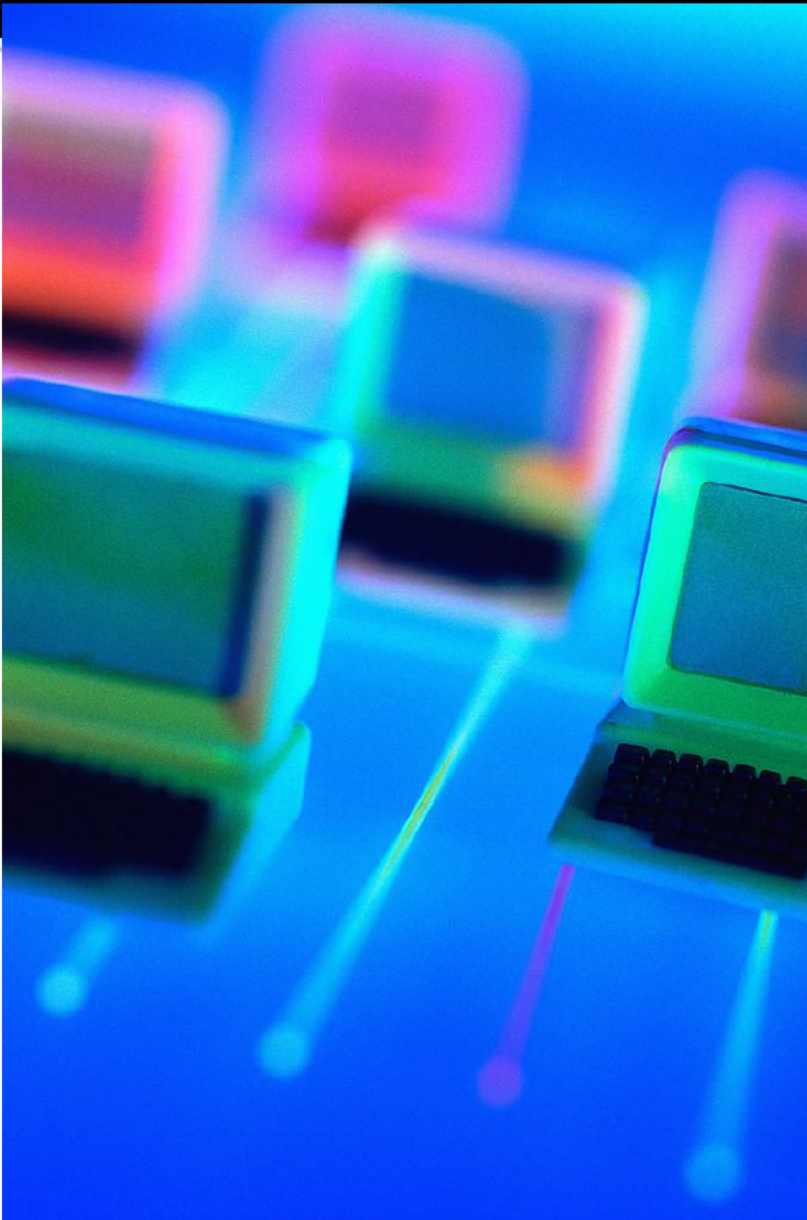


Information Technology 2012-2015 Strategic Plan



Draft

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Introduction

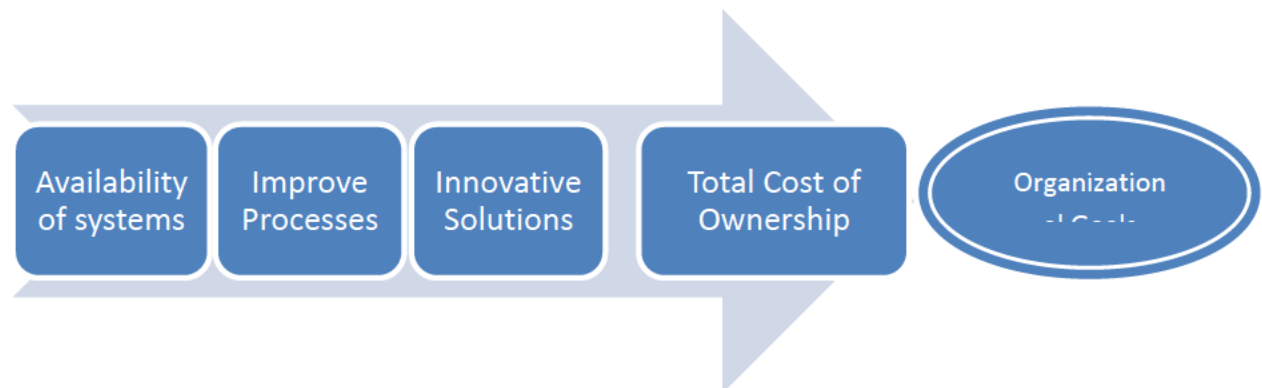
Information Technology is vital to the success of any organization and involves arranging the right mix of skilled individuals who share common objectives and defined processes to deliver services and solutions that support the mission of the organization. Lake Michigan College is served by a dedicated team of individuals whose purpose is to deliver technology to students, faculty and staff in an accountable and cost effective manner.

Mission of IT

Information Technology is a service organization that works in partnership with members of the College to provide technical solutions, systems and services that improve business processes, protects informational assets, and kindles innovation that advances Student Success and the college's academic mission and partnerships.

Primary Service Delivery Objectives

IT has three constant objectives as it provides services and solutions for the organization. The first objective targets the **availability** of key information services and systems. The second objective is a progressive focus on **improving processes** that enables the organization to be more efficient. The third focuses on growing the organization through the **deployment of innovative solutions** that allows the organization to offer new services and applications.



Availability of Systems

IT must ensure the **availability** of vital information services to the organization at all times. This is accomplished through capacity planning, requirements validation and solution design, project management, risk management and through the monitoring of critical systems and processes. The lack of vital services can harm the reputation and effectiveness of the organization and result in financial loss and missed opportunities. It is also critical that the confidentiality and integrity of information be maintained for all systems. This requires traceability and strong access controls. Without confidentiality, information is not secured and without integrity, information cannot be trusted.

Improve Processes

IT must also work closely with key business process owners to **improve** operational efficiencies. In many cases this relates to the discovery, understanding and documentation of key business

processes and the defining and documenting of business rules. The goal of IT is to assist the organization in the development of effective processes that are repeatable, sustainable and transferable. Improvements are also realized through the full utilization of existing technology investments and through the alignment of software solutions with the needs of the business. Improvements may also include the procurement and deployment of new technical solutions.

Innovation

IT must partner with key organizations within the College to select and deploy innovative solutions that grows and furthers the mission of the College. Traditionally, IT organizations spend 70% of their operational budget maintaining what they already have. It is essential that IT allocate part of its budget to support growth opportunities for the College.

IT Planning & Alignment Process

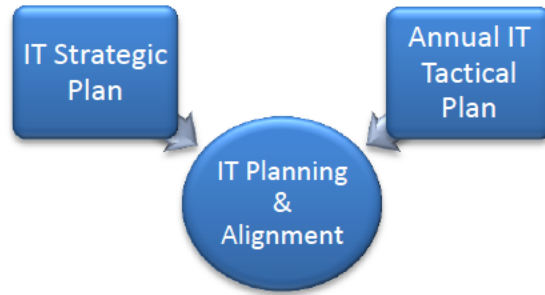
One of the key roles for IT is to align its internal goals and objectives with that of the organization. This is a continuous process that involves developing a constructive dialog with members of the College. A key element of success involves IT building trust with members of the College to work collaboratively to solve problems and build solutions. IT must listen collectively and embrace positive tension as an opportunity for building a more effective organization.

IT must not only align with the organization goals, but must also develop agility and capacity to respond to unplanned needs and opportunities.



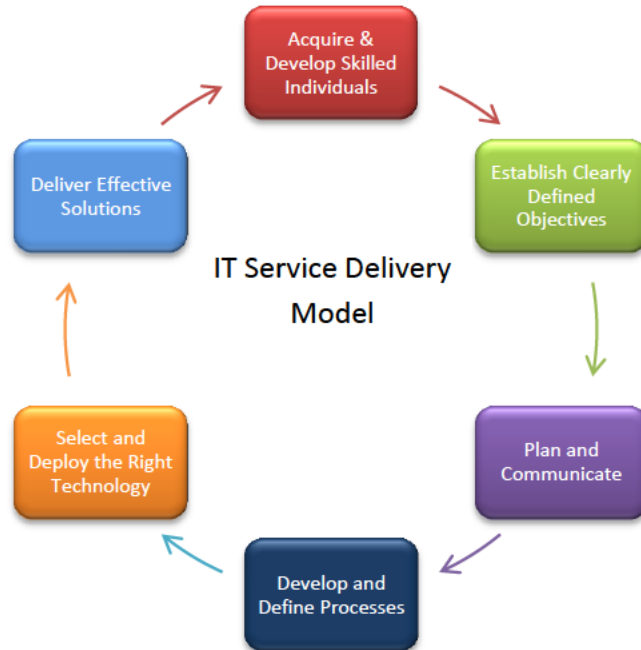
Planning and Alignment

IT publishes an annual strategic plan and a tactical horizontal plan. The strategic plan is a multi-year view that is broad in nature and addresses key deficiencies with IT services, aging and emerging technology, cost of ownership and critical needs within the organization. The tactical horizontal plan is a granular plan that focuses on projects for the upcoming academic year.



IT Service Delivery Model

IT is refining its Service Delivery Model to continuously align projects and services with the needs of the organization. The goal of this model is to deliver cost effective solutions and services that enables and furthers the mission of the College. IT must develop an approach of meeting the goals of the organization in a timely and cost effective manner. This model is a methodology used to build structure within the organization for executing and for measuring results.



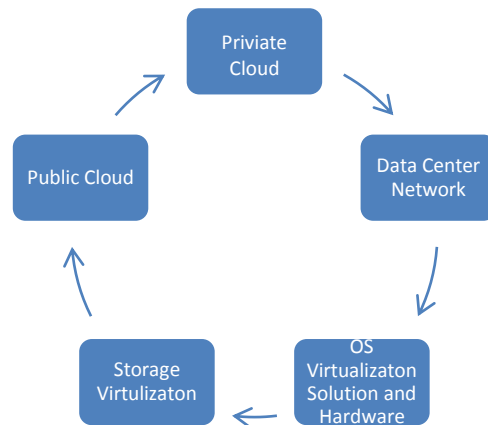
2012 – 2015 High Level Objectives and Projects

The strategic plan covers eight broad categories for 2012 to 2015 that include:

1. Cloud Computing
2. Virtual Desktop Infrastructure
3. Decision Support
4. IT Risk Management
5. IT Helpdesk & Instructional Support
6. Network and Telephony
7. Data Center and Computing Resources
8. Enterprise Applications

Cloud Computing

LMC IT desires to continue to develop an “IT as a Service model” using private and public clouds strategies to lower operating cost and improve agility.



“IT as a Service” includes the dynamic provisioning of computing services within a managed framework for the following class of services:

- **Infrastructure as a Service (IaaS)** - Delivery of raw, virtualized computing infrastructure such as servers and storage as a service to build applications. (Windows Server / Linux Server / Virtual Desktop)
- **Platform as a Service (PaaS)** - Delivery of a virtualized application runtime platform that has a software stack for developing applications or application services. PaaS applications and infrastructure are run and managed by the services vendor. (IIS / HTTP / SQL)
- **Software as a Service SaaS** - Cloud based delivery of complete software applications that run on infrastructure the SaaS vendor manages. SaaS

applications are accessed over the Internet and typically charged on a subscription basis. (**Email / CRM / SharePoint**)

Cloud Infrastructure Architecture Considerations

- Dynamic provisioning of Servers
- Dynamic provisioning of storage
- Operational metrics for services
 - Storage management
 - Trend Line for Growth
 - Class of Service for Storage
 - Performance
 - IOPS
 - Network Utilization
 - Server Utilization
 - Scalability
- High speed backbone
- Policies and Operational Plans

Virtual Desktop Infrastructure

For 2012-2013, LMC IT will develop a Virtual Desktop Infrastructure computing model to lower the acquisition cost of PCs and provide computing services on demand through thin and thick clients. The objectives of this strategy include:

- **Lower desktop infrastructure acquisition cost and total cost of ownership** - Lower acquisition cost through the use of thin clients and bring your own resource (BYOR).
- **Lower provisioning and support cost** - Provide an on demand computing resources to any client without the need to provision software apps to a physical PC.
- **Strengthen controls around information assets** – Move staff PC consumers to VDI services to safeguard data against theft and unauthorized access.
- **Support new computing form factors** – Tablet based computing will emerge in 2012 as a major shift in how computing resources are consumed and used. The tablet models with detachable keyboards will offer an optimal platform for some users proving mobility and new functionality through a touch interface. LMC plans to provide full VDI support on tablets for users to gain remote desktop access to traditional computing resources.

Decision Support

The College will have effective systems for collecting, analyzing and using organizational information to advance the College's academic programs, improve service to students and the community, and improve decision making.

- 1) **Continue the implementation of Cognos – Leverage Cognos to support effective organizational decision making.** In 2010, IT selected and deployed a new Business Intelligence solution Cognos to support data-driven decision making. (LMC has traditionally allowed users to pull data directly from Banner to meet their information needs.) This new system has improved consistency and quality of reports.
- 2) **Continue to develop and implement automated reports** to support key functional areas within the organization.
- 3) **Strengthen the auditing capabilities** to safeguard the quality of information.
- 4) Assist the organization in the **development of feedback loops** to support continuous improvements.
- 5) Assist the organization in **developing a culture of evidence.**

IT Risk Management

Continue to manage compliance and reduce risk across the organization to safeguard IT assets and information.

- 1) **Develop and implement a business continuity plan** that supports redundant systems that are geographically dispersed to ensure Business Continuity. The Exchange E-mail system already has redundancy and we have recently introduced **Distributed File System** technology that increases our share of geographically redundant data; however, almost all the business-critical systems are located in the same data center. A second data center should be considered to host redundant systems in the event of a major disaster that would enable crucial systems to continue to function in the other data center. As new systems are built, redundancy and geographic dispersing of that equipment should be considered.
- 2) **Maintain the IT risk management plan to safeguard IT assets** and to reduce exposures.
- 3) **Update the security program** to include external third-party penetration test that verifies layered defenses, validates firewall rules and web services safeguards.
- 4) **Implement a logging system for Network devices and Servers** that support critical applications and information.
- 5) **Policies and Procedures** Continue to develop policies and procedures so that IT personnel perform duties using common guidelines. In the next year, policies and procedures should be created that provide for better communication regarding employees being hired or leaving the college, so that user accounts can be created or **deleted in a timely fashion.**

IT Helpdesk / Academic Team

- 1) **Maintain the 5 Year PC refresh plan** – IT plans to refresh these systems on a 48 to 60 month basis to ensure that there is adequate hardware to support the infrastructure as it ages. IT has selected Dell as our manufacturer of choice based on pricing, support, reliability and platform stability.
- 2) **Select and Implement desktop virtualization solution** to increase the productivity of IT staff and to provide more effective access to academic software applications to students.
- 3) **Continue the Windows 7 Migration Plan and review options for Windows 8 Deployment Plan.** IT will facilitate a task force to manage the migration to Windows 7 in order to meet the instructional needs of courses.
- 4) **Establish Quality Gates** for key processes within IT to deliver effective services and to provide accurate information.
- 5) **Development of benchmark standards** for key services within IT.
- 6) **Implement a new QA process for managing academic software applications.**
- 7) **Select and implement a classroom lab manage solution** that addresses technology management needs in the classroom.

Networking & Telephony

- 1) **Replace end-of-life Network Components** - 7 year life-span for all new components... expandability. Approximately one half of our LAN switching infrastructure lacks both future support and a feature set that will adequately embrace new technologies such as voice over IP and network access control.
- 2) **LAN Connectivity Expansion and Improvement**
 - a) Implementation of network-based telephony will necessitate cabling upgrades and new cabling implementations on all of our campuses that have not been necessary until now.
 - b) Electric power for the telephones in the upcoming network-based telephone system will have to be provided by newer LAN switching technology.
 - c) An increasing need for network connectivity in classrooms, labs, office areas as well as customer-service and one-stop areas will also require future expansion of cable runs and expanded LAN switches' port capacity. Some of this can be supplemented with wireless (802.11) LAN technology; however, wireless bandwidth capacity does not scale nearly as well as wired.
- 3) **Continue to ensure survivability for core levels** - Provide support for a "new level" of fail-over and survivability within the core infrastructure to support connectivity to the data center and Internet for core business services. In 2010, we implemented an enterprise-class network switch capable of switching many hundreds of gigabits of data per-second. This solution has provided wire-speed transfer of data for:
 - a) Closet Connectivity
 - i. Increased Fiber port density means we can greatly leverage the Napier campus's large fiber infrastructure to deliver much more bandwidth throughout the campus.
 - b) Server connectivity

- I. Today, numerous servers are attached to the network using dual Ethernet connections – added Gigabit port density means this will be expanded to all critical systems and tested.
- 4) **Ensure survivability for some distribution and access zones- Today**, Core switches are interconnected and cross-connected. The new network core switching infrastructure will employ a much improved fiber switch backbone redundancy and dual-connections too many electrical (network access) closets that will increase bandwidth and reliability.
- 5) **2012-2013: Acquire and implement a new unified threat management Firewall with expanded remote-access and multiple DMZ zones**
 - a) Our newly acquired ASA technology is the next generation of Internet firewall technology which employs more granular filtering capabilities, greatly enhanced remote-access security authentication features, with improvements in all popular VPN technologies.
 - b) **Internal Firewall Services module** –Most network and data security breaches originate from within the organization; not from the Internet and our internal network is virtually open to the public. Implementing a firewall on our “inside” network will allow us to quickly and easily put a very secure barrier around our server network as well as around less-secure areas of our network, both wired and wireless.
- 6) **Implement Meaningful Network services metrics** - IT is continuing to develop the means for reporting on a monthly basis critical and meaningful metrics which will best represent the level of success and quality of our product of our changes and implementations. The main goal is to provide a means to easily spot trends which might over time affect service levels. This will help capacity planning and resource development. The key to this is not quantity of information, but appropriately selecting the few metrics that best represent our service level.
- 7) **Improved Internet bandwidth and bandwidth management** - Improved bandwidth metrics have made it clearer than ever that the growth of Internet traffic has been exponential. Most of this traffic; however, is entertainment and social networking content requested by student client workstations attached through the wireless networks or in open labs and the library. We now employ technology that allows us to guarantee Internet bandwidth for mission critical hosts and applications by dynamically limiting the size of outbound requests for Internet-based content. Although the need for this type of bandwidth management is critical, the exponential growth in demand for those critical applications continues. The only solution is to provide more bandwidth capacity.
- 8) **Increased Gigabit Backbone bandwidth and Increased Local Area Network Reliability at all sites.** Adding switch ports and interconnecting switch-to-switch links will allow us to multiply bandwidth to select areas in the school by simply using the available fiber connectivity. This has the added benefit of increasing the reliability of the network areas that connect directly to the classrooms and office user’s computers. 2010 will be a big year for IT delivering Local Area Network bandwidth and network reliability to all of our classrooms and offices.
- 9) **Implement 10-Gigabit for supporting iSCSI within the data center for storage.**

- 10) **Increased Intercampus WAN bandwidth** – Now that M-TEC and Bertrand have 12 and 7 times the bandwidth that they had last year, Bertrand’s Internet bandwidth has just been improved. This frees up inter-campus bandwidth for critical classroom-based connectivity and other LMC-sourced content.
- 11) **Increased Internet access bandwidth** to support the growth needs of the college.

Data Center and Computing Resources

- 1) **Exchange Hub Transport/Client Access Redundancy** - The message store of the Exchange system has been built with redundancy, but the Hub Transport/Client Access portion is not redundant. As we move to redundant and geographically dispersed data centers, we should add an additional Exchange server to make the system completely redundant.
- 2) **Monitor Disk Space Requirements** - We have implemented What’s Up Gold for Network Monitoring, this allows us to receive alerts when production systems quit responding on the network. The same program can be used to monitor things such as CPU, Memory and Disk utilization. We will take advantage of this feature to help us plan for system upgrades such as needing more disk space.
- 3) **Virtualization Management** - We have begun building servers using Windows 2008 Hyper-V Virtualization. As this technology advances and as we learn more about this product, we may come across third party utilities which will help us better manage these virtual machines. We may also determine that we may need to invest more into i-SCSI SAN technologies to better utilize virtualization. These technologies will help us provide better Business Continuity by allowing us to quickly move virtual machines between data centers.
- 4) **Implement a data storage strategy** to address the growing needs to store more data and to support high-availability of data. LMC will begin the implementation of a storage area network (SAN) server from EMC. The SAN will allow IT to add disk space on demand based upon application data needs and for disaster recovery.

Enterprise Applications

1. **Address Key Banner Issues** – Banner is the core system that supports the business of the College. IT will continue to engage Ellucian Consultants and internal Users to resolve Banner issues and to more fully utilize Banner functionality to meet the needs of the College.
2. **Provide Banner Training** through internal programs or through external consultants or events.
3. **Document business rules and key business processes** to retain knowledge of core business processes and to improve operational efficiencies.

- 4. Plan for the Banner 9 upgrade within the 2013-2014 timeline.**
- 5. Upgrade the student portal in 2013 and implement a mobile solution.**
- 6. Migrate from Blackboard to Canvas**
 - a. Single-sign on
 - b. Real time account creation
 - c. Real time class population