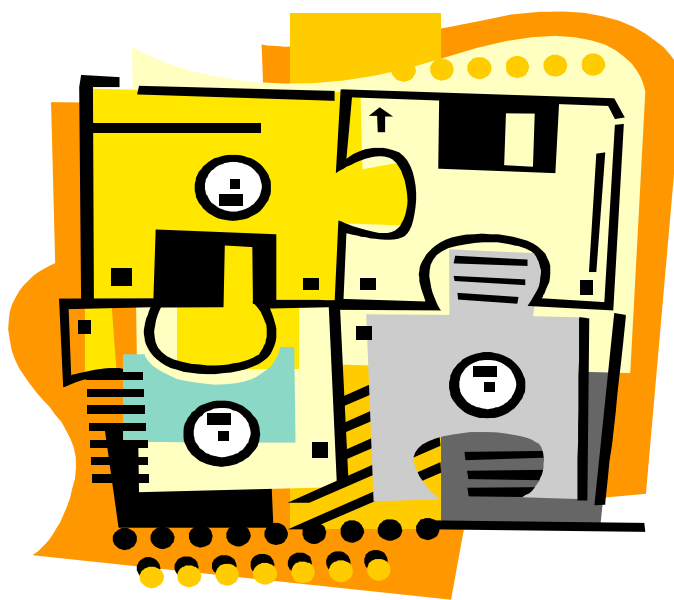


# Austin Independent School District

## Vision for Technology 2001 – 2005



February 26, 2001

**Austin Independent School District  
Austin, Texas  
2001 – 2005**

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**Austin Independent School District**  
**Vision for Technology**  
2001 – 2005

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## Executive Summary

The Austin Independent School District Vision for Technology provides a framework for enhancing education and business functions using technology. Over the last five years the District has made great strides in making technology available at every campus and administrative building. This plan integrates and institutionalizes the technology transforming the infrastructure into a transparent tool with a multiplying effect on all aspects of education and administration. There are several over-arching themes that comprise the plan:

1. Integrate technology into the curriculum to enhance the educational process for every student and teacher.
2. Provide a unified information management system with easily accessible student and business information to authorized users.
3. Provide access to information for parents and students outside the physical school environment.
4. Provide support that is efficient, timely, and cost effective to ensure technology is available when needed.
5. Create architectures, procedures and standards that allow for technology evolution and streamline regular and frequent processes.

Technology is changing the classroom landscape. At the end of this five-year Vision for Technology, it is expected that every student will have an access device that is used as an integral part of daily instruction. Access to electronic textbooks, the Internet, collaboration and editing tools, instructional software, and electronic notes will be available instantly from anywhere within the school environment as well as via common communication means outside the school. This environment will promote increased parent and community involvement and facilitate communication with schools.

The administrative environment is also changing. Data will be entered and accessed electronically as close as possible to the source with user-generated queries. The Internet and Intranet will be used to conduct general employee and administrative functions of the District. Additionally, this data will be available to increase community awareness of District status and initiatives.

These dramatic changes in process and method require a solid and robust infrastructure. Therefore, technology skills and support are key initiatives in this plan. They are required to unlock the potential of this technology and to allow seamless integration with the conduct of business--whether administrative or teaching.

This Vision for Technology includes ten goals that capture the five over-arching themes and addresses evolution in the classroom and administrative environments. These goals are:

*Goal 1: Provide instructional technology leadership for District objectives and initiatives.*

- ☞ Using technology integrated into all areas of the curriculum, teachers and students will increase their learning and work more efficiently.

*Goal 2: Provide a secure, comprehensive information environment that can be accessed at anytime, anyplace, and from any device.*

- ☞ Through a stable, secure infrastructure, staff can access information they need when they need it.

*Goal 3: Facilitate use of information resources to improve instruction.*

- ☞ Taking advantage of new technologies, students and teachers have ready access to appropriate electronic resources for instruction and learning.

*Goal 4: Provide educator development to support instructional goals.*

- ☞ As a result of training, teachers will be prepared to use technology in their teaching and analysis of data.

*Goal 5: Improve collaboration and cooperation between AISD departments, campuses, and outside entities for effective implementation of AISD instructional priorities, goals, and initiatives.*

- ☞ Through closer collaboration between Information Systems and AISD departments, and with community partners, support of District goals in instruction can be enhanced.

*Goal 6: Increase effective, efficient use of technology resources*

- ☞ With new software systems, enforcement of standards, staff training, and a retooling of current practices, staff can become more productive.

*Goal 7: Ensure Customer Satisfaction*

- ☞ As a result of a highly trained support staff, remote network management, and communication with staff on processes and procedures to access customer service, hardware, software and the network will be maintained in optimal condition.

*Goal 8: Provide AISD staff, students, parents, and community the opportunity to access appropriate information.*

- ☞ Using a common interface, staff and community can search AISD information resources.

*Goal 9: Improve PEIMS reporting process*

- ☞ Using new software tools, PEIMS data will be entered, tracked and reported consistently.

*Goal 10: Improve data integrity for the District*

- ☞ To ensure reliability of District data, up-to-date software, training, and new procedures will be implemented.

All these goals provide an environment to allow learning to continue outside the walls of the classroom after school hours. However, another issue remains; many students do not have access to computers at home. This is a larger concern commonly known as the “digital divide” and must be addressed by the community in partnership with the District.

## DISTRICT OVERVIEW

The Austin Independent School District is a vital part of the Austin, Texas metropolitan area. The seat of government for the state of Texas, Austin has become a vibrant, dynamic business, government, and education center. Founded in 1839 as the tiny village of Waterloo, the city has become a metropolitan area of more than one million citizens—the 27<sup>th</sup> largest in the United States and the second fastest growing. Austin is also a highly touted education center, hosting the respected University of Texas, St. Edwards University, and a variety of other institutions of higher education. In addition, the city is known as a technological mecca.

Austin offers an incredible array of intellectual resources, a progressive, innovative atmosphere, and is home to dozens of high-tech companies. In addition, Austin is widely renowned as the “Live Music Capital of the World” and is one of only fourteen US cities with its own ballet, symphony, and opera. During the past decade, as Austin has experienced phenomenal growth, the city has been awash in superlatives including:

- third best place to live in the United States
- the nation’s best-read and most computer-literate populace
- the most fit city in the United States
- seventh best city for business

The Austin Independent School District serves this bustling community with a student enrollment of 76,857, and a growing number of campuses: eleven high schools, 17 middle / junior high schools, 71 elementary schools, and four alternative programs. A staff of 9,687 serves Austin students everyday.

Overall, AISD serves a diverse student population. 44% of AISD students are Hispanic; 37% are White; 16% are African American; 2.5% are Asian and .5% are Native American. Over 51% of the total enrollment qualifies for free and/or reduced lunches.

The AISD technology program plays an important role in the overall services provided to its teachers and students. Focusing on using technology to promote better teaching and learning, the District provides classroom and lab access to computers and related technology to enhance instruction. These computers are networked at all campuses through high-speed networks and use the Greater Austin Area Technology Network (GAATN) to afford Austin ISD students and staff with high speed Internet access and other related technology experiences. The District runs the third largest private ATM network in the southwest. The District runs it’s own telephone company with 10,000 telephones. A staff of 110 maintain over 600 servers, 20,000 computers, and the infrastructure in over 130 locations.

These cutting edge technology advances reflect the dynamic community that is Austin, Texas.

# **Chapter 1**

## **Guiding Principles**

# CHAPTER 1

## GUIDING PRINCIPLES

### ***I. Introduction***

The previous document guiding technology use in the District was published in 1995. That technology plan has served its purpose well. The District has an extremely robust communications infrastructure and provides access to the information highway to virtually every classroom. The District has set high technology standards for K-12 and is a model for others to follow. However, much has changed in the last five years and it is time to revise the document with these new developments to ensure AISD continues to set the example for education in the new millennium.

A first step in developing a Vision for Technology is assessing the needs of the community and developing a shared vision. To collect these data, AISD solicited input from multiple sources: educators, parents, community members, and business leaders. Focus groups were established to collect community and staff input. Their contributions are listed in Appendix 2. This valuable input stresses the need for a current plan that addresses the following issues: the establishment of standards, the integration of technology and curriculum, adequate support and training, and ubiquitous access to information. The new Vision for Technology builds on the current infrastructure and addresses these issues.

### ***II. District***

The Vision for Technology is aligned with and provides support for the overall AISD Vision, Mission Statement and Long-Range Goals:

#### ***A. District Vision Statement***

*The Austin Independent School District will be recognized for providing every student with an excellent education.*

#### ***B. District Mission Statement***

*The Austin Independent School District educates every student every day.*

#### ***C. AISD Long Range Goals***

- I. Students show improved achievement
- IV. AISD will have quality teachers and principals in all schools.
- V. All data systems provide reliable, accurate and useful information.

### ***III. Information Systems***

#### ***A. Mission for Technology***

The Department of Information Systems will support the achievement of the business and educational goals of the District by providing technology, resources, and building staff skills.

#### ***B. Technology Vision***

Technology will be integrated into teaching, learning, and administration by providing ready access to resources and by assuring secure and accurate data.

#### ***C. Technology Belief Statements***

*In fulfilling the District's Vision for Technology, we believe that:*

- Every student should have access and the skills necessary to use technology to learn appropriate academic, life and career skills, in and out of the classroom.
- Every staff member should have access and the skills necessary to use the technology needed to perform his or her job effectively.
- State-of-the-art software and integration of new technologies support effective management, teaching, learning, and research.
- Efficient and accurate data collection allows AISD to operate effectively and meet all legal requirements and timelines.
- Easy data access and effective analysis tools and skills support information-based decision-making and reporting.
- Technology support should be immediate and customer-oriented.
- Technology resources should be highly valued for achieving the education and business goals of the District and supported accordingly.

- District implementation of technology should be a model for other Districts and, as a result, attracts both attention and funding opportunities.
- The efficient use of technology improves communication both within and outside the District.
- Technology resources allow parents to participate more directly in their children's education.

# **Chapter 2**

## **Teaching and Learning: Technology/Curriculum Integration**

## CHAPTER 2

### Teaching and Learning—Technology and Curriculum Integration

#### *I. Introduction*

The teaching and learning component of the Vision for Technology Plan is dedicated to utilizing technology in support of the Austin Independent School District’s mission to “educate every child every day.” It seeks to provide resources and assistance to school personnel, enabling classroom teachers to avail themselves of best practices as they deliver curriculum integrated with technology. While supporting a variety of software packages and addressing hardware and infrastructure issues, the Vision calls for a concerted effort to implement an integrated approach to the implementation of the Texas Essential Knowledge and Skills, and to support content areas and teaching methodologies.

The teaching and learning section of the Vision for Technology supports the District’s mission through the innovative use of technology and is consistent with the four national goals for instructional technology:

- A. All teachers will have the training needed to help students learn through technology and the information highway.
- B. All teachers and students will have modern technology in their classrooms.
- C. Every classroom will be connected to the information superhighway.
- D. Effective and engaging software and on-line resources will be an integral part of every school’s curriculum

In addition to addressing, meeting and exceeding these four national goals, the teaching and learning component of the AISD plan seeks to address the fundamental goal of the Texas Long-Range Plan for Technology, 1996-2010:

“...to enhance students’ acquisition of knowledge through technology.”

AISD staff will utilize the existing technology infrastructure, which provides consistency at all campuses and sites, as an avenue to align curriculum, instruction, and assessment. With the existing infrastructure providing the access addressed in second and third national goals above, AISD will focus on the first and fourth national goals by assisting teachers in selecting, integrating, and using engaging software, on-line resources, and effective practices. Staff development, provided at the Professional Development Academy and through on-site training, will help District staff and students to move forward in utilizing technology to support the evolution from the traditional classroom

environment into one that is increasingly information- rich, student-centered and teacher-facilitated.

As technology implementation and integration re-engineers the classroom environment, teachers will be enabled to address the needs of all students. As a variety of technologies and techniques are incorporated, the classroom can reach students with a variety of learning styles and special needs. Every child will be educated every day when the classroom enables all students to explore at differentiated levels while at the same time learning in cooperative and collaborative settings.

In support of state and national goals for instructional technology, the Texas Essential Knowledge and Skills, and in accordance with the AISD vision to “educate every child every day,” the teaching and learning component of the technology plan addresses the following overriding commitment and subsequent, supporting four goals:

*Commitment: All students in the Austin Independent School District will meet and exceed the Texas Essential Knowledge and Skills for Technology Applications in the context of core curriculum and content areas.*

## ***II. Current Status***

### **Instructional Software Support**

AISD staff provides support to administrative personnel for the following District-adopted software titles: Windows 2000, MS Office 2000, AppleWorks 5.x, Integrate Pro, Lotus Notes, MS Internet Explorer, McAfee, WinZip, Adobe Acrobat Reader, QuickTime. Additionally, instructional technology staff support instructional personnel and students on the following software titles: AppleWorks 5.x, Netscape / MS Internet Explorer, Hyperstudio 3.3, Inspiration, Paint Shop Pro (Windows) / Graphic Converter (Macintosh), Type to Learn (elementary only), Understanding Mathematics (middle and high schools only), Green Globes (middle and high schools only), and KidPix (elementary only)

### **Productivity and Integration Effort**

In addition to professional development activities, technology staff provides informal one-on-one, small group, and just-in-time assistance to educators in the integration of technology—especially the technology TEKS. This assistance includes informal training and support, modeling, and lesson- and unit-planning.

### **Distance Learning Initiative**

Ten distance learning sites are in development and will be in limited in use during the 2001-2002 school year. These distance learning sites will incorporate two-way audio, video and data, and will be housed at the following sites: Anderson High School, Austin High School, Bowie High School, Crockett High School, Johnston High School, LBJ High School, McCallum High School, Travis High School, Garza Independence High School, and Kealing Middle School. It is anticipated that Lanier High School, Reagan

High School, and Akins High School will receive funding for similar classrooms in the near future.

Deployment and implementation of these distance learning classrooms include the research and development of facility plans, proposals for grant funding, supervision of site development, technical support and training, and the coordination of instructional resources and content to be delivered via the system.

### **IFL/NetLearn**

Technology support of Institute for Learning / Principles of Learning is a high priority in the Austin Independent School District—especially implementation of the Clear Expectations and Accountable Talk components of this philosophy of instructional approach. AISD is in initial implementation of NetLearn, a server- and CD-ROM-based program that provides teachers and administrators with resources, research, and video vignettes to complement educator development efforts and classroom implementation of IFL principles. The teaching and learning component of the technology plan provides for the commitment to use IFL / Principles of Learning as the “anchor” of support and professional development efforts of the department.

### **Infrastructure and Hardware Support**

Though not intended for this purpose, instructional technology staff often find it necessary to provide infrastructure and hardware support on the campuses due to current shortages in available technical support staff. This support ranges from basic computer setup and software installation to troubleshooting and problem solving and, increasingly, network support.

### **Administrative Support and Management**

Instructional technology staff often provide campus administrator and instructional personnel with assistance in the implementation of technologies to assist with personal productivity. Such tasks include effective use of desktop / workstation file and directory structures, use of the network, and use of productivity software and applications (word processing, spreadsheets, databases) and on-line resources.

### **Professional Development**

- A. Professional Development Academy—Instructional technology training focusing on productivity and integration efforts continues to be a vital part of the many offerings of the AISD Professional Development Academy.
- B. District and Campus Leadership Teams—Campus personnel participate in regularly scheduled face-to-face meetings and via electronic means (e-groups) to collaborate and communicate on issues vital to the implementation and integration of technology in Austin ISD. These unpaid staff members (mostly classroom teachers) provide input on District initiatives, aid in installation and maintenance of hardware and software and help in the development of integration efforts at their schools.
- C. MAESTRO—Approximately 300 teachers from over 60 AISD campuses participated in this three-day institute that focuses on the acquisition,

application, and integration of technology tools into the curriculum and content areas. Participants create units of practice that are then implemented in instruction and posted to a district server as models for others.

- D. **Teacher Competencies / Assessment**—Over 50% of AISD teachers have successfully completed projects and assessments on use of basic technology tools and skills which can be applied to classroom productivity and instruction. Basic skills such as the use of word processing, spreadsheets and databases and more advanced skills like the use of Hyperstudio to create presentations or projects are included as part of that assessment.
- E. **On-site training**—AISD regularly offers classroom teachers, administrators, and other staff with on-site training and consultation in the use of hardware and software in teaching and learning. Much of this work centers around the application of standard software applications like AppleWorks, Inspiration, and Hyperstudio.

### ***III. Future Direction***

#### **Goal: Provide instructional technology leadership for District objectives and initiatives.**

The primary goal of providing instructional technology leadership is to increase students' proficiencies in using technology to enhance learning in the context of all content areas. In order to accomplish this goal, students will be able to demonstrate mastery of the technology TEKS, and teachers will utilize technology resources to support the implementation of the Principles of Learning. District staff will support students and teachers as they integrate technology into their methodologies and content. Recognizing the importance of parents and communities, AISD seeks to provide access for these stakeholders to the infrastructure for educational resources through effective planning, distance learning opportunities, and communication of best technology practices. Ultimately, the end-result of these efforts is to foster student achievement through the implementation of technology in collaborative, student-centered classroom environments.

#### **Goal: Facilitate the use of information resources to improve instruction.**

Students, their teachers and parents live in an information-rich and information-driven society. As such, AISD seeks to provide resources to a scholarly environment that reflects and prepares students to become productive citizens in this society. To accomplish this goal, students and teachers will regularly use information resources like the Internet, the intranet, CD-ROMs, and collaborative software to enhance their learning and to increase productivity. In addition, AISD will employ and utilize distance-learning facilities to deliver instruction and staff development that might otherwise be unavailable or difficult to deliver traditionally.

#### **Goal: Provide educator development to support instructional goals.**

Clearly, educator development is essential in all efforts to improve teaching and learning through the use of technology. The AISD Long-range Vision for Technology provides opportunities, incentives, and support to develop model practices using technology. It provides these opportunities through professional development programs intended to promote improved educator productivity and by modeling practices to help educators examine and utilize electronic student data to make sound educational and methodology choices. Most important, educator development and incentives are intended to promote the integration of appropriate technologies into teaching and learning.

**Goal: Improve collaboration and cooperation between AISD departments, campuses, and outside entities for effective implementation of AISD instructional priorities, goals, and initiatives.**

It is vital that communication and collaboration between AISD departments, campuses and other organizations occur in order to allow for instructional technology to play a vital and important role in teaching and learning. Instructional technology must support important curricular issues and District initiatives, and this support can occur only in an atmosphere that is highly collaborative and in which communication flows easily between staff, divisions, and campuses. In an effort to create such an atmosphere, the AISD Vision for Technology calls for an improvement in planning and coordination within the Information Systems Division and between content area staff and instructional technology staff. In addition, planning and assessment efforts that measure success of instructional technology initiatives will be developed and utilized. District Technology Leadership Teams, Campus Technology Leadership Teams, and the Educational Technology Advisory Committee will continue to provide input into instructional technology initiatives, goals and plans.

In addition to AISD coordination efforts, it is vital to seek outside partnerships. AISD will tap into business, education, and other community, state, and national groups in efforts to seek input on best practices and direction and vision. In addition, AISD will seek and maintain outside funding and grants to help fund technology projects.

# **Chapter 3**

# **Information Systems**

# **CHAPTER 3**

## **INFORMATION SERVICES**

### ***I. Introduction***

The vision for Information Systems is to provide a secure, accessible repository for the District's data and the tools to successfully store and mine that data. This will allow use of data to support meeting the District's stated goals of providing an environment where all children can learn. Data supports instructional decisions, business decisions, grant proposals, and to some extent, even the environment in which we work. A district the size of Austin Independent School District must have a vision for the future and a roadmap for attaining that vision. Today's technology supports easier, faster access to secure data. Newer software applications take advantage of the technology to make data access and maintenance available to staff when they need it, how they need it, and where they need it.

### ***II. Current Status***

AISD faces daily challenges regarding its data and access mechanisms. Procedures rely heavily on manual processes rather than being supported by electronic processes. Staff is not used efficiently or effectively because of antiquated systems and data structures. While the District supports e-mail and office automation tools, not all staff takes advantage of these tools to work more efficiently. These issues apply to the entire organization.

Current mainframe applications were not designed to allow ease of entry or to capture data a single time. Because of this inefficiency, there is redundant data entry and data storage. The lack of a common data dictionary that tracks all District data further complicates data issues. No one area is "officially" responsible for specific data.

Departments purchase stand-alone applications needed to serve special needs. Feasibility studies are not part of the purchasing processes. The result is further data redundancy, lack of a common definition for data items, and lack of interfaces that could reduce data entry.

Documents are filed and stored in filing cabinets that take up massive floor space both at the campus and at the central offices. Staff time is used to file, pull and re-file information on a regular basis. Warehouse space is taken to archive older files that may prove impossible to access after any length of time. The security and preservation of materials is questionable.

AISD is in the process of addressing many of these issues with the implementation of new business and student information systems. The new interactive, integrated

information systems will support the technology demands for all types of users. The new systems allow for use of information to support current business processes and allow analysis of information collected for future decision-making requirements.

### ***III. Future***

#### **Integrated Applications**

In moving from a disjointed data structure to a more effective relational data structure, the types of support required will change. There will no longer be a need for as many programmers to write complex code to pull data. End-users at both the campus and department levels will be enabled to view data across the District in varying levels of detail according to defined limitations. Application Development staff will focus on maintaining any customization within packaged software, assist end-user development efforts, support end-user queries and ad hoc reporting, and move toward web development to support information access.

There are currently two major projects underway that have implementation dates in the 2001-2003 fiscal years. National Computer Systems SASIxp application and Tranquility will provide support for student data collection and the staff who must work with that data. SunGard Bi-Tech's IFAS software will provide more robust accounting and human resource functions. Together these applications provide the beginnings for a consolidated, more accurate data store for the District. The power of an Oracle database and application tools will allow data to be retrieved more easily and quickly. More robust security features will, depending on security clearance, empower customers to create reports and respond to requests for information without going through the current cumbersome programming request process.

In designing or configuring systems, standard codes and processes will be employed to the greatest extent possible. Edits will be put in place to ensure valid data entry. While these processes cannot ensure absolute data accuracy, they will substantially improve the accuracy of data. Query tools will allow monitoring of required information – another method of ensuring valid and complete data entry.

The combination of new applications, strengthened edits, standard codes, and a robust data storage structure will allow the District to improve its reporting to both state and federal agencies. PEIMS data and other necessary information for reporting will be an integral part of data collection rather than reviewed and collected/corrected as an end-process.

Moving further into the future, careful evaluation of new trends, applications and tools will be done in an on-going effort to improve applications and their use. [Goal 6] Future changes could enable teachers to be free of their desk by using hand-held devices for entering attendance. Students may carry a single id card with their picture and a magnetic strip that allows cross-use for everything from library book checkout to

cafeteria payment to school event admissions. Parents will be able to access their students' information about attendance, homework, and grades through the Internet.

### **Central Data Repository**

One of the more important goals of Technology is to provide a secure central data structure that can support broad access to information. The District is in the process of purchasing and migrating to Oracle 8i, a powerful relational database structure with a tool set that will allow a secure environment while making fast data access a reality. When fully implemented, this database structure will be the standard for new applications. By implementing a District data dictionary, unnecessary duplication of data items can be avoided improving the overall validity of data.

### **Internet/Intranet Access**

Access to Internet and intranet capabilities provides AISD the ability to share forms and data without maintaining stockpiles of paper forms inventory, manuals, and files. Information Systems has begun to expand the District's web capabilities by first focusing on internal needs. Work has begun on making information available by laying a basic framework for departments. The organizational structure of the internal web site was developed in conjunction with a work group represented by various areas within the District. The internal web site will support publishing of department procedures, forms, contacts and other internal department level information – in general, a wealth of information that is not readily available to all District employees. Broad availability of this type information will allow employees to spend more time doing their work and less time trying to find out how to do it.

Movement toward Internet and intranet applications will support employee access to employee benefits and time reporting thus eliminating the paper-intense processes currently in place. Every classified position will no longer have to file a paper time report and campus/department time-keepers will not longer have to fill in carbon forms for off-site key entry. Time reporting will be a simplified on-line reporting mechanism with on-line approvals.

Once intranet development is complete, the web support group will begin improvements to the District's external web site. New applications will allow the District to migrate data to relational database structures, thus making Internet access to public information a more realistic possibility. Internet applications will allow secure parental access to their student information at any time. This parental access will free campuses or central office staff to focus more on the student and work with better informed parents. The potential for data mining will be limited only by legal constraints and the technical resource availability of those persons accessing the data.

### **Document Management**

Austin Independent School District has amassed literally rooms full of paper files stored in both filing cabinets and storage boxes across the District. These documents are kept either at the discretion of District staff or for specific legal requirements. Competition for office space continues to rise, making it imperative that the District review alternative

data presentation and storage options. Decisions to improve this aspect of the District involve document management at a District level as supported by Information Systems.

Document management is comprised of the policies and procedures that govern document retention and the mechanisms used to store those documents. Between campus files, central office files, and stored files, the District has amassed tons of paper much of which is not easily accessible. Over time, paper not stored under ideal conditions deteriorates compromising the District's ability to produce historical information. Movement toward electronic media will provide safe long-term storage to meet legal requirements. Careful selection of a document management product will provide a mechanism to organize electronically stored documents, support retrieval of those documents as necessary, and allow for archiving of documents as defined by AISD requirements. Current direction is to first define policies and procedures for document and data retention. Once new applications are installed and fully operational, Information systems will review products to identify a product that will meet the District's long-term needs to reduce paper, provide safe and secure storage to meet legal requirements, and provide access to both current and historical information.

# **Chapter 4**

## **Systems Architecture**

# Chapter 4

## SYSTEM ARCHITECTURE

### *I. Introduction*

The goal of the AISD architecture is to make information available to users at any time, in any place, on any device.

Since AISD is a large, rapidly growing enterprise, coordination of information resources across departments and campuses and providing seamless, transparent access to users provides some significant design challenges. Additionally, as technology is evolving quite rapidly and since there is no way to predict the products available three or four years from now, hardware, software, and network architectures must be designed according to commonly accepted standards. This chapter outlines our current architecture and the proposed evolution over the next few years.

### *II. Current Status*

**A. General:** AISD is nearly complete with the implementation of a \$30.5 million bond funded network infrastructure project. These improvements include:

- ▶ Six 10mbps Ethernet network connections per classroom
- ▶ One telephone per classroom (for a total of 10,000 handsets District-wide)
- ▶ Air-conditioned wiring closets for network connections
- ▶ Installation of eleven server farms
- ▶ Implementation of District- wide Lotus Notes email package
- ▶ PA/Intercom installation in each classroom
- ▶ Upgraded video capabilities
- ▶ ATM network electronics for fiber network connections

The architecture allows for six Ethernet drops to each classroom at a campus. Each campus is then linked via 100mbps Ethernet to an ATM based WAN. The 114 campuses and facilities in the District are subdivided into six ATM rings that are interconnected with a half mesh. Figure 1 shows a typical campus design. Figure 2 shows the WAN topology. Each High School hosts a server farm for campuses in close proximity.

**B. Classroom:** Every classroom in the District is wired with six 10mbps Ethernet drops. Five are used for computers and one is reserved for a printer. One of the computers is a multimedia teacher workstation with video-in and video-out capabilities. Additionally, each classroom has a telephone, a PA drop, and a coaxial video drop. The District has reached 50% of its stated goal of five computers per classroom. The District is at a 100% of its goal of one laser printer for each four classrooms.

The student and teacher computer architectures use either a variation of the Microsoft Windows or McIntosh operating systems. The video drop is connected to a 20 inch television which provides access to the cable vision network.

**C. Library:** The campus libraries use the SIRSI system for electronic checkout and inventory. They also have multiple drops used for circulation desk, online search and research.

**D. Lab:** There are multiple labs in the secondary schools. The elementary campuses are a mixture – some schools do not have labs.

**E. Campus:** Each campus has a LAN that interconnects the classroom drops with a router and a 100 mbps connection to the WAN. Additionally, every campus has a telephone switch and a PA system as well as a connection to the cable network.

**F. WAN:** AISD owns and operates the WAN. It uses the fiber provided by the Greater Austin Area Telecommunications Network (GAATN) of which AISD is one of seven partners. GAATN is comprised of approximately 300 miles of fiber optic cable across the city of Austin. GAATN carries voice, data, and video across a backbone network that interconnects all AISD campuses. The network electronics installed on this fiber backbone support the ATM network at OC3 (155 mbps) and OC12 (622 mbps). The WAN connects to the Internet through a T-3 connection provided by the University of Texas.

**G. Application Software:** The application software is determined by instructional or administrative need. District standard applications are published and updated periodically.

**H. Network storage:** Because we are in initial implementation of campus WAN servers, the ability to store information over the network has just begun. When fully implemented, these servers will allow staff, secondary students, and individual classrooms a discrete area to store, retrieve and share documents.

**I. Security:** The District security architecture is a tiered system providing many levels of protection from unauthorized access—from the user, through the desktop, to all aspects of the LAN and WAN. Users are the key to AISD technology security. The technology allows for virus control and data protection; however, users must be aware of security, and protect their individual user IDs. Additionally, filtering is implemented to eliminate access to inappropriate content on the Internet

**J. Disaster Recovery:** The District does have some contingency processes in place; for example, the wide-area backbone network is built to withstand fiber cuts, power loss, and most equipment failures. In addition, the District computer room and network operations center have battery and generator backup systems in place. The District has tape backup systems in place and stores archival tapes off-site. However, the District is not truly prepared to deal with a major disaster that would cause long-term

disruption of headquarters operations. Attention to contingency planning will be a top priority this year as the new enterprise applications are implemented.

### ***III. Future Direction***

**A. General:** As stated in the introduction, the goal of the technology deployment is to allow access to information at anytime, in any place, using any device. The current architecture will continue to evolve to provide the appropriate level of performance and capabilities. Technology continues to evolve rapidly and AISD uses a dynamic design concept anchored to key standards and precepts that will be reviewed and updated annually to meet this challenge.

- ▶ The architecture will evolve and use the current systems as much as possible.
- ▶ The architecture will provide ubiquitous access to information.
- ▶ It will be secure both in protection of data and in the protection of students.
- ▶ It will be sustainable and provide for high availability.
- ▶ It will provide a positive return on investment in terms of increased productivity and enhanced educational outcomes.
- ▶ It will support industry-accepted standards.

**B. Classroom:** The technology-enhanced classroom environment will continue to evolve. Notable improvements could include the addition of a presentation device (projector) and desktop network access for secondary students. By 2005, every secondary student will have some device similar to an electronic tablet that uses a wireless infrastructure to take notes, track and organize assignments and projects, and to access the Internet, electronic textbooks, applications, email. A student-to-computer-ratio of three-to-one will be maintained to support elementary goals. Multimedia capabilities will be the standard for all classrooms, and television will be accessed via the LAN instead of traditional dedicated coaxial cable. Presentations can be streamed on the network.

**C. Library:** All libraries will be automated fully and will have sufficient access devices to ensure students and staff can retrieve and utilize information resources on demand.

**D. LAB/media room:** The need for labs continues based on campus needs. To offer flexibility, mobile wireless labs may be available at elementary schools. Distance learning classrooms will be available at all high schools.

**E. Campus:** The secondary campus LANs will be augmented with wireless access. The access will allow for every student in every classroom to access the network.

**F. WAN:** The WAN will evolve with changing technology and grow in capacity to meet the increased needs. Remote access will be implemented for appropriate users using a variety of techniques including virtual private networks. Data will be available for parents to monitor student progress. Students will be able to access homework and reference material from outside the school environment. By 2005, much of the

equipment in the WAN and LAN infrastructure will be over eight years old and obsolete. This equipment will have to be refreshed.

**G. Application Software:** Application software continues to evolve based on the needs of users

**H. Network Storage:** Further implementation of network storage devices and other new storage technology will enable students and teachers to access their files from any computer. This will allow collaborative work to extend beyond the individual classroom or office to any area of the world. It will also allow for increased protection of data through redundancy and backups.

**I. Security:** A comprehensive plan will be developed for administering multiple levels of security that are required by new software systems. All levels of security will be addressed: security for desktops, applications, file servers, and the WAN. In addition, the current filtering capabilities will be refined based on community standards. Processes and procedures for security will be redeveloped, communicated and enforced. A single sign-on and password will make it easier for users to access multiple systems and appropriate data.

**J. Disaster Planning:** AISD will continue implementing new disaster recovery solutions, including multiple levels of redundancy for data and applications systems. Through the implementation of new network storage devices and new automated tape libraries, the District will have mirrored copies of its critical applications and data at multiple locations. This will allow critical systems to remain functional in the event of a large-scale disaster.

# **Chapter 5**

# **Systems Support**

# CHAPTER 5

## Systems Support

### *I. Introduction*

Efficient coordination of information systems resources across the departments and campuses of the Austin Independent School District (AISD) is a serious challenge. Issues related to reliable data, legacy systems, retention of qualified information systems staff, severe budget cuts, limited disaster planning, and conflicting or nonexistent practices complicate the task of managing AISD's information resources.

AISD is in the process of addressing many of these issues with the implementation of new business and student information systems. The new interactive, integrated information systems will support the technology demands for all types of users. The new systems allow for client use of information to support current business processes and gives clients the ability to analyze information collected for future decision-making requirements.

### *II. Current*

The rapid growth of technology at AISD has resulted in increased network complexity, an increased customer and equipment base, unacceptable response times to requests for assistance, inadequate training of users and technology support staff, and insufficient number of support staff

#### **Dissatisfied Customers**

The current staffing levels in Information Systems are not adequate to support the number of customer requests. In addition, high turnover of technical staff and low salaries have resulted in a technical work force that often lacks the skills to adequately support the customer request.

#### **Retention of Qualified Staff**

Once the new enterprise systems are implemented, the primary challenge facing AISD is providing quality technical support for these sophisticated systems. The users of this new technology will expect reliable, immediate access to information from work and home.

AISD has difficulty attracting and retaining qualified information systems resources employees. Often, as a result of competition from the private sector, the District hires less qualified personnel and then spends time and money to train them to the required level. Once trained, a large number of information resources employees leave the District for significant pay increase offered by the private sector. Frequently, the District must hire consultants or contract staff at two or more times the salary level of a District employee in order to gain access to specific skill sets.

The District has made a significant financial investment to implement the network infrastructure and the new enterprise finance, human resource, and student information systems. Support of this sophisticated new technology demands a level of technical expertise that is highly skilled. AISD must begin to fairly compensate existing employees that have these analytical skills, knowledge, and training.

### **Procurement of Technology**

Technology resources procurement is widely segmented with no centralized control. The majority of instructional resources are procured centrally and allocated to campuses but these resources are augmented by donation, grants, and other sources that are not documented centrally. Administrative resources, while generally procured centrally but funded by individual budget centers, are not documented for Information Resource Management.

### **Life Cycle Management**

A Life Cycle policy was implemented effective July 17, 2000 that limits repair of computer equipment that is more than four years old. However, reality is that, due to budgetary limitations, computers will not be replaced for another four to eight years based on the current goal of five computers per classroom and requirements that every teacher have access to a dedicated computer for email and SIS access. The computers that are older than four years are still providing valuable capability and cannot be left in an unusable status without impacting equitable access to technology for both students and staff.

### **Asset Management**

There is currently no policy or process in place for campuses, departments and individuals to assume responsibility for technology assets. Equipment is not tracked and is often stolen or vandalized with no procedure or process to fund the repair or replacement. In addition, each piece of donated equipment is not consistently inventoried or tracked. Such practices result in inefficient use of and sometimes duplication of resources.

### **Configuration and Change Management**

AISD is in the beginning stages of implementing a configuration and change management process. ]

### **Current Environment—Network Systems and Support**

The Department of Network Systems and Support (NSS) provides support to the District's 110 campuses and administrative locations for the District's wide area network communications, local area network/server systems, telephony communications, PA/intercom systems, help desk operations, desktop configuration and repair, network software, distance learning hardware, and the AISD Greater Austin Area Telecommunications Network (GAATN). Please reference Appendix VI for current Network Systems and Support staffing information. These employees are committed to providing the quality of technical support and resources for Austin's children,

administrators, instructors, and parents to access information at anytime, in any place, from any device.

Because of limited staffing resources, Network Systems and Support has implemented numerous remote management tools to assist in problem diagnosis and resolution. These tools greatly reduce staff time required to travel to 110 locations and allow 24 x 7 coverage of critical systems. However, even with these tools, Network Systems and Support does not have enough staff to meet the end-user expectation of timely response to reported problems.

### **Current Environment—Management Information Systems**

The Department of Management Information Systems (MIS) provides support for information storage and security, information retrieval, custom application maintenance, and package software that collects data for storage on the District's central data repositories. MIS staff provides daily support for the District's 110 campuses and administrative locations. Staff is challenged daily by the antiquated storage mechanisms and system designs that require programming support for access to data. As in other areas of technology, these staff strive to support the District goals and technology direction in providing the quality of technical support and resources for Austin's children, administrators, instructors, and parents to access information at anytime, in any place, from any device.

### ***III. Future Direction***

In 2001, AISD will complete implementation of new enterprise and student information systems. AISD will implement pilot projects to evaluate and select technology that allows for anytime, any place, from any device access to AISD information resources.

AISD will evaluate opportunities to augment existing technical staff with contract services. Technology opportunities will be evaluated to support the goal of anytime, any place, from any device access. AISD will seek to improve customer satisfaction, customer response time, and customer communication.

AISD will continue to evaluate grant opportunities and other funding sources to assist in technology implementation and improvement. In addition, the District will procure and deploy tools that allow for centralized and remote problem resolution and network management and web based tools and services that provide information to customers and allow customer self-sufficiency. AISD will support education/certification for technical staff and will implement customer training and processes to allow employees to attend training. Information Systems will develop student mentoring programs and will work with School to Career to provide the technology to support additional school-to-career programs. AISD will continue to evaluate strategies for purchasing and distributing classroom technology.

# Chapter 6

# Resources

# Chapter 6

## Resources

### *I. Introduction*

This vision has the potential to change dramatically the face of technology over the next five years and advance the quality of education for the students in this District. However, the objectives outlined will require an investment of resources—capital, personnel, and time. Creative and innovative approaches are needed to address the resource issue, especially during this period of significant budget constraints as a result of the Chapter 41 of Texas law. It is the intent that all the proposed objectives will provide a positive return on investment in some respect. A cost benefit analysis will be conducted prior to the budget process and an evaluation conducted at the conclusion of the project. Many of the objectives will provide resource savings due to efficiency, and some will provide a return on investment in the form of a higher quality education or other intangible benefit.

### *II. Current Status*

The District has been highly successful in attracting support—from the local community, from the business community, and from the various state and federal aid/grant programs. This support takes the form of volunteer labor, donated equipment, donated funds, and grant funds, all welcomed supplements to the AISD budget. The District has received hundreds of computers from local corporations, classes have been taught by local experts, campuses have been wired with the help of parents, businesses have repaired computers, and students have repaired and installed computers and networks. Some examples of other programs are:

**A. TIF**—AISD is the recipient of \$993,000 in Public School (PS8) Telecommunications Infrastructure Funds which have been applied to support the implementation of two-way audio and video distance learning sites at the following schools: Anderson High School, Austin High School, Bowie High School, Crockett High School, Johnston High School, LBJ High School, McCallum High School, Travis High School, Garza Independence High School, and Kealing Junior High. In addition, Austin ISD has applied for approximately \$500,000 in additional funds as part of the Public School (PS9) Telecommunications Infrastructure Funds grant program to fund distance learning sites at Lanier High School and Reagan High School and to establish wireless networking infrastructure at the following middle schools: Bedichek, Porter, Martin, Fulmore, Murchison, and Lamar.

**B. INSITE**—Inventing New Strategies for Integrating Technology in Teacher Education is a collaborative effort between the University of Texas College of Education and College of Sciences and the Austin Independent School District to model integrated,

technology-infused educational experiences for new high school and middle school teachers of mathematics and science. AISD math and science teachers and administrators will partner with and the University of Texas to provide support and implementation of the INSITE program and to create a cadre of potential classroom teachers who are savvy at using educational technology in math and science content areas.

**C. Intel Teach to the Future**--The goal of the Intel Teach to the Future Program is to train classroom teachers how to promote inquiry-based learning and effectively integrate the use of computers into their existing curriculum so that students will increase their learning and achievement. The training consists of forty hours of hands-on instruction to be delivered via ten curricular modules. Five Austin ISD teachers have completed "Master Teacher" certification, and another 60 have completed the 40-hour "Participant Teacher" program.

### ***III. Future***

We anticipate funding to remain relatively stable in the short term. Therefore, prioritization is key in determining resources available for the various projects. There are several recurring essential expenditures. These expenditures include telephone access and maintenance, cell phones, pagers, GAATN, and network connections. These costs are approximately \$2.5 million per year.

By 2003, AISD will have to address items with significant budget impact. These items include providing computer devices to secondary students and updating and refreshing obsolete infrastructure.

Along with retaining the maintenance and operations budget, AISD will continue to encourage partnerships with the community and pursue potential revenue sources in business and government. Additionally, savings will be sought through the redistribution of current assets, and improved processes will provide the necessary resources to accomplish much of the vision. The estimated costs for routine acquisition and maintenance of hardware and software are projected to remain at current levels: hardware--\$4 million, software--\$600,000. The source of funds will be state technology allotment and local funds.

There are, however, some substantial increases needed.

- ▶ One aspect of the vision is to provide every secondary student with a portable electronic device for anywhere, anytime, anyplace access to the local network infrastructure, instructional and productivity software, and the Internet. Such an initiative will be feasible when these devices are implemented at a cost point of approximately \$500 per device. In order to defray one-time costs, rollout of this initiative would be over successive years. These costs are above current levels of funding. Potential sources of funds: state technology allotment, state textbook fund, local funds, bonds, and grants (Telecommunications Infrastructure Fund, Technology in Education).

- ▶ Another aspect of the vision that precipitates increased funding is the refreshment of the existing infrastructure: The WAN and LAN infrastructure inevitably will need to be updated in order to maintain and improve levels of service. As a result, the District will need to purchase replacement routers, switches and servers. The cost of replacement and updating will be approximately \$6 million.
- ▶ Budget for personnel, time, and materials for staff development is expected to increase. Staff development in the use of network infrastructure, desktop computers, and relevant software for productivity and instructional purposes will continue to be a priority. Increases of approximately \$200,000 are expected as implementation of enterprise data systems training continues.
- ▶ Current levels of service require increased support personnel. In order to improve the ability to provide adequate service to users, at least 30 people need to be added at an approximate cost of \$35,000 each per year.

The District must not only examine its funding needs but also locate potential sources as well. Potential funding sources for achieving the technology vision include local funding, bonds and grants such as the Telecommunications Infrastructure Fund (TIF), Technology in Education (TIE) funds, the Universal Service Fund (e-Rate), Title I, and a variety of other sources.