**Lake Park School District**

**Information Technology**

**Strategic Plan**

July 3, 2011

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**Lake Park School District**

**Information Technology Strategic Plan**

Executive Summary

This executive overview highlights the recommendations identified in the Information Technology Strategic Plan. The main body of the report provides the background for these conclusions along with a detailed plan for their implementation.

**Overview of Approach**

The Information Services Division was tasked by the Superintendent and Board of Trustees to provide a document to assist with the long term planning of information technology at Lake Park School District. Information Services worked with

the Technology Committee, represented by the following departments:

Superintendent’s Office

Accounting & Finance

Athletics

Curriculum & Counseling

Education Technology

Food Services

Information Technology

Maintenance & Operations

Research & Student Assessment

Transportation

The Technology Committee was tasked with providing feedback regarding their needs,

desires and vision for information technology within their departments. Utilizing this information, along with an assessment of the present technology environment of Lake Park School District, this document identifies opportunities for improving, expanding and embracing new information technologies.

**Assessment of Current Technology**

Section 2 of this document assesses the technology based services and infrastructure at Lake Park School District. It provides a review of the current information technology environment and existing standards for hardware, data communication, databases and application software. The strategies for managing each of these areas is discussed.

**Strategies for Managing Systems and Application Architecture**

Systems and Application architecture can be broken into three basic categories—host based, distributed and stand alone. Lake Park’s hardware inventory is found in Appendix A. Standards and strategies for replacement include:

Plan for replacing or moving host-based applications to a distributed environment as end of life approaches for hardware and/or software platforms.

Continue efforts to standardize the platforms for hardware, database and application

development to further lower the total cost of ownership.

Choose platforms with a high market presence to obtain better price competition,

improve availability of tools and integrated solutions, and enhance availability of qualified staff and contract/consultants.

Identify opportunities to improve service levels through hardware and data redundancy. Examples of this include the use of storage area networks and database replication strategies.

**Strategies for Managing Database Architecture**

The Database Standards should meet the following requirements:

Relational Database Management System (RDBMS) Compliant

Structured Query Language (SQL) Compliant

Open Database Connectivity (ODBC) Compliant

Open Systems Compliant

Oracle meets all of these requirements and is the standard product for database management and development. SQL Server meets the first three requirements, and may be implemented when the advantages of its use outweigh the disadvantages of varying from the standard platform.

**Strategies for Managing Desktop Hardware and Applications**

The Six-year Microcomputer Study in Appendix E outlines Lake Park School District’s strategy and standards for PC based hardware and software acquisition and support for the next six years. These are the highlights of that strategy:

Continue to standardize and acquire “Tier I or II” microcomputers.

Assume a microcomputer life cycle of four years.

Continue to acquire Microsoft Office Professional for each microcomputer.

Institute a formal software licensing tracking program.

Acquire work group or departmental printers wherever possible.

Replace printers during the five to seven year period.

Select scanners that can meet the production requirements.

Continue to use remote management tools.

**Strategies for Managing Network Architecture**

Continue to monitor and ensure balance regarding application needs, desktop needs, and the backbone architecture and speed. As the user needs increase and create more/bigger data traffic, the back-end platforms need to have faster and multiple

network connections.

Monitor technology evolution to cost effectively improve network throughput to remote school locations. Current key issue is the performance of the Assist work order management system in the Maintenance & Operations department.

Pursue Wireless for both in-building convenience and Training staff needing “Portable Office” capabilities. Current concerns with Remote Access center around security.

Closely monitor the explosion of Web-enabled cell phones and PDA’s. Identifying the market leader may be difficult early on. Hitching-on to the wrong choice, or too many

choices, could be expensive in the long run.

Maintain model for security that protects against both external and internal threats.

**Assessment of Technology Needs**

The Technology Committee and Information Services have identified a number of new requests for technology and opportunities to improve the existing applications, systems and data communications infrastructure. Section 3 outlines the proposed strategic technology initiatives for Lake Park School District for 2012 and beyond.

**Vision for the Future**

We can identify basic strategies for maximizing our technology resources and implementing technology with a positive net value to the District. When addressing technology-based decisions, applying these principals and strategies enhance our opportunity for success.

Minimize the variation of hardware platforms, operating systems, network infrastructure, database and application development platforms so that depth of technical staff knowledge is attained and cross training maintained more easily.

Minimize support issues by standardizing the desktop configurations and software interfaces (the look and feel of an application). Promote self-sufficient users through user-friendly interfaces, authentication, applications and training. This lowers the total cost of technology ownership.

Identify and establish Best Practice standards and methodologies for technical support, application development and support, database management, disaster recover, and change management in an effort to standardize support efforts and lower total cost of ownership.

Use technology that has a high market presence. This presents greater opportunity for long term viability of the product or platform, lowers costs for support in terms of maintenance contracts, integration tools, and potential employee base.

Provide seamless integration and data sharing between applications. Identify opportunities to share data between departments and schools and applications to promote data consistency and integrity.

Take advantage of commonalities among department and school needs by utilizing generic solutions and customizing and/or integrating these solutions for each department and school.

Evaluate and utilize efficiencies in out-sourcing where it lowers the total cost of ownership. This may be applicable to multiple aspects of Information Services - hardware support (as evidenced by the out-sourcing of PC and printer maintenance), software development (the buy or build dilemma), or technical support of legacy systems.

As technology evolves update the security model to continue to protect the District’s information resources.

Provide increased public access to information by expanding E-Government services on the Internet.

Build on Application/ Web Server Infrastructure to accommodate increasing demand for web-based information services both internally and externally.

**Information Technology Strategic Plan**

**Section 1. Planning for Technology**

**Introduction**

Information technology, when applied in a cost effective and integrated manner, provides improved District efficiencies leading to enhanced and expanded service. The benefits of information technology may be measured in net value by comparing the total cost of ownership of the technology against the reduction in use of resources or a targeted increase in a measured quality of services. The cost of ownership includes:

Acquiring hardware and data communication infrastructure

Developing, integrating or acquiring software applications

Planning and implementing

Training of end-users and technical staff

Administrating and supporting

Information technology planning is the process of establishing information technology goals and objectives, defining strategies and policies to achieve these objectives, and developing plans to ensure that the strategies are implemented. This document is a tool representing a District-wide approach to applying information technology based solutions for the next five years.

The Information Services Division and the Technology Committee developed this

plan to serve as a roadmap for guiding and planning growth and management of Information Technology in Lake Park School District.

**Goals**

Identify strategic District and departmental opportunities for utilizing existing and developing information technology.

Identify the total cost of ownership for information technology initiatives.

Emphasize integration of current and planned District information systems and data.

Implement information technology solutions that will have a positive net value for the District over the technology’s projected useful life.

**Objectives**

Review current information technology environment

Provide an awareness and understanding of current technology trends

Inventory existing hardware, software and data communication assets

Identify replacement schedule for hardware, software and data communication assets

Identify existing standards for hardware, data communication, databases and application software

Identify technology initiatives for 2012

Identify technology initiatives for 2013 and beyond

Define strategies and recommendations for technology-based decisions in 2012 and beyond

**Challenges**

Data collection at the source is primitive and becomes a bottleneck to users. How do we integrate new technology with existing systems, i.e. web-based applications, electronic filing, imaging systems, mobile computers, PDAs, cellular phones and other mobile devices?

Wireless devices and applications that interface with these devices are in their infancy. As the technology matures, price will go down. When does it become cost effective to invest in new hardware and applications?

The existing data communication infrastructure mostly consists of physical wiring, walls, and a desktop computer. When does it become cost effective to build infrastructure for wireless computing?

How do we manage total cost of ownership while planning for new technology and meeting increasing demands for complex hardware and software solutions?

Users see increasing application and utility for the Internet and Intranet. How do we plan for building a web-enabled environment?

We are vested in building an accurate SIS system. How do we leverage this investment and meet demands for new services?

How far do we go to secure systems and data from internal and external threats in an increasingly mobile and web-enabled environment?

How do we provide high availability solutions that ensure consistent service levels to students, parents, and staff?

How do we accomplish all of the above with limited financial resources and a fixed supply of skilled, experienced technicians?

**Section 2. Current Technology Environment**

**Technology Based District Services**

Developing a comprehensive strategy for information technology planning requires an understanding of the existing information technology infrastructure at Lake Park School District. This baseline information provides insight into the available assets and resources, a strategy and timeline for replacement of these assets, and standards established to guide decision-making for future investments.

Establishing standards for information technology infrastructure becomes increasingly important as the District continues to implement distributed systems that require accessibility throughout the District and to the public. Without adherence to standards, even the best system design will become proprietary and increase its cost of ownership. This section provides an overview of Lake Park School District’s technical infrastructure and established architectural standards.

**Systems and Application Architecture**

As we look toward developing workable systems for all users at Lake Park School District, the architectural challenges involve addressing the issues characterized by each of these categories. The existing system hardware is identified in Appendix A. The application inventory is found in Appendix B. It is broken down into categories represented by the basic architecture - hostbased, distributed, and desktop.

**Host-based Applications**

These applications are highly centralized in terms of information storage and centralized processing. Both the application and data reside on a main computer and are managed, maintained and supported by the Information Services staff. The opportunities presented by these systems include:

Business rules and data access rules are linked so change to either requires significant redevelopment effort.

Interfaces are not intuitive. This increases the learning curve, training costs, and support costs.

Processing resides on centralized hardware and must handle entire user load of CPU and data input/output activities.

Hardware and applications are approaching end of life in some situations. Lake Park School District’s financial system is an example of a host-based application.

**Distributed Application Architecture**

A distributed architecture may utilize varying technologies, the most well known being client/server and web-based applications. Client/server applications take advantage of the processing capabilities of the desktop PC and work in conjunction with a server that stores common data and objects for the application. This architecture distributes the workload of the application between the server and the client (desktop PC), which results in efficiencies in response and performance. The two-tier architecture is intended to improve usability by supporting a forms-based, user-friendly interface.

This design improves scalability by accommodating up to 100 users, and improves flexibility by allowing data to be shared, usually within a homogeneous environment. Two-tier software architectures are recommended for non-time critical information processing where management and operations of the system are not complex. This design frequently is used in decision support systems where the transaction load is light. Two-tier application architectures require less system operator intervention when the application is designed and implemented efficiently. The two-tier architecture works well in relatively homogeneous environments with business rules that do not change often and when workgroup size is expected to be fewer than 100 users.

One aspect of the two-tier architecture that may be difficult to administer and maintain is the client software. When applications reside on the client, upgrades must be delivered, installed, and tested on each client. The typical lack of uniformity in the client configurations and lack of control over subsequent configuration changes increase administrative workload and increases the cost of ownership for the application and the desktop client.

Distributed applications typically have targeted unique department/school specific functions. In doing so, data has not always been shared between department applications, creating data redundancy and inconsistency between departments/schools. Moving from a two-tiered approach to a three-tiered integrated approach starts to resolve the inconsistencies and reduce data redundancy.

**Strategies for managing Database Architecture**

Database Standards outline strategies for managing data, data models and relational database management systems within Lake Park School District. To summarize, the database should meet the following requirements:

Relational Database Management System (RDBMS) Compliant

Structured Query Language (SQL) Compliant

Open Database Connectivity (ODBC) Compliant

Open Systems Compliant

Oracle meets all of these requirements and is the standard product for database management and development. SQL Server meets the first three requirements, and may be implemented when the advantages of its use outweigh the disadvantages of varying from the standard platform.

**Desktop Hardware and Applications**

In order to understand the options for strategic direction regarding personal computers and printers, it is important to understand the total cost of ownership. This includes acquisition, setup and installation, end user operation, administration and support. Identifying all the costs, especially the soft costs such as down time for the user, lost productivity, and Help Desk support, can be difficult.

There is a rapid increase in demand and use of mobile devices, i.e., laptops with data cell phones, personal digital assistants with modems, and web-enabled cell phones. These devices will complement or augment the desktop microcomputer. Our students, parents, and staff anticipate and could effectively use wireless connectivity, however, there are some considerations in the cost benefit analysis with this technology. The more mobile or portable a device is the higher the complexity of hardware and back-end application development to support it. This increases the total cost of ownership.

**Strategies for managing Desktop Hardware and Applications**

The Six-year Microcomputer Study outlines Lake Park School District’s strategy and standards for PC based hardware and software acquisition and support for the next six years. These are the highlights of that strategy:

Continue to standardize and acquire “Tier I or II” microcomputers.

Assume a microcomputer life cycle of four years.

Continue to acquire Microsoft Office Professional for each microcomputer.

Institute a formal software licensing tracking program.

Acquire work group or departmental printers wherever possible

Replace printers during the five to seven year period.

Select scanners that can meet the production requirements.

Continue to use remote management tools.

**Data Communication Architecture**

In the mid-90’s Lake Park School District implemented bridged networking to accommodate multiple locations’ access to all the various network services, i.e., Email, internet, etc. In the late 90’s Lake Park School District implemented switched routing using Cisco Routers and HP Switches. This topology change was required to eliminate/reduce the broadcast storms and network traffic contention. As with host-based platforms and other technology issues, standardizing on market leading vendors helped to reduce staff and training costs while also lowering maintenance costs.

In 2000 the first imaging applications were planned and implemented. These applications incorporate large volumes of data to be transported on the network infrastructure. This created the need to upgrade the physical wire within the High School Campus to support 100 Mb speed (Cat 5) to the desktop where needed. To support the higher speeds and volumes to the desktop, Gigabit speed (1,000 Mb) was implemented on several central platforms and servers as well as to/from several of the communication closets. The remaining closets are scheduled for upgrade to Gigabit in July-August 2011.

**Section 3. Information Technology Initiatives**

Within a technology-based environment, it is a given that the need and level of services will evolve. The user community within Lake Park School District is knowledgeable and abreast of opportunities for implementing technology within their respective departments. The Technology Committee and Information Services have identified a number of new requests for technology and opportunities to improve the existing applications, systems and data communications infrastructure.

**Section 4. A Vision for the Future**

**Looking toward the Future**

**Wireless Computing—Changing the Way We Work**

The PC is now just one of many client devices, and the number of new client types is growing. Each new device brings significant changes. There are three major classes of mobile clients – laptop PCs, personal digital assistants (PDAs) and mobile telephones. Laptops have already changed working practices. PDAs, smart phones and other mobile devices will produce even more changes.

PDAs are becoming an established business tool. It is important to gain an understanding of how employees are using PDAs, what the risks are, how to control those risks, and how to maintain standards in an effort to control the cost of ownership of these devices. By maintaining a standardized model the PDA has potential to become a medium for exchanging information between users and departments/schools.

PDAs and mobile phones currently perform different roles, but the gap between them is narrowing as the computing power of phones increases and communications technology improves. Consequently, the same issues will apply to both.

The combination of laptop, mobile phone, and PDA helps break down the barriers of wires and concrete to enable District employees to perform their work at the source, instead of having to return to a desk. New client technology will accelerate this trend allowing employees to work at different locations.

There is an increasing need to address and plan for the acquisition and use of mobile

computing devices. Lake Park School District employees anticipate and could effectively use wireless connectivity. The more mobile or portable a device is, the higher the complexity of hardware and back-end application development to support it. Because this technology is in its infancy, evaluating the total cost of ownership will help determine when this technology will provide net value to the District.

**Implementing Information Technology at Lake Park School District**

Implementing technology to provide more efficient public services increases both the number and complexity of services that department staff must learn and Information Services must support. Services, complexity, security and training are all key items that drive-up total cost of ownership.

We continually face the question of how to best utilize limited resources to support and

implement new technology. **The goal remains to evaluate the net cost of new technology and implement cost effective solutions.** This means understanding and establishing an environment that will reduce the total cost of ownership.

With the advent of wireless communication, web-enabled services, and evolving devices for input/output (PDA, Cell Phones, Laptops, Desktop PC to name the most common) the PC is now just one of many client devices. New technologies enable users to work in different ways. The biggest risk is not to have a district strategy that incorporates the new technologies alongside the PC.

As wires disappear, new opportunities for securing our information and technology resources arise. Encryption becomes a critical component of the security model, and with that, the need to support increased demand on the network infrastructure. While users seek easier authentication and a single sign on, we must ensure secure authentication and evaluate new opportunities for authentication such as voiceprints and fingerprints.

The challenge when investing in emerging technologies is to know when to start investing. As technology matures, the cost of ownership goes down. It is imperative to evaluate the net cost of the technology against the reduction in use of resources or a targeted increase in a measured quality of services. This must be measured over the useful life of the technology. At the same time we need to be prepared for the changes new technology bring in terms of infrastructure and architecture.

**Strategies for Technology–based Decisions**

We can identify basic strategies for maximizing our technology resources and implementing technology with a positive net value to the District. When addressing technology-based decisions, applying these principals and strategies enhance our opportunity for success.

Minimize the variation of hardware platforms, operating systems, network infrastructure, database and application development platforms so that depth of technical staff knowledge is attained and cross training maintained more easily.

Minimize support issues by standardizing the desktop configurations and software interfaces (the look and feel of an application). Promote self-sufficient users through user-friendly interfaces, authentication, applications and training. This lowers the total cost of technology ownership.

Identify and establish Best Practice standards and methodologies for technical support, application development and support, database management, disaster recover, and change management in an effort to standardize support efforts and lower total cost of ownership.

Use technology that has a high market presence. This presents greater opportunity for long term viability of the product or platform, lowers costs for support in terms of maintenance contracts, integration tools, and potential employee base.

Provide seamless integration and data sharing between applications. Identify opportunities to share data between departments and applications to promote data consistency and integrity.

Take advantage of commonalities among department needs by utilizing generic solutions and customizing and/or integrating these solutions for each department/school.

Evaluate and utilize efficiencies in out-sourcing where it lowers the total cost of ownership. This may be applicable to multiple aspects of Information Services hardware support (as evidenced by the out-sourcing of PC and printer maintenance), software development (the buy or build dilemma), or technical support of legacy systems.

As technology evolves update the security model to continue to protect the District’s information resources.

Build on Application/ Web Server Infrastructure to accommodate increasing demand for web-based information services both internally and externally.

**Conclusion**

Information technology presents challenges to the leadership of Lake Park School District. The core of Lake Park School District’s business processes and services are immersed in a metaphorical sea of changing technology. Clear, articulated strategies in combination with a sustained vision are crucial elements of technology-based decisions. What we can do is identify our strategies, prioritize our needs, prepare our staff, engage our resources, and sustain the things we are doing “the right way”. This will enable Lake Park School District to nurture the information technology culture and transform it into a positive force to improve the efficiency and quality of services provided well into the future.

Great philosopher, Earl Nightingale, stated, “We become what we think about.” If we keep these concepts in the forefront of our minds and we keep them as essential components of our technology planning and implementation philosophy, we are poised to achieve great success.