2007-2012 Education Technology Master Plan

Kentucky Education Technology System (KETS)

December 2006

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EXECUTIVE SUMMARY

The Kentucky Department of Education (KDE) is a service agency of the Commonwealth of Kentucky. KDE provides resources and guidance to Kentucky's 174 school districts and more than 1,300 public schools. The department also serves as the state liaison for federal education requirements and funding opportunities.

Within KDE, the Office of Education Technology (OET) is responsible for planning and support of the educational computing needs of KDE and local school districts. The Education Technology program has as its goals:

- Equal access to technology for all teachers and students
- Empowerment of teachers and students to use technology
- Preparation of all Kentucky children to be productive and contributing members of a modern workforce

Strategy, direction and activities to achieve these goals are documented in the Education Technology Master Plan.

The 2007-2012 Education Technology Master Plan (hereafter referred to as the Master Plan) describes how technology will be used to improve teaching and learning for all of Kentucky's children. It builds upon past successes and defines a path that will enable all students to understand and leverage technology to realize their full potential. It extends instruction beyond traditional school walls and leads students to understand that every opportunity is available to them.

The priorities and initiatives contained in the Master Plan reflect an aggressive approach to enhance teaching and learning through the creative application of technology. These initiatives are possible only because of the commitment of substantial new funds to support education technology by the 2006 General Assembly. Initiatives such as the Kentucky Education Network (KEN), a high-speed education centric communications network to facilitate the development, deployment, and operation of the P-16 educational environment would not be possible without a large infusion of new operating and capital funding.

The initiatives and programs identified within the Master Plan support the Kentucky Board of Education goals:

- High student performance
- A strong and supportive environment in each school for every child
- High-quality teaching and administration

The Master Plan highlights the importance of enhancing instruction through the use of educational technology. It demonstrates the potential for instructional transformation using technology to address the diverse ways that students learn. It supports the multiplying effect of education technology to provide students the opportunity to realize their full potential. It empowers teachers to deliver differentiated instruction based on data driven decision-making.

The goal of the Master Plan is not to maintain the technological status quo but to enable all teachers and students to enhance their teaching and learning experiences in Kentucky's classrooms. This Master Plan will ensure that students leave the Kentucky's public school system prepared to be capable and successful participants in higher education, the military, and the workforce.

Relationship to Previous Master Plans

The fundamental concepts of equity, standards-based planning, unmet need and accountability, which were so vital to the original vision documented in the 1992 version of the Master Plan for Education Technology, remain. They are as important today as they were fourteen years ago. They are have withstood the test of time and remain as guiding principles and benchmarks for future decisions. We have incorporated, therefore, the concepts of the original Master Plan into this new Master Plan. They will continue to guide progress in 2007 and beyond.

This Master Plan does reflect a fundamental change from previous versions. It focuses on a long-term vision for educational initiatives at the state, district and school levels. More than past plans, the Master Plan design involved extensive stakeholder input. Focus groups included students, university admissions staff, district teachers, technology resource teachers, state agency leadership and members of the business community. Because of the process used, more than 2,000 people provided input for the Master Plan.

Appendix A contains a comprehensive list of planning participants and the process used to develop this Master Plan.

Priorities of the Master Plan

The Master Plan describes projects, initiatives and priorities that reflect common characteristics and recurring themes. The following areas are emphasized:

- Anytime, anywhere, always-on, differentiated teaching and learning
- Capacity building and enhancement of staff and resources
- Data-driven decision-making for teachers and administrators
- Efficiency and governance

More information about these topics is found in Chapter Three, *Major Areas of Emphasis*.

Supporting these areas of emphasis, ten specific initiatives are presented in Chapter Four, *Major Initiatives and Projects*:

- Ease and equity of access to instructional resources as well as collaboration and communication tools across all parts of the curriculum, from school or at home
- Intelligent classroom and differentiated collaboration tools, mapped to students' unique needs and learning styles, rich curriculum resources, supporting multiple modes of communication and collaboration – essentially, the classroom of tomorrow, today!
- Student performance measured by electronic formative and summative assessments
- Data systems that provide instructional assistance and allow informed decision making by teachers and administrators resulting in increased educational "business intelligence"

- Professional development for teachers and administrators
- Next generation high speed network for districts and schools
- Differentiated service delivery for districts and schools
- Project portfolio management that addresses alternative funding mechanisms and streamlined procurement practices
- Security including disaster recovery, authentication and identity management
- Long term education technology enterprise approach for districts and schools, covering governance, organizational structure, architecture, planning, communications and hardware and software consolidation

Implications at the Local Level

Most of the projects addressed in the Master Plan will require significant local activity and involvement to be successful. Resources are required to plan and implement initiatives at the local level. On-going costs for maintenance and operation must be addressed. Just as the Master Plan was created through school, district and state agency collaboration, detailed planning and resource requirements will be finalized collaboratively. By including specific initiatives and timelines in the Master Plan, districts and state agencies will be able to measure and demonstrate their progress.

Implementation

Consensus building and communication began at the inception of the planning process. Throughout the life of the Master Plan, KDE will continue to work with key stakeholders and P-12 schools to inform them of progress, identify and resolve issues, and build broad support for the program.

OET will collaborate with KDE staff, local schools and districts, and other stakeholders to develop an annual KETS Operating Plan. Specific activities will be prioritized each year, taking into account available funding and educational priorities.

From time to time throughout the life of the Master Plan, priorities, needs, or technologies may change. If the changes are significant, KDE will amend the Master Plan.

Where We Are Headed

Implementation of the projects and initiatives described in the Master Plan will deliver many benefits to teachers and students. These benefits will be incremental over time, collectively coming together to assist teachers and students to advance educational achievement.

The impact of the Master Plan will be demonstrated in developments and improvements such as:

Greater and more meaningful interaction between family, school and community
- Expand parental access to school, administration and teachers
- Remove time, place and distance barriers to teacher, student and parent communication
- Expand student access to instructional resources and tools outside the regular school hours and locations

Improved student learning and preparedness for higher education, the military and the workforce
- Increase thinking and problem-solving skills by analyzing information with technology tools

- Address differentiated learning styles through the delivery of video, voice and written content
- Develop communication skills through writing, verbal interactions and the exchange of information with students at other sites
- Access to rich instructional content
- Basic skills and concepts developed through simulations and computer-assisted instruction
- Instructional content available expand students research and information processing skills
- Student awareness of a multi-cultural world view enhanced through access and communication with students at other schools throughout the world
- Encourage respect of rights of others and ethical issues in using school technology assets

Increased teacher productivity
- Improved effectiveness and efficiency of instruction, curriculum development, school organization and operation
- Improved communication among teachers, parents, and students
- Computer-managed instructional delivery system
- Improved special education management
- Reduced teacher paperwork
- Encourage and support joint curriculum development and sharing
- Improved capacity to individualize instruction and to monitor assessment

Enhanced communications
- Immediate availability of memos, letters, bulletins, reports and documents
- Improved communications between buildings, school districts, libraries and KDE
- Enhanced calendaring and scheduling to assist coordination of personnel, building and district resources
- Facilitate the creation of "Electronic communities"

Strategic decision-making
- Improved accuracy and timeliness of information
- Reduced cost and improved accuracy from centralized data
- Data collection becomes a by-product of daily processing activities
- Required reports are automatically generated from the database
- Data retrieval is simple and available in multiple formats, providing flexible access
- Data is maintained and stored electronically and printed only when required
- Required data can be reported electronically to state- or federal-level entities

A robust infrastructure
- School buildings, educational centers, libraries and statewide education networks are interconnected
- Stationary or mobile access to instructional tools is provided where appropriate
- Access to video, voice and text instructional and administrative content is provided
- Standards and protocols are provided
- Current and timely information for decision-making is provided
- Information sharing is quick and easy

How Far We Have Come

As the result of following a comprehensive plan for education technology investment over the last 14 years, Kentucky has significantly improved the deployment of technology to its schools.

- Even though the state has one of the lowest home and business technology adoption rates in the country, Kentucky's public schools perform above average and higher in terms of teacher and student access and use of technology
- Through KETS, KDE has made significant strides in adopting forward-looking education technology management strategies that have resulted in millions in potential savings for Kentucky in the areas of business process efficiencies and technology maintenance and support
- Kentucky is uniquely positioned in its technology deployment strategy because KETS provides services not only to KDE, but also to school districts through a shared services model that provides statewide support for electronic mail, network infrastructure, Help Desk and statewide student information and financial management systems
- KETS operational efficiency is ranked higher than many other education technology organizations
- KETS provides access to instructional content and tools in classrooms and homes that might not be readily available to students and teachers
- KETS enables communications, collaboration and interactions that might not be readily available to students, teachers and administrators
- KETS connects differentiated student learning styles with teaching points made by the teacher through voice, video and text
- KETS allows students to produce products to complete classroom assignments
- KETS provides data and analysis to teachers and administrators for strategic decision-making and learning support

Budget

The Master Plan Budget outlines essential operational, support, and maintenance costs required to maintain KETS core network and day-to-day services over the next six years. The Budget also includes education initiative costs that foster higher levels of educational technology service delivery. The Budget provides guidance for local district technology planning.

Many of the budget line items remain very similar to those in previous versions of the Master Plan, but the costs associated with these items have been adjusted to reflect the anticipated costs for the future. More information about the Master Plan Budget is located in Appendix F.

Summary

KDE's vision for the Education Technology program is clear. Regardless of the size or location of school districts, access to information and technology is equitable. Information and communication services are provided at reduced cost, with no degradation of the quality of these services. Educational technology providers justify the technology selected, the projects undertaken, and the methods of evaluation for initiatives. This Master Plan is the blueprint to achieve KDE's vision.

Chapter One: *Current Education Technology Situation, Observations and Recommendations*

As a part of the planning effort, KDE assessed the education technology capabilities at all levels of the organization. This chapter summarizes the findings, focusing on an assessment of opportunities for improvement in technology processes and management practices, particularly in the areas of:

- technology management - governance, organization and structure
- technology application - in instruction and administration
- technology provisioning – service delivery tools and processes

Detailed information regarding independent observations about the current condition of Kentucky's K-12 education technology situation can be found in Appendix B.

Technology Solutions Framework

The following technology solutions framework is recommended to generate the shared view of how technology should be viewed, managed and deployed to support the needs of P-12 education. It maps the education model and provides a mechanism to relate educational technology initiatives and applications to KDE and district operations.

The framework includes three main components:

- **Education technology governance,** which includes decision rights, priority setting processes, technology decision-making and strategic alignment of education technology activities and education priorities. There are a variety of governance bodies that guide education technology activities. These bodies should be coordinated and linked in terms of priority setting and funding. The decision-making processes must be clear as to who is involved in which decisions. The severe funding constraints affect all service delivery, and tradeoffs are continually made that require technology providers to do more and more with less and less.

- **Education technology service delivery**, which includes service-level agreements, performance metrics, agreement on education technology management processes and ensuring that the enterprise technology direction is operationally aligned. Enterprise standards must be broad enough to meet the needs of a diverse organization, and include a standard process for allowing exceptions. There must be shared mechanisms for evaluating and adopting new and emerging technologies. In addition, there should be service level agreements to define agreed-upon performance standards between the education technology providers and their customers.

- **Education technology organizational structure**, which includes ensuring that the education technology organization structure can ensure that adequate technology management and leadership are provided. Technology management capabilities are emerging and must support the breadth of skills needed to successful management and delivery for district, agency, vendor or state technology providers. The instructional, administrative and technical aspects of technology services must have an overall leadership point for the organization,

and a leadership point is needed for effective collaboration with each educational program as well.

Coordination and Collaboration Needed

There are a number of technology service providers supporting Kentucky's P-12 educational system including:

- KDE's Office of Educational Technology (OET)

- School and district level education technology providers

- Education technology vendors

- KDE program areas that use technology to address program execution, management and reporting requirements

The large number of participants makes it imperative that there must be a common approach and understanding of how the individual components fit together and support the strategic direction of the P-12 educational environment. The lack of a unified approach among service providers opens the door for multiple and potentially conflicting agendas that dilute the effectiveness of invested resources.

Coordination and deliberate use of methods to lower tension among service providers leads to situations where:

- The ultimate goals are shared, so the buy-in needed for successful implementation will occur

- Conflicting messages and requests are reduced

- Redundant effort and rework are reduced, ultimately leading to lower costs and shorter implementation times

Recommendation: Primary education technology providers in KDE and the districts should be formally included in education technology decision-making, especially when the issue is around the core technology infrastructure or other key strategic education technology decisions.

Collaborative Governance

Successful P-12 strategic education initiatives require effective coordination and collaboration between KDE, the state technology providers, and district technology providers**.** Effective representation of stakeholders in key education technology decisions reduces fragmented, sub-optimal education technology funding decisions and project execution.

When there are multiple education technology providers, strong governance must be in place to avoid a silo approach that limits the participation of affected educational technology providers and stakeholders in decision-making. Widespread communication about education technology initiatives must occur early in the process and offer a chance for "real" input. Implemented solutions, created in a silo, limit the benefits to the enterprise and may not take into account the needs of all users. In addition, lack of effective standardization on key initiatives may lead to redundant solutions.

The question of standards also presents a balancing requirement for the organization -- how to balance the drive for economies of scale with the diverse needs of the

organization. This is especially the case when assistive technologies are being deployed to meet the needs of special populations.

KDE has identified a number of strategic education initiatives requiring education technology capabilities that will only be successful if coordination and collaboration are addressed, along with the fundamental technology capabilities.

KDE Strategic Business Initiatives

Project Name	Owner	Description
Online Summative Assessment	Office of Assessment and Accountability	Vehicle for automated summative (high stakes) testing
Online Assessment (without summative)	Office of Assessment and Accountability	Vehicle for automated testing (annual, periodic and ad hoc) covering the assessment life cycle
Kentucky Instructional Data System (KIDS)	Office of Teaching and Learning	Provides educators with detailed student data for instructional analysis
Consolidated Program Monitoring	Office of Special Instructional Services	Provides means to assess program compliance for federal and state funding programs in a coordinated manner
School and Student Management Systems	Office of District Support Services	Administrative student information
Identity Management	Office of Educational Technology	Implementing identity management strategy and solution
Security Backup System	Office of Educational Technology	Implementing security and backup methodology for the organization
Security/ISA 2006 (SB 230)	Office of Educational Technology	Implement software security solution for districts
Videoconferencing for Deaf Students	Office of Special Instructional Services	Provide videoconferencing capabilities for the Kentucky School for the Deaf and other hearing-disabled customers, per ADA compliance
P-16 Virtual Learning Environment	Office of Teaching and Learning	Course administration, content management and scheduling solutions for the virtual learning environment
Reading First/Read to Achieve	Office of Teaching and Learning	Provide data access and analysis of reading assessment data, which consolidates efforts from separate existing databases
Kentucky Education Network (KEN) WAN/Broadband Network	Office of Educational Technology	Upgraded and expandable network capabilities for wide-area network
Knowledge Management Portal	Office of Teaching and Learning	Portal for instructional resources for teachers
School Facilities Inventory	Office of District Support Services	Management system for school facilities information
Hardware/Services Consolidation	Office of Educational Technology	Develop hardware consolidation strategy and implementation for hardware and service consolidation

Old Equipment and Narrow Bandwidth
In a survey that generated nearly 2,000 responses from teachers, students, parents and guardians, respondents identified the state of the technology infrastructure as a significant factor affecting their use of technology for instructional and learning efforts. The online survey, conducted by the Student Technology Leadership Program, asked respondents to describe their use of technology in 12 categories available in their school districts. (In the case of parents and guardians, they were asked about their children's use of technology.) The profile of the respondents is shown in the following figure.

Profile of Respondents

12%

36%

52%

■ Teachers   □ Students   ■ Parents
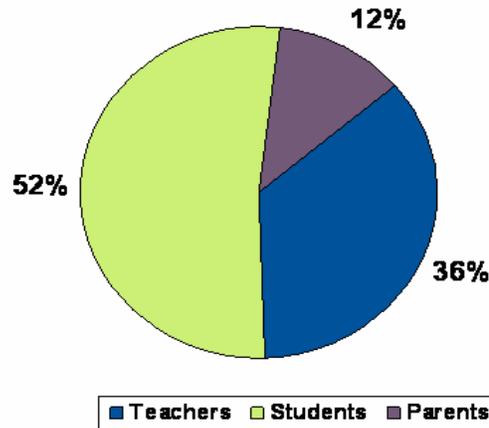
1,997 Total Survey
Respondents

E-mail, productivity tools (word processing, spreadsheets, databases, presentation tools) and the Internet for general or subject-specific research were the most frequently used technology tools cited by teachers and students.

Overall, all groups' felt the technologies are fairly well supported. However, when responding to questions about opportunities for improvement, more insight was generated. Comments from respondents included:

- "No improvements can be made until the bandwidth for our campus is made better. Obviously, more equipment from laptops to projectors for teachers and students would serve to better our situation. However, without teacher training for any/all of these technologies, they will be a waste of money."

- "I find some pretty neat Web sites that I can't use at the school because of the tight restrictions."

- "The Internet runs very slowly and downloads of materials for the classroom are impossible to do any time during the teaching workday."

Address Technology Gaps
The review of the current education technology situation revealed gaps in core areas related to the technology solutions and management framework that must be addressed. Reducing these gaps will leverage the strategic educational initiatives for enterprise-wide benefits, optimize the costs of implementing the solutions by offering the opportunity for re-use, and eliminate redundant and potentially conflicting efforts. These core areas include:

- application data standards

- solutions delivery methodology and capability

- application portfolio management

- education application support and training

- portal strategy and management

- data warehouse and business intelligence

- instructional and assessment applications

- document and content management

- shared enterprise, local and agency applications

- shared utilities, hardware, network and computing infrastructure management

Equitable Service Delivery

The service delivery model used by education technology providers should equitable. A lack of funding for infrastructure support and upgrade has forced most districts to spend less on direct costs, such as those for desktops, and spend more on indirect and support activities.

Older, obsolete hardware and lower speed networks require more support. Teachers, students and administrators suffer significant productivity losses because of the older, slower equipment. For some districts, technical support staff, and in many cases Technology Resource Teachers (TRT) and Technology Integration Specialists (TIS), spend a higher portion of their time dealing with break/fix issues resulting from outdated hardware and software. Broken or inefficient hardware severely affects the operational efficiency of teachers, students and administrators. As a result, many districts prefer to invest in updating the existing infrastructure, rather than taking on a large number of new initiatives that would not be supported adequately by the current infrastructures.

Schools and Districts are not Alike

There are distinctions in the types and levels of service needed by individual schools and districts based on financial independence, leadership support, and understanding of technology, among other variables.

- The **Type X** district has an established vision at the local level for its use of technology and typically has access to funds and resources to move independently toward that vision. The district has a structured and successful TIS/TRT program. District leadership is oriented to using technology effectively for administrative and instructional processes.

- The **Type Y** district relies somewhat on the state technology providers for its vision, but may have a vision at the local level that reflects conditions and strategic direction. The district may not have the funding to implement the technology it envisions. The district often has a structured and successful TIS/TRT program.

- The **Type Z** district relies heavily on state technology providers for its vision of technology. The district may be severely financially constrained and may not have significant local education technology resources. The district has an unstructured or nonexistent TRT program.

With those categorizations, KDE found that service delivery requirements differed, as shown in the following figure.

Service Delivery Requirements by District Type

	Type X	Type Y	Type Z
Funded and Unfunded State Shared Services	less	about	less
Operating Performance Expectations of State Shared Services	less	about	about
Network Bandwidth Capacity	less	about	about
Currency of Technology Infrastructure	less	more	about
Anytime/Anywhere District Technology Delivery	less	more	about
Data Warehousing	less	less	less
Reporting and Information Analysis	more	about	about
District Technology break/fix Support	more	less	less
District Technology Leadership Activities	about	about	less
State Decision-Making Process	less	more	about
Communication Between the State Technology Providers and the Districts	less	less	about
District Level of Autonomy	less	about	about

Legend
- Type and level of service is more than what is needed (more)
- Type and level of service is about what is needed (about)
- Type and level of service is less than what is needed (less)

Reflecting the varying levels of expertise and need at the local level, the Master Plan recommends the adoption of a differentiated model for the delivery of service. See Chapter Four, *Major Initiatives and Projects*, for more details.

Chapter Two: *Recommendations and Implementation Roadmap*

Several themes run throughout the Master Plan – enhance the maturity of the education technology function, integrate technology into instruction, and strengthen infrastructure and operations management. In establishing the roadmap over a six-year timeframe, this plan addresses those themes with specific recommendations and initiatives.

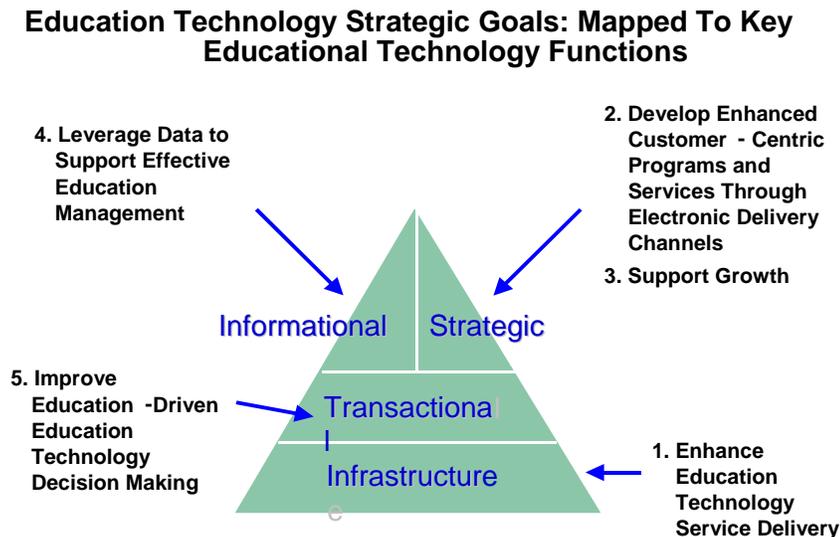## *Enhance the Maturity of Education Technology*

As schools, districts, and KDE acquire and deploy educational technologies, they must develop additional capabilities to manage their environments. Failure to do so may result in loss of credibility in the eyes of their customers. Today, managing the technology environment is more complex than ever due to a variety of factors.

- The breadth of technology solutions deployed in the organizations – voice, video, office productivity applications, administrative applications, specialized applications and educational mission-specific applications -- requires ongoing and frequent maintenance and updates to meet changing business needs.

- The number of individuals using computers as part of their jobs has expanded from traditional administrative roles of accounting, finance and human resource management to include teachers, students, other administrative staff, facilities and security, and school nutrition staff. Individual customers require training, support and ongoing care to ensure their effective use of technology. In addition, each customer is a potential source of innovation, identifying new opportunities for the organization to use technology.

- Ongoing maintenance, upgrade and support for the technology and infrastructure components require specialized skills. Those components include networking and communications technologies; workstations and printers; assistive technologies for special-needs populations; classroom instructional tools; and security and other protective solutions.

- There is a continuing need to integrate solutions and information in ways that were not envisioned when they were originally implemented and to manipulate information that has been captured over time.

- Typically, the total value of dollars invested in education technology is low when compared to private sector organizations. However, the pattern of under-funding P-12 education technology still results in large funding requirements that are difficult to accommodate in public sector budgets. In its last plan, KDE estimated a need for $122 million for core education technology support.

Because of these factors (and others not mentioned here), managing the education technology environment requires more sophistication and tools than ever needed before.

Integrate Technology into Instruction

Research has shown that the greatest return on investment in education technology occurs when organizations align their investments with the strategy and mission of the organization. Historically, education technology investments are one of three types, each leading to an increasing level of value, as shown in the following figure:

Education Technology Strategic Goals: Mapped To Key Educational Technology Functions

4. Leverage Data to Support Effective Education Management

2. Develop Enhanced Customer - Centric Programs and Services Through Electronic Delivery Channels

3. Support Growth

Informational   Strategic

5. Improve Education -Driven Education Technology Decision Making

Transactional

Infrastructure

1. Enhance Education Technology Service Delivery

Value of Education Technology Investments

- *Infrastructure* investments focus on the technology components needed to enable effective use of technology throughout the organization. For example, they include applications such as e-mail, communications and networking, workstations, printers, and servers.

- *Transactional* investments provide applications that automate administrative business processes, such as financial management, human resources, and student administration. They typically improve productivity, carrying out the work of the business more efficiently and effectively.

- *Transformational* investments directly support and enhance activities critical to the delivery of instruction. They offer opportunities to collaborate in new ways and foster innovation in instruction. Transformational investments may provide information not previously available (such as the ability to access, report, manipulate and trend data) or support other strategic capabilities.

While investments in infrastructure are clearly needed to enable strategic activities, it is usually difficult to demonstrate a link between "pure" infrastructure investments and mission-oriented, transformative investments.

In many organizations, the technology evolves so that the infrastructure provides the foundation, transactional education technology solutions are deployed, and as organizations become accustomed to the capabilities provided, they identify needs for new information and strategic solutions that help them achieve the mission of the organization more easily. As new capabilities are deployed and mature, they become part of the infrastructure being managed.

The Master Plan has a dual focus, addressing both replenishment of an eroding infrastructure and introduction of new, mission-oriented solutions. This is evidenced by initiatives that address high-speed network capacity, updated instructional devices, online assessment, Internet 2, strategic data systems, instructional aids and professional development.

Strengthen Infrastructure and Operations Management

Educators increasingly depend on technology-based products and services to deliver effective instruction to students. Meanwhile, the organization must drive down costs, including those associated with education technology. In this context, the education technology organization's infrastructure and operations management has an extremely important mission:

- To keep the technology up and running to ensure business processes operate efficiently

- To innovate and improve business processes and employee productivity

- To drive down the cost of education technology infrastructure and the operation of education technology

If an education technology organization achieves operational and infrastructure management excellence, the implication is that it is doing each of these tasks well — yet most organizations cannot consistently achieve this goal. Performing these tasks requires working well, changing the organizational culture, defining processes and cross-process integration, engaging stakeholders across organizational boundaries, and continuously striving for improvement.

Within P-12 education, infrastructure and operations management occurs at various levels. Each district has responsibility for managing the local infrastructure. OET has responsibility for managing the enterprise infrastructure and the infrastructure for some of the office-level computing. To the extent that individual offices are managing their own infrastructure, the office level is another area of infrastructure and operations management.

Chapter Three: *Major Areas of Emphasis*

The Master Plan brings forth projects and initiatives that reflect common characteristics. Constituents such as teachers, students, district leaders, and the business community identified the need for the following major areas of emphasis:
- Anytime, Anywhere, Always-On, Differentiated Teaching and Learning
- Capacity Building and Enhancement of Staff and Resources
- Data-Driven Decision-Making for Teachers and Administrators
- Efficiency and Governance

Anytime, Anywhere, Always-On, Differentiated Teaching and Learning

One of the most significant advances in education during the past few years has been the concept of anytime, anywhere, always-on learning. This concept is revolutionary, fundamentally changing the way students, teachers, parents and administrators interact with the state's educational program.

The main premise of anytime, anywhere, always-on learning is that learning is not confined to the classroom and can continue regardless of the time of day, the physical location of the students, teachers, staff or the subject matter being studied. This flexibility creates a "child-centered" learning experience. Students can access course material and independent research or take distance-learning courses if a particular subject is not available at their local school. Teachers can access grading and attendance systems outside of the classroom and prepare lessons remotely. Parents can view their children's homework, schedules and grades using the Internet. All parties can communicate effortlessly using education technology such as e-mail.

It is this concept that fundamentally changes the education experience by aligning it to that of highly productive organizations such as business or the military. In short, anytime, anywhere, always-on learning allows educators to be extremely productive and effective in helping students reach their true potential.

However, the concept requires a solid educational technology platform. In order for the students, teachers, parents and administrators to participate fully, they must have access to the proper educational technology tools. The educational technology infrastructure within Kentucky must be robust and contain certain educational technology components.

Instructional Device or Workstation
The most visible component of the education technology program is a student instructional device or workstation. It can be a desktop computer, a laptop computer or some type of mobile learning device.   Given the economic realities of funds available for the KETS program, this Master Plan continues the goal of at least a workstation to student ratio of 6:1 and a 1:1 workstation to teacher ratio.

Districts are encouraged to pursue lower workstation to student ratios. Lower ratios provide ease of access to all parts of the curriculum in the classroom and at home. The ideal standard includes one workstation for every secondary student and one workstation for every three elementary students. However, this is a very challenging target, given the costs of purchasing, sustaining, and maintaining such a large number of workstations. Most districts choosing to pursue this goal will utilize different strategies

and approaches. Some districts may choose to include personally-owned devices as an option to lower the workstation to student or teacher ratio. This becomes more attractive and feasible as the devices get smaller, more powerful and less expensive.

Mobile Workstations and Wireless Connectivity
In addition to the ideal of a 1:1 student to workstation ratio, Kentucky's goal is to have mobile workstations connected wirelessly to the Internet with high-speed connections. A wireless foundation will allow students to utilize their laptops to continue their studies, free of the constraints of time and place. Students would have continuous access to not only their documents and course materials, but could easily transport that material back and forth from the classroom to their homes. It is expected that mobile learning devices that use electronic text will eventually replace textbooks, placing even more importance on a wireless environment.

Equity
The movement toward a 1:1 workstation ratio combined with the proliferation of wireless connectivity goes a long way toward supporting the concept of anytime, anywhere, always-on learning. However, as educational technology changes the way that students learn, we must ensure that the same educational technology does not bring disadvantages to certain student populations. Parity must be a high priority consideration. If certain students are able to access course material from home today using a family computer while others cannot, parity no longer exists. The existence of a modern technology instructional device with Internet access in the home and in the general community is scarce in Kentucky. Computer and Internet access within public schools must figure prominently in the state's attempt to protect its young people from being held back because of the "digital divide."   In fact, it is becoming generally accepted that access to information technology directly supports economic success.

While parity has always been difficult to attain, it was more easily addressed in an environment where all students use textbooks. All students can be given books that they access all of the time. While parity should not be used as an excuse to stop investing in educational technology, those investments should be distributed in such a way that will assist those who are less fortunate. One idea has been to create a content delivery fund, which would eventually cover the purchase of laptops for all students rather than funding the textbooks themselves. The text would then be electronically delivered to the devices at a far lower cost than printing new textbooks. This is an effective way to address some of the current challenges we face while trying to achieve a 1:1 workstation to student ratio.

Innovative Devices
The marketplace is full of wireless products, such as cell phones, iPods and other innovative devices. Students, in particular, have embraced these products. Some students have shown an interest in using iPods, for example, to access lectures and other course materials. The educational leadership within Kentucky believes that these tools can become valuable for students in a monitored environment. Personal devices are a classroom management issue, and KDE recognizes that these devices are on the educational horizon.

Intelligent Classroom Design
Schools that pursue "intelligent classroom" design with electronic whiteboards and projectors, laptop devices, wireless access and a low workstation to student ratio shall consider the following from a facilities perspective:

(1) Even in a wireless environment, there may still be a need for wire in the classroom. For example, projectors, electronic whiteboards, classroom printers, and telephones are traditionally connected via wire.   A wire usually connects the wireless access hubs to the local area network.

(2) It is very possible that schools will need to significantly increase their power capacity to handle the new technology. New schools should assume that their school will move to this environment during the life of the school.

(3) The number of wireless access points required for student workstations will depend on the school architecture. Some schools may need as many as one access point per classroom.

(4) The physical space required for classrooms and other instructional areas will be determined by whether the school implements a laptop or mobile device approach and how aggressively the school pursues a lower workstation to student ratio.

(5) Strong consideration should be given to using servers to cache and distribute video to classrooms for more efficient use of network resources. Fully implementing an Encyclomedia type of technology adds the benefits of indexing and ease of access by students and teachers.

(6) An expected steep growth in the use of wireless personal communication devices over the next decade will probably require a policy change that allows these devices to be used in school. Teachers and students may begin to use these devices for educational activities as well as for voice communications. Voice communications over the network (a.k.a., Voice over IP) is also expected to have a great impact on district communications.

(7) An electronic whiteboard/projector can substitute for a TV in the classroom.

(8) Schools and teachers will want to consider including handheld voting devices as part of their electronic whiteboard and projector purchases.

(9) An improvement in the maturity of voice recognition software will lead schools to examine classroom layout and design for improved sound management. It will become more common for students to interact with their instructional device using voice commands rather than typing.

(10) Internet 2 and desktop conferencing will cause classrooms to move toward more advanced sound systems. The quality of their educational experiences will be enhanced with capabilities beyond that of a speakerphone.

Capacity Building: Enhancement of Staff and Resources

Maintenance and Support
Beginning in 1992, when previous versions of the Master Plan focused on increasing the number of workstations and building the technology infrastructure, students benefited greatly. Program funding was largely devoted to the initial purchase of technology components, the hardware and systems were new, and the ongoing maintenance costs were relatively low. However, over the past few years, funding for education technology

has decreased, the infrastructure has aged significantly, and costs for maintenance and upkeep have increased.

The usefulness of the educational technology infrastructure decreases when it is not kept up-to-date. When funding decreases, schools choose to continue using out-dated equipment, following a "something is better than nothing" approach. Inventories indicate the numbers of workstations remains high, but the figures are misleading. Old workstations are often incapable of running modern applications or providing students with acceptable access to current instructional resources.   What is truly important is that the students have access to modern and useable educational technology.

When making significant new investments in technology, total cost of ownership including support, maintenance and replacement costs must be considered in addition to initial purchase costs. For example, the total cost to purchase a workstation must include the cost of the workstation; the cost to license the software it runs; the cost for the technicians who are on stand-by to fix problems; and the expected cost of replacing the workstation in five years when it is obsolete. Schools and districts will only derive the full benefit of the workstations when these costs are planned for and managed.

The People
Skilled and talented technical staff are required to operate, maintain and plan for technology in schools. In many Kentucky communities, schools have the most advanced and sophisticated technology in the area. The success of new and existing education initiatives will require adequate numbers of properly trained people to operate and maintain them long after they are implemented. Multiple in-house or outsourced technicians are required to sustain state and district-level hardware and services for schools.

School-based support includes installation and configuration of workstations and applications; operation, repair and maintenance of workstations and servers; and troubleshooting and security. These tasks are only a few of the ones that local support staff focuses on every day. Their dedication and work ethic enables teachers and students to access the educational technology that is an essential component of their education.

Customer Relationship and Resource Management (CRM)

Technical Resource Teachers (TRT) and Technology Integration Specialists (TIS)
The TRT and TIS works with teachers, administrators, staff and students to enhance instruction through the use of technology in the classroom. The TRT and TIS trains teachers to use technology and electronic software effectively, through in-class instruction and hands-on exercises. Their understanding of the curriculum allows them to collaborate effectively with teachers and support them in their educational goals of student proficiency.

The TRT and TIS also is capable of assisting with concepts such as classroom management of educational technology, participation in the selection of educational software and assisting students with technology-related activities or projects.
There is an important distinction between technical support staff and TRTs (Technology Resource Teachers) or the TIS (Technology Integration Specialist). Technical support staff possess technical skills and certifications but are not necessarily familiar with curriculum or instruction. TRTs and TIS staff provide leadership and vision in the use of technology to support the learning and education process.

The recommended number of staff to support and operate various technology components must be determined on a district-by- district basis. Detailed formulas and planning guidelines to estimate the number of staff and budgetary allocations to support educational technology are included in Appendix C.

The one-one-one and small group nature of the TRT and TIS program makes it a core component of a quality professional development program. However, it must be augmented due to the high cost. It is just too expensive to use at the exclusion of other PD experiences.

KETS Engineers
KETS Engineers are the field-based technology leaders of the Office of Education Technology. They serve as the primary point of contact for customer relationship and resource management for all school districts as well as KDE. They support the instructional, administrative and planning efforts of school districts through direct, face-to-face work with district leadership and district technical staff. Based on experience during the first 14 years of KETS, they provide invaluable benefits and their current mission and numbers should be maintained.

Office of Education Technology (OET)
Providing educational technology across an entire state is a complex undertaking. It requires leadership and a long-term vision that considers both improved teaching and learning through the appropriate use of technology, the efficient and cost-effective use of shared services and improved statewide educational technology equity.

The provision of shared services is based on the proven concept that combining need and leveraging that need will reduce costs and provide improved service levels. In addition to these benefits, the central delivery of these services reduces administrative costs over time. For instance, the total cost to the education technology program for the Help Desk would be about 10 to 15 times more if each district contracted for those services independently. In fact, some districts, because of their geographical locations, would simply not be able to find a responsive vendor, and the schools would lose the service entirely. The same can be said for engineering and instructional consulting services that are provided on a regional basis to the districts from the state level and for related services that may be provided from the district to the schools.

OET brings its resources together with school and district educational technology providers to complement their hard work and determination with OET's educational technology vision.

Student Technology Leadership Program (STLP)
The mission of STLP is to advance individual student capabilities, to motivate participating students to learn, and to create leadership opportunities using technology. STLP provides students with marketable technology skills and experiences. It prepares them for the workforce as they address their schools' technology support needs and empowers students to use technology to learn and achieve.

Schools may choose to use STLP for some of their technology support, but a large amount of adult operations and maintenance talent is required to lead these services for the schools and districts.

Data-Driven Decision-Making for Teachers and Administrators

In the Master Plan, recognizing data as a strategic educational asset remains a top priority. As demonstrated in previous plans, KDE initially recognized this fact early in the life of the KETS program. The 1992 Master Plan called for a decision support system to assist the management and evaluation of the public education system in Kentucky. The Statewide Reporting and Information Management (SRIM) System, with an enterprise data model depicting the data collected and shared within the public education system, was constructed. The 2001 Master Plan established a vision for an enterprise database that came to be known as Max.

Today, the demand for access to data to improve decision-making and instruction at the federal, state and local levels continues. The principles of data management in the P-12 educational environment, originally introduced in previous versions of the Master Plan, remain pertinent and applicable today.

For emphasis and reiteration, these principles are intentionally repeated:

- Data is a strategic enterprise asset and will be managed as such.
- Enterprise-wide processes will be developed to move data collection and validation to the source and reduce duplication and redundancy.
- Data will be moved and made available electronically.
- Stewardship and ownership of the various data will be explicitly identified.
- Data owners will establish procedures and processes that articulate the circumstances under which data will be collected, validated or purged.
- Common data definitions will be established as standards.
- KDE will differentiate data from "records" in the context of public records management. The department will review and update its procedures for managing public records in electronic format.
- Data reporting to support compliance and assurance with state and federal program requirements will be consolidated.
- Security and authentication policies will be associated with each aspect of the enterprise data model.
- Privacy will be protected.
- Policy-worthy information will be available for decision support.
- The decision support needs of the Kentucky Board of Education and others will continue to be analyzed. Priority will be placed on supporting the information requirements of the board within the context of current board priorities.
- Standards will be defined for data collection and end-user reporting tools.
- Data from disparate systems will be combined in a common repository or data warehouse.
- Those who provide data to the enterprise data management system will be able to use the data management system for their decision support needs.

KDE will continue the collection and reporting of student and school management information from the schools. The role of standards including the School Interoperability Framework (SIF) and SIF Zone Integration Services (ZIS) at the vendor provider, school, district office, state and federal levels will be investigated.

While the concept of a centralized data repository is essential to the enterprise data management system, it should be clear that the intention is not to collect all data into a single repository. Only the data that is essential will be held in the repository.

Efficiency and Governance

The Master Plan addresses the recommendations of stakeholders including teachers, principals, students, parents, business leaders and policymakers in the areas of efficiency and governance.

- As discussed in previous sections of this document, teachers, students and administrators are hampered in their use of educational technology by older equipment and narrow bandwidth.

- Schools and districts want to participate in key educational technology decisions. This participation will lead to optimal educational technology funding decisions and execution. KDE will utilize a collaborative and participatory style of governance.

- With the size and number of new initiatives, a necessity for success will be coordination and collaboration between KDE program offices, school, district, state, and vendors.

- Educational technology service delivery must equitably address districts' varied service expectations and the lack of adequate funding.

- P-12 education has multiple educational technology providers that define, support and implement educational technology initiatives. While they provide many valuable benefits, these groups should focus on developing a coordinated and collaborative approach.

- School, district and state technology providers must provide a unified approach in the management and delivery of educational technology capabilities.

The initiatives that have been included in this Master Plan address, in part, the following summary-level recommendations.

- Review and revise the process to ensure effective representation in technology decision-making. Provide schools and districts with the opportunity to offer their input and to voice their needs conveniently and consistently.

- Create a unified "voice of education technology" that enables the multiple educational technology providers across schools, districts and state agencies to better serve the students, teachers and educational staff throughout the state.

- Establish a process to coordinate and collaborate on statewide core technology areas to enable strategic education business initiatives. These areas include statewide enterprise applications, workstations, high-speed Internet connectivity, learning and teaching programs, security, policies and change management.

- Adopt and deploy a differentiated service delivery model by providing a core set of services tailored to groups of districts with similar characteristics. This will ensure that the educational technology services more closely align with district expectations.

- Leverage all available funding options to upgrade obsolete educational technology and communications infrastructure

# Chapter Four: *Major Initiatives and Projects*

Technology Solutions and Management Framework

The Master Plan is organized around a framework for viewing, managing and deploying technology that aligns the scope of technology activities with the education model. The strategic value and importance of an investment in technology is highlighted and value is demonstrated. The framework demonstrates an enterprise view of education technology.

As mentioned previously, this framework provides both a management and a technology view for P-12 education in Kentucky.

- The **Portal** includes the technology access platforms that enable universal, equitable access to educational resources by all stakeholders.

- **Enterprise Functions** provide applications to support instruction and operations at the statewide enterprise, state agency or district level.

- **Infrastructure and Shared Services** relate to the shared applications and technology requirements used by all, including e-mail, hardware, software and communications.

Technology in K-12 Education and Administration
Alignment of Strategic Initiatives
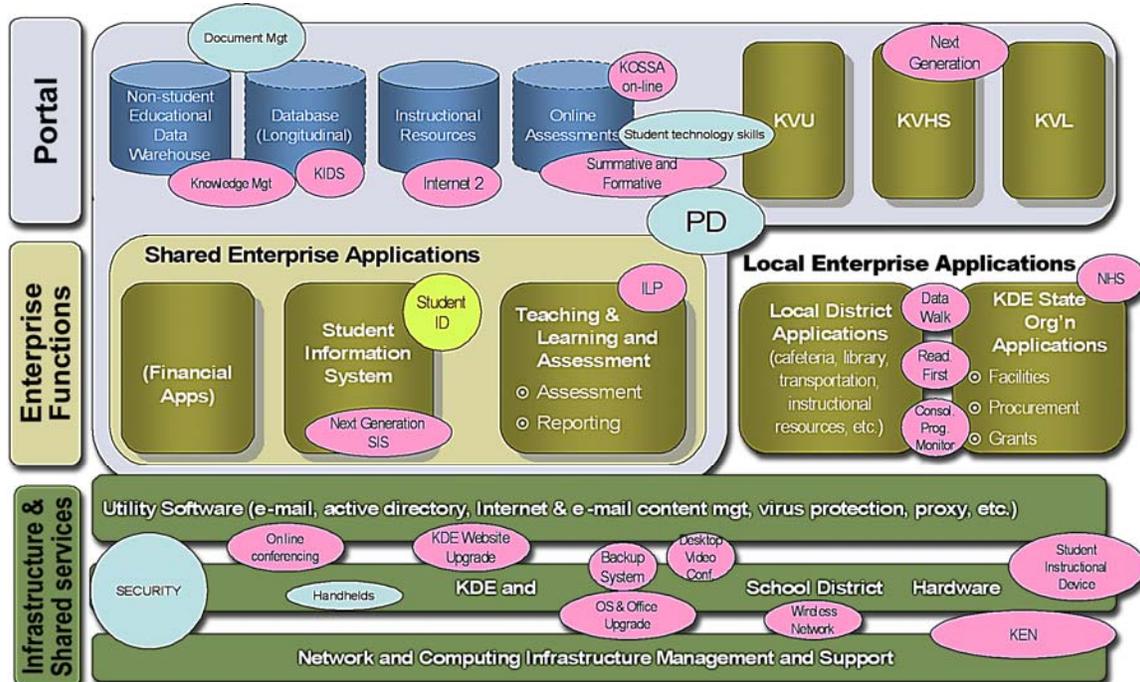
Educational initiatives scheduled to be implemented over the next six years

The following initiatives are best practice and mandatory. They are recommended and required for effective and efficient operation of the KETS system and will receive emphasis and priority throughout the life of this Master Plan. Implementation of these initiatives is not optional, but the timelines associated with implementation will vary according to initiative and local school and district approach. Presented here are high-level descriptions of each initiative. As these projects are fully implemented, other priority initiatives may be added during the annual KETS Spending Plan approval process. Appendix D describes each project in more detail.

	2007	2008	2009	2010	2011	2012	And Beyond
Ease and Equity of Access	Instructional Student Device						
Intelligent Classroom	Internet 2						
	Next Generation Virtual Learning Environment						
	E-mail and Content Management						
Student Performance	Math Achievement			Large Scale Summative Testing			
Professional Development	Continuing Professional Development for KDE and District Staff						
Data Systems	Document and Content Management						
	Next Generation Student Information System						
	Individual Learning Plan (ILP)						
	Kentucky Instructional Data Systems (KIDS)						
			Knowledge Management Portal				
	Reading First / Reading to Achieve						
Instructional Infrastructure	Kentucky Educational Network (KEN)						
	Grid Computing						
Security	ISA 2006						
	Backup System						
		Identity Management					
	Authentication and Authorization						

Instructional Devices for Students and Teachers

Students and teachers will be provided modern instructional devices to support their use of educational tools such as advanced virtual learning courses, Internet 2 instructional opportunities, and on-line formative and summative assessment. These workstations will allow teachers to provide their students dynamic and engaging learning experiences that prepare them to be productive members of a modern workforce.

$50M was appropriated by the 2006 General Assembly to begin this initiative. Local schools and districts will be provided modern workstations, stationary or mobile, to support advanced instructional activities. Districts, at their discretion, may use other fund sources (federal, state or local funds), in addition to the $50M, or methods to provide lower student to workstation/device ratio.

The maximum educational value of this initiative will be achieved when it is combined with the next generation high-speed network, Kentucky Educational Network (KEN).

Internet 2

Internet 2 applications, made available via a high bandwidth, high performance network, enable collaboration among researchers, instructors, students. They provide interactive access to information and resources in a way not possible on today's Internet. For example:

- **P-20 interactive collaboration** – A science teacher in Owsley County can dissect an anatomical specimen for her class, zooming, rotating and putting it back together and discuss this virtual dissection with researchers at Murray State University and Stanford University in real time.
- **Resource-sharing** – Math teachers in Clay County can participate interactively in professional development workshops conducted live from the University of North Texas and Western Kentucky University.
- **Remote instrumentation** – A student in a Frankfort High School biology class can operate a microscope located in Lehigh University in real time.
- **Digital libraries –** A student in Bowling Green can perform simultaneous, intelligent search and retrieval of KET's rich reservoir of videos, the Kentucky History Center's oral tapes and artifacts, and the Filson Club's photographs as she works on her multimedia assignment on Kentucky history.
- **Performing arts –** A Powell County violin student can audition or take a master class with the Manhattan School of Music.

The Next Generation Virtual Learning Environment

The goal of this initiative is to continue the cost savings and benefits of virtual learning for P-12 public school students and staff. Schools and students have access to online courses that can be taken outside the classroom. Students are offered advanced placement and supplemental courses, credit recovery, tutoring, and dual credit or college credit courses. The students complete the workload independently, with ad hoc or scheduled access to a teacher. These virtual learning experiences are offered at the middle and high school level as well as for teacher professional development.

E-mail and Content Management

This provides guidance for e-mail and Internet content management for schools and district offices. Today, electronic communications are often the primary mainstream collaboration medium. With greater and faster ability to communicate to a broader and more diverse audience, comes the added responsibility to ensure appropriate access and use for both students and adults. Email and Internet content management is a multi-layer approach specifically targeting four functional areas: a) Content Monitoring, b) SPAM Management, c) Access Management, and d) Content Filtering.

Math Achievement

Math curriculum programs have been established in six pilot districts. Each innovative curriculum combines software-based, individualized computer lessons with collaborative, real-world problem-solving activities. Students spend about 40% of the class time using the software and the balance of their time engaged in classroom problem-solving activities. The classroom environment promotes discourse, collaborative work and depth of understanding.

Large-Scale Summative Testing

Kentucky's educational leadership fully understands the need for electronic testing and supports the ongoing steps to build a necessary foundation for this goal. Using a large-scale sampling on a limited set of indicators, assessments are a cost-efficient way of informing administrators, policymakers and the public of our progress toward proficiency.

In addition to the obvious need for summative assessment, formative assessment is extremely important because it provides more immediate feedback. While summative assessment is less frequent and typically involves a large student population, formative assessment is administered on an as needed basis. It is part of a feedback loop, providing a snapshot of student performance. Multiple assessments, whether informal or a formal, help teachers determine the most appropriate teaching strategies for individualized differentiated instruction

The commitment to the realization of this goal is not in question, but there are hurdles that must be overcome before electronic formative and summative testing becomes a reality. The primary issues are access, equity and technology. The student-to-computer ratio is by far the largest issue for schools and districts. Before online testing can be used regularly, we must move lower the student-to-computer ratio. Even schools with a low ratio need Internet connections powerful enough to accommodate every student during the test simultaneous sending data back and forth to a central server.

Security is another obstacle that must be addressed. Both the test information and student responses must be secure. Schools must be able to identify students and track those who enter and exit the testing process. Additionally, variations in student workstation may affect the validity and reliability of test results. Differences in computer platform, processor speed, display size and resolution impacts the rate and quantity of testing information and may create disparate testing environments.

The path to electronic formative and summative testing has not been completely charted. There remain several unanswered questions that must be addressed in the future. Assessment will be altered by new technology, such as voice recognition, and new processes, such as distributed testing, will have to be considered. In addition, the emergence of distance learning will result in students having increased access to a variety of course material, but will create difficulty for the schools' ability to test from one central classroom location.

Continuing Professional Development for KDE and District Staff

For schools to fully capitalize on their technology investment, it is crucial that teachers understand and feel comfortable using appropriate technologies in their classrooms to support teaching and learning. Therefore, it is important to focus on two major themes. The first is the amount of professional development that the teachers will receive, and the second is ensuring that the time spent is as productive and effective as possible.

It is widely accepted that, in order for teachers to use technology effectively in the classroom, they must be supported by those who understand not only technology, but also the curriculum and instruction. The Technology Resource Teacher (TRT) or Technology Integration Specialist (TIS) addresses this need.

The TIS works with teachers, administrators, staff and students to enhance instruction using technology. The TIS trains teachers to use technology and electronic software effectively, through in-class instruction and hands-on exercises. Their understanding of the curriculum allows them to collaborate effectively with the teacher and support that person in the goals of student proficiency.

The TIS also is capable of assisting with concepts such as classroom management of educational technology, participation in the selection of educational software and assisting students with technology-related activities or projects. While this is a core component of the professional development program, it must be augmented, given that it is challenging for schools and districts to fund this highly effective and extremely costly method of professional development.

KDE and school districts must create an overall professional development strategy that will maximize the effectiveness of its professional development staff. This can be accomplished by using an optimal mix of individualized and one-to-many professional development programs.

Document and Content Management

The purpose of this initiative is to provide the schools, districts and state agencies with Internet-enabled access to content management.

Content management is a process that allows organizations to create, manage, store, distribute, search and view digital content. Examples of digital content are pictures, text, reports, video, audio, transactional data, catalogs and code.

Enterprise content management systems usually focus on the capture, storage, retrieval and distribution of digital files for statewide use. Enterprise content management will assist schools, districts and state agencies in sharing knowledge and various media types.

Next Generation Student Information System (SIS)

This initiative focuses on the next generation Student Information System. This initiative will provide a system based on modern technology architecture. It allows educational leaders at all levels – state, district, school and classroom – appropriate access to information about students. It captures information necessary to manage schools and districts. Approximately $2.2 billion in Support Educational Excellence in Kentucky (SEEK) funds are distributed based on student attendance data maintained within this system. This system is the main source for student information including grades, attendance, demographics, health immunization records, school safety information and participation in special programs such as gifted and talented.

Initial implementation costs for the next generation SIS is funded with a $10M appropriation from the 2006 General Assembly.

Individual Learning Plan (ILP)

The ILP (previously referred to as the Individual Graduation Plan) provide schools with a technology-enabled student-level planning tool, spanning grades 6–12 and beyond, to guide individual, student-centered planning focused on student proficiency. The ILP shares information with the Student Information System and the post-secondary education planning resources available through the Kentucky Higher Education Assistance Authority's Go Higher Kentucky system.

Kentucky Instructional Data Systems (KIDS)

KIDS is a federally-funded business intelligence initiative designed to provide teachers, administrators and other educational leaders access to longitudinal student data so that they can provide optimum educational services to their students.

The system will include information from many sources including the student information system, formative and summative assessment systems, instructional resources, district-level financial management systems, etc. Analysis capabilities will allow early detection of trends at the student, classroom, school, district or state level. State and federal reporting will be facilitated. The good work and lessons learned from KDE's first generation data warehouse, MAX, are not being discarded but built upon and extended.

Knowledge Management Portal

The Knowledge Management Portal will simplify and secure access to information for students, parents, teachers, administrators, policymakers, third-party researchers and vendors. It will build upon the capabilities of KIDS and provide advanced web-based features such as on-line collaboration and personalization. KMP will recognize users and display information based on their specific interests and job duties. For example, using the features of a fully developed Knowledge Management Portal, a classroom teacher will analyze the results of a formative assessment, research web-based instructional resources that cover specific classroom topics not mastered by the students, and direct students to appropriate remediation opportunities. Teachers will access instructional resources such as units of study, online collaboration and assessment models.

Reading First/Read to Achieve

The Read to Achieve and Reading First initiatives are closely related programs, funded by state and federal grants, respectively, to provide early intervention in kindergarten through 3rd grade reading programs in selected Kentucky schools. The information gathering and reporting requirements for these programs are similar and are addressed with a single data management system. Reading First/Read to Achieve shares information with the SIS.

Kentucky Educational Network (KEN)

In 1995, Kentucky became the first state in the nation to connect all public school districts to the Internet with what was then called a "high speed" connection. In 2000, Kentucky became the first state in the nation to connect all public schools to the Internet with a "high speed" connection. That investment served Kentucky public school students and teachers very well for a long time. However, growing demand and use of the Internet leads that original high-speed network to now look and feel like a "single lane, dirt road".

The KEN initiative provides each district with improved network access. It addresses the need to improve the speed by which information is shared (e.g. KIDS), instructional content is accessed (e.g. Internet 2), applications respond (e.g. on line assessment, individual learning plan, the virtual high school) and communications takes place (e.g. e-mail). The increased bandwidth supplies additional network capacity throughout the state and satisfies the large demands being asked of the current network by students, teachers and educational leaders.

This initiative is funded for FY07 and FY08. Funding will be requested in future biennia to maintain and continue to improve network capacity.

Grid Computing

By harnessing the computing power sitting throughout Kentucky's P-12 schools, higher education and businesses, grid computing provides access to much-needed computing capabilities to forward research and commercialization efforts.

Internet Security and Acceleration (ISA 2006)

At a very high level, this initiative enhances the security of the technology resources in each district. As multiple computers are connected together, the need for increased security becomes necessary. Computer networks can be vulnerable to hackers -- individuals who are attempting to access KETS computers without being authorized to do so. In order to protect the computer network, a firewall is used to allow access to only those people who are recognized. This initiative will add advanced firewall protection for the Microsoft Exchange Server in each district.

Backup System

As technology becomes more widely used for business and instruction, teachers and administrators expect that the data and systems be available, reliable and accurate. When disruptions to availability occur, service must be restored quickly. Examples of disruptions include computer failures, natural disasters, or illegal access and sabotage. This initiative insures that data is copied onto separate computers for safe storage and is available to recover from failures or disasters. This is a critical component of a more comprehensive disaster recovery program.

Identity Management

The main objective of the identity management project is to provide a single login process for all systems. When implemented, this initiative will provide students, teachers and administrators a single user account rather than requiring them to use different identifiers and passwords for each system. This system will reduce end user confusion and simplify the administration required by technology service providers.

Authentication and Authorization

The purpose of this initiative is to identify and manage the risk of unauthorized access to important school, district and state computer information. Statewide security programs shall be purchased and installed at all different levels, including security for workstations in the classrooms, the network that links the computers and user logon security for all systems used within the state.

Best Practice, Discretionary and Optional Initiatives

The following initiatives are considered best practice and discretionary. While they are recommended, implementation is optional within each district. As these projects are fully implemented or become mandatory, other discretionary initiatives may be added during the annual KETS Spending Plan approval process. Appendix D describes each project in more detail.

Ease and Equity of Access	Lower Workstation Ratio Wireless Personally Owned Devices
Intelligent Classroom	Video Conferencing (Desktop & Large Group) Electronic White Boards Speech Recognition Pod Casting Large Scale E-Books
Student Performance	Large Scale Formative Testing
Data Systems	Consolidated Program Monitoring School Facilities Inventory
Instructional Infrastructure	Hardware/Services Consolidation Capacity Planning
Differential Service Delivery	Differentiated Service Delivery Performance-Based Service Delivery
Project Portfolio Management	Application & Project Portfolio Management Procurement Strategy
Governance	Governance Organizational Structure Enterprise Architecture Foundation Communication Planning

Intelligent Classroom
This initiative will provide access to a full suite of classroom-based technology tools. Tools such as two-way video desktop conferencing, electronic projection and whiteboard systems, interactive student voting systems, wireless connectivity, phone conversations over the internet, instant messaging (IM), speech recognition, electronic books (e-books), electronic "paper" and grid computing will become common-place and will dramatically change the way instruction occurs in the classroom.

Video Conferencing (Desktop and Large Group)
This initiative will provide assistive educational technologies for all students, including those at the Kentucky School for the Deaf by creating a video-enabled communication channel.

Consolidated Program Monitoring

The purpose of this initiative is to reduce the number of tools and processes used to monitor compliance with program guidelines and funding requirements.

School Facilities Inventory

This initiative improves the current inventory and facilities management processes to include a self-service component for data entry and data access.

Hardware/Services Consolidation

The goal of this initiative is to provide an efficient education technology server environment at KDE, the districts and schools.

Capacity Planning

This initiative will result in a baseline assessment and a strategy to address capacity planning to manage resources, scope, cost, risk and schedules efficiently.

Differentiated Service Delivery Model

This initiative will provide all districts with a minimum level of educational technology capability, differentiated by needs of the school and districts.

Performance-Based Service Delivery

Performance-based service delivery provides enhanced educational technology to schools and districts by being as efficient as possible. It involves shaping educational technology providers like OET and other KDE and district providers so that they focus on schools and districts as their customers.

Application and Project Portfolio Management

Application and project portfolio management describes how schools, districts and state agencies can work through KETS to invest in the types of educational technology that will offer the greatest benefits to the overall educational system. Processes will be established to decide which projects should have priority over other projects.

Procurement Strategy

The objectives of this initiative are to establish procurement processes that will ensure educational technology funds are spent efficiently and to ensure that these processes align with educational priorities.

Governance

This initiative will establish a process and structure to insure that technology decisions are made to provide optimum educational value for the children of Kentucky. More information about KETS Governance, Statutory Authority and Policies is located in Appendix E.

Organizational Structure Evaluation

This initiative will analyze the different organizational models involved in the delivery of technology services in Kentucky's P-12 educational system to understand the best structure with which to move forward based upon needs at the state, district and school levels.

Enterprise Architecture Foundation

This initiative will ensure that strong enterprise architecture continues to form the foundation of the KETS program. It will make certain that the technology deployed is designed to support the educational goals of the state. Essentially, strong enterprise architecture helps to answer basic questions like "What are the schools, districts and state agencies' educational goals and processes?" and "How is educational technology supporting those educational goals?"

Communication Planning

This initiative deals with reviewing how the various educational technology providers within the schools, districts and state agencies communicate with each another and with students, teachers, principals and other administrators.