

Information Technology Services at AVC
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Industry trends in information technology can have a significant impact on AVC instruction, services and operations. As an institution of higher education, AVC must continually assess these trends, develop strategies and implement responses that give our students what they need to reach their goals, and give our institution what it needs to serve and enable those students. Some recent trends in the IT industry include cloud computing, “green” initiatives and virtualization, personalized services and social networking, mobility, security and access management, and the use of advanced analytics. A brief description of each of these trends follows, along with examples of how AVC is responding.

“Cloud” computing is basically the notion that computer systems, applications and services are made available to users by various providers and accessed through the internet. This replaces the more traditional means of offering services and applications “in-house” on institutional servers with institutional staff developing and supporting them. A major advantage of cloud computing is that the institution is no longer concerned with the infrastructure needed to offer an application. This can result in significant operational cost savings while offering the added value of ease of maintaining technical currency. If an application such as Blackboard (AVC’s course management system) is provided to AVC through a cloud computing model, then AVC need not provide the servers, personnel, and maintenance updates traditionally needed for that application.

Cloud computing can be described as essentially “outsourcing” technologies, applications and automated services, or even discrete parts of systems. A few of the cloud computing services and systems available to AVC students and employees include the Blackboard course management system for online learning, the WeaveOnline student learning outcomes database repository, the CurricuNet curriculum management database, the Smarthinking online tutoring resource for students, the AlertU text-message emergency alert service, EBSCOHost, the library’s periodical and reference database, and CCCConfer, an online collaboration resource facilitating video conferencing, shared desktop presentation, teleconferencing and much more.

“Green” initiatives and virtualization include implementing energy efficient equipment, optimizing existing equipment by hosting multiple server-based systems on a single server hardware platform, and implementing “internal cloud computing” systems and services. Thin client computers are scaled down workstations that provide minimal services on their own and can also be paired with remotely located blade computers or applications running on servers. When thin clients replace traditional PCs, particularly in lab environments, energy consumption is significantly reduced, often by 60% or more. In addition, when applications are implemented on blade computers or servers, and accessed by thin clients, those applications can be accessed from any location on campus, as opposed to being accessible only from a limited lab location. This departs from the

traditional method of implementing an application in a specified computer lab, and enables the institution to expand the use of limited lab resources, while extending the availability of that application to varying facilities. The use of thin clients, blade computers and server-based applications results in energy savings and optimization. Added benefits of this model over using traditional computers are that the thin client lasts longer than the traditional computer (5 years as opposed to 3 years) and the blade configuration dramatically reduces operational maintenance efforts on the part of support staff. This is significant when staffing levels are already below optimum.

At AVC, thin clients are used in the Assessment Center, Library Information Competency lab, Math lab and in the Palmdale multi-purpose rooms and computer labs. The Assessment Center testing application is provided through a server-based (internal cloud) implementation, enabling Assessment testing to occur in any networked location as desired.

In addition to thin clients and blade computers, servers are available as blades as well. Blade servers offer energy cost efficiency, as well as physically taking less space in the data center than traditional servers. Through our Server Consolidation Project, AVC has been able to replace many servers that have reached or passed their recommended “end-of-life” dates, as well as to consolidate the services of many servers that were once individual computers into collections of “virtual” servers operating on a single piece of equipment.

At AVC, we are implementing blade servers and virtualization to save energy and streamline operations, while at the same time extending capacity. The recent Server Consolidation Project, completed with assistance from Chevron, has enabled us to reduce the number of physical servers from 78 to 44. At the same time, the project has facilitated an expansion of the number of virtual servers to 72, for a total server count (physical and virtual) of 116, a net increase in the number of servers of over 30%. The combination of blade servers and virtualization has given AVC the ability to save energy and reduce operational cost while providing opportunities for expansion as requirements dictate.

Personalized service and social networking technologies can provide role-based and interest-based access to institutional resources. Social networking technologies like Facebook are often used for marketing or informational purposes. You will find a [link to Facebook](#) on the www.avc.edu web site maintained by the Office of Public and Governmental Relations. Personalized service can add great value to the student’s experience, as well as increasing efficiency for the employees. By identifying a technology user’s role or interests, information and services specific to that role or those interests can be delivered to the user. For example, students can receive access to materials specific to courses in which they are enrolled or student clubs in which they are interested, while employees can receive access to employee information, or job-specific software applications, utilities and data. When students log in to myAVC, they are presented with a set of information and resources different from that presented to employees when they log in to myAVC.

As one can imagine, personalized service presents security and access challenges for the institution and for the users. At AVC, we are in the process of developing, testing and refining a universal login process to facilitate personalized service. We have already implemented the universal login for all users of e-mail, on-line calendar service, Blackboard and the myAVC portal. This means that users will have a single username and password credential that allows access to all of these services. The goal is to eventually extend this single access credential to include network-based resources, including software applications. This will enable students to access software applications on the institutional network that are used in classes in which they are enrolled. A longer term goal is to enable students to access permitted resources using their personally owned computers and other devices.

Mobility, security and access management are industry trends that IT organizations must address carefully. The universal login process described above is an important component in enabling mobility for students and employees. Currently at AVC, employees can log in to any networked computer on campus (including the Lancaster campus, Palmdale Center or Fox Field) and gain access to their permitted network resources and their specific documents and data. This is one step in facilitating mobility and access for the institutional workforce, as well as for students.

Once the universal login credential is implemented, students will be able to individually connect to network resources at AVC. (Currently students can only access institutional network resources with classroom or lab issued credentials.) The universal login credential is important for student access so that access and data protection can be managed and institutional computer use policies and procedures can be enforced. Open network access provides no protection for network resources and data; and provides no means to identify users who misuse the institution's resources. AVC's internet access is provided by the [Corporation for Education Network Initiatives in California \(CENIC\)](#), and all users of this service are required to abide by [CENIC's Acceptable Use Policy](#). However, if violations of the Acceptable Use Policy are identified by CENIC, the institution is held accountable and required to address the violations. For AVC to be able to address violations, we would need a way to identify the account in question.

Another step to enhance mobility at AVC as well as to expand access to information technology resources for both students and faculty involves implementing wireless access to network resources. Wireless access to network or internet resources has become so prevalent in the IT industry that students as well as faculty commonly expect wireless access to be available everywhere, particularly in educational venues. Wireless network access gives technology users flexibility in terms of location and choice of equipment. Widespread wireless access to AVC network resources would be especially helpful to adjunct faculty who could use their personally owned computers to work on campus, as well as to connect to AVC network resources.

Currently, wireless access to the AVC network is available to support the Chemistry Lab in SC3, Physics Lab in SC2, Electronics Lab in TE 1, Fire Technology in TE 2,

Agriculture in TE3 (new facility), EOP&S in SSV, BE 207 conference room users, and presenters and events in the Board Room (on an as needed basis). In addition, a publicly available fee-based wireless internet access service is available in the Library, Library plaza, Cafeteria and Student Lounge. The public “hot spot” service is provided by AT&T for fees paid by the individual users, and is configured independently from the AVC network and internet service. The AT&T public service is not subject to AVC’s (or CENIC’s) use policies.

Extending wireless access much beyond this, even for employee use only, will require both hardware and personnel resources that are not currently funded. “Although the freedom to roam the facility and always be connected to the LAN [local area network] can be a great advantage for network users, the amount of support needed to manage the system and users is much higher than that required by a wired network. Due to the broadcasting nature of a wireless system, security is an important concern and provisions should be made for guest / unauthorized users to use the system in a limited and controlled way. Additional support by the IT Team is often required to configure a user [computer] to use the wireless network, to ensure the wide variety of disparate hardware will work with the College’s wireless system, and to provide Help Desk support for wireless issues.”¹

Another IT industry trend that is receiving significant review is the use of data to drive institutional decisions. Advanced analytics is the analysis of institutional data to show trends in the data and then develop interventions or communications for specific populations. Accountability reporting is a familiar example of advanced analytics, that was legislated by the state in 2004 (Assembly Bill 1417) as a funding condition for California community colleges. Data repositories and reporting tools facilitate advanced analytics.

At AVC, institutional data is accessed using basic tools such as Microsoft Access and Banner’s jobsub utility, then analyzed, reported and used to develop strategies. Examples range from the award-winning Probability Based Advising research project recently completed by AVC’s Office of Institutional Research to the use of data to send targeted messages to specified student populations. As an example, currently enrolled students can be notified of important dates by automatically “harvesting” from Banner the population of students who need to be informed and then automatically sending the information they need to their e-mail address or phone. The Office of Institutional Research is a key user of advanced analytics for many purposes, including FTES projections used for enrollment management and budget planning. Other examples can include equipment monitoring and alert software such as temperature sensors, or the collection and reporting of computer usage statistics to help drive decisions regarding new computer requirements.

¹ “Data Networking Systems, Wired Vs. Wireless Report, Antelope Valley Community College Health and Sciences Building”, 02/17/2010, Prepared for Antelope Valley Community College by Vantage Technology Consulting Group, Copyright © 2001-2010 Vantage Technology Consulting Group

The Information Technology Services Area at AVC continues to play a supporting role to the institution, providing “reliable, accessible, high quality information technology services supporting the district’s instructional and operational needs.”² Some recent major accomplishments in ITS include completion of campus network infrastructure upgrades and implementation of a new voice over IP (internet protocol) telephone system (~\$2.5M); implementation of several significant Banner “add-on” products including Luminis Content Management System, Xtender Document Imaging, DegreeWorks, Blackboard integration, SARS (~\$.5M); \$137,000 in one-time computer upgrades in FY0607; implementation of “green” technology initiatives using blade computers, thin client computers and virtualization as described earlier (~\$.5M); and expansion and improvement of the Palmdale Center and Fox Field network infrastructure.

Current or planned IT projects include all construction-related technology planning and implementation (bond funded; additional personnel required but currently unfunded); the universal login development project described earlier; required network switch upgrades (~\$75K, currently unfunded); network access control and intrusion prevention system (unfunded); the “green” enterprise computing project described earlier (~\$.5M); the Banner and institutional server upgrade project, including additional “green” academic computing expansion (~\$.5M); and the wireless access infrastructure expansion project (~\$.25M + additional personnel, currently unfunded). Funds have been requested through appropriate institutional procedures for each planned project; however several major initiatives remain unfunded and un-staffed.

As this paper describes, the ITS Area must continually work to keep abreast of emerging technologies and IT industry trends in order to be responsive to the institution’s needs. “With the immense dependence that the institution has on information technology services, AVC must ensure a stronger commitment to providing the resources necessary to support the operation of the district and to sustain the Educational Master Plan and its Guiding Principles.”³

² Information Technology Services Area Vision Statement

³ ITS Area Program Review Self Study – Spring 2008