologies, some more extensively than those discussed. However, they are having the same difficulties and are examining the digital alternatives.

Content Access and Management

Outreach Engineering and the OIR Media Resource Library are two examples of units that make content available on videotape and film. The various media include several formats of videotape, laser disks and 16mm film. The items require significant storage space, are subject to wear with a limited service life, must be physically handled, picked up or delivered for each use. While they may only take an hour to view, they are unavailable to be checked out by others during the time they are being delivered or returned, as well as during the time they may sit unused on someone's desk.

In Academic Year 1999-2000, the College of Engineering's (COE) outreach activity recorded and stored approximately 3,600 hours of video, and shipped and received an estimated 15,000 videotapes via courier services. The COE plans call for a complete transition to high quality digital recording, archiving, and high speed delivery using high capacity video servers during the next two-to-five years as resources become available. The capability to digitally store and retrieve educational content, and make it readily accessible (i.e. education-on-demand) to both on- and off-campus students via the campus backbone and the Internet, is key to the success of the college's outreach activities. Current plans also call for the use of CD-ROM and DVD technologies as intermediate steps towards the digital future.

OIR has a library of over 7000 items and faculty members check out around 10,000 items each year. A move towards DVD media is currently being started.

Redistribution rights for licensed video (e.g. commercial cable television channels, documentaries, etc) must be acquired before it can be provided to the end users. Several distinct systems exist at UF that carry these channels. The units that operate these systems must negotiate their own contracts for carriage. A system to deliver the channels to each unit operator for redistribution must be installed. At best, it is very difficult to provide these channels a-la-carte. This means that acquiring the rights for large groups of channels is the only practical approach.

The cable TV system that is operated by Campus Video Service reaches 43 buildings. Most of these buildings do not have any other method to receive commercial cable television channels. Many of the channels on this system are locally produced and not available to users on the other cable TV systems at UF. Although units served by this system have requested various commercial channels, redistribution rights have been acquired only for WCJB (ABC Channel 20), WRUF (PBS Channel 5) and the student operated low-power station WLUF (Channel 10). These rights have been granted without charge. No procedure currently exists to acquire and charge for additional channels. Even if a procedure were established, it would represent yet another duplication of the efforts already undertaken by several other units.

Many cable television channel providers are transmitting their signal digitally. Some encourage redistribution on a campus data network to be viewed using computers. Further investigation into redistribution over the data network is needed.

Recommendations

Establish a virtual digital multimedia server based on open standards. It should support modular cross-platform text, graphics and video content, and provide extensive indexing, searching, accounting, and authentication functions. It should include the ability to provide content from the repository through delivery systems such as the data network, CD-ROM or DVD. It should also closely integrate existing access procedures for non-digital media.

Initiate a formal investigation into the conversion from multiple cable TV systems to the data network for redistributing locally originated content and commercial television channels.

Distribution

The College of Business is a good example of how multiple systems are used at UF. They originate programming in their classroom studio and make it available for students to view by multiple methods. Programs can be delivered either live, by scheduled replay, or on demand. Students make extensive use of these services. The signal starts at Bryan Hall and is sent over the fiber network to Campus Video Service at CSE. From there, it is sent back out in two ways. First, it goes by fiber to WLUF in Weimer Hall where it becomes part of the programming for the student-run television station (Channel 10). The WLUF programming is delivered to Cox Communications by fiber and is distributed throughout Gainesville and the surrounding area. Housing receives most of the Cox channel lineup (including WLUF) directly from Cox by fiber and redistributes it to residents in student housing. Wireless One, a Multi-Point Multi-Channel Distribution system ("MMDS"), also distributes WLUF to area apartment complexes where it serves as cable TV to the occupants. They currently pick up the broadcast signal of Channel 10 but are in the process of installing a fiber link. Also, from Campus Video Service at CSE, it is converted from fiber to a cable television signal and sent out to the 43 buildings that can receive Campus Video Service Cable TV. The College of Business also maintains a dedicated cable TV system reaching select rooms in Bryan, Matherly and Stuzin halls.

There is a large amount of equipment and infrastructure used to make this work. The numerous signal conversions and amplifiers required for these delivery methods keeps the costs associated with their construction and operation, both in staff-hours and dollars, quite high. And units that are not currently connected are required to bear the entire expense of system expansion if they wish to receive the services. The cost of new building construction and renovation projects is substantially more if cable TV distribution systems are included. The cost to add the systems later if they are not included is even worse.

The College of Business is also a good example to show the advantages of digital distribution of video content over the existing data network. They have closed their Viewing Room in favor of providing streaming video that can be viewed in existing CIRCA labs, classrooms, dorm rooms and virtually anywhere with a reasonably fast connection to the Internet. Between 100 and 200 simultaneous users take advantage of this service most hours of the day and night. The college has made an investment in training, equipment and facilities that will provide a huge return once the continuing costs of cable systems, VCR's, televisions and tape libraries, and associated staffing are removed.

Many University of Florida academic units reach into geographically separate locations. Many of these locations are within business and industry sites, homes, and other academic institutions. Some are in areas with limited network infrastructure.

Certain departments in the Health Science Center are providing telemedical consulting and clinical services to locations that are not part of any University of Florida campus. There is a stated need and resultant goal to make services available in rural areas which do not have the sophisticated tele-services needed. Alternatives are being explored, including the use of Very Small Aperture Satellite systems, to reach into these areas.

The growth of video infrastructure on the geographic and virtual campus under the control of the University of Florida must include the ability to interconnect with "outside" distribution systems. These systems may remain analog for some time, may use different technical standards, and may be subject to governance structures that cannot be influenced by UF. These are essential variables for consideration in the design of a global UF video distribution system.

Recommendations

Evaluate new technology in close collaboration with Network Services. This includes encoders, decoders, gatekeeper systems, videoconferencing equipment, test equipment, scheduling and directory systems.

Provide equipment that will allow the existing fiber and coaxial cable based video traffic to be converted and distributed digitally over the data network. This includes encoders, decoders, test equipment and related software.

Provide portable units that allow high-quality video connectivity on and off campus. This will allow a program originated in one location to be transmitted to other locations.

Establish transport systems to external sites that will allow seamless integration with the data network.

Videoconferencing

The Institute of Food and Agricultural Sciences (IFAS) has nine locations throughout the state that comprise a videoconferencing network. Their video conferencing equipment is connected to the state DivCom T1 network contracted with BellSouth. When they wish to use the system, they must schedule the desired time in advance on the BellSouth Multipoint Control Unit (MCU). If they wish to hold a videoconference with a site that is not on the state backbone, they must ask BellSouth for a guest port on the BellSouth MCU, and the site or sites must dial in via ISDN. IFAS also has satellite facilities at 29 locations around the state. These provide one way video downlinks and two way audio via telephone. Prices for uplinking programs via satellite have recently come down due to discounted prices for use of the state-owned transponder, and this may lead to increased use in the future. The fiber network through Campus Video Service provides a connection to the N&PA satellite uplink truck so the truck no longer has to be moved to McCarty for such events.

Other units on campus use ISDN telephone lines for video conferencing. These lines incur monthly charges and long distance charges that are significantly more than standard phone lines. When more than two participants are involved, an MCU service must be called upon to provide that feature for a fee. The carriers that provide ISDN services do not cooperate with each other and do not have networks substantial enough to ensure reliable service. This results in frequent problems, difficult trouble resolution, and dependence on systems beyond our control.

IFAS is currently investigating the possibility of contracting an intranet to connect their various sites. This would provide a data network reaching those sites in the same way that Network Services provides the campus data network. Network based video conferencing using well-established standards, will then be available with fixed costs and high reliability. Once this is established, they will not only have a reliable system for network based video conferencing to the IFAS locations, but they will have the capability to conduct videoconferences with any location that has a good Internet connection.

For units on campus that currently do not have video conferencing systems, they must schedule to use the facilities of other units. This is inconvenient and sometimes prohibitive. For individuals or groups of three or four to participate in informal video conferencing, the existing campus network can provide connectivity worldwide. Some functions that are best provided over the network, like a calling directory, gatekeepers to provide access control and gateways that allow connection to standard telephone based systems will be necessary.

Recommendations

Provide affordable MCU service, gateways, gatekeepers and a directory for network based videoconferencing.

Establish a coordinated scheduling system for the videoconferencing facilities operated by several units on campus.

Information and Technical Training

When units wish to build facilities for formal, high-grade videoconferencing, the technical design issues are immense. Issues that must be addressed include lighting, noise from the air conditioning system, noise from adjacent rooms and hallways, room acoustics, seating arrangements, wall color and texture, sound and

video equipment selection and placement, and much more. The parameters used to evaluate these items for videoconferencing are unique and usually unknown to those trying to design the facility. Often, contractors are not familiar with the techniques involved. Many designs are based on ideas attained by looking at other videoconferencing facilities. The best way to evaluate many of the important qualities of a facility is to be on the receiving end of a videoconference from that site. This is almost never the method used so that the bad design features of one location are repeated in the design of another.

By assimilating accurate information and providing standards and recommendations for the design of these facilities, the quality of facilities at UF could be improved. This would apply to new designs as well as problem solving for existing ones.

Finding information about facilities and services on campus can sometimes be daunting. Faculty or staff usually don't even know where to start. If they don't give up first, they are often sent from one source to another before finding what they need. If an outside party tries to get similar information it is even harder. In the process of preparing this report, the VAC attempted to put together an inventory of video-related facilities. The members of this committee are some of the biggest users of video on and off campus. We were not able to get a complete accounting of what UF has.

By formally combining information from the units at UF into a virtual Web-based guide to video services and facilities, we would provide easy access to much of this information. Not only could external contacts have a better chance of finding what they need, the information about other units and their facilities would encourage interaction between the units.

Recommendations

Determine and publish standards, provide evaluation results and recommendations of new technology.

Acquire, expand and maintain coordinated documentation and a campus-wide video facilities and services inventory.

Support staff training programs pertaining to the operation of facilities and equipment related to video.

Establish a process to update the University of Florida Planning, Design and Construction Standards to address the impact of evolving technology.

Content Production

The BOR meetings that have been held at UF provide an example of producing high-grade video in a location that is not designed or equipped for that purpose. The request was to broadcast the meetings using live video streaming on the Internet. It is a simple matter to capture sound and video on a computer and send it out on the Web. But, for a formal public presentation like the BOR meetings, this is unacceptable. In this case, a large mixer and nineteen individual microphones had to be used. They required individual adjustment that took hours of preparation time. A video switcher and three cameras were used requiring three camera operators and a director to operate the switcher. Studio lighting was also brought in. For the first meeting in Touchdown Terrace, several hundred feet of fiber optic cable was temporarily installed and then removed when the meeting concluded. The video was carried by this fiber to encoders at CSE. Web pages with links to the video streams were set up.

Several units on campus have combined their staff and equipment in order to provide this service for a variety of programs. Much of the equipment is pulled out of its regular service and outside contractors are used for the functions we are unable to support.

If additional equipment was available to augment what already exists, this process would be much more efficient with less chance for things to go wrong. By establishing a well-defined production capability for public events, staff from multiple units would be able to make this service available for more events. A high-quality

encoder for digital video connectivity could be used wherever network support existed. The end results would be better and there would be less impact on the daily operations of those involved.

Recommendation

Formalize a transportable high-quality production capability by supplementing the efforts already being made by several units on campus. This capability currently is patched together for BOR and other meetings on campus that are broadcast externally over satellite, the Internet or by other means.

Organization and Collaboration

The Video Advisory Committee was formed in 1997 by the Vice-Provost. Some of the original members are no longer employed by the University of Florida or no longer participate, and some currently active participants in VAC activities (including the preparation of this report) have not been officially appointed to the committee.

Beyond maintenance of the existing services, no official mission for Campus Video Service existed. Although there are many differing ideas of what the responsibilities of Campus Video Service are, it is not well defined. To facilitate the coordination of various units' efforts to provide virtual unified services and information, that function should be formally defined and supported.

The Health Science Center is currently offering a series of classes that meet simultaneously at three H.320 sites and one H.323 site. The link between the UF and USF (H.323) campuses is accomplished via Internet II. The operation has been less than satisfactory so far. While the H.320 sites connect without difficulty, the H.323 site continues to "lock up" on a regular basis in intervals of 20 to 30 seconds. It clears itself but proves quite disruptive to faculty and students.

The MCU at the Health Science Center has significant capacity and usefulness for H.320 applications. Another campus unit could combine their H.323 MCU with the Health Science Center to establish a virtual MCU service with the capabilities of both. This would require close collaboration and cross training between the units.

Many services on campus are dependent on one key individual to operate important components of each service. If these staff members with similar responsibilities had frequent interaction, they would be able to share support and training.

Recommendations

Formalize a permanent Video Advisory Committee that establishes recommendations that are incorporated into the development of the University of Florida Strategic Plan. Insure close coordination with Network Services.

Develop an official Campus Video Service mission statement and provide mission-oriented job descriptions for the staff.

Support efforts to facilitate collaboration and cross training between video related staff among multiple units.

FUTURE DIRECTIONS

The University of Florida is an institution of geographically distributed people, institutions and information. There is a need to apply common data points (including images and motion video) across a number of functions. Many areas of the University have already integrated video technologies as an intrinsic part of their core activities.

The future direction of video development at the University of Florida will involve innovation and evolution in the capture, storage, access, transport and viewing of video. As this process moves forward it must:

- Maintain the reliability and interoperability of existing systems.
- Preserve the investment in legacy infrastructure.
- Design systems from the application to the most appropriate technology.
- Provide an affordable introduction or transition to the most current and appropriate video technology.
- Bear in mind that “campus” refers to affiliated individuals and not geography.

The application of these tenets will define a process by which the University of Florida continues to integrate the use of video as part of daily practice. The testing and evaluation of video technologies must not interrupt existing operations. Standards must be adopted and implemented in a manner that provides interoperability that is transparent at the client station. Portals to translate digital and analog video must be available for the near future.

The digital infrastructure must be expanded and become more robust. However, support for University of Florida associates and clients in technology challenged areas must be maintained and improved.

The future will be built by leveraging existing and new hardware resources to build a virtual Video Network Operations Center (VNOC). This VNOC will provide a means of interconnecting all existing resources and integrating new systems. It will provide translation between standards and algorithms. It will provide cross connects between different transport media. It will provide translations between data speeds so each node will operate in an optimized fashion. The VNOC will be the focal point of moving developing technology into an operational environment.

The VNOC will also be the organizational construct that allows an exchange of expertise and support. Units will provide and receive support for and from each other without sacrificing autonomy or control. Interpersonal exchange at the administrative and technical level will provide a means for the greatest return on individual investments. Expenditures can be coordinated to provide the greatest functionality possible by planning for integration and flexibility.

The VNOC will be dynamic. Technology will evolve and governance will be cooperative. This will assure the future of video at the University of Florida as “world class.”

References

1. A Report on the Task Group on Distance Learning Technology, “Technology Infrastructure for Distance Learning,”University of Florida, October 31, 1995.
2. Distance Learning Subcommittee on Program and Substance, “A Report of the Subcommittee, University of Florida, November 27, 1995.

Appendix A List of Recommendations

Content Access and Management Recommendations

Establish a virtual digital multimedia server based on open standards. It should support modular cross-platform text, graphics and video content, and provide extensive indexing, searching, accounting, and authentication functions. It should include the ability to provide content from the repository through delivery systems such as the data network, CD-ROM or DVD. It should also closely integrate existing access procedures for non-digital media.

Initiate a formal investigation into the conversion from multiple cable TV systems to the data network for redistributing locally originated content and commercial television channels.

Distribution Recommendations

Evaluate new technology with close collaboration with Network Services. This includes encoders, decoders, gatekeeper systems, videoconferencing equipment, test equipment, scheduling and directory systems.

Provide equipment that will allow the existing fiber and coaxial cable based video traffic to be distributed digitally over the data network. This includes encoders, decoders, test equipment and related software.

Provide portable units that allow high-quality video connectivity on and off campus. This will allow a program originated in one location to be transmitted to other locations.

Establish transport systems to external sites that will allow seamless integration with the data network.

Videoconferencing Recommendations

Provide affordable MCU service, gateways, gatekeepers and a directory for network based videoconferencing.

Establish a coordinated scheduling system for the videoconferencing facilities operated by several units on campus.

Information and Technical Training Recommendations

Determine and publish standards, provide evaluation results and recommendations of new technology.

Acquire, expand and maintain coordinated documentation and a campus-wide video facilities and services inventory.

Support staff training programs pertaining to the operation of facilities and equipment related to video.

Establish a process to update the University of Florida Planning, Design and Construction Standards to address the impact of evolving technology.

Content Production Recommendations

Formalize a transportable high-grade production capability by supplementing the efforts already being made by several units on campus. This capability currently is patched together for BOR and other meetings on campus that are broadcast externally over satellite, the Internet or by other means.

Organization and Collaboration Recommendations

Formalize a Video Advisory Committee that establishes recommendations that are incorporated into the development of the University of Florida Strategic Plan. Insure close coordination with Network Services.

Develop an official Campus Video Service mission statement and provide mission-oriented job descriptions for the staff.

Support efforts to facilitate collaboration and cross training between video related staff among multiple units.

**Appendix B
Campus Video Inventory***

UNIT	PORTABLE	AUDITORIUM	CLASSROOM	TV STUDIO	CONF. ROOM	OTHER	TOTAL	COMMENTS
Business	0	1	6	1	3	2	13	
Engineering	0	2	5	0	1	1	9	
Housing	0	0	0	0	0	23	23	3127 Rooms
IFAS	0	2	8	1	1	1	13	
UF HSC	6	1	5	0	1	2	24	
NAPA	1	0	0	1	0	1	3	
OIR	0	39	16	0	1	4	60	
WUFT	1	0	0	2	0	0	3	
TOTAL	8	45	40	5	16	34	148	

*Not all campus units have responded to the survey as of the date of this report.