

BOARD OF HIGHER EDUCATION

REQUEST FOR COMMITTEE AND BOARD ACTION

COMMITTEE: Fiscal Affairs and Administrative Policy **NO.:** FAAP 14-01

COMMITTEE DATE: October 22, 2013

BOARD DATE: October 29, 2013

**ENDORSEMENT OF THE BERRY DUNN REPORT ON THE STATE UNIVERSITY
AND COMMUNITY COLLEGE IT COLLABORATION AND EFFICIENCY PROJECT**

MOVED: The Board of Higher Education accepts and endorses the attached Berry Dunn Report on the State University and Community College IT Collaboration and Efficiency Project.

The Board welcomes the presidents' readiness to pursue the strategic directions with regard to Information Technology outlined in the Berry Dunn Report, and urges the presidents to pursue their deliberations regarding full implementation of the strategy with a high sense of importance.

Authority: Massachusetts General Laws Chapter 15A, Section 9

Contact: Sean P Nelson, Deputy Commissioner for Administration & Finance
Fiscal and Administrative Policy

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Executive Summary

Under the auspices of the Partnership Advancing Collaboration and Efficiency (PACE) Council on Collaboration and Efficiency, BerryDunn was engaged in April 2013 to conduct an information technology (IT) assessment for the 24 institutions that participate in PACE. The focus of this work was to address the following key elements:

- Identify cost saving opportunities
- Improve operating efficiencies
- Identify recommendations that benefit from both shared and local services
- Optimize IT investments
- Outline an implementation plan that provides a framework for implementing the recommendations

Project Approach

Our work began with developing a common information request to gather data about each institution's use of IT in a consistent format. During April, we collected this information utilizing a shared web-based data repository. All institutions contributed to this repository prior to our site visits.

Throughout the month of May we visited each institution. Each visit followed the same general approach, which included meeting and reviewing information with senior IT staff and meetings with the Chief Financial Officer (CFO), Chief Academic Officer (CAO) and President of the institution.

We then completed our objective analysis, drawing upon the information collected, interviews performed, and consideration of trends impacting higher education broadly and specifically with respect to IT and the use of benchmark research where relevant. Our analysis incorporated both quantitative and qualitative information, and was completed within the project scope and time constraints.

This report presents the complete results of our work and analysis, and identifies specific opportunities for the PACE institutions to consider that can help them advance their higher education mission, better support academic goals, and gain efficiencies through future IT and operational improvements.

Addressing the "Iron Triangle" – Challenges and Trends Impacting Higher Education

According to Josh Jarrett at the Bill & Melinda Gates Foundation, five years ago the National Center for Public Policy and Higher Education and Public Agenda wrote about the concept of the "Iron Triangle." *"In the view of many college and university presidents, the three main factors in higher education—cost, quality, and access—exist in what we call an iron triangle. These factors are linked in an unbreakable reciprocal relationship, such that any change in one will inevitably impact the others."* This concept of the iron triangle presents a challenge to the PACE institutions to find better, more efficient ways to operate and fulfill their mission while taking advantage of changes in technology and operational practices that can be gained through effective planning and collaboration.

The PACE institutions, like all of higher education, are being impacted by trends that will shape changes in the coming decade. These trends, which include increasing expectations of students, changing options and growing capabilities of software, cloud computing, the need to be more agile and adaptive, demand for new technology knowledge and skills, and a changing workforce, have been considered in our analysis. These are described in Section #1 of this report.

Leveraging Operational Strengths at PACE Institutions

In the limited time we had, our team worked hard to listen and understand the unique culture and identity of each institution. We have captured this in the form of “institutional snapshots” that provide a one-page synopsis relevant to IT at each institution.

Overall, it is clear that IT organizations are working hard to support their respective institutions and to meet the needs of students, faculty, and staff. The IT departments realize the pervasive nature of technology and the ever-increasing demand for technology support and services that strain the resources that institutions have at their disposal. That is why this effort is so important and why it will have a largely positive outcome for those involved, because the basic premise of collaboration is to identify and leverage shared opportunities that can take advantage of economies of scale to be achieved when the PACE institutions work together.

Overview of Opportunities

This report presents 15 opportunities for the PACE Presidents to consider, prioritize, and address. Collectively, these opportunities help to strengthen service for students, better support learning outcomes, and gain increasing efficiencies for the PACE institutions. For ease of understanding, the opportunities are grouped into one of five categories:

- Professional Development
- Coordinated Purchasing
- Shared Services
- Improved Data Standards and Information Sharing
- Enterprise Applications and Business Process Improvements

With respect to efficiency improvements, opportunities can be found by establishing collaborative purchasing functions, coordinating network and telecommunication contracting, strengthening the use of enterprise resource planning (ERP) systems, gaining business process improvements, and potentially migrating to the use of a shared ERP system.

Better risk management and strengthened security practices can be gained through opportunities to collaborate on disaster recovery (DR), security, help desk services, training, and professional development for IT staff.

In support of all of these efforts, we have also identified efforts that will help to provide shared tools and develop the foundation for future collaboration.

The greatest benefits will be realized over the long term which, for purposes of this analysis, is considered to be a 10-year horizon. The benefits of strategic decisions regarding technology and collaboration will, however, extend well beyond this timeframe if driven by intentional planning and concerted long-term efforts.

Opportunities are presented in full in Section #4 and an overview is presented on pages 53-54 and Appendix #1 of this document.

Themes

In general, the following themes can be seen throughout the report and the opportunities identified:

- Commit to developing a common purchasing approach that can take advantage of valuable cost savings on IT hardware, software, and services across the 24 institutions
- Strengthen data standards and better coordinate data definitions with the State and each other in light of new demands being put on PACE institutions to report student outcomes

- Create a long-term vision for shared services that starts with realistic objectives and reflects the reality of a changing workforce at most schools and acknowledges the impact of staffing retirements on the horizon
- Build both physical and virtual infrastructure to support a collaborative model for IT that addresses collaborative planning, shared governance, and resources, but does not homogenize the unique qualities and perspectives of the institutions they support
- Establish a 10-year plan to address enterprise applications and the changing landscape for managing and delivering IT services

These themes will warrant further consideration. A thoughtful process needs to be developed to gain advantage from these opportunities within the context of other efforts at the institutions. The result can be improved efficiencies that enable PACE institutions to direct more resources towards student and mission-direct efforts.

Next Steps

The Presidents of the PACE institutions should consider the following immediate next steps:

- Understand this report in its entirety. It contains some opportunities that can be quick wins, and others that are significantly complex and will require substantial resources and effort.
- Set priorities and develop a plan for action. Planning will be important and impactful for collaborative efforts and the initiatives of individual institutions.
- Establish a formal structure to support increased collaboration, communications, and coordination of IT services for PACE institutions. In order for PACE to move forward with this effort, dedicated resources will be required.
- Investigate opportunities to utilize available resources that may kick-start these efforts, as well as provide funding mechanisms that will not divert additional dollars away from other work being done at PACE schools.

Acknowledgements

The entire BerryDunn team wants to take this opportunity to acknowledge and thank the leadership and staff at all the PACE schools for their cooperation and participation. In addition, we want to thank Sheila Sykes, Betty Ann Learned, and Al Ayers for their stewardship and assistance throughout this project. Without their assistance, it would not have been possible to complete the work done within the time permitted.

Questions about this report may be directed to Clinton E. Davies, Principal, BerryDunn, at 207.541.2322 or cdavies@berrydunn.com.

Overview of Report

This report is based on our independent analysis of information provided by the institutions, on-site visits to campuses, interviews with IT staff and stakeholders, and other research. Below is an overview of the sections that comprise this report.

Our assessment report is broken into six sections, including the appendices, and is designed deliberately to provide the reader with an overview of technology within the PACE institutions and the current higher education environment. Collectively, this report presents a basis for our identified opportunities for collaboration and efficiency.

Section #1: Important Trends Impacting Higher Education

This section provides an overview of important trends that are impacting higher education and the PACE institutions at the current time. Top trends are identified by BerryDunn's experience in the industry, EDUCAUSE, and the Campus Computing Project.

Section #2: PACE Institutional Snapshots

This section provides an overview of the collective PACE IT environment and each PACE institution. Included in each snapshot is a summary of key facts, challenges and opportunities as identified by BerryDunn, and strengths observed during our on-site interviews.

Section #3: Summary of the Current Software and Network Environment

This section provides a general overview of the current environment at PACE schools for both software and network infrastructure. Data collected from PACE schools informed the analysis and material for this section.

Section #4: Opportunities for Collaboration

This section identifies opportunities for collaboration and increased efficiency at PACE institutions based on our assessment and analysis. Opportunities are grouped into the following five categories: Professional Development, Shared Services, Improved Data Standards and Information Sharing, Network Infrastructure, and Enterprise Applications & Shared Administrative Services.

Section #5: Success Factors for Strengthening Collaboration and Efficiency

This section identifies critical success factors for PACE to strengthen collaboration and efficiency efforts. These efforts are considered foundational for PACE and instrumental for future success as a consortium. These success factors include: IT Planning and Governance, Service Catalog, and Technology Refresh and Reassessment.

Section #6: Next Steps/Roadmap

This section provides PACE with the next steps following the issuance of our assessment report. It also includes a roadmap to assist PACE, as an entity, in considering how to practice and implement opportunities for increased collaboration and efficiencies.

Section #7: Appendices

This section includes supporting materials for the other sections of this report.

Project Overview

The following section describes PACE today, provides an overview of the IT Assessment and the process utilized, and documents assumptions and constraints used in our analysis.

PACE Today

PACE is a collaboration effort led by the Massachusetts Community Colleges Executive Office (MCCEO) and the State University System Councils of Presidents representing 24 public institutions of higher education across the Commonwealth. These two organizations joined together to create PACE with a shared belief that a *systematic mode of cooperation amongst Massachusetts state universities and community colleges will have benefits to all that participate and for the students and communities they serve*¹. We have included the PACE Charter as Appendix #2.

The 24 schools that make up PACE were created as, and remain, autonomous institutions with their own boards and leadership. As publically funded institutions, they all have common reporting requirements to the Commonwealth's Department of Higher Education as well as the Federal Government. They serve a common mission of educating students and serving and supporting their respective communities and regions in Massachusetts.

This report represents an independent and objective understanding of the current IT operations environment and identifies opportunities for increased collaboration among the PACE schools.

Assessment Overview

Our approach entailed gaining perspective on the current capabilities, resources, needs, and issues surrounding PACE, both as a whole and on an institution-by-institution level. The objective of this assessment report is to provide PACE with recommendations for cost savings opportunities, operating efficiencies, resource sharing, and IT investment optimization.

BerryDunn's IT assessment project took place from April through June 2013. Readers should understand that this assessment reflects a point in time, and the information presented in the report may have changed.

In April, we requested that each institution provide us with a variety of data to inform our understanding of the institution prior to our on-site time. We requested that each institution's IT leader provide the following information to the BerryDunn KnowledgeLink site, used for this project:

- General background data that included high level financial and IT organization information, in addition to high level IT information about current technical infrastructure, databases, and operating systems
- IT organization charts
- Descriptions of IT positions at the school, including the Chief Information Officer (CIO)/IT leader position
- IT contracts for the current and past two fiscal years with an annual value greater than \$5K
- IT budget and expenditures for the current and past two fiscal years
- ERP system data, including modules in use, and other software systems used at an enterprise level

¹ From the PACE Charter updated March 2013

- Current network environment, including wide area network (WAN) speed and provider
- Annual IT report and/or IT strategic plan, if applicable
- IT governance structure, if applicable
- Current IT projects with estimated costs and timeframe

In May, BerryDunn visited each school to meet with institutional stakeholders and review the information provided. Each visit consisted of a full day on-site that included meetings with the IT department, IT leader, CAO, Chief Financial Officer (CFO), and the President. A memo was sent to each IT group and Executive Leader with an agenda and talking points for our on-site time.

Our assessment was developed throughout the month of June and included multiple work sessions internal to our project team, interviews with other consortia, vendors, and follow-up discussions with schools, if necessary.

Assumptions and Constraints on Data Used

All numbers in this report were self-reported by PACE institutions unless otherwise specified. In most cases, we have rounded the numbers provided for simplicity of presentation. In order to conduct “apples-to-apples” comparisons, we used fiscal year 2012 data for financial information, as it was the most complete information available. The only exception is costs associated with future IT projects, which are reported as presented by the institutions. The financial data provided was used to present estimated projections where relevant as part of our analysis.

Unless otherwise noted, all assumptions are based on analysis of all 24 institutions. In addition, when estimating personnel costs we have identified a salary estimate based on data provided and our experience, and then added 27.3% for average fringe benefits based on information provided to us by PACE. When possible, we have used numbers provided by PACE materials. This included estimates on Information Security personnel where we have used the same baseline estimate as was used in the RSAM proposal.

Numbers in this document should be viewed as for planning purposes only. The nature of this assessment was not to conduct a detailed spending analysis, but to gather information at a level of detail that would enable identification of opportunities, high-level planning, and future consideration.

The intention of this effort was to seek opportunities and identify areas that could benefit from more collaboration to improve efficiencies. While this type of assessment can be construed as critical by nature, the goal is to highlight opportunities that exist and should be considered that further the mission of institutions.

Finally, we have included a Glossary of Terms at Appendix #7 to help the reader understand the many acronyms and technical terms that populate this report.

Section #1 | Important Trends Impacting Higher Education

This section provides an overview of important trends impacting higher education and the impact relevant to information technology.

The PACE institutions need to be mindful of trends that are impacting higher education broadly as well as each institution. During our on-site visits, we observed these trends impacting the PACE institutions, many of which are also affecting higher education as a whole.

Addressing Increased Expectations: Students, faculty, and staff expect IT to be available at all hours. The Bring-Your-Own-Device (BYOD) trend has greatly increased the number of devices per user, and users expect that their institution's wireless infrastructure will provide them with the bandwidth that they need to access their information. IT organizations at each institution are addressing BYOD and making efforts to have the right resources in place to meet the bandwidth expectations, as their customers expect multiple devices to have service throughout the entire campus. In addition, users expect to use mobile applications to access campus resources and services, such as the Learning Management System (LMS) and the portal.

Controlling Costs and Funding Technology Effectively: The cost of higher education is steadily on the rise, and these costs can deter students from attending the institution of their choice. Institutions must offer education to their students at competitive prices. Due to recessionary pressures in the U.S., for most schools budget cuts have been the norm, which puts pressure on the IT organization to "do more with less" while the demand for services increases. Institutions are seeking to leverage technology to lower or stabilize education cost increases.

Institutions need to plan and direct their limited resources towards IT investments that will provide the most value and make the greatest impact for their campus. In doing so, institutions will need to align priorities amongst Executive Leadership. According to the Campus Computing Survey, only 42% of presidents and 50% of CAO's viewed IT investment as "very effective" in supporting on-campus instruction.

Moving to the Cloud: Cloud computing is a key trend that is rapidly changing the technology industry. When outsourced effectively, IT departments can offer services more efficiently at lower start-up costs than hosting the service in the institutional data center. Use of the cloud to host institutional applications can result in economies of scale and can leverage the scope of services offered at the institution's IT department. Use of cloud computing as a service in higher education is on the rise, and developing a campus-wide strategy for the cloud is one of EDUCAUSE's "Top-Ten IT Issues." One cloud service that is heavily used is LMS hosting. According to the 2012 Campus Computing Survey, 38% of survey participants reported that they are moving or plan to move LMS applications to the cloud.

Becoming Agile and Adaptive: In 2012, EDUCAUSE identified "updating IT professionals" skills and roles to accommodate emerging technologies and changing IT management and service delivery models"² as the most important issue of the year. Likewise, the Campus Computing Survey identified hiring and retaining qualified IT staff to provide adequate user support as a primary IT institutional priority of the year. Institutions need to develop an organizational model that is proactive and agile that will be able to meet the demands of customers as technologies change. The

² <http://www.educause.edu/ero/article/top-ten-it-issues-2013-welcome-connected-age>

importance of professional development also becomes increasingly important as demands for expertise in new technologies grow and change such as cloud computing, BYOD, data analytics, and information security.

Focus on Information Security: IT organizations are expected to safeguard their institutions' data, protect the integrity of their networks, and meet evolving compliance regulations. Students, faculty, and staff expect the institution to protect their data, but at the same time expect to have access to it. As such, it is important for institutions to have information security measures in place. Cyber security is becoming an important issue to address in higher education, especially due to the fact that cyber-attacks, hacking, and other IT security events are on the rise. Therefore, IT departments have had to adjust their efforts in information security and allocate more resources to addressing the protection of their institution's informational assets.

Shifts in Learning Management Systems: Competition in the LMS market is steadily increasing, as Blackboard's market share dominance has been in decline in recent years. LMS applications such as Desire2Learn, Moodle, Sakai, and Canvas are emerging as direct competition to Blackboard. Based on survey participant feedback from the Campus Computing Survey, Blackboard's share of the market has decreased from 71% in 2006 to 45% in 2012. In addition, two thirds of survey participants stated that their campus will review their LMS strategy within the next two years.

Embracing Online Learning: Online learning has an established role in the landscape of higher education. In the past five years, the number of students who take at least one online course has doubled, amounting to 45% of the overall college student population³. Institutions are creating strategies for online learning, and determining a plan/vision for where they will be in the online learning community. They also need to determine if this plan is a sustainable approach to how online learning is administered at their institution. The concept of the Iron Triangle is a challenge to PACE schools to meet the needs of students today, by providing them access to quality online learning programs that are delivered cost effectively.

Strengthening Collaborative Efforts: Collaborations between institutions can result in cost savings, vendor leverage, improved communications, and shared services. These collaborations can be successful when they are well organized and have strong governance in place. The opportunity to collaborate is becoming more important than ever in a budgetary environment that has been plagued by constant cuts in recent years. Institutions can find value in collaborating and by doing so can collectively address some of the top issues in higher education, such as information security and leveraging technological investments.

Leveraging Data: Information is the culmination of data that produces meaningful and informed decision making. In order to leverage data to support the mission in higher education of achieving student success, institutions need to ensure that they have data that is accurate, accessible, and trustworthy. This can sometimes be a challenge, such as when the data is available but it is not stored centrally, systems do not interface, or manual processes affect the integrity of the data and prevent it from becoming information. Ultimately, data unto itself is useless; it is the capacity to store, retrieve, and analyze data like never before that makes buzzwords like business intelligence tools so attractive. Institutions have an opportunity to take advantage of leveraging their data by using analytics to support critical institutional outcomes.

³ <http://campustechnology.com/articles/2013/06/24/report-students-taking-online-courses-jumps-96-percent-over-5-years.aspx>

Workforce Departures Accelerate in the Next 10 Years: According to the Executive Office of Elder Affairs in Massachusetts, the population of individuals aged 60 and over is expected to increase by 48.8% by 2020⁴. This trend can be projected to impact information technology professionals as well as other administrative, management, and clerical positions at the PACE institutions in the coming 10 years. This trend is likely to be an increasingly significant factor upon the workforce as people near retirement age.

EDUCAUSE Top-Ten IT Issues

EDUCAUSE, a leader in data collection for IT in higher education, produces a report each year identifying the Top-Ten IT Issues in higher education.

Top-Ten IT Issues, 2013

1. Leveraging the wireless and device explosion on campus
2. Improving student outcomes through an approach that leverages technology
3. Developing an institution-wide cloud strategy to help the institution select the right sourcing and solution strategies*
4. Developing a staffing and organizational model to accommodate the changing IT environment and facilitate openness and agility
5. Facilitating a better understanding of information security and finding appropriate balance between infrastructure openness and security
6. Funding information technology strategically*
7. Determining the role of online learning and developing a sustainable strategy for that role
8. Supporting the trends toward IT consumerization and bring-your-own device*
9. Transforming the institution's business with information technology*
10. Using analytics to support critical institutional outcomes*

*Also one of the 2012 Top-Ten IT Issues

The issues identified by EDUCAUSE are also consistent with our current higher education experience and our observations at the PACE institutions.

⁴ We recognize that this statistic includes individuals who are both employed and unemployed. Source: <http://www.mass.gov/elders/regs-stats/elder-population/>

Section #2 | Institutional Snapshots

This section captures an overview of information collected from each PACE institution via interviews and requests.

BerryDunn has developed “Institutional Snapshots” that present a quick view of the current environment at each institution. This view includes information gathered by BerryDunn during on-site interviews and information self-reported by each institution.

On the following pages, we first present a collective snapshot depicting information for all PACE institutions. Subsequently, we present information on each institution.

In each snapshot, a quick facts table displays key information such as the student population size, campus expenditures, IT expenditures, and IT projects. In addition, each page includes an introduction and the strategic direction of the institution. Lastly, challenges and strengths observed are described as determined by our on-site interviews and observations.

Please note that FY2012 data was primarily used throughout this report, as FY2013 data was not complete at the time the assessment was performed. However, IT project data reflects projects that were planned or just underway as of April 2013.

The table below displays a “snapshot” of the collective institutions in aggregate.

All PACE Institutions			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Total Student FTE	106,249	Ellucian	\$ 3,395,000
Total Institutional FTE (Faculty & Staff)	13,116	Blackboard	\$ 1,950,000
Total Institutional FTE (Faculty, Staff, & Students)	119,365	Microsoft/SHI International	\$ 1,513,000
Total Student Headcount	190,330	Oracle	\$ 1,099,000
Total College Expenditures	\$ 1,503,380,391	Cisco	\$ 530,000
Total Central IT Expenditures	\$ 73,592,647		
Central IT Expenditures to Total Expenditures	4.9%	Top Five IT Projects as Reported by Projected Cost	Proposed Cost
Central IT Staff FTE	516	Computer Refresh/Replacement	\$ 1,404,000
Student IT Workers FTE	151	VDI	\$ 588,000
Top Key Enterprise Systems	Name	Website Redesign	\$ 510,000
ERP	Banner, Colleague, Jenzabar, PeopleSoft	Disaster Recovery	\$ 380,000
LMS	Blackboard/Angel, Moodle, Canvas	Customer Relationship Mgmt	\$ 360,000
Helpdesk	HEAT, Numara Footprints, SchoolDude, Perceptis	Basic Infrastructure Ranges Facts	
Portal	Luminis, Homegrown,	Network Connectivity Speed	10 - 500mbps
Email	Colleague, JICS, Moodle	% of Servers Virtualized	17 - 94%
	Google, Microsoft		

Total IT Expenditures

The total IT expenditures for all 24 institutions in FY2012 was \$83,822,403. The total Central IT expenditures were \$73,592,647. The difference of \$10,229,756 represents decentralized, or department specific, IT expenditures. From a sampling of eight institutions (three State Universities and five Community Colleges), we identified that the average salaries and fringe expense comprised 49% of the total Central IT expenditures.

On the following page, we compare aggregate PACE institutional infrastructure with Educause benchmark data for relevant institution classifications.

How Institutions Compare to National Data within the Same Carnegie Classification

Table 1: Comparative Data of Community Colleges and Educause Core Data Service from 2012
Carnegie Classification = Associate's Institutions⁵

EDUCAUSE 2012		PACE Community Colleges		
Description	Educause Data	Minimum	Average	Maximum
Total Central IT spending as a percentage of institutional budget	6%	2.4%	5.2%	7.6%
Central IT spending per institutional employee (faculty and staff)	\$ 4,328	\$ 1,598	\$ 5,679	\$ 10,464
Central IT spending per institutional employee (faculty, students, and staff)	\$ 519	\$ 181	\$ 572	\$ 933
Percentage of institutional IT spending outside of central IT	3%	0%	13.9%	38.0%
Central IT staff as a percentage of institutional employees (faculty and staff)	3%	1.7%	4.3%	7.8%

Table 2: Comparative Data of State Universities and Educause Core Data Service from 2012
Carnegie Classification = Master's Institutions⁶

EDUCAUSE 2012		PACE State Universities		
Description	Educause Data	Minimum	Average	Maximum
Total Central IT spending as a percentage of institutional budget	5%	3.0%	4.2%	6.2%
Central IT spending per institutional employee (faculty and staff)	\$ 5,046	\$ 3,934	\$ 5,426	\$ 7,152
Central IT spending per institutional employee (faculty, students, and staff)	\$ 779	\$ 521	\$ 730	\$ 933
Percentage of institutional IT spending outside of central IT	6%	0.0%	10.8%	32.8%
Central IT staff as a percentage of institutional employees (faculty and staff)	5%	1.9%	3.9%	4.8%

⁵ Reflects data collected from 112 survey participants nationally

⁶ Reflects data collected from 216 survey participants nationally

Graphical Summary of ERP, LMS, Portal, Help Desk and Email Systems for Institutions

The following pie charts represent the data collected from the 24 institutions regarding the ERP system, Learning Management System (LMS), and other major applications in use. Following the charts are the “snapshots” of each institution.

Figure 1 represents the distribution of ERP systems in use at the institutions. Collectively, Banner and Colleague amount to 19 schools that are using an Ellucian product.

Figure 1: Institutions ERP Distribution

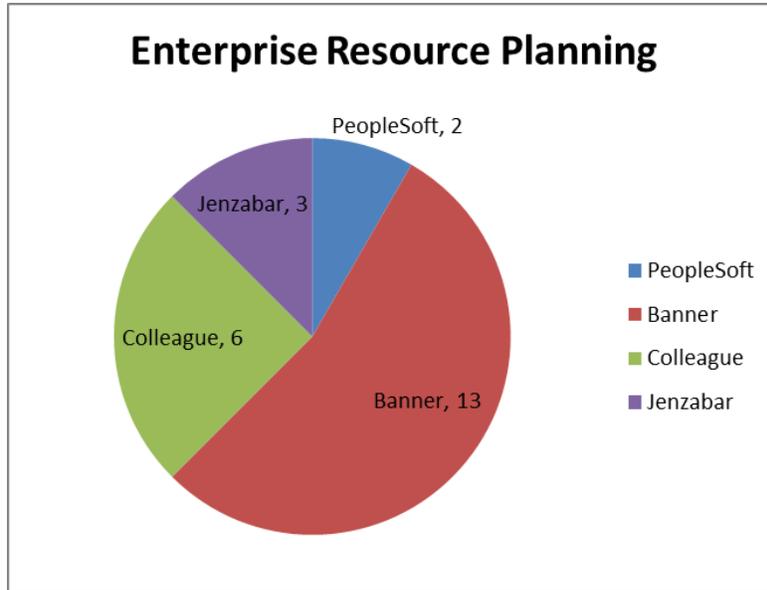
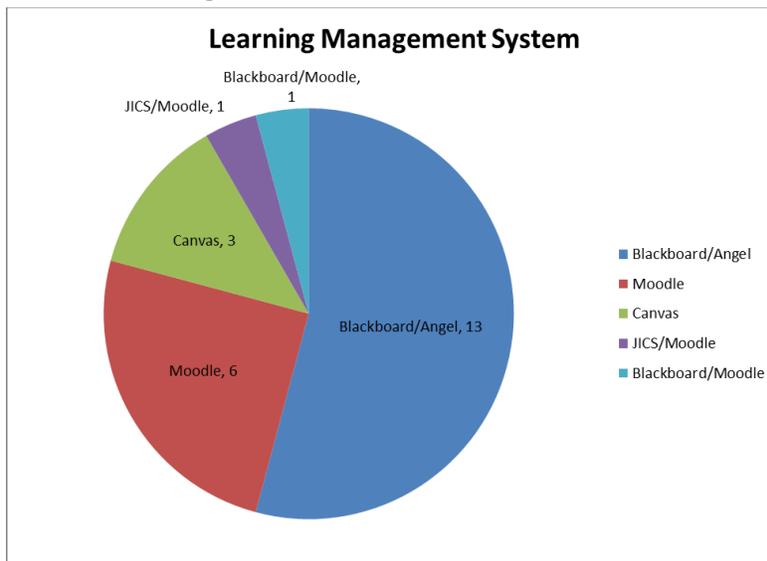


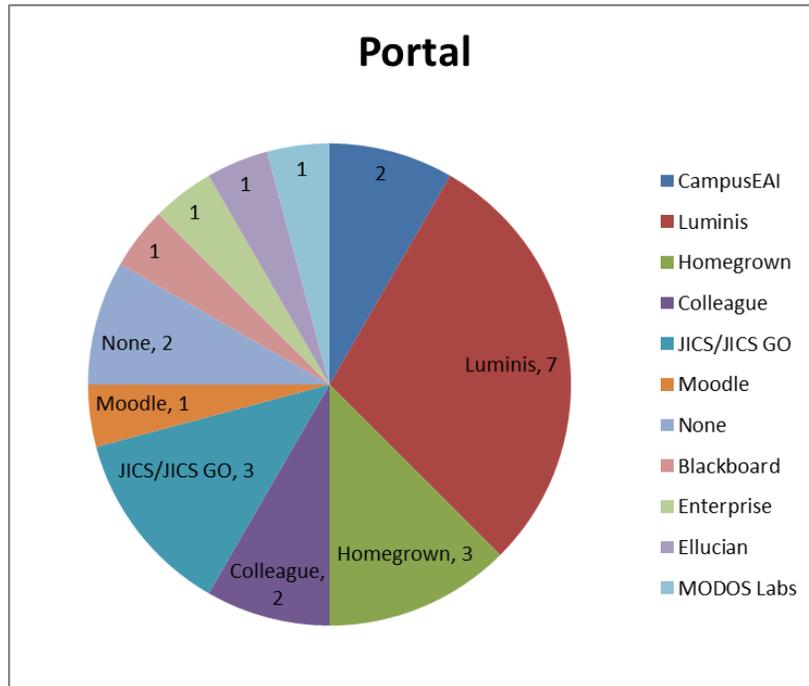
Figure 2 presents the distribution of LMS products as reported at the institutions. Blackboard is in use at almost two thirds of the schools. However, unlike ERP, LMS platform has been in flux.

Figure 2: Institutions LMS Distribution



A total of 11 vendors (including homegrown systems) are used for portal services, as displayed in Figure 3.

Figure 3: Institutions Portal Distribution



A total of 16 vendors provide HelpDesk software/services to the institutions (this includes schools that are not contracting for HelpDesk software/services). The breakout is presented in Figure 4.

Figure 4: Institutions HelpDesk Distribution

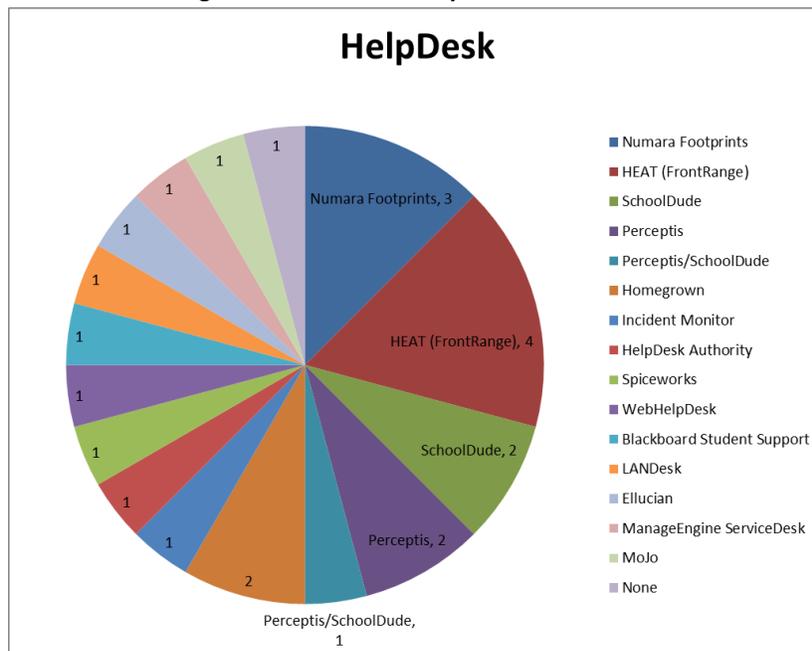


Figure 5 presents the distribution of student email systems in use at the institutions. Google is the email of choice for 54% of schools.

Figure 5: Institutions Student Email Distribution

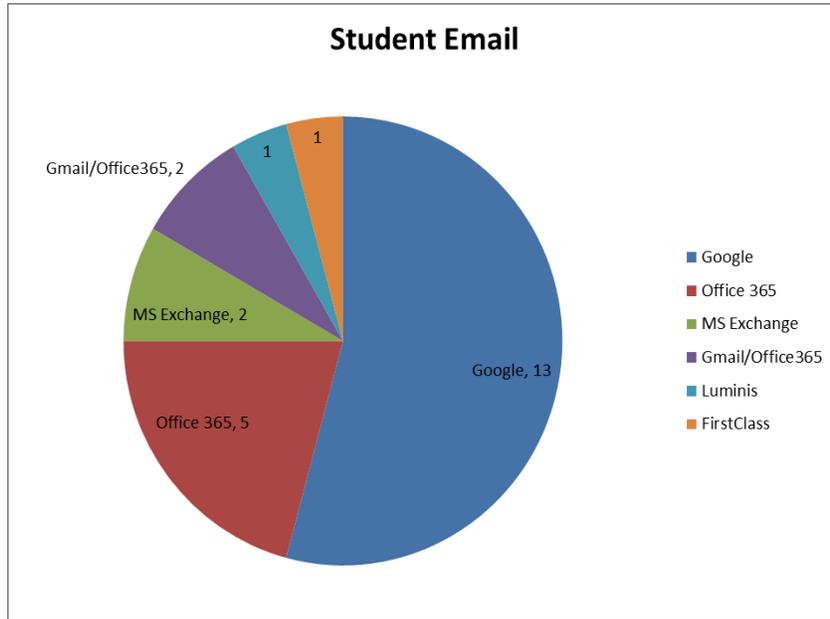
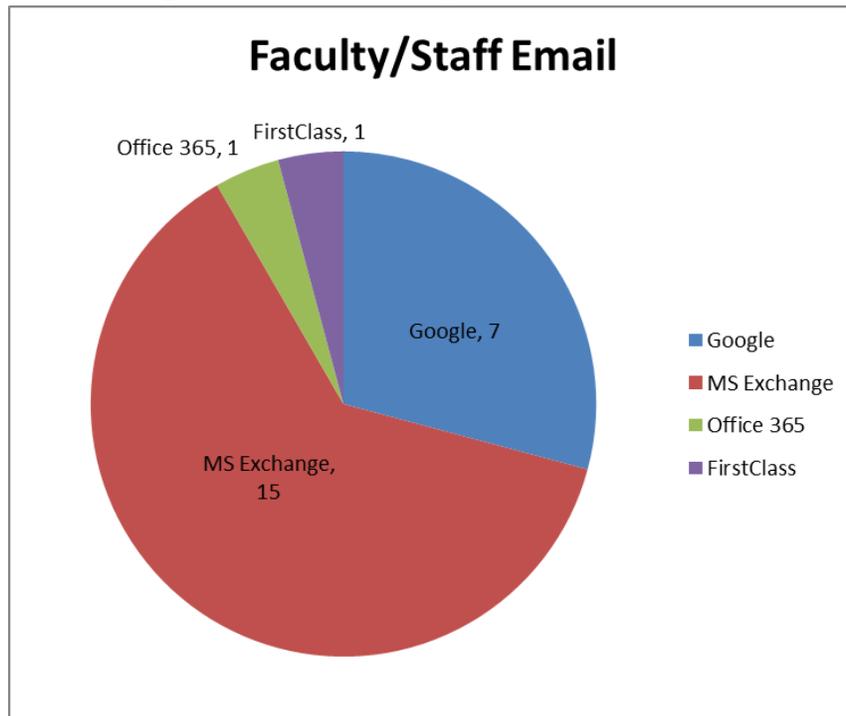


Figure 6 presents the distribution of Faculty/Staff email systems in use at the institutions. Microsoft Exchange is the email system of choice for 58% of schools.

Figure 6: Institutions Faculty/Staff Email Distribution



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Individual Institutional Snapshots

The following pages present information on each of the 24 institutions.

Berkshire Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	1,557		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	232	Ellucian	\$ 170,654
Total Institutional FTE (Faculty, Staff, & Students)	1,789	Multi-function Printer Lease	\$ 70,835
Student Headcount	2,566	Moodle	\$ 17,500
Total College Expenditures	\$ 24,745,694	Cisco Smartnet	\$ 16,225
Central IT Expenditures	\$ 1,411,069	Phone System Maintenance	\$ 15,252
Central IT Expenditures to Total Expenditures	5.7%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	7	Network Infrastructure Upgrade	\$ 500,000
Student IT Workers FTE	2	Colleague Report & Operating Analytics	\$ 150,000
IT Reports to whom?	VP of Admin & Finance	Web Site Upgrade/CMS Implementation	\$ 150,000
Key Enterprise Systems	Name	Colleague SQL Migration	\$ 100,000
ERP	Colleague	Computer Replacements	\$ 100,000
LMS	Moodle	Basic Infrastructure	Facts
Helpdesk	Homegrown	Network Connectivity Speed	100mbps
Portal	Colleague	WAN Provider Name	Time Warner Cable
Student Email	Gmail	% of Servers Virtualized	17%
Faculty/Staff Email	Office 365		
Advancement	Donor Perfect		
Imaging	PaperVison		

Overview

Berkshire Community College (BCC) was the first community college established by the Commonwealth. Located in Pittsfield with a satellite location in Great Barrington, it offers 35 associate degree and 15 certificate programs. It has a more isolated population than most of the institutions, with 95% of its students from Berkshire County, and 41% “nontraditional” students.

Strategic Direction

BCC serves a critical need in the rural western Massachusetts area. The College is looking to improve their reporting capability by having more robust analytics and adding longitudinal reporting capability for Institutional Research and assessment. The College also seeks to expand mobile device applications, LMS capabilities, and virtualization solutions.

Challenges/Opportunities

- Difficulty finding vendors, resources, and technical expertise.
- The Colleague ERP system is highly customized and requires significant operational support from IT.
- Difficulty meeting state reporting requirements due to the current lack of data standards and definitions.
- IT struggles to keep up with resource demands for grant-funded projects with little advanced notification.

Strengths Observed

- Network infrastructure needs updating.
- Proactively looking to move emergency phones to VoIP due to aging physical infrastructure.
- Berkshire has purchased additional Colleague modules to create data marts and warehouses and an advance query tool for reporting.

Bridgewater State University			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	9,067		
Residential Y/N?	2,793		
Total Institutional FTE (Faculty & Staff)	1,095	Dell	\$ 387,643
Total Institutional FTE (Faculty, Staff, & Students)	10,162	Ellucian Banner	\$ 311,842
Student Headcount	11,294	Microsoft	\$ 306,176
Total College Expenditures	\$ 126,473,940	Cisco	\$ 140,673
Central IT Expenditures	\$ 7,831,951	Blackboard	\$ 93,830
Central IT Expenditures to Total Expenditures	6.2%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	53	Improve Course Scheduling	\$ 112,000
Student IT Workers FTE	14	Banner Travel & Reimbursement Module	\$ 100,000
IT Reports to whom?	President	Migrate Blackboard LMS to Moodle	\$ 60,000
Key Enterprise Systems	Name	SQL Server Upgrade Project	\$ 50,000
ERP	Banner	Banner Campus Codes	\$ 46,400
LMS	Blackboard/Moodle	Basic Infrastructure	Facts
Helpdesk	Numara Footprints	Network Connectivity Speed	500/200mbps
Portal	CampusEAI	WAN Provider Name	Sidera/Tower Stream
Student Email	Office 365	% of Servers Virtualized	63%
Faculty/Staff	Microsoft Exchange		
Advancement	Raiser's Edge		
Imaging	Xtender		

Overview

Bridgewater State University has experienced significant growth by focusing on maintaining a strong student to faculty ratio. Bridgewater has invested in the students with plans for a new science center. The University maintains more than 20 computer labs strategically located across the campus.

Strategic Direction

The focus is on maintaining small classes, good retention rates, and regular upgrades to learning center and classroom technologies. Looking to gain efficiencies through collaboration, Bridgewater hopes to strengthen the Connect Consortium.

Challenges/Opportunities

- New release of Banner will require more technical and functional staff development.
- Involvement of academic and administrative user groups in determining Banner service priorities will alleviate some of the burden on IT resources as well as garner buy-in from users.
- Advancement is responsible for maintaining and operating application of their server environment while IT is responsible for hardware, OS, patching, etc.

Strengths Observed

- New chart of accounts to meet the needs of managing the business operations of the university.
- Investments have been made with a third party to assist in moving forward with a Project Management Methodology.
- The technology at the campus is well maintained through contract reviews and requirement reviews.
- IT service to the Academic Departments is addressed by Service Level Agreements (SLAs).

Bristol Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	5,654		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	577	Ellucian	\$ 168,951
Total Institutional FTE (Faculty, Staff, & Students)	6,231	Blackboard	\$ 136,638
Student Headcount	11,949	Smart Catalog	\$ 42,000
Total College Expenditures	\$ 61,407,942	Microsoft	\$ 28,262
Central IT Expenditures	\$ 2,759,029	TerminalFour	\$ 29,495
Central IT Expenditures to Total Expenditures	4.5%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	26.5	Phone System Overhaul	\$ 150,000
Student IT Workers FTE	2	New Web Content Management System/Website	\$ 115,000
IT Reports to whom?	President	Digital Signage	\$ 40,000
Key Enterprise Systems	Name	VDI View Pilot	\$ 30,000
ERP	Banner	Core Router Upgrade	\$ 28,000
LMS	BlackBoard Angel	Basic Infrastructure	Facts
Helpdesk	HEAT (FrontRange)	Network Connectivity Speed	250mbps
Portal	Ellucian Luminis Basic	WAN Provider Name	Meganet
Student Email	Luminis	% of Servers Virtualized	67%
Faculty/Staff Email	MS Exchange		
Advancement	Blackbaud Raiser's Edge		
Imaging	Xtender		

Overview

Bristol Community College is one of the largest community colleges in the Commonwealth and offers more than 120 career and transfer programs for associate's degrees in science, arts, applied sciences, and certificates of accomplishment or achievement. Bristol has four locations around the county including Fall River, New Bedford, Attleboro, and Taunton.

Strategic Direction

Bristol has four directions in its college strategic plan: *Successful Students, Sustainable Growth and Change, Engaged Campuses, and Strong Partnerships*. With one of the highest retention rates in the Commonwealth, the focus is to continue supporting student needs by expanding online offerings. With a focus on sustainability, the school provides paperless bills and grades. Security and emergency preparedness is a concern for the institution and will require the collaboration of IT and facilities to implement sirens, door locking, and campus-wide communication systems.

Challenges/Opportunities

- E-Learning is not part of IT, but IT provides support.
- Faculty contracts are manual and there is a desire to automate them.
- E-Learning has accelerated enrollment growth, but requires more support from IT.
- Project reports are issued monthly, but there is no formalized Project Management philosophy.
- Data standards are in place.

Strengths Observed

- The College has embraced sustainability and uses document imaging extensively to reduce paper consumption and travel between campuses.
- IT reviews all technology purchases on campus for approval.
- There are staff development funds available for training and conferences.
- There is an IT governance committee in place.

Bunker Hill Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	8,470		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	721	Ellucian Banner	\$ 262,500
Total Institutional FTE (Faculty, Staff, & Students)	9,191	Verizon	\$ 145,000
Student Headcount	20,407	UMass	\$ 100,000
Total College Expenditures	\$ 80,407,057	Cisco	\$ 149,566
Central IT Expenditures	\$ 4,391,066	Microsoft	\$ 92,049
Central IT Expenditures to Total Expenditures	5.5%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	38	Workstation Refresh	\$ 280,000
Student IT Workers FTE	2	Implement CRM Solution	\$ 250,000
IT Reports to whom?	CFO	Expand DR Site Capabiliy	\$ 130,000
Key Enterprise Systems	Name	BYOD Solution	\$ 130,000
ERP	Colleague	VDI	\$ 20,000
LMS	Moodle	Basic Infrastructure	Facts
Helpdesk	Incident Monitor	Network Connectivity Speed	200mbps
Portal	Ellucian Portal (SharePoint based)	WAN Provider Name	UMASS UITs
Student Email	MS Exchange	% of Servers Virtualized	74%
Faculty/Staff Email	MS Exchange		
Advancement	Raiser's Edge		
Imaging	Perceptive Image Now		

Overview

Bunker Hill is one of the largest and fastest growing community colleges in the Commonwealth. With a high percentage of first generation college students and international students, the student body speaks 90+ languages. It provides a high level of logistical support to students, such as bus passes, food and emergency funds, and other programs such as the Compelling Conversation series to provide an environment that assists in student retention.

Strategic Direction

Life Map (<http://www1.bhcc.mass.edu/lifemap/>) offers an integrated support to support student success. Also, the college is expanding course offerings and class times to make better use of limited classroom space.

Challenges/Opportunities

- IT needs advanced warning of outside projects for planning, especially for grant applications.
- Updated IT job descriptions would strengthen allocation of staffing resources.
- Plans to incorporate the "Life Map" project with Ellucian SharePoint portal with program.

Strengths Observed

- Customer service is approached with immediacy by IT, having implemented a "first call" approach.
- CampusWorks provides an on-site CIO to provide start up expertise for special projects.
- Effective review process for IT vendor due diligence.
- Extensive use of the delivered Colleague functionality with few customizations.

Cape Cod Community College			
Institutional Data as reported by IPEDS	FY 11-12		
Student FTE	2,750	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	390		
Total Institutional FTE (Faculty, Staff, & Students)	3,140	Jenzabar	\$ 145,000
Student Headcount	6,530	Starfish	\$ 33,000
Total College Expenditures	\$ 30,967,270	Adobe Suites	\$ 28,000
Central IT Expenditures	\$ 1,230,927	Windstream	\$ 27,600
Central IT Expenditures to Total Expenditures	4.0%	VMWare	\$ 25,000
Central IT Staff FTE	22.75	Top Five IT Projects as Reported by Cost	Proposed Cost
Student IT Workers FTE	0		
IT Reports to whom?	VP of Finance		
Key Enterprise Systems	Name	VDI	\$ 500,000
ERP	Jenzabar	Network Upgrades	\$ 400,000
LMS	Moodle	Data Center Redundancy	\$ 200,000
Helpdesk	HelpDesk Authority	Basic Infrastructure	Facts
Portal	JICS (Campus Web)		
Student Email	Office 365		
Faculty/Staff Email	Microsoft Exchange	Network Connectivity Speed	500/30mbps
Advancement	Starfish	WAN Provider Name	Comcast/UMass
Imaging	None	% of Servers Virtualized	73%

Overview

Cape Cod Community College has two campuses: the main campus in West Barnstable, and a secondary campus with six classrooms in Hyannis. It offers associate’s degrees in art and science as well as career certificates, and works in partnership with some four-year institutions to provide undergraduate and graduate degrees. It also provides dual enrollment options for local high school students and programs for returning adult students.

Strategic Direction

Geographic location and the large tourism in the region create challenges. The college sees the opportunity to focus on offering more online classes and to reposition the school to assist with the economic development of the Cape. They have also invested in creating new pathways for learning, such as an Licensed Practical Nurse (LPN) to Registered Nurse (RN) program on Martha’s Vineyard and a partnership with marine biology labs in the area.

Challenges/Opportunities

- No IT governance model in place.
- Jenzabar is not used to its fullest capacity.
- Broadband connectivity is weak.
- No formal technology budget planning in place.
- IT needs more helpdesk staff to meet demands.
- Departments have different contracts for printers/copiers.

Strengths Observed

- The CIO is on the President’s cabinet.
- IT has invested in Virtual Desktop Infrastructure (VDI) technology, and has rolled out the technology to the campus. There are plans to offer the VDI services to local area high schools and non-profits in the area as a revenue generator.

Fitchburg State University			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	4,476		
Residential Y/N?	1,623		
Total Institutional FTE (Faculty & Staff)	597	Ellucian-Banner	\$ 209,752
Total Institutional FTE (Faculty, Staff, & Students)	5,073	Windstream	\$ 205,260
Student Headcount	6,891	Blackboard	\$ 171,723
Total College Expenditures	\$ 92,494,275	SHI International	\$ 129,218
Central IT Expenditures	\$ 3,203,175	Ricoh	\$ 119,691
Central IT Expenditures to Total Expenditures	3.5%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	25	Replace Network Core	\$ 379,500
Student IT Workers FTE	8	Fiber Replacement	\$ 161,000
IT Reports to whom?	President	Blackboard Analytics	\$ 98,000
Key Enterprise Systems	Name	Cable TV Contract renewal	\$ 81,000
ERP	Banner	WEBS Emergency Notification Review	\$ 48,616
LMS	Blackboard	Basic Infrastructure	Facts
Helpdesk	Perceptis/Gmail	Network Connectivity Speed	300mbps
Portal	MODOS Labs	WAN Provider Name	Windstream
Student Email	Gmail	% of Servers Virtualized	53%
Faculty/Staff Email	Microsoft Exchange		
Advancement	Raiser's Edge		
Imaging	Xtender		

Overview

Fitchburg State University is a four-year University providing liberal arts, science, and professional programs in a small college environment. Fitchburg State is committed to the community it serves, and offers the opportunity for traditional campus learning environments as well as online learning.

Strategic Direction

Fitchburg State is focused on employing technology in an innovative way to support student learning, and builds partnerships within the community to best prepare students for a “global society.” The focus is on moving towards a service delivery model that provides state-of-the-art technology and fostering a learning-based environment that incorporates technology in several programs.

Challenges/Opportunities

- Like most schools, they are challenged in meeting the demand for support of the new technologies students bring to campus.
- Data standards have been published but are not always enforced across campus.
- Additional training programs are needed to educate staff to better utilize Banner functionality.

Strengths Observed

- Outsourced HelpDesk provides 24/7 support; 80% of issues resolved IT staff are involved.
- A vendor scorecard system is in place to review contracts and vendor performance annually.
- Using the cloud to reduce staff responsibilities.
- Regular surveys are used to gauge satisfaction with IT services.
- Identity Management tools are in place with automated provisioning.

Framingham State University			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	4,710		
Residential Y/N?	1,976		
Total Institutional FTE (Faculty & Staff)	729	Blackboard	\$ 347,068
Total Institutional FTE (Faculty, Staff, & Students)	5,439	Ellucian Banner	\$ 273,798
Student Headcount	6,415	Microsoft/SHI International	\$ 120,127
Total College Expenditures	\$ 80,262,601	Touchnet	\$ 79,200
Central IT Expenditures	\$ 4,247,188	Blue Spruce Technologies	\$ 54,924
Central IT Expenditures to Total Expenditures	5.3%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	25	Avaya Telephone System Upgrade	\$ 208,000
Student IT Workers FTE	15	Upgraded Technology Installation	\$ 155,000
IT Reports to whom?	VPAA & VP of Finance	Replace Helpdesk Tool	\$ 98,000
Key Enterprise Systems	Name	Basic Infrastructure	Facts
ERP	Banner	Replace Room Scheduling Software	\$ 90,000
LMS	Blackboard	IT Services Management Improvement (based on ITIL)	\$ 60,000
Helpdesk	HEAT (FrontRange)		
Portal	Luminis		
Student Email	Office 365		
Faculty/Staff Email	Microsoft Exchange	Network Connectivity Speed	300mbps
Advancement	Raiser's Edge	WAN Provider Name	UMASS ITS
Imaging	Xtender	% of Servers Virtualized	30%

Overview

Framingham State University offers 27 undergraduate degree programs in arts, humanities, sciences, social sciences, and professional fields. Technology enhanced classrooms and interactive learning environments available on the Internet are integrated throughout the curriculum. Nearly 2,000 students reside in 7 newly-renovated residence halls.

Strategic Direction

The University is three years into their five-year strategic plan. The plan is updated on a yearly basis. As part of the plan, the University is focusing on making technology easy to use and more accessible to the entire campus population. In addition, the University wants to enhance hybrid course offerings to serve the diversified student population. Likewise, the University is exploring the option of teaching language courses via video to expand enrollment in those courses.

Challenges/Opportunities

- Cap on hiring Full-Time Equivalents (FTEs) makes support of systems and IT service delivery difficult. Part-time contractors (limited to 18 hours/week) no longer fill vacant positions due to departures and lack of applicants.
- DBA and operating system support services are contracted through Ellucian and Strata Information Group (SIG) on an as-needed basis to augment the DBA on staff for projects, to provide expertise, and to provide coverage during extended absences.

Strengths Observed

- No Information Security Officer on staff.
- 24/7 Blackboard support and HelpDesk staffed 7 days a week available to students, faculty and staff.
- Agreement with UMASS for MITI network access and a DR backup site.
- Use of cloud technologies to reduce workload on IT.
- All Banner modules licensed by the University have been implemented in conjunction with operational data store, job scheduling, imaging, workflow, and portal.

Greenfield Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	1,514		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	182	Ellucian	\$ 60,044
Total Institutional FTE (Faculty, Staff, & Students)	1,676	Oracle	\$ 50,517
Student Headcount	3,244	MS Campus	\$ 19,351
Total College Expenditures	\$ 26,815,750	PBX System Maintenance	\$ 12,000
Central IT Expenditures	\$ 1,579,755	Nelnet	\$ 7,263
Central IT Expenditures to Total Expenditures	5.9%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	14	CORE switch Upgrade	\$ 95,000
Student IT Workers FTE	2	Computer Refresh	\$ 46,000
IT Reports to whom?	CFO	VDI Expansion	\$ 8,000
Key Enterprise Systems	Name	Active Directory Domain Upgrade	\$ 8,200
ERP	Banner	MoodleDB	\$ 5,200
LMS	Moodle	Basic Infrastructure	Facts
Helpdesk	Spiceworks	Network Connectivity Speed	125mbps
Portal	Homegrown	WAN Provider Name	Earthlink/Comcast
Student Email	Gmail	% of Servers Virtualized	22%
Faculty/Staff Email	Gmail		
Advancement	Raiser's Edge		
Imaging	Homegrown		

Overview

Greenfield Community College focuses on creating an environment for students interested in receiving an education and developing job skills in specific areas. It offers associate’s degrees and certificate programs for students entering the workforce and provides academic planning services for students moving on to four-year colleges. It is the only institution of higher education in Franklin County and attracts students from Southern Vermont and New Hampshire.

Strategic Direction

Greenfield’s priority is to make education as accessible and affordable for the area as possible by offering online education and access to technology that may not be available at home. Their additional focus is on developing programs for lifelong education strategies that fit the needs of the community. Greenfield has received grant funding to continue providing educational programs for developing students for the workforce.

Challenges/Opportunities

- Budgeting and staffing are major concerns for IT.
- IT develops many applications in house to support the needs of the academics and administration.
- Cost of ownership is not considered when acquiring new systems or accepting grants.
- Disaster recovery plans are not documented.

Strengths Observed

- The campus will be a hub for the Massachusetts Broadband Initiative.
- IT is pursuing grant funding to bring more technology and services to the campus.
- All IT contracts are reviewed prior to renewal.

Holyoke Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	4,923		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	727	Ellucian	\$ 131,980
Total Institutional FTE (Faculty, Staff, & Students)	5,651	TouchNet Info Systems	\$ 83,106
Student Headcount	9,425	Oracle	\$ 32,923
Total College Expenditures	\$ 47,964,438	Server System Maintenance	\$ 18,288
Central IT Expenditures	\$ 2,423,845	Dell	\$ 11,130
Central IT Expenditures to Total Expenditures	5.1%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	16	DegreeWorks	\$ 167,000
Student IT Workers Headcount	26	Luminis 5	\$ 152,000
IT Reports to whom?	President	Event/Space Management System	\$ 58,000
Key Enterprise Systems	Name	Basic Infrastructure	Facts
ERP	Banner	Single Sign-on	\$ -
LMS	Moodle		
Helpdesk	WebHelpDesk		
Portal	Luminis		
Student Email	Gmail		
Faculty/Staff Email	Gmail	Network Connectivity Speed	300mbps
Advancement	Raiser's Edge	WAN Provider Name	HGNE
Imaging	SiLo/PaperVision	% of Servers Virtualized	91%

Overview

Holyoke Community College has two locations in Holyoke with a focus on providing liberal arts and general education courses for students in one of the state’s lowest income areas. The College also focuses on providing quality online education to approximately 2,000 students a semester.

Strategic Direction

Holyoke strives to create a four-year college feel at community college prices. The focus is on providing education at the best value for the diverse community and expanding its current culinary and healthcare programs to attract more students. They are currently building a new Center for Life Sciences building with state-of-the-art lab spaces. In addition, the College is focused on meeting the bandwidth expectations of the students, faculty, and staff.

Challenges/Opportunities

- The disaster recovery plan is out of date.
- 70% of the IT operations budget is allocated for maintenance, leaving insufficient funds to undertake new projects.
- There are many manual processes in user departments and IT is experiencing increased demand for more automation.
- Departments are not utilizing Banner’s full functionality and are in need of additional training.

Strengths Observed

- The CIO is on the President’s cabinet.
- The IT department utilizes student workers for lab monitoring, classroom equipment setup, and troubleshooting.
- Classroom technology standards are in place to address refresh/upgrades for technology in the classroom.
- IT is responsible for evaluating all technology purchases before they are made.

Massachusetts Bay Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	3,588		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	370	Blackboard	\$ 242,146
Total Institutional FTE (Faculty, Staff, & Students)	3,958	Oracle (PeopleSoft)	\$ 241,413
Student Headcount	8,067	Dell	\$ 127,705
Total College Expenditures	\$ 44,953,059	UMass ITS	\$ 111,000
Central IT Expenditures	\$ 2,295,394	HP	\$ 93,653
Central IT Expenditures to Total Expenditures	5.1%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	14	PeopleSoft Upgrade	\$ 1,700,000
Student IT Workers FTE	0	Network Upgrades to Wire/Wireless	\$ 900,000
IT Reports to whom?	VP of Finance	Online Catalog	\$ 50,000
Key Enterprise Systems	Name	Online Student Orientation	\$ 50,000
ERP	PeopleSoft	HelpDesk Replacement	\$ 40,000
LMS	Blackboard	Basic Infrastructure	Facts
Helpdesk	Blackboard	Network Connectivity Speed	300/100mbps
Portal	Homegrown	WAN Provider Name	UMASS/Comcast
Student Email	Gmail/Office365	% of Servers Virtualized	93%
Faculty/Staff Email	Microsoft Exchange		
Advancement	Raiser's Edge		
Imaging	None		

Overview

Mass Bay is an open-access community college offering associate's degrees and certificate programs. It operates three campuses: the main campus in Wellesley Hills, a secondary campus in Framingham, and an Automotive Technology Center in Ashland. Although Mass Bay is located outside Boston, the college attracts many students from Boston who are looking to attend a school outside the city in order to have a more traditional college experience.

Strategic Direction

The strategic plan at Mass Bay is geared towards innovation and incorporating current technology within the curriculum. The institution recognizes the importance of providing faculty with the tools to utilize technology in the classroom and continuing to grow online learning opportunities for students. Seeking to prepare students for graduation, Mass Bay is strengthening partnerships with area businesses, the community, and other colleges and universities.

Challenges/Opportunities

- Staff and resources are stretched due to the diversity of services they must provide.
- There are limited back-ups for key personnel.
- Third-party management of marketing content limits the ability for support from IT.
- Mass Bay does not have an active DR site, but is planning to repurpose the Storage Area Network (SAN) as a DR server at the Framingham Campus.

Strengths Observed

- The CIO is working to establish operational procedures and develop a standard operating manual for the IT Department.
- Specific areas of IT expenditures have been reduced through better procurement practices.
- Upgrading the Financial and Student Applications.
- IT works closely with the faculty and Center for Learning Technology.

Massachusetts College of Art and Design			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	1,998		
Residential Y/N?	370		
Total Institutional FTE (Faculty & Staff)	415	Ellucian	\$ 164,239
Total Institutional FTE (Faculty, Staff, & Students)	2,413	Cisco/Eplus	\$ 47,384
Student Headcount	3,292	Studica/AudoCad	\$ 45,450
Total College Expenditures	\$ 53,687,622	Colleges Of the Fenway	\$ 45,245
Central IT Expenditures	\$ 1,632,779	Hobsons/Intelliworks (CRM)	\$ 45,000
Central IT Expenditures to Total Expenditures	3.0%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	20	Colocation Implementation	\$ 125,000
Student IT Workers FTE	8	Raiser's Edge Overhaul	\$ 40,000
IT Reports to whom?	Executive Steering Comm.	Implement Contracted ISO	\$ 40,000
Key Enterprise Systems	Name		
ERP	Colleague	Integrate Intelliworks with Colleague	\$ 30,000
LMS	Moodle		
Helpdesk	Numara Footprints	Campus-Wide Printing/Print Management Strategy	\$ 30,000
Portal	Moodle		
Student Email	Gmail	Basic Infrastructure	Facts
Faculty/Staff Email	Gmail	Network Connectivity Speed	2GB
Advancement	Raiser's Edge	WAN Provider Name	Colleges of the Fenway
Imaging	None	% of Virtualized Servers	63%

Overview

Massachusetts College of Art and Design (MassArt) is the only public art college in the United States, accredited by four agencies and offering NASAD degrees. It has a number of existing close collaborations that have resulted in residential building and shared hosted solutions (Colleges of the Fenway). MassArt seeks to produce graduates who will teach art at area schools, as well as train professional artists, designers, and architects.

Strategic Direction

MassArt is focused on providing specialized program offerings and learning resources. IT supports a user-run system with training, power users, and enhanced departmental based reporting self-service capability. MassArt seeks to enhance their web self-service and mobile device offerings for students and faculty.

Challenges/Opportunities

- Specialized course offerings require unique classrooms and teaching technology.
- Like many of the Colleague schools, MassArt will need to convert from Unidata to a Structured Query Language (SQL) database environment.

Strengths Observed

- Colleges of the Fenway Consortium provides a hosted server site and DR capability.
- MassArt has a project manager and is seeking an outsourced security officer with Framingham.
- IT uses a model to bring in outside expertise to implement new technology and allow internal staff to assume the support role on an established framework.
- Actively engaged with Ellucian to reallocate licensing fees to allow implementation of the portal and mobile applications.

Massachusetts College of Liberal Arts			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	1,617		
Residential Y/N?	973		
Total Institutional FTE (Faculty & Staff)	316	Ellucian	\$ 119,197
Total Institutional FTE (Faculty, Staff, & Students)	1,933	Microsoft/SHI International	\$ 47,807
Student Headcount	1,886	Advia Communications	\$ 37,760
Total College Expenditures	\$ 42,349,365	Open Text Corp.	\$ 13,663
Central IT Expenditures	\$ 1,802,958	Digication	\$ 11,000
Central IT Expenditures to Total Expenditures	4.3%		
Central IT Staff FTE	14	Top Five IT Projects as Reported by Cost	Proposed Cost
Student IT Workers FTE	7		
IT Reports to whom?	VP of Admin & Finance	Replace Phone System with VoIP	\$ 766,000
Key Enterprise Systems	Name	Replace Network Infrastructure	\$ 400,000
ERP	Banner	Institutional Information System	\$ 200,000
LMS	Canvas	Replace Email System	\$ 100,000
Helpdesk	Homegrown	Refresh/Redesign Website	\$ 100,000
Portal	None	Basic Infrastructure	Facts
Student Email	FirstClass		
Faculty/Staff Email	FirstClass	Network Connectivity Speed	200 mbps
Advancement	Raiser's Edge	WAN Provider Name	UMASS/Time Warner
Imaging	None	% of Servers Virtualized	94%

Overview

Massachusetts College of Liberal Arts (MCLA) is located in North Adams in the heart of the Berkshires. The residential four-year institution focuses on providing small undergraduate classes, research opportunities, and a close-knit community. MCLA also offers graduate and continuing education programs.

Strategic Direction

MCLA is opening a new Center for Science and Innovation in the fall of 2013. An IT Strategic Plan has been drafted and is awaiting Cabinet approval. The plan includes initiatives such as global IT service, maintaining the current technology, and improving the IT infrastructure.

Challenges/Opportunities

- Constrained bandwidth capacity.
- Many manual paper-based forms are used, which delay processes.
- IT staff requires more cross-training.
- Some data is manually uploaded to Banner.
- IT reports to the CFO, preventing needs from being properly voiced at an executive level.
- Data is not maintained centrally, which creates difficulties in data mining.

Strengths Observed

- An E-portfolio program is in place for each student to have a data repository.
- MCLA hosts an annual “TechFest” to teach and provide training to faculty and staff on new technologies and technology as a whole at MCLA.
- Efforts have been made to centralize IT projects to manage projects costs.

Massachusetts Maritime Academy			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	1,283		
Residential Y/N?	1146		
Total Institutional FTE (Faculty & Staff)	369	Ellucian	\$ 200,000
Total Institutional FTE (Faculty, Staff, & Students)	1,652	Windstream	\$ 60,000
Student Headcount	1,368	Blackboard	\$ 30,000
Total College Expenditures	\$ 49,151,337	Cogent	\$ 26,400
Central IT Expenditures	\$ 1,470,101	Blackbaud	\$ 20,000
Central IT Expenditures to Total Expenditures	3.0%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	7	Recruiter Implementation	\$ 250,000
Student IT Workers FTE	2	Access Layer Switch Upgrade	\$ 200,000
IT Reports to whom?	VP of Academic Affairs	Wireless Network Expansion	\$ 100,000
Key Enterprise Systems	Name	Classroom Technology Upgrade	\$ 80,000
ERP	Colleague	Ship Security System Upgrade	\$ 20,000
LMS	Blackboard	Basic Infrastructure	Facts
Helpdesk	MoJo	Network Connectivity Speed	300mbps
Portal	None	WAN Provider Name	Windstream/Cogent
Student Email	Gmail	% of Servers Virtualized	85%
Faculty/Staff Email	Gmail		
Advancement	Raiser's Edge		
Imaging	ImageSilo		

Overview

Massachusetts Maritime Academy (Mass Maritime) is a small, four-year institution, offering degrees in maritime-related fields, with the majority of students living in on-campus dormitories. All residential students are regimented cadets. Mass Maritime has increased enrollment from 800 to 1,300 FTEs in the last five years.

Strategic Direction

With a capacity of 1,600 FTEs, the focus is to grow enrollment using a hybrid or online format, a big culture change from the current traditional method. Video conferencing and lecture capture technologies will be the key to expanding current classes to a larger population of students. Proactive training and teaching of this pedagogy will be important to future success.

Challenges/Opportunities

- Limited resources allow addition of only a few “smart” classrooms per semester.
- Ellucian administrator spends most time on day-to-day operational user support.
- Reporting to CAO prevents a proper voice at executive level.
- Infrastructure support with a growing enrollment.
- Faculty and staff are underutilizing Blackboard, Ellucian, and Informer due to lack of training.

Strengths Observed

- Utilization of third-party contractor support.
- Use of hosted or cloud services for software applications.
- Cross-training among the staff on the majority of responsibilities within the department.

Massasoit Community College			
Institutional Data as reported by IPEDS	FY 11-12		
Student FTE	5,069	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	646		
Total Institutional FTE (Faculty, Staff, & Students)	5,715	Ellucian	\$ 216,819
Student Headcount	8,263	Verizon	\$ 39,482
Total College Expenditures	\$ 43,290,961	Microsoft	\$ 27,963
Central IT Expenditures	\$ 1,032,509	Ellucian Luminis	\$ 27,812
Central IT Expenditures to Total Expenditures	2.4%	TriNet/Carousel	\$ 22,045
Central IT Staff FTE	25	Top Five IT Projects as Reported by Cost	Proposed Cost
Student IT Workers FTE	0		
IT Reports to whom?	VP of Faculty & Instruction		
Key Enterprise Systems	Name	Campus EAI	\$ 45,000
ERP	Banner	BYOD	\$ 23,000
LMS	Canvas	Footprints	\$ 10,000
Helpdesk	Footprints	Basic Infrastructure	Facts
Portal	Luminis to CampusEAI		
Student Email	Google		
Faculty/Staff Email	MS Exchange/Gmail	Network Connectivity Speed	100mbps
Advancement	Ellucian	WAN Provider Name	Comcast
Imaging	Xtender	% of Servers Virtualized	39%

Overview

Massasoit Community College offers a number of certifications and two-year degree programs, with courses that transfer to four-year schools (including a 2+2 transfer program with Bridgewater State University). It has four locations: Brockton, Taunton, Westborough, and Westbury.

Strategic Direction

The focus is for students to become a visible part of the community and contribute to the community’s development. To meet this goal, the College wants to establish internships with local companies and businesses and work with senior citizens’ organizations in Brockton to provide training and teaching support. In addition, the College is expanding program offerings and investing in staff development to improve efficiencies, as well as implementing additional modules of the ERP system to enhance business operations.

Challenges/Opportunities

- Lack of funds impairs proper support to both the Academic and Administrative functions.
- Mobile applications and networking are growing at a rapid pace and require additional staff support.
- Disaster Recovery needs to become a formal documented process to insure that business continuity is priority.

Strengths Observed

- The CIO has a seat on the President’s Cabinet.
- There is a budgeted computer refresh program for academic labs.
- Help Desk software is being implemented to provide support and tracking for help desk tickets.
- Student ID cards are currently being implemented.

Middlesex Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	6,073		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	431	Campus Works	\$ 480,660
Total Institutional FTE (Faculty, Staff, & Students)	6,504	Pearson	\$ 184,457
Student Headcount	13,267	Blackboard	\$ 156,585
Total College Expenditures	\$ 65,627,058	Carousel Industries	\$ 99,372
Central IT Expenditures	\$ 4,510,096	UMass ITS	\$ 79,314
Central IT Expenditures to Total Expenditures	6.9%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	24		
Student IT Workers FTE	1.5		
IT Reports to whom?	EVP & CFO	Lifecycle Replacements	\$ 1,186,975
Key Enterprise Systems	Name	VDI	\$ 550,000
ERP	Banner	PBX System Upgrade	\$ 160,000
LMS	Blackboard	Disaster Recovery	\$ 120,000
Helpdesk	LANDesk	Network Visibility and Security	\$ 96,000
Portal	Homegrown	Basic Infrastructure	Facts
Student Email	Office365		
Faculty/Staff Email	Microsoft Exchange	Network Connectivity Speed	110/10mbps
Advancement	Raiser's Edge	WAN Provider Name	UMASS ITS
Imaging	None	% of Servers Virtualized	71%

Overview

Middlesex Community College is one of the largest community colleges in the Commonwealth with an open admissions policy and no restrictions on admissions capacity. It is comprised of two campuses split by academic program offerings: a 15-building suburban campus in Bedford and a consolidated two-building urban campus in Lowell. It offers certificates, associate's degrees for career placement, and transfers to four-year programs, and has relationships with both Lowell High School and Billerica High School.

Strategic Direction

Course offerings are shifting to online, night, and weekend classes in order to accommodate the increasing population of working adult students. Additionally, expanding video capacity in the future will allow faculty to broadcast their lectures.

Challenges/Opportunities

- A need for document management of imaging software and paperless processes.
- Students have unlimited printing capacity and there are too many individual staff printers.
- No disaster recovery plan in place, but a full data redundancy exists at the Bedford campus.

Strengths Observed

- Use of a student performance assessment tool.
- Automatic ticket generation at the help desk.
- IT personnel are split between the two campuses providing students, faculty, and staff at both locations access to IT.
- Outsourcing the CIO.

Mount Wachusett Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	3,209		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	572	Blackboard	\$ 139,891
Total Institutional FTE (Faculty, Staff, & Students)	3,781	Ellucian	\$ 89,928
Student Headcount	6,613	Remote Technical Solutions	\$ 75,233
Total College Expenditures	\$ 45,303,408	Microsoft/SHI International	\$ 35,292
Central IT Expenditures	\$ 1,910,781	Campus EAI	\$ 30,290
Central IT Expenditures to Total Expenditures	4.2%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	10	LeepFrop	\$ 82,980
Student IT Workers FTE	1	Hosted Email Migration (Microsoft 365)	\$ 30,000
IT Reports to whom?	Executive VP	Integrated Avaya/Microsoft Lync	\$ 30,000
Key Enterprise Systems	Name	VM Blade	\$ 15,000
ERP	Banner	Active Directory	\$ 7,680
LMS	Blackboard	Basic Infrastructure	Facts
Helpdesk	Perceptis/SchoolDude	Network Connectivity Speed	100mbps
Portal	CampusEAI	WAN Provider Name	DSCI
Student Email	Gmail	% of Servers Virtualized	68%
Faculty/Staff Email	Microsoft Exchange		
Advancement	Excel		
Imaging	None		

Overview

Mount Wachusett Community College has a main campus in Gardner, with additional campuses in Leominster, Devens, and Burbank/Fitchburg. The College is a sustainable campus and committed to green energy, featuring two wind turbines, solar panels, and a biofuel heating building on the main campus. The College is committed to education in the community, and aims to provide educational services in any capacity regardless of age. The College is also committed to service learning and civic engagement by requiring all tenured faculty members to incorporate these elements into the courses.

Strategic Direction

Key initiatives in the IT strategic plan include information security, telecommunications, web services, network administration, and instructional technology. The College is also considering a residential hall to attract more students.

Challenges/Opportunities

- Help desk services are outsourced to Perceptis.
- IT wants VDI, but cannot afford it.
- Lack of funds for VDI.
- No professional development requirements and lack of time to partake in training activities.
- There is no formal IT governance process.
- Students have unlimited printing capabilities.
- IT has data standards in place.

Strengths Observed

- Most classrooms have smart technology.
- Classrooms are on a three-year technology replacement cycle.
- Paperless class rosters, bills, grades, and schedules.
- Surveys are conducted to gauge what types of IT training are desired.
- Secondary data center in Leominster replicating data from the primary data center in Gardner.

North Shore Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	5,253		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	599	Ellucian and Oracle	\$ 241,006
Total Institutional FTE (Faculty, Staff, & Students)	5,852	Verizon	\$ 111,662
Student Headcount	11,187	UMASS	\$ 68,820
Total College Expenditures	\$ 61,937,422	Touchnet	\$ 64,195
Central IT Expenditures	\$ 4,370,058	Avaya	\$ 46,111
Central IT Expenditures to Total Expenditures	7.1%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	22	Voice Mail System Upgrade	\$ 86,000
Student IT Workers FTE	4.5	Banner Hardware Refresh	\$ 60,000
IT Reports to whom?	VP of Admin & Finance	Mobile Device transition	\$ 12,000
Key Enterprise Systems	Name	Basic Infrastructure	Facts
ERP	Banner	Ellucian Mobile	\$ 9,000
LMS	Blackboard Angel	Security Camera and Monitoring System	\$ 8,000
Helpdesk	Ellucian		
Portal	Luminis		
Student Email	Google Apps		
Faculty/Staff Email	Google Apps	Network Connectivity Speed	393mbps
Advancement	Banner/Ellucian	WAN Provider Name	UMASS/Comcast
Imaging	Xtender	% of Servers Virtualized	71%

Overview

North Shore Community College offers two-year associate’s degrees in addition to short-term degree programs, lifelong learning programs, and courses for transfer to four-year institutions. It also offers workforce training, programs for disabled veterans, and online education courses. The College has three locations: Danvers, Lynn, and Beverly.

Strategic Direction

North Shore serves an increasingly diverse student body and seeks to leverage partnerships with other public and private organizations to provide value for its students and the community. They strive to make education accessible and affordable by offering online education programs that allow students to take classes on a schedule that meets their needs. North Shore has a dedication to sustainability and has incorporated sustainability and environmental into its curriculums and practices as an institution.

Challenges/Opportunities

- Although the demand is increasing for system support, funding for IT positions has decreased.
- The multiple interfaces that have been developed in-house to make use of the Banner data could become an issue when upgrading to the next major release.

Strengths Observed

- Provides online hosting services for other PACE community colleges.
- Long-term relationship with colleges for outsourcing IT management and other positions such as DBA when required to fill staffing gaps or special projects.
- A documented Disaster Recovery plan is in progress.
- Implementation of security, system access back-up, and recovery procedures.

Northern Essex Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	4,535		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	544	Ellucian	\$ 138,432
Total Institutional FTE (Faculty, Staff, & Students)	5,079	Blackboard	\$ 113,464
Student Headcount	9,632	Oracle Licensing	\$ 47,564
Total College Expenditures	\$ 56,569,822	Touchnet	\$ 45,826
Central IT Expenditures	\$ 4,120,891	Hardware and Software Support	\$ 32,000
Central IT Expenditures to Total Expenditures	7.3%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	31		
Student IT Workers FTE	0		
IT Reports to whom?	President	Avaya Phone System Upgrade	\$ 195,000
Key Enterprise Systems	Name	Collegenet Course Scheduling	\$ 122,545
ERP	Banner	Virtual Server Environment	\$ 55,000
LMS	Blackboard	Basic Infrastructure	Facts
Helpdesk	SchoolDude		
Portal	Luminis		
Student Email	Office 365		
Faculty/Staff Email	Microsoft Exchange	Network Connectivity Speed	60/25mbps
Advancement	Raiser's Edge	WAN Provider Name	Comcast
Imaging	Treeno	% of Servers Virtualized	67%

Overview

Northern Essex Community College is a two-year institution that offers associate's degrees in arts and sciences, as well as certificate programs. It has a large percentage of Latino students and is an Achieving the Dream institution focused on improving student performance and improving completion rates.

Strategic Direction

The focus is on being one of the lowest cost institutions in the Commonwealth and on growing hybrid course offerings aimed at working adults. With a growing demand on social media and mobile technology needs, Northern Essex is leveraging empowered faculty and creating opportunities for informal knowledge sharing in order to adopt best practices. Implementation of the student portal in summer 2013 will be an important piece of engaging and informing students.

Challenges/Opportunities

- Growing demands for network capacity.
- Maintenance costs were not estimated during the grant application for smart classrooms and are now coming from the IT budget.
- Significant Banner customizations requiring two dedicated developers.
- Need for data standards and data mining.
- Student IT training support is not fully integrated with the IT department.

Strengths Observed

- DegreeWorks is used to create academic plans.
- Recently purchased the CollegeNet scheduling application to improve utilization.
- Help Desk leverages veteran students for more hands-on training and advising in technology issues at the start of each semester.
- Collaboration with other schools when possible.
- Certified an internal staff on Oracle for internal DBA services rather than outsourcing the position.
- Faculty contracts are in Banner.

Quinsigamond Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	5,654		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	630	UMASS	\$ 206,337
Total Institutional FTE (Faculty, Staff, & Students)	6,284	Jenzabar	\$ 187,403
Student Headcount	9,130	Paetec/Windstream	\$ 74,924
Total College Expenditures	\$ 64,750,332	Enterasys Maintenance	\$ 58,462
Central IT Expenditures	\$ 4,912,151	Microsoft	\$ 53,756
Central IT Expenditures to Total Expenditures	7.6%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	21	Security Camera Install	\$ 375,000
Student IT Workers FTE	2.5	Network Infrastructure	\$ 250,000
IT Reports to whom?	VP of Admin Services		
Key Enterprise Systems	Name		
ERP	Jenzabar	Early Alert/Renterion Software	\$ 120,000
LMS	Blackboard	Event Management - Room Scheduling Software	\$ 100,000
Helpdesk	HEAT	Identity Finder	\$ 36,000
Portal	JICS/JICS GO	Basic Infrastructure	Facts
Student Email	Gmail	Network Connectivity Speed	140mbps
Faculty/Staff Email	Exchange	WAN Provider Name	UMASS/Charter
Advancement	Raiser's Edge	% of Servers Virtualized	24%
Imaging	Perceptive ImageNow		

Overview

Quinsigamond Community College is a two-year institution focused on preparing students for workforce placement or transfer to four-year institutions. The College has five campuses and is one of the fastest growing institutions in the Commonwealth, experiencing 50% growth over the last six years.

Strategic Direction

The focus is on increasing transferability across the Commonwealth. By having “stackable” certifications while working towards an associate’s degree, students will have flexible entry and exit points in their curriculum to enter the workforce and start courses throughout the year. The College is also partnering with area high schools to expand the concurrent learning opportunities for high school classes to be eligible for college credit.

Challenges/Opportunities

- Jenzabar is highly customized, requiring a consultant when upgrades are made.
- Progression and upgrade issues in databases.
- Difficult to control the data standards and know what data is current and accurate.
- Payroll data is input into Kronos and HRCMS.
- Need to start succession planning and cross training to prepare for key staff retirement.

Strengths Observed

- A dedicated Information Security Officer (ISO) position in the IT department.
- The ISO is working on developing policies for mobile security. This is a great opportunity for collaboration and standardization across all institutions.
- Moving to SaaS or hosted applications, as needed, to optimize current IT resources. The decision to externally host applications is evaluated on a case-by-case basis.

Roxbury Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	2,317		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	247	Jenzabar	\$ 152,063
Total Institutional FTE (Faculty, Staff, & Students)	2,564	DSCI	\$ 60,000
Student Headcount	3,912	AdvizeX Technologies	\$ 49,041
Total College Expenditures	\$ 29,685,038	RetrioFit Technologies	\$ 45,467
Central IT Expenditures	\$ 936,664	College Board	\$ 18,702
Central IT Expenditures to Total Expenditures	3.2%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	10		
Student IT Workers FTE	0		
IT Reports to whom?	President	Green Datacenter Revitalization	\$ 25,000
Key Enterprise Systems	Name	Citrix Upgrade	\$ 22,000
ERP	Jenzabar	JICS Custom Registration	\$ 18,000
LMS	JICS/Moodle	Room Scheduling Software	\$ 15,000
Helpdesk	ManageEngine ServiceDesk	Security Plan	\$ 15,000
Portal	JICS/JICS GO	Basic Infrastructure	Facts
Student Email	Gmail	Network Connectivity Speed	100mbps
Faculty/Staff Email	Microsoft Exchange	WAN Provider Name	DSCI
Advancement	None	% of Servers Virtualized	74%
Imaging	None		

Overview

Roxbury Community College is a two-year institution located in the Greater Boston area offering associate’s degrees and certificate programs. It is a multi-cultural institution focused on breaking down socio-economic and academic barriers to educational opportunities and making education accessible through open-access.

Strategic Direction

The focus is on expanding opportunities to students by allowing them to build upon certifications, while working towards associate’s degrees. Partnering with industries for immediate workforce placement and expanding the offering of hybrid courses both further this goal.

Challenges/Opportunities

- Due to resource constraints, IT usually provides a first level of troubleshooting support only.
- Training is largely provided by online manuals or third parties without hands-on assistance.
- Funds for the maintenance of classroom technology come from the IT budget as it was not considered in the grant application process.
- Bandwidth demands are increasing on current network infrastructure with the growth of mobile devices on campus and a growing need for more reliable Wireless Access Points (WAP) on campus.

Strengths Observed

- Leads significant faculty training efforts on new technologies.
- Uses collective Requests for Proposal (RFPs) to get better pricing for bookstore and banking contracts.
- Sends regular newsletters to the school community on updates of the Title III Grant progress in classroom technology upgrades, as well as, offering training and education opportunities for faculty.

Salem State University			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	8,097		
Residential Y/N?	3,896		
Total Institutional FTE (Faculty & Staff)	1,018	Oracle	\$ 324,099
Total Institutional FTE (Faculty, Staff, & Students)	9,115	Microsoft	\$ 173,702
Student Headcount	13,387	Comcast	\$ 170,000
Total College Expenditures	\$ 137,696,763	Embark	\$ 142,500
Central IT Expenditures	\$ 6,970,116	Expedient	\$ 84,120
Central IT Expenditures to Total Expenditures	5.1%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	43		
Student IT Workers FTE	18		
IT Reports to whom?	EVP of Administration	Website Redesign	\$ 250,000
Key Enterprise Systems	Name	Library Computer Refresh	\$ 250,000
ERP	PeopleSoft	NCATE Reporting	\$ 153,100
LMS	Canvas	iStrategy Student Financial Aid	\$ 131,000
Helpdesk	Perceptis	CRM	\$ 110,000
Portal	Enterprise	Basic Infrastructure	Facts
Student Email	Gmail/Office365		
Faculty/Staff Email	Exchange	Network Connectivity Speed	300mbps
Advancement	Raiser's Edge	WAN Provider Name	Expedient/Verizon
Imaging	Hyland/Onbase	% of Servers Virtualized	76%

Overview

Salem State University is one of the largest state universities in the Commonwealth. It offers students a variety of degree options including bachelor's, master's, and certificate programs in arts and sciences, humanities and business.

Strategic Direction

Salem State recently achieved university status and is seeking to improve the efficiency of its business operations. It views IT as central to its ability to meet the University's strategic goals.

Challenges/Opportunities

- No off-site recovery facility or data center.
- Additional resources could be used to prevent future security issues.
- Limited staff and resources prevent proper support the growing University and the diversity of services they must provide.
- Use of contractors to support common software equipment and projects that do not require full time staff.

Strengths Observed

- Implementation of a process to prioritize and rank projects, which includes a cross-departmental committee that evaluates the proposed projects based on pre-established criteria.
- Dedicated staff member who is responsible for all technology purchases.
- Positions within the IT department dedicated to cross department project management; gathering and documenting business requirements; and developing and delivering end user training.

Springfield Technical Community College			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	4,358		
Residential Y/N?	No		
Total Institutional FTE (Faculty & Staff)	436	Datatel	\$ 255,219
Total Institutional FTE (Faculty, Staff, & Students)	4,794	SHI International	\$ 87,177
Student Headcount	9,286	Blackboard	\$ 76,007
Total College Expenditures	\$ 67,057,654	Dell	\$ 66,797
Central IT Expenditures	\$ 2,139,207	Cisco SMARTnet/ePlus	\$ 52,728
Central IT Expenditures to Total Expenditures	3.2%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	15.5	Cisco Enhance Communication	\$ 800,000
Student IT Workers FTE	9.5	Cisco Security Access and Video Surveillance	\$ 500,000
IT Reports to whom?	CFO	Ellucian Portal Project	\$ 120,000
Key Enterprise Systems	Name	Disaster Recovery Site	\$ 100,000
ERP	Colleague	Board of Director's Portal	\$ 10,000
LMS	Blackboard Learn	Basic Infrastructure	Facts
Helpdesk	SchoolDude	Network Connectivity Speed	125mbps
Portal	Colleague	WAN Provider Name	UMASS ITS
Student Email	Google	% of Servers Virtualized	56%
Faculty/Staff Email	Google		
Advancement	Raiser's Edge		
Imaging	Perceptive ImageNow		

Overview

Springfield Technical Community College is the only community college that was founded as a technical school. It now offers a wide range of liberal arts programs. The extremely old facility is a historic landmark.

Strategic Direction

The focus is on committed higher management to governance and resource allocation. Springfield's technology will enhance their growing online courses and programs offered and the wide variety of software and labs.

Challenges/Opportunities

- Difficulty extracting data from Colleague for state reporting requirements.
- Human Resources (HR) data is entered twice to capture data sent to the State HRCMS.
- Business Objects reporting application is unwieldy and costly to conform to state reporting requirements.
- Springfield's students need a wide variety of software and labs and this service level puts pressure on maintaining in-house expertise.

Strengths Observed

- Challenges in training resources were noted by both the CIO and CFO.
- Extensive use of the delivered Colleague self-help web system, WebAdvisor, and a large reduction of customizations in recent years.
- They are implementing a portal to provide enhanced student self-service.
- Targeted redeployment of Colleague, in the direction of the new generation of Colleague's web self-service applications.

Westfield State University			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	5,386		
Residential Y/N?	2978		
Total Institutional FTE (Faculty & Staff)	693	Ellucian	\$ 240,352
Total Institutional FTE (Faculty, Staff, & Students)	6,079	Comcast	\$ 207,862
Student Headcount	6,115	Microsoft	\$ 135,935
Total College Expenditures	\$ 95,793,160	Xerox	\$ 85,000
Central IT Expenditures	\$ 3,666,208	BlackBoard	\$ 81,870
Central IT Expenditures to Total Expenditures	3.8%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	21	Paperless Admissions DBMS	\$ 500,000
Student IT Workers FTE	21	Luminis 5	\$ 200,000
IT Reports to whom?	VP of Academic Affairs	Deploy Microsoft 360 for students	\$ 30,000
Key Enterprise Systems	Name	Basic Infrastructure	Facts
ERP	Banner	Banner XE	Unknown
LMS	Blackboard		
Helpdesk	None		
Portal	Luminis		
Student Email	Microsoft Exchange		
Faculty/Staff Email	Microsoft Exchange	Network Connectivity Speed	350/50mbps
Advancement	Final Site/Ruffallo City	WAN Provider Name	UMASS/Comcast
Imaging	None	% of Servers Virtualized	32%

Overview

Westfield State University is a four-year undergraduate institution offering programs in liberal arts and sciences in central Massachusetts. The school has distinguished itself with a strong educational program for students with learning disabilities. Enrollment is up 200 students in the fall, and a new residence hall is under construction.

Strategic Direction

Technology has been installed in 100% of the classrooms to provide an environment for students to gain experience in the latest equipment as part of training for their careers. In addition, there has been a significant investment in library subscription services for student research. The University has also developed special educational programs for veterans.

Challenges/Opportunities

- Lack of resources to implement VDI technology.
- No help desk ticketing system in place; requests come in via email and are addressed by the first person available.
- Lack of training and professional development.
- Vacant positions are not filled to reduce costs.
- No project management methodology in place.
- Perception on campus that IT is falling behind.

Strengths Observed

- Computer equipment is refreshed every four years for faculty and staff.
- Student workers provide services for the help desk, AV group, and Media Services group.
- Every classroom has smart technology, including at least a projector and podium.
- Staff includes a DBA and a Systems Analyst.

Worcester State University			
Institutional Data as reported by IPEDS	FY 11-12	Top Five Greatest Expenditures on IT Vendors as Reported	Contract Amount
Student FTE	4,691		
Residential Y/N?	1,230		
Total Institutional FTE (Faculty & Staff)	580	Blackboard	\$ 232,395
Total Institutional FTE (Faculty, Staff, & Students)	5,271	Ellucian	\$ 216,513
Student Headcount	6,204	Charter	\$ 182,000
Total College Expenditures	\$ 73,988,423	Microsoft/SHI International	\$ 144,964
Central IT Expenditures	\$ 2,744,729	New Horizons	\$ 84,000
Central IT Expenditures to Total Expenditures	3.7%	Top Five IT Projects as Reported by Cost	Proposed Cost
Central IT Staff FTE	27		
Student IT Workers FTE	5		
IT Reports to whom?	VP of Academic Affairs	Upgrade Phone System to VoIP	\$ 250,000
Key Enterprise Systems	Name		
ERP	Colleague	Web Redesign	\$ 160,000
LMS	Blackboard	Upgrade Core Router	\$ 130,000
Helpdesk	HEAT (FrontRange)	Replace SAN	\$ 80,000
Portal	Blackboard	Printer Replacement	\$ 16,420
Student Email	Google	Basic Infrastructure	Facts
Faculty/Staff Email	Google	Network Connectivity Speed	500mbps
Advancement	Raiser's Edge	WAN Provider Name	Charter
Imaging	Perceptive	% of Servers Virtualized	54%

Overview of School

Worcester State University is a four-year institution with 70% of their students from Worcester or the county. The transfer rate from Quinsigamond Community College is rising. The IT department has been under the control of an interim CIO, who restructured the staffing, and a new CIO will be replacing him soon.

Strategic Direction

Worcester is expanding their web presence and providing online graduate programs. The University is expanding their transfer and international student partners to provide more options for the student experience. The University is planning to update their media, TVs, phones, and wireless capabilities.

Challenges/Opportunities

- Media, TVs, and phone technology are aging.
- Attracting qualified staff and providing training.
- Short-term funding sources.
- New state programs have resulted in data definition and processing issues.
- Issues defining data for state reporting and the HR system require double entry to provide the College database with the information.

Strengths Observed

- Promotes an outreach program to push technology training out to school users.
- Implementation of a Blackboard site for facilitation of the training outreach program.
- Good wireless infrastructure.

Section #3 | Summary and Analysis of Software and Network Environment

This section provides a general overview of the current technical environment at PACE schools for both software and network infrastructure.

What is ERP?

The term enterprise resource planning became popular in the early 1990s to describe software systems that integrate information and business processes to enable sharing throughout an organization of information entered into a central database. While ERP had its origins in manufacturing and production planning systems, the scope of ERP offerings expanded in the mid-1990s to include other back-office functions such as Order Management, Financial Management, Asset Management, and Human Resources Management.

The range of functionality of ERP systems has further expanded to include more applications. Today's PACE campuses use ERP systems that combine functions of Student Information, Finance, and Human Resources. Examples of ERP vendors and systems include Ellucian (Colleague and Banner), Oracle (PeopleSoft), Jenzabar (EX and CX), and others. The Higher Education marketplace is limited in the number of vendors and the market is stratified amongst vendors and size of schools.

Common Expectations of ERP Systems

- Improve access to accurate, timely information
- Enhance workflow, increase efficiency, and reduce reliance on paper
- Tighten controls and automate email alerts
- Provide user-friendly, web-based interfaces
- Streamline processes and support adoption of best business practices
- Establish a foundation to integrate existing systems

As presidents, CFOs, or board members attempt to understand a university's overall performance, they may find many different versions of the same data. An ERP system is supposed to create a single version of the data because everyone uses the same system. Furthermore, ERP systems are expected to make developing reports easier to create and share. Modern ERP systems often improve upon this process by offering a foundation for moving to a data warehouse that can provide even more capability to extract data from administrative information systems.⁷

Overview of Software and ERP Modules Used by the Institutions

As part of our assessment, our team was asked to look at the current ERP software across the institutions. The schools have historically operated ERP systems in an independent and autonomous manner. This includes hosting the software on premise and supporting the applications with in-house staff and technical expertise.

⁷ <http://net.educause.edu/ir/library/pdf/eqm0121.pdf>

Most schools implemented their current systems from the 1990s to the mid-2000s and all are now in an operational phase with ongoing maintenance and support. Currently, four distinct ERP systems are being utilized across the 24 institutions:

Table 3: ERP System by Institution

ERP System (Vendor)	PACE Members	
Banner (Ellucian)	Bridgewater State University	Massasoit Community College
	Bristol Community College	Middlesex Community College
	Fitchburg State University	Mount Wachusett Community College
	Framingham State University	Northern Essex Community College
	Greenfield Community College	North Shore Community College
	Holyoke Community College	Westfield State University
	Massachusetts College of Liberal Arts	
Colleague (Ellucian)	Berkshire Community College	
	Bunker Hill Community College	
	Massachusetts College of Art and Design	
	Massachusetts Maritime Academy	
	Worcester State University	
	Springfield Technical Community College	
Jenzabar (Jenzabar)	Cape Cod Community College	
	Quinsigamond Community College	
	Roxbury Community College	
PeopleSoft (Oracle)	Salem State University	
	Mass Bay Community College	

It should be noted that as of 2011, the Banner and Colleague products are owned by the same vendor (Ellucian) but continue to operate as independent ERP platforms with no direct ability to share data or integrate. However, this means that 19 of the 24 schools are being supported by and currently maintain individual contracts with one vendor (Ellucian).

Our analysis shows that schools that use the same ERP software are currently on several different release levels. This holds true for PeopleSoft, Banner, and Jenzabar schools. However, it does appear that Colleague schools are all on release 18 of that software. The table following table provides an overview of reported information amongst the various schools and multiple ERP platforms and demonstrates the variety that exists today.

Table 4: Overview of ERP Versions by Module as Reported by Institutions⁸

Release Levels of Banner		Count
Finance	8.8	1
	8.7	3
	8.6.1	2
	8.6	2
	8.5	1
	8.4	1
Financial Aid	8.17.1	2
	8.17	1
	8.16	6
	8.8	1
Student	8.5.6	4
	8.5.4	4
	8.5.3	1
	8.5.1	1
Human Resources	8.8	1
	8.7.1	2
	8.5	1
	8.4	3
General	8.5.2	1
	8.5	1
	8.4.2	1
Accounts Receivable	8.4.3	1
	8.4.1	1
Advancement	8.5	1
	8.4.2	1
	8.3.1	1
	8.2	1
	8.0	1
	Licensed but not used	5
Position Control	8.4	2

Release Levels of Colleague		Count
Finance	18	1
Financial Aid	18	5
Student	18	5
Human Resources	18	2
WebAdvisor	18	1

Release Levels of Jenzabar		Count
Finance	EX	1
	CX	1
Financial Aid	EX	2
	CX	1
Student	EX	2
	CX	1

Release Levels of PeopleSoft		Count
Financials Application	9.1	1
	8.9	1
Financial PeopleTools	8.51	1
	8.47	1
HCM Version	9	1
	8.9	1
HCM PeopleTools	8.51	1
	8.47	1
Campus Solutions	9	1
	8.9	1
Campus Solution PeopleTools	8.51	1
	8.47	1

⁸ Please note that not all schools reported this level of detail. We have aggregated what was provided to our team, but totals may not always match number of schools utilizing that ERP system.

The lack of common ERP versioning poses challenges for increasing collaboration and coordination because each school maintains its own maintenance cycles, database, and vendor contracts based on differing versions of the same software packages being utilized.

Other Software Utilized by Institutions

In addition to ERP, institutions are using other software across multiple departments and/or colleges. We counted at least 229 commercial, public, and homegrown software packages that are currently used across the PACE community. The vast majority of these are utilized by only one or two institutions. Approximately 170 software products are utilized by only one school, while 16 are used by four or more. This suggests additional evidence of opportunity to gain efficiencies in software purchasing, maintenance, implementation, and usage.

Please note that this information was self-reported. It is likely, for example, that more than four schools are using Microsoft Active Directory (see table below) for account management.

The following table depicts those software products being utilized by at least four schools currently.

Table 5: Summary of non-ERP Software used by four or more PACE Schools

Other Enterprise Software/Systems ⁹	# of Schools
Blackbaud Raiser’s Edge	18
Blackboard Learn	13
SALT Membership Program (American Student Assistance)	11
eTutoring	9
Evisions FormFusion and/or IntelliCheck	9
MaintenanceDirect (SchoolDude)	9
Moodle	7
Rave Alert (Rave Mobile Safety)	7
HR/CMS (PeopleSoft)	6
Interview Exchange	6
PowerFaidS (College Board)	5
Active Directory (Microsoft)	4
EdConnect	4
Electronic Transcript Exchange (National Student Clearinghouse)	4
Follett - CourseWorks	4
Google Apps for Education	4

⁹ This information is taken from a different data set that was self-reported and may not represent 100% of schools using a particular LMS. Or it may indicate confusion because MoodleRooms is now owned by Blackboard.

An Overview of Network Connectivity and Telecom

The table below summarizes the information provided by the schools regarding the maker of the key elements of their network infrastructure.

Table 6: Summary of Network Equipment Vendors

Institution Name	Network Schematic	Core Router	Edge Switching	WLAN
Berkshire CC	Y	Fortigate	Cisco	Aruba
Bridgewater State	Y	Juniper/Cisco	Cisco	Cisco
Bristol CC	Y	Extreme	Extreme	Extreme
Bunker Hill CC	Y	Cisco	Cisco	Cisco
Cape Cod CC	N	Cisco	Cisco	Aruba
Fitchburg State	Y	Enterasys	Enterasys	Enterasys
Framingham State	N	Enterasys	Enterasys	Enterasys
Greenfield CC	Y	Cisco	Cisco	Blue Socket
Holyoke CC	Y	Cisco	Cisco	Aruba
MA College of Art	Y	Cisco	Cisco	Cisco
MA Maritime	Y	Cisco	Cisco	Cisco
Mass Bay CC	Y	Cisco/Extreme	Cisco	Cisco
Massasoit CC	Y	Cisco	Extreme	Aruba
MCLA	Y	Cisco	HP	Cisco
Middlesex CC	Y	Cisco	Extreme	Meru
Mount Wachusett	Y	Enterasys/Cisco	Enterasys	Enterasys
North Shore CC	Y	Cisco	Cisco	Blue Socket
Northern Essex CC	N	Extreme	Extreme	Aruba
Quinsigamond CC	Y	Enterasys	Enterasys	Enterasys
Roxbury CC	Y	Cisco	HP	HP
Salem State	Y	Palo Alto/Juniper	Alcatel-Lucent/Juniper	Xirrus
Springfield Tech	Y	Cisco	Cisco	Cisco
Westfield State	Y	Cisco	Cisco	Cisco
Worcester State	Y	Cisco	Cisco	Cisco

Cisco is the dominant supplier to PACE schools, which is not uncommon. However, the selection of vendor equipment at many campuses demonstrates that other vendors are available and should be considered when making decisions about network equipment refresh and upgrades.

Wide Area Network (WAN)

WAN services encompass both the Internet and connectivity to satellite campuses, and are important for two primary reasons: the WAN is the life-line that connects the campus to the rest of the digital world, including cloud vendors, etc., and is a significant recurring expense. We asked PACE schools to provide three pieces of information: speed of connection expressed in megabits per second (Mbps), annual WAN cost, and provider.

The tables on the following pages show WAN cost per Mbps per month for each institution’s primary provider, which provides a simple means of comparing costs between the institutions. For this analysis, we have separated out community colleges and state universities because the residential nature of universities puts additional demands on bandwidth.

Table 7: Summary of Primary WAN Costs, Speeds, and Providers as Reported

Institution Name	Annual WAN Cost at Primary Location	WAN ¹⁰ Capacity (Mbps)	WAN \$/Mbps/Mo.	Primary Location Main Service Provider(s)
Residential				
Bridgewater State University	\$ 42,792	500	\$ 7	Sidera
Fitchburg State University	\$ 93,000	300	\$ 26	Windstream
Framingham State University	\$ 184,200	300	\$ 51	UMass ITS
MassArt	\$ 15,712	400	\$ 3	Colleges of the Fenway
Mass Maritime Academy	\$ 89,000	300	\$ 25	Windstream
Mass College of Liberal Arts ¹¹	\$ 108,000	200	\$ 45	UMass/Time Warner
Salem State University	\$ 84,000	300	\$ 23	Expedient
Westfield State University	\$ 67,200	350	\$ 16	UMass ITS
Worcester State University	\$ 66,000	500	\$ 11	Charter

¹⁰ For purposes of this analysis, the information provided here represents each institutions PRIMARY WAN connection and the related cost for that service. Many institutions have additional service providers and additional bandwidth capacity and this has been noted in the institutional snapshots (see Section #2).

¹¹ For MCLA, annual WAN costs represent total cost because only aggregate numbers were reported.

Institution Name	Annual WAN Cost at Primary Location	WAN Capacity (Mbps)	WAN \$/Mbps/Mo.	Primary Location Main Service Provider(s)
Non-Residential				
Massasoit Community College	\$ 28,800	100	\$ 24	Comcast Fiber
Berkshire Community College	\$ 67,000	100	\$ 56	Time Warner Cable
Bristol Community College	\$ 48,000	250	\$ 16	Meganet Communications
Bunker Hill Community College	\$ 196,800	200	\$ 82	UMass ITS
Cape Cod Community College	\$ 54,000	500	\$ 9	Comcast
Greenfield Community College	\$ 30,144	45	\$ 56	Earthlink
Holyoke Community College	\$ 39,000	320	\$ 10	HGNE
Mass Bay Community College	\$ 106,800	300	\$ 30	UITS
Middlesex Community College	\$ 79,314	110	\$ 60	UMass ITS
Mount Wachusett Community College	\$ 84,000	100	\$ 70	DSCI
Northern Essex Community College	\$ 19,000	60	\$ 26	UMass ITS
North Shore Community College ¹²	\$ 77,040	150	\$ 43	UITS & Comcast
Quinsigamond Community College ¹³	\$ 31,284	40	\$ 65	UITS & Charter
Roxbury Community College	\$ 41,747	100	\$ 35	DSCI, Inc.
Springfield Technical Community College	\$ 35,400	125	\$ 24	UMass ITS
Totals	\$ 1,688,233			
Average across all schools	\$70,343	235/Mbps	\$34/Mbps/Mo	

¹² North Shore's annual WAN costs represent total cost because only aggregate numbers were reported.

¹³ QCC's annual WAN costs represent total cost because only aggregate numbers were reported.

Network Speeds

On average, the range WAN connectivity speed is 200-300 Mbps across all schools primary location. As the table shows, speeds at the residential institutions are somewhat higher on average than non-residential schools, which is to be expected given the demands that residential students place on the WAN connection. Schools at the lower end of the spectrum generally indicate a need to increase bandwidth, but all schools need to be steadily increasing their bandwidth in coming years as data volumes increase and more services can be expected to move off campus.

Recurring Expenses

The \$1.7M total annual WAN cost across PACE represents only a portion of the annual spending on all network and telecommunications services. In addition to the cost of the Internet service at the primary site, WAN services are provided at remote campuses at an additional cost of \$250K, totaling approximately \$1.85M for WAN cost across PACE.

Network Costs

Cost per Mbps varies widely from campus to campus. In some instances, such as Berkshire Community College, the cost is substantially higher than the average due to the expense of provisioning a high-speed connection in a rural part of the State. In addition, a major factor affecting price is the year when contracts were signed. There has been significant expansion of fiber-optic networks and intense competitive pressure within the telecommunications industry of late, both of which are driving prices down dramatically from what they were just a few short years ago.

For comparison, below are established 2013 State of Massachusetts contract rates from Windstream, a provider that already services several PACE institutions:

Table 8: Windstream Contract Rates

Speed (Mbps)	<u>100</u>	<u>200</u>	<u>300</u>	<u>400</u>	<u>500</u>	<u>600</u>	<u>700</u>	<u>800</u>	<u>900</u>	<u>1000</u>
Cost/mo.	\$1,720	\$2,795	\$3,085	\$3,590	\$4,080	\$4,570	\$5,005	\$5,375	\$5,745	\$5,990
\$/Mbps	\$17.20	\$13.98	\$10.28	\$8.98	\$8.16	\$7.62	\$7.15	\$6.72	\$6.38	\$5.99

Based on these Windstream rates, our analysis indicates that WAN/Internet costs could reasonably be lowered by 40% or more. However, increased bandwidth demand will offset some of these savings and multi-year contracts that are already in place will delay the savings yield to some institutions.

Service Providers

UMass Information Technology Services (ITS) is the most common provider across the 24 PACE schools. The wide variety of providers, other than UMass ITS, reflects how many viable providers there are and how much provider capability and price varies by geography. The presence of multiple providers at most campuses is evidence of a best practice of more than one WAN connection in the event of a network failure. Please note that most schools do have multiple vendors providing service, which is why this table totals more than 24.

Table 9: Common Internet Providers¹⁴

Internet Provider	# of Schools
UMASS ITS/UITs	12
Comcast	8
Verizon	5
Windstream	3
Time Warner Cable	2
DSCI	2
Charter	2
Sidera	2
Cogent	2
Meganet Communications	1
Earthlink	1
HGNE	1
Tower Stream	1
Expedient	1

Level of WAN Satisfaction

In order to get a more qualitative assessment of the current WAN services, we asked campuses to provide a ranking of Not Satisfied, Satisfied, or Very Satisfied. The majority of schools report that they are Satisfied or Very Satisfied with their current WAN service. Some campuses complained about the high costs of the UMass ITS service; however, with the use of new providers, all campuses should find lower cost/Mbps going forward.

¹⁴ Totals in this table represent both primary and secondary providers of WAN services.

Other Infrastructure Elements

WAN services connect to the campus' local area network (LAN), which is comprised of copper, and fiber cabling, data switches and routers, and wireless local area network (WLAN). To gain some additional insight into PACE institutions' network infrastructures as a whole, data was gathered on these components.

Copper and Fiber-Optic Cabling

Copper and fiber form the basic transmission path for all communications. As network speeds increase, higher quality copper is required. Based on the experience of the last 20 years, the average useful life of copper cabling is about 15 years before it will no longer support evolving bandwidth requirements. Fiber-optic cabling is not as limited as copper but still requires occasional enhancement to provide quality and/or quantity for new applications.

Many campuses report deficiencies in their copper and fiber-optic infrastructure that will require remediation in the coming years. One technology that PACE IT planners should be watching is passive optical networking (PON). Pioneered for telecom carrier offerings like Verizon FiOS, PON relies exclusively on fiber, eliminating copper for good. With very high bandwidth capabilities, a PON approach means campuses should not have to re-cable for the foreseeable future. Some units of the US government have already endorsed PON exclusively and no longer run copper cabling.

Other Recurring Expenses

Beyond WAN cost, the cost for telephone services for trunking, toll calling, and plain telephone lines is substantial. We did not receive telephone expense data from the majority of PACE institutions, perhaps because IT departments do not oversee these telephone services contracts. Based on the information we did receive for cost data from six schools, we estimate telephone expense to be in the range of \$1.25M annually. Added together, total network connectivity and telecom spending is in the range of \$3M to \$3.2M per year.

Section #4 | Opportunities for Collaboration Identified in our Study

This section identifies opportunities for collaboration and increased efficiency among PACE institutions based on our assessment and analysis.

Our team has identified 15 opportunities for increased collaboration that we believe will result in cost savings, cost avoidance, or improved effectiveness of IT resources at PACE schools. We have grouped these 15 opportunities into five categories to help the reader organize and understand the material in a more succinct manner. The five categories are:

- I. Professional Development
- II. Coordinated Purchasing
- III. Shared Services
- IV. Data Standards and Information Sharing
- V. Enterprise Applications and Shared Administrative Services

In addition, these categories help to group common themes that exist. For example, when addressing “Shared Services” we have grouped together multiple opportunities that have the ability to strengthen service delivery at PACE schools by taking a collaborative approach, instead of attempting to address these needs on an individual basis. Below are brief introductions that describe and inform what each opportunities section represents.

I. Professional Development

People are the key to excellent delivery and support of IT services. Based on our analysis, we have identified opportunities to better support current IT staff resources at each institution and strengthen the support of systems and services that they are already maintaining. In this section, we have identified the following opportunities:

1. Coordinate and Share Professional Development Opportunities
2. Increase Collaboration to Meet Changing IT Organizational Needs

II. Coordinated Purchasing

All institutions are procuring hardware, software, networking, etc., and may be contracting with the same vendors, but for varying prices. Our analysis indicates there are significant opportunities to reduce costs amongst PACE schools based on similar efforts undertaken by other groups. Specifically, the current procurement of network and telephone infrastructure and services appears to be an opportunity for reducing costs.

This is particularly important because the trends in technology indicate that as bandwidth costs continue to decrease the demands for connectivity, mobility, and 24/7 access to systems will increase. We have identified the following opportunities that PACE schools should explore:

3. Establish a Shared IT Purchasing Function
4. Establish Coordinated Purchasing of Network and Telecom Services

III. Shared Services

PACE institutions have an opportunity to improve collaboration and provide shared services from which each institution in the PACE community can benefit. There is significant potential for PACE schools to collaborate more on areas of information security, disaster recovery planning, and help desk support.

Security, in particular, is becoming increasingly important as compliance requirements are changing and becoming more demanding and time consuming. With increased collaboration, institutions can increase value to their institution at a lower cost point and without creating a new dedicated resource position(s) within each school.

5. Develop a Collaborative Approach to Meeting Information Security Needs
6. Design a Collaborative Approach to Provide 24/7, Tier 1, IT Help Desk support
7. Build a Shared Approach to Data Backup and Disaster Recovery

IV. Improved Data Standards and Information Sharing

Each PACE institution is unique and autonomous from its peers; however, many processes and desired outcomes are the same (purchasing, student success, and improving customer service). By establishing shared standards, the PACE institutions will be in a better position to collaborate, share knowledge, and streamline processes for key functions. This will directly benefit students and improve the efficiency of IT operations. We have identified the following opportunities in this area:

8. Create a Central Repository to Support Increased Collaboration
9. Adopt Shared Tools and Practices to Strengthen IT Project Management
10. Develop Common Data Definitions and Align Data Standards

V. Enterprise Applications and Business Process Improvements

There are opportunities to gain efficiencies with software applications that are used enterprise-wide. This will help the PACE institutions utilize applications more effectively, strengthen processes, improve operations, and gain efficiencies. Opportunities include:

11. Eliminate 901 Reporting
12. Strengthen Enterprise Resource Planning (ERP) Utilization
13. Shared ERP Platform for all PACE Institutions
14. Gain Business Process Improvements
15. Investigate Options to Implement a Shared Learning Management System (LMS) Platform

Opportunity Template

This describes opportunities for PACE institutions.

Opportunities have been described in a consistent format using the following template. For each opportunity we introduce an opportunity statement, identify stakeholders impacted, examine the investments needed to implement the opportunity, and present anticipated timing to operationalize. We provide analysis both quantitative and qualitative, including anticipated value, perceived risks, and next steps to further implement the opportunity.

Sample Template	
Opportunity Statement	
Opportunity background and supporting documentation	
Stakeholder Impact	Stakeholders needed to consider and implement this recommendation.
Investment Considerations	Considerations to be included in direct costs, if applicable. This section contains estimates based on information provided by institutions and research conducted by our team.
Time to Implement	A high level estimate to consider for planning purposes.
Analysis	
<ul style="list-style-type: none"> Data and analysis (both quantitative and qualitative) that supports the recommendation. 	
Anticipated Value	
<ul style="list-style-type: none"> Benefits (both quantitative and qualitative) that will result from the implemented recommendation. 	
Risks	
<ul style="list-style-type: none"> Potential risks of not addressing an opportunity; or Possible risks when attempting to implement an opportunity. 	
Next Steps	
<ul style="list-style-type: none"> Next steps for implementing. 	

Professional Development Opportunities

The following opportunities better support current IT staff resources at each institution and strengthen the support of systems and services already maintained.

1. Coordinate and Share Professional Development Opportunities	
<p>Analysis of current spending on training and professional development indicates that on average PACE schools are spending above the national average. We do not recommend reducing the overall spend, but instead suggest ways to optimize the training and development opportunities through better coordination.</p> <p>Collaboration helps to maximize the benefits of professional development spending. Many PACE institutions are providing training and other development resources independent of each other, despite the overlapping needs among the schools. While some institutions have provided in-house training sessions with invitations to other schools, developing an approach that can take advantage of scale would benefit the entire PACE community.</p> <p>Collaboration could also be used to get better rates on professional subscriptions so that bulk rates may reduce the cost to each PACE school for common professional subscriptions, journals, etc.</p>	
Stakeholder Impact	IT departments, Budget/Finance departments.
Investment Considerations	This may require additional investments, but more likely the focus will be on shifting existing spending in ways that focus on increased collaborative efforts to improve purchasing power for training and workshops, as well as, sharing best practices.
Time to Implement	1 year, ongoing.
Analysis	
<ul style="list-style-type: none"> Self-reported data revealed a wide range of incurred costs related to the professional development per Central IT FTE within each school (\$80 - \$4,800). To provide a more accurate assessment, the two outlier schools were removed, resulting in an average training cost per Central IT FTE of \$910 (range of \$217 - \$2,393). This average is higher than the EDUCAUSE average of \$625 for community colleges and \$749 for state universities; however, due to the nature of self-reported statistics, the data may not be indicative of excessive spending, but instead may simply reflect the difference in the types of spending reported. What the data does show is that some PACE institutions may not have provided enough training and development for IT staff, while others may not have received enough benefit for the money spent on training efforts. 	
Anticipated Value	
<ul style="list-style-type: none"> Improved coordination will benefit all institutions because most schools have overlapping needs in training and development opportunities. 	

1. Coordinate and Share Professional Development Opportunities	
	<ul style="list-style-type: none"> • Promoting knowledge sharing requirements for all users who attend conferences or workshops would be a way to extend the dollars spent to the entire PACE community. • More customized training for PACE schools will provide an increased level of learning that will benefit the entire IT Department. • The collaboration between PACE institutions will help foster ongoing relationships that could lead to future collaborations on larger projects.
Risks	
	<ul style="list-style-type: none"> • Lack of communication between the institutions could result in an inefficient utilization of training opportunities. Shared training information on a central repository would allow each institution to see the needs of the group so that trainings could be shared as efficiently as possible. • Creating experts within PACE may require hiring additional staff if current employees do not have the ability to take on extra responsibilities. This could be another reason for creating a small group of experts to share amongst the entire PACE community.
Next Steps	
	<p>Options to consider:</p> <ul style="list-style-type: none"> • Facilitate on-site training workshops with outside vendors at some of the PACE institutions. The benefit of in-house workshops is the customization of the lessons, which can be tailored to the specific needs of those who participate. Multiple schools could send at least one IT staff member, who could take home that knowledge to the individual institution’s community. • Create experts for specific areas within the PACE community. Designate certain IT professionals to become experts in LMS, ERP, portals, etc. “Train the trainer” programs could be established where each designated professional would attend customized vendor training, and could be responsible for training the respective IT staff at each school, as needed. Each institution could have one expert who shared his/her knowledge with the remaining PACE community, or a separate group of experts could exist outside of the individual schools. • PACE institutions will set up a central repository to share professional development needs to create a master list of the overlapping requirements for each school. • By example, Fitchburg State and North Shore have already hosted training workshops that other schools have attended. These institutions could share experiences conducting workshops and help the other schools to facilitate and plan more coordinated training efforts.

2. Increase Collaboration to Meet Changing IT Organizational Needs

During interviews, many IT departments reported having limited staffing resources and believe they do not have the budget to retain staff with niche or specialized skills. These skill sets include, for example: Database Administrators, Security/LDAP/Active Directory, Business Analysis, Trainers, and Project Managers. At some schools, these roles are part-time, left unfilled, assigned to already busy existing staff, or filled by contract resources.

We realize that PACE schools will continually seek to increase the effectiveness and efficiency of the entire IT community by aligning staffing resources with changing IT demands. Areas to address include standardizing job titles, identifying opportunities for increased collaboration between PACE schools, and developing processes that ensure staff evaluations are done in a consistent manner.

As individuals in IT leave the organization, the organization needs to review each position for its relevance by evaluating the viability and necessity of replacing the position, or determining if the position requires changes and updates.

IT classified positions should be considered based on the following criteria:

- **Replace:** The IT position should remain as is. When the position becomes open, hire new staff, as available, to replace the former employee.
- **Refine:** The IT position is no longer needed in its current capacity, but the personnel resource is needed to support IT operations. Determine a new reporting structure (if necessary) and revise the job description and organization chart accordingly.
- **Remove:** The IT position is no longer relevant to the current IT organization or this IT service(s) is no longer provided. Do not fill this position and remove from the organization chart.

IT skillsets will continue to change over time, as will the demand for particular skills. In order to be adaptive to the changing demands of technology, PACE schools should establish a formal mechanism to review IT positions as they become available.

<p>Stakeholder Impact</p>	<p>IT and HR departments will have to collaborate on this initiative.</p>
<p>Investment Considerations</p>	<p>There is no upfront cost to implement this initiative. What is required of IT and HR is the time and effort to determine the future of the position, which should be expected as standard procedure.</p>
<p>Time to Implement</p>	<p>1-2 years to develop a coordinated approach and then ongoing.</p>

2. Increase Collaboration to Meet Changing IT Organizational Needs
Analysis
<p>According to the Executive Office of Elder Affairs in Massachusetts, the population of individuals aged 60 and over is expected to increase by 48.8% by 2020¹⁵. Given the 516 IT staff within PACE schools, a conservative estimate projects that over the next 10 years, one fourth of PACE faculty and staff will retire. This will amount to 129 individuals. The PACE schools should determine a means to prepare for the large amount of individuals who will be reaching retirement in the near future and plan accordingly.</p>
Anticipated Value
<ul style="list-style-type: none"> • Agile IT staff positions provide value and relevance within a department that requires constantly changing skills geared toward service. • PACE schools can strengthen their IT service delivery by continually seeking to fill staff positions that meet the needs of its users or by removing or refining positions that have become obsolete. • This effort will improve resource management and better align skills and resources.
Risks
<ul style="list-style-type: none"> • There is a mix of IT staff in both union/non-union positions, and this may pose a challenge when evaluating positions with the replace, refine, or remove methodology. • Schools may not be able to find and/or retain the necessary staff skills and should also consider staff augmentation where necessary (e.g., DBA services). • According to the Bureau of Labor Statistics, the total labor force of workers aged 55-64 will increase by 36.5% and workers aged 65-74 by 83.4% by 2016¹⁶. A significant portion of the workforce will either be retiring or planning to retire within the next 10-15 years, and institutions will need to be agile when adapting to these changes.
Next Steps
<ul style="list-style-type: none"> • Investigate pooling resources to enter into joint outsourcing agreements with vendors for common needs such as help desk, PC refresh services, and classroom technology maintenance. • Establish a Staffing Review approach that will assist the IT leader at each PACE school. • Work with HR to comply with federal, state and local requirements that might impact this effort. • As each position in the PACE community retires, leaves, etc., evaluate the position based on job description to determine if the role should be replaced, refined, or removed.

¹⁵ We recognize that this statistic includes individuals who are both employed and unemployed. Source: <http://www.mass.gov/elders/regs-stats/elder-population/>

¹⁶ http://www.bls.gov/spotlight/2008/older_workers/

Coordinated Purchasing Opportunities

IT purchasing presents a significant opportunity to gain efficiencies through collaboration. In addition, the demands of customers to provide support and services are increasing while overall funding is stagnant making the need to do more with less a critical factor for all IT service providers in the PACE community.

3. Establish a Shared IT Purchasing Function	
<p>PACE institutions lack consistent coordination of purchasing activities for IT infrastructure, maintenance, software, and planning of future projects. Although some collaboration takes place, it is informal and usually dependent on personal relationships between schools. PACE schools need to create a formal approach that identifies opportunities for cost savings, but also one that coordinates future purchasing activities to better position the schools for long-term cost avoidance and increased purchasing power.</p> <p>For example, the costs for the same bundles of software licenses from the same vendors vary greatly across PACE schools. This is one example of an opportunity to coordinate and gain cost savings by negotiating and purchasing licenses at a multi-institution level.</p>	
Stakeholder Impact	IT, Purchasing, and Finance Departments; outside vendors; PACE Steering Committee
Investment Considerations	PACE Purchasing Coordinator, \$95,500 salary – includes benefits. Conduct a detailed Spend Analysis of IT across the 24 institutions building upon the work done in this assessment with the stated outcome of creating a Strategic Purchasing Plan. Estimated one-time cost is \$250,000.
Time to Implement	1-2 years
Analysis	
<ul style="list-style-type: none"> Based on data provided by the Central Office of UMASS, a similar initiative at the UMASS campuses has resulted in cost savings in excess of \$2M based on an original IT spend of \$17.75M. This equates to 12% recurring cost savings. UMASS has dedicated legal and purchasing staff as part of the General Council and Enterprise Strategic Procurement groups within IT. Recently the procurement group has focused on implementing more standards to consolidate IT expenditures to fewer vendors. As a result, UMASS was able to successfully negotiate more favorable pricing contracts with enterprise-wide vendors. PACE could benefit from group negotiation with software contracts. For example, Oracle costs range from \$19,500 to \$324,000 with an average cost of \$84,525. Another vendor example is Blackboard. Framingham State and Worcester State have similar total institutional FTEs (5,439 and 5,271, respectively); however, Framingham pays \$347,068 while Worcester pays \$232,395 to Blackboard. This represents \$63.81 in contrast to \$44.09 per institutional FTE for Framingham and Worcester respectively. 	

3. Establish a Shared IT Purchasing Function

- Many PACE institutions have a technology refresh/replacement cycle or indicated that they lacked the funds to replace technology on a consistent refresh cycle. PACE schools can leverage their purchasing power by coordinating technology purchases (e.g., laptop computers). With coordination, if one school is making a technology purchase, discounts could be applied if multiple schools decided to make a purchase as well. PACE schools will need to determine a method for communicating potential technology purchases. In addition, a central repository would be helpful to create a master list for future purchases.
- Coordination of purchasing efforts could result in millions of dollars of cost savings for the PACE institutions. PACE schools spent approximately \$18.75M in FY2012 on IT maintenance contracts alone. In addition, PACE schools reported \$22.3M for planned or committed IT projects, as of April 2013.
- There is significant opportunity to reduce costs on upcoming IT projects, as well as through increased purchasing coordination. For estimation purposes, in our cost projections we have only used half of the identified \$22.3M to project savings opportunities.
- For analysis purposes, we have combined the ongoing maintenance costs and included half of the proposed IT project costs to reach an estimate of \$28M of IT spending that should be further analyzed. In addition, we have identified a specific purchasing opportunity for WAN and telephone services in Opportunity #4.

Anticipated Value

- We conservatively estimate an 8% cost savings and/or cost avoidance could be realized on the \$28M, which could result in a \$2.24M cost savings per year based on current figures.

Risks

- Initial investments to support the start-up effort will be required for both for personnel and infrastructure.
- Communications and coordination will be critical at the operational level, but the most important immediate factor will be buy-in and support from senior leadership of the PACE institutions. This could be considered a year one, foundational effort that quickly meets the spirit of the PACE initiative.
- Lack of communication between the institutions could hinder cost savings if some of the schools do not collaborate on joint purchasing.
- Some schools may not be financially capable of collaboration at the time of purchase and therefore cannot benefit from the joint cost savings.
- Schools will need to improve their ability to plan well in advance for IT purchases in order to allow proper lead time for joint purchasing.

3. Establish a Shared IT Purchasing Function

Next Steps

- Define a charter for the group – focus on creating demonstrable savings in IT procurement
- Establish a committed team to create initial success to sustain the momentum
- Team meets biweekly to assess progress and explore new opportunities
- Charter specifies that focus will be on enterprise wide contracts for both new and existing IT spend
- Gain executive buy in and support
- Effort has visibility to the President of each campus, PACE Steering Committee, and Commissioner for Higher Education
- All PACE Presidents sign agreement that correlates with existing PACE charter
- Develop a coordinated purchasing plan
- Create a multi-institution team of resources to support the new Coordinator's office

4. Establish Coordinated Purchasing of Network and Telecom Services

PACE institution recurring spending on network and telecom services (WAN between campuses, Internet access, telephone trunk lines, toll calling, alarm, and other stand-alone lines) is approximately \$3M annually.

The overall trend is that prices are declining rapidly due to new provider capacity, competition, and new technologies such as Session Initiated Protocol (SIP) trunking used to connect VoIP phone systems to the public telephone network. This trend is offset by increasing demand.

We estimate that the potential aggregate cost savings to be in the range of 40%; however, increasing bandwidth requirements will offset some of these savings and current multi-year contracts will take some time to expire before reduced costs can be realized.

Issuing a Request for Information (RFI) that encompasses all schools and potential services to a wide group of network and telephony service providers will generate a more detailed snapshot of provider services and pricing on a campus-by-campus basis, and demonstrate the benefits of collaborative purchasing.

This opportunity should be considered in conjunction with establishing a shared IT Purchasing Function described in Opportunity #3. The estimates provided here and in subsequent cost projections are not duplicated by the calculations provided in #3.

<p>Stakeholder Impact</p>	<p>IT departments will need to forecast bandwidth requirements, and they will need to become familiar with SIP architecture.</p> <p>Telephone department personnel, when not part of the IT organization, will need to understand SIP architecture and integration requirements with their VoIP phone system.</p> <p>Purchasing personnel will need to understand how to conduct a procurement for all telecom services (what vendors to engage, how to structure the bidding process, how to evaluate the proposals) to take advantage of this opportunity.</p>
<p>Investment Considerations</p>	<p>We have estimated a one-time cost associated with the proposed RFI process of \$100,000.</p>
<p>Time to Implement</p>	<p>1-2 years.</p>

Analysis

- Data was gathered from all institutions on recurring WAN expense. In addition, 25% of schools provided information on recurring telephone spending and this data was extrapolated to all schools. Current Massachusetts State Contract pricing from a leading telecommunications provider (Windstream) was used to establish a current pricing benchmark and to derive the 40% savings estimate.

* Additional details for both WAN and telecom expenses are provided in Section #3 of this report.

4. Establish Coordinated Purchasing of Network and Telecom Services
<ul style="list-style-type: none"> The annual WAN cost across the PACE institutions is approximately \$1.85M for both primary and remote campuses. A 40% reduction could provide annual savings of approximately \$740K across the PACE institutions for WAN cost. As noted above, some of the savings may be offset in the future by increasing the bandwidth demands from a current average of 200-300Mbps to upwards of 500Mbps. However, an increase in bandwidth is a decreased per unit cost. The example provided above in Section #3 shows the Windstream cost per Mbps for 200Mbps as \$13.98, for 500Mbps as \$8.16, and for 1000Mbps as \$5.99. Therefore, despite an increase in overall cost that occurs with an increase in bandwidth, the cost per Mbps will actually decrease with a good provider. Although telephone cost data was received by only six of the PACE institutions, we extrapolated those costs to achieve an estimated total cost of \$1.25M across PACE for telephone related services. With an RFI approach, we estimate a reduction of 30% to 40% in telephone costs, resulting in approximately \$460K savings across the PACE institutions.
Anticipated Value
<ul style="list-style-type: none"> The total cost savings for both network and telephone costs could be as high as \$1.2M per year, which is approximately \$50K in savings per school. Campuses will improve manageability, scalability, and reliability by properly designing and procuring their telecommunications services in a systematic and coordinated manner.
Risks
<ul style="list-style-type: none"> The risk of not proceeding with an RFI is that schools may stay with current providers at higher costs.
Next Steps
<ul style="list-style-type: none"> Review this opportunity in conjunction with #3. Conduct a Carrier Service RFI.

Shared Resource Opportunities

There is significant potential for PACE schools to collaborate more on areas of information security, help desk support, and disaster recovery planning and data backup. Security, in particular, is becoming increasingly important as compliance requirements are changing and becoming more demanding and time consuming.

5. Develop a Collaborative Approach to Meeting Information Security Needs

Massachusetts Governor Patrick’s Executive Order 504 (E.O. 504) states: “Each agency shall appoint an Information Security Officer ("ISO"), who may also hold another position within the agency. ISOs shall report directly to their respective Agency heads and shall coordinate their agency's compliance with the requirements of this Order, applicable federal and state laws and regulations, and ITD security standards and policies.”

Our meetings with PACE schools identified IT security as both a current risk and also an opportunity to strengthen security practices. With information from organization charts supplied by each institution, it was revealed that only four out of the 24 institutions involved with the PACE initiative include a staff position whose partial function is to deal with information security. Only two schools, Fitchburg State and Bridgewater State, reported having a dedicated ISO role. No institutions have more than one security role. Most schools do utilize an existing resource to serve as their de facto ISO, but this is not consistent across the institutions. ISO job duties are typically in addition to regular duties that this individual performs.

A clear opportunity exists for creation of a shared Information Security function at the PACE level. We estimate this would include a Chief Information Security Officer (CISO), and four ISOs. Each ISO will be responsible for providing information security support services to multiple PACE schools. Specific workload will be determined by factors such as size, region, ERP, level of need, etc. The ISO analysts will also work closely with the IT staff at each of the institutions of which they are assigned. The CISO will oversee planning and coordination of information security policy and procedure for the PACE institutions collectively.

Stakeholder Impact	PACE Executive Leadership, CIOs at each PACE institution.
Investment Considerations	<p>Recurring costs are based on data provided from the “Using RSAM Software to Protect and Manage Campus Data” proposal dated August 13, 2012.</p> <p>That document projects the cost of an ISO resource at \$80,000 per year. We have added benefits to come up with an annual cost of \$102,000 per year. We have estimated an additional \$50,000 per year for indirect costs and the additional salary requirements of the CISO position beyond the \$102k per ISO position.</p> <p>This results in an annual cost of \$560,000 to support new positions for PACE schools.</p>
Time to Implement	2-3 years.

Analysis	
<ul style="list-style-type: none"> The EDUCAUSE benchmark for Associate’s institutions of total institutional FTE per information security staff is 4,920. Likewise, the benchmark for total institutional FTE per information security staff for Master’s institutions is 6,685. If the averages of the Associate’s and Master’s benchmarks are combined, the total is 5,802. This serves as the benchmark for the total PACE 	

5.	Develop a Collaborative Approach to Meeting Information Security Needs
	<p>community. In order to meet the EDUCAUSE benchmark of one information security staff per 5,802 institutional FTES, a total of 20.5 FTEs are needed across PACE.</p> <ul style="list-style-type: none"> • We estimate that the cost of a dedicated ISO for each institution will equate, on average, to \$102,000 each year. In total, to get to “average” for PACE-wide schools this would be \$2,091,000 in additional costs. Taking a fourth of that number and using the shared services information security staff is therefore a less expensive alternative. • Our analysis estimates that the cost of the shared services information security staff, including the CISO, will equate to \$560,000 each year. Therefore, the total cost avoidance for PACE to implement a shared services information security staff group will amount to \$1,531,000.
Anticipated Value	
	<ul style="list-style-type: none"> • E.O. 504 states that an each institution can have an ISO in a partial role. By utilizing the support services of the shared service model with PACE-wide ISOs, schools can supplement the current information security services they are providing, thus sharing their burden and responsibilities of information security and providing better backup capabilities. • A shared, dedicated IT security staff should strengthen service delivery while reducing risks to the school and providing cost avoidance when compared to an individual solution.
Risks	
	<ul style="list-style-type: none"> • ISOs will not be able to dedicate their time equally to each assigned institution. • Geographical location could be a barrier for getting an ISO on-site regularly. • ISOs will not know the institution’s systems and culture, as well as a dedicated ISO on staff for each institution. ISOs will need to work in collaboration with institution IT staff.
Next Steps	
	<ul style="list-style-type: none"> • Conversations with the UMASS Central Office indicated that they are in the process of standing up a Security Operations Center to support a more centralized and streamlined approach to managing their security needs. PACE schools could also explore this possibility for collaboration and/or partnership. • Allocate monies to develop a shared Information Security function at the PACE level. • Develop a job description and determine the services that the ISO will provide to each school. • Hire staff, including the CISO and four ISOs. • Determine primary and backup ISOs for each region. • Develop a kick-off program introducing the ISO and roles to PACE schools. • PACE schools could consider this opportunity in conjunction with the 2012 proposal to purchase “RSAM” (http://www.rsam.com/) or another compliance management tool that would be most effectively utilized in a shared service environment.

6. Design a Collaborative Approach to Provide 24/7, Tier 1, IT Help Desk Support	
<p><i>The non-traditional student is becoming the traditional student. Enrollment in online courses has nearly doubled, jumping 96% in the last five years according to the 2013 Campus Explorer report.¹⁷</i></p> <p>All PACE institutions provide online/hybrid learning environments. Growth in this area is growing not only at PACE but also nationally. In response to the increasing demand, PACE schools should anticipate that many students expect some level of 24/7 Help Desk service be available to meet their needs as students juggle a complex school/work/life schedule.</p> <p>Tier 1 support is the initial support level to provide help for basic customer issues such as username and password issues and assistance with navigating applications. Tier 1 issues comprise the majority of help desk requests, and these services will be increasingly needed on a 24/7 basis.</p> <p>Limited resources provide a challenge for PACE institutions to provide this service independently. Some schools have outsourced off-hours support while some have fully outsourced components of help desk activities (such as initial point of contact/call center). PACE institutions could outsource help desk support for “after hours” with a vendor for Tier 1 support to provide coverage 24 hours a day.</p>	
Stakeholder Impact	IT and Finance Departments, Outside Help Desk Vendors
Investment Considerations	<p>\$250,000 is estimated for startup costs to coordinate an RFP and develop a plan for supporting a Tier 1 support model for multiple institutions.</p> <p>See Analysis section below for additional cost considerations.</p>
Time to Implement	2-4 years
Analysis	
<ul style="list-style-type: none"> • According to EDUCAUSE data, help desk services were the number one most commonly outsourced IT function at Associate Institutions in 2012 (based upon Carnegie Classification). • The help desk availability per school was gathered directly from PACE institution websites. The available hours per week ranged from 35 to 168.¹⁸ The average across PACE was 79 hours per week. • PACE institutions could share one resource, a 24/7 help desk service that provides Tier 1 support for all participating institutions. Alternatively, groups of institutions using the same LMS or ERP could collaborate to provide support services from one or more vendors. For example, many institutions already provide 24/7 Blackboard support for students and faculty through Blackboard directly. 	

¹⁷ <http://campustechnology.com/articles/2013/06/24/report-students-taking-online-courses-jumps-96-percent-over-5-years.aspx>.

¹⁸ Four of the schools did not display Help Desk Hours on their websites. Those schools are not used in the calculation of the average Help Desk availability.

6. Design a Collaborative Approach to Provide 24/7, Tier 1, IT Help Desk Support	
	<ul style="list-style-type: none"> • Mount Wachusett currently outsources Tier 1 support at an annual cost of \$24,000. • This service provides Mount Wachusett with 24x7x365 support for its students. Extrapolating the Mount Wachusett example for all of PACE, total cost by student headcount is \$690,749 across all schools. Four PACE institutions currently provide 24/7 help desk support. The 20 remaining schools who need to provide additional support will require approximately an additional 1.5 FTE per school to fulfill a 24/7 help desk service. The cost to hire additional staff at each school would be approximately \$1.5M in total. • $\\$1.5M = 1.5 \text{ FTE} \times 20 \text{ schools} \times \\$51,000 \text{ salary}$ ($\\$40,000 \text{ salary plus } 27.3\% \text{ fringe benefits}$). • Outsourcing could provide a cost avoidance of \$810,000 per year. This is a savings compared to the cost to hire extra IT staff at each institution to provide 24/7 support.
Anticipated Value	
	<ul style="list-style-type: none"> • By providing additional help desk hours to both students and faculty/staff, each PACE institution will achieve better customer service. • Establishing a common vendor across PACE to use for creating help desk tickets, as well as creating a protocol for identifying the different levels of help desk support will be useful to streamline processes across the institutions. • If a single help desk resource is established, a marketing campaign across PACE could help to promote the contact information and create positive awareness of customer service and support availability for each institution's community.
Risks	
	<ul style="list-style-type: none"> • With increased numbers of students, faculty/staff, different ERP and LMS vendors, there is a risk of a heavy burden upon a small pool of in-house, cross-trained help desk staff. If this option is chosen, it would be best to simplify the vendors, programs, and systems used to help alleviate the large necessity to train staff on the basics in all of those areas. • With an outsourced vendor, there is risk of a lack of personalization and direct control of the help desk process. • Results will require effective coordination and collaboration between the PACE institutions.
Next Steps	
	<ul style="list-style-type: none"> • Determine help desk options that are suitable for a large group of PACE institutions to collaborate upon. • Create a working group of multiple PACE schools to explore and develop common help desk procedures and ticketing practices.

7. Build a Shared Approach to Data Backup and Disaster Recovery

There is opportunity to collaborate on developing a single standard for data back-up and exploring shared disaster recovery (DR) services. All 24 PACE schools, regardless of the ERP system they are using, could benefit from this exercise. Each school performs some level of back-ups on their current files today, but there are no shared standards or consistent practices.

Specialized vendors provide backup services by offering software as a service (SaaS), capability to move files to an offsite storage location. This type of service removes the daily intervention required by technical staff and operational staff. In comparison, just moving files across campus does not protect against disasters that impact the entire campus.

A number of vendors that offer back-up service also provide full DR planning services. Many will provide an SLA that guarantees to have the system(s) returned to full or at least critical system operations within a set of hours. This frees staff to work on other associated tasks with recovery.

From a network planning point of view, PACE schools should be keeping two general principles in mind when considering DR. First WAN/Internet services to each campus should be redundant, provisioned from different carriers and taking physically diverse routes to the campus data center if at all possible; and WAN services should be designed and contracted for with the expectation that bandwidth will be increasing steadily in coming years, i.e., the service should be scalable to accommodate the likelihood of offsite data replication.

Stakeholder Impact	Stakeholders needed to consider and implement this recommendation: CIOs, Record Retention Group, some functional staff
Investment Considerations	In the analysis section, we have provided startup costs for basic data backup of student data at approximately \$100k. However, this cost is not for DR, which was not calculated as part of this assessment.
Time to Implement	2-4 years.

Analysis

Anticipated Value

- A significant value to this service is that an entire database can be recovered quickly (for example, in less than 30 minutes depending on size and internet connection speed).
- Another possibility for this type of service is the recently built Massachusetts Information Technology Department (ITD) data center in Springfield. With its new facility, it will be offering a number of new services, including disaster recovery. We understand that pricing for this option will probably not be available until fall 2013.
- Continuity of operations; protecting investments, revenue generation streams, operational processes; and having a strong data back-up and DR plan rank high in accreditation audits.

7.	Build a Shared Approach to Data Backup and Disaster Recovery
Risks	
<ul style="list-style-type: none"> • Revenue loss from customers being unable to contact IT. • Reputation loss that could occur from students not being able to complete courses or graduate in a timely manner. • Added costs by not being prepared with a plan. 	
Next Steps	
<ul style="list-style-type: none"> • Select a project sponsor. • Establish a group to investigate this type of service and come back with a recommendation. • Assess and establish priorities. • Determine state of readiness for a disaster at each of the PACE schools. • Inventory critical systems that would be required to be operational day one; build out the list depending on disaster duration. • Estimate facility requirements if required to relocate operations. • Build a logistics matrix based on event type and projected duration. • Develop an RFI to gain a better understanding of services available and include Information Technology Department (ITD) in this process to compare costs. 	

Data Standards and Information Sharing Opportunities

Each PACE institution is unique and autonomous from its peers; however, many processes and desired outcomes are the same (purchasing, student success, and improving customer service). By establishing shared standards, institutions will be in a better position to collaborate, share knowledge, and streamline the process for key functions that benefit students and improve the efficiency of IT operations.

8. Create a Central Repository to Support Increased Collaboration	
<p>PACE schools can benefit from a shared repository to strengthen collaboration and knowledge sharing. By having a centralized repository of material, institutions will be able to share time and resources needed for projects, planning, and process improvements. Areas of IT operations and planning that could benefit from a central, shared repository include, but are not limited to:</p> <ol style="list-style-type: none"> 1. Information Security Policies and Procedures 2. Best Practices 3. RFPs 4. Training Needs and Opportunities for Collaboration 5. Project Planning and Coordination of IT Initiatives <p>In the short term, PACE could continue to use and build upon the KnowledgeLink SharePoint site built for this project. This could serve as a central repository for material collected to date.</p> <p>Although this is not a long-term solution, it offers immediate continuity based on data already collected and allows for continued information sharing while a longer term solution is pursued.</p>	
Stakeholder Impact	IT departments, procurement roles, IT stakeholders
Investment Considerations	The time and cost of building a common portal for all schools to share information in a secure and standardized method. However, the PACE schools already have made significant investments in developing portals that they may be able to utilize to accomplish this.
Time to Implement	1 year, ongoing.
Analysis	
<ul style="list-style-type: none"> • Based on our discussions and site visits with stakeholders across PACE schools, we have determined a clear need to develop shared collaboration tools. Developing a central repository would be valuable for institutions and provide a resource for schools to share information in a more streamlined and consistent manner. 	
Anticipated Value	
<ul style="list-style-type: none"> • Increased collaboration across the PACE schools and allows for certain transparency and knowledge sharing of projects, practices, and processes that are working well. 	

8. Create a Central Repository to Support Increased Collaboration	
	<ul style="list-style-type: none">• Eliminates best practices that are being done in a vacuum and increases communication across the schools for others to take part. This recommendation can be implemented in the short term.
Risks	
	<ul style="list-style-type: none">• Limited participation from PACE schools.• Data will become obsolete if the site is not regularly updated.• Requires a long-term vision and commitment of the participants.
Next Steps	
	<ul style="list-style-type: none">• A point-of-contact should be established to assist with site issues, and the addition/subtraction of users who have access to the site.• Determine a long-term solution for a central repository.

9. Adopt Shared Tools and Practices to Strengthen IT Project Management

Project Portfolio Management is a discipline that seeks to better manage resources and project work, and to improve collaboration on similar projects by using specialized software. For example, Bridgewater State has entered in an agreement with TeamDynamix for use of their product to address this area.

This type of system would enable all PACE schools to see projects that are planned, in progress, as well as completed across all schools that participate. IT directors could see which schools are doing like projects for collaboration purposes or what schools may have already completed a project that they are about to undertake. Lessons learned could be derived. Portfolio management would also introduce Project Management discipline to the schools that do not have a baseline to work from.

This type of software can also be leveraged as a project management development tool. At present, most of the schools do not use any type of project management methodology for tracking project progress or allocating resources. Having a record of how staff resources are allocating their time and efforts creates a record of available resources to consider when planning new work.

Over time, this information will also assist in developing new projects by providing a historical repository of project information. Using this type of software assists with grant management reporting and in some situations has helped in providing information for accreditation on related projects.

Outside of IT, Facilities is also a good candidate for using this type of system, adding another department that could share the cost and elevate the ROI, as they constantly have a number of projects going on and need to schedule large numbers of resources. Several of these projects are driven by the time periods that students are off-campus.

<p>Stakeholder Impact</p>	<p>Stakeholders: CIOs, IT Department Heads, Facilities The impact should be improved management of their resources.</p>
<p>Investment Considerations</p>	<p>We estimate approximately \$500,000 to purchase and deploy a project portfolio tool, such as TeamDynamix, that could be shared amongst the PACE schools. Please note that we are not recommending TeamDynamix, but use this as a tangible example of a recognized product for IT portfolio management. We have also estimated approximately \$35,000 in recurring costs to maintain the software regardless of vendor.</p>
<p>Time to Implement</p>	<p>2-3 years. It is our experience that this will require time to build a common project management platform and agree to standard processes for sharing information. This effort should build upon the concept of developing a “shared central repository” introduced in the prior write-up.</p>

9. Adopt Shared Tools and Practices to Strengthen IT Project Management	
Analysis	
<ul style="list-style-type: none"> • Many PACE schools lack formal project management tools and staffing resources today making it difficult to manage projects in a consistent, standardized manner. • According to Project Management Institute (PMI) statistics, 80% of all projects that fail are due to a lack of planning. Having documented plans that show each step with start and stop dates, forecasted labor, and project milestones can support project success. This is also a tool that can be implemented in the cloud, meaning little setup effort and/or ongoing maintenance costs. 	
Anticipated Value	
<ul style="list-style-type: none"> • Types of data that can be collected include: Project Management, Portfolio Analysis, Portfolio Planning, Time and Expenses on Projects, Finance Reporting, Knowledge Management, Service Desk Management, and Asset Management • Improved coordination of IT projects. • Better project outcomes and long-term cost avoidance. 	
Risks	
<ul style="list-style-type: none"> • Missed deadlines for critical systems. • Planning more work than there are resources to accomplish. 	
Next Steps	
<ul style="list-style-type: none"> • Identify interest in pursuing this opportunity based on level of participation for Opportunity #8 (shared central repository). • Collect the list of projects with their varied current status. • Determine approved, funded projects. • Establish committee for RFI criteria and product selection. • Develop RFI for Project Portfolio Management tool that could serve the PACE community. 	

10. Develop Common Data Definitions and Align Data Standards

The purpose of developing common data standards is to establish rules for the definition and content of data entered into PACE databases regardless of ERP system each school maintains. Strengthening data integrity is critical for the protection, access, and use of information maintained in college and university databases. This effort should also define the responsibilities of staff that input and access data.

Data standards set expectations for people who use and maintain college systems with respect to data integrity. *Please see Appendix #6 for an example of a recently updated Data Standards Model from Mount Wachusett Community College.*

With the growing number of RFIs from state, federal, and certification agencies, it becomes critical to insure that the information being reported is based on the same criteria. Errors in the data could impact funding allocations and ratings by external groups.

An example of this is the **“Vision Project”**¹⁹ that has recommended modifying funding models for state schools that would be driven by new data points and require more outcomes based tracking information that many schools do not currently collect.

<p>Stakeholder Impact</p>	<p>Manager or staff from the areas below should be engaged in or at least aware of decisions that are made which could directly impact the data that is being developed or used by the following areas:</p> <p>Financial Aid, Employment Services, Registrar, Development, Admissions, Academic Programs and Advising, Business Services and Student Accounts, Purchasing and Accounts Payable, Student Affairs, Information Technology Services.</p>
<p>Investment Considerations</p>	<p>The initial investment in establishing the criteria for this effort would be in staff time from all stakeholders that would be impacted by changes.</p> <p>This is an important effort that should be seen as the “cost of doing business”.</p>
<p>Time to Implement</p>	<p>2-3 years.</p>
<p style="text-align: center;">Analysis</p>	
<ul style="list-style-type: none"> • Based on the on-site visits, this is a topic that needs attention across the entire PACE group. A select number of schools have some form of documented standards, while others use the HEIRS II standard (state standard). • A good deal of time is spent correcting HEIRS II data alone. One school stated that they easily spend more than 180 hours correcting data for just HEIRS. 	

¹⁹ <http://www.mass.edu/visionproject/>

10. Develop Common Data Definitions and Align Data Standards	
	<ul style="list-style-type: none"> This entails 4,320 labor hours if projected across all 24 schools; equivalent to 2.3 FTEs required to simply focus on HEIRS corrections. 2.3 FTEs with an annual salary per FTE of \$50,000 +27.3% fringe = \$146,395/year.
Anticipated Value	
	<ul style="list-style-type: none"> Improving standards would streamline the process when students transfer from one school to another. There is a high rate of student transfers between the community colleges with the 2+2 degree programs that have been established between the community colleges and the university degree programs. The benefits of this recommendation would greatly improve the reporting credibility of information and accountability for various departments. Improved ability to analyze and share data, and address increased reporting needs and demands. Data migration would be much more efficient if all of the PACE members ever needed to move to a single data collection system. This is a key risk factor in any implementation of this type.
Risks	
	<ul style="list-style-type: none"> The risks of not addressing this issue will be continued reporting challenges and inconsistent data standards and definitions that will hamper the ability of PACE schools to improve data integration and information sharing. Schools could potentially lose funding if they are not able to be adaptive in their ability to meet new data requirements.
Next Steps	
	<ul style="list-style-type: none"> PACE Presidents declare this as a key opportunity that serves to support other longer term efforts documented in this assessment. A team would be established that is comprised of members of the college communities who come together to set data requirements concerning electronically stored information on campus. Standards are determined through collaboration of the constituents involved to find solutions that work for the colleges coupled with best practices established by peer institutions. The team also meets to discuss proposed changes to the system by one group of users that may affect one or more other groups. Proposed changes that do not require a lot of discussion should be handled via email; thus allowing decision to be made in a timely manner. Training will also be required in order to clearly state what those standards are. After going through an established process, it must be clear to the employee the consequences of not performing their work duties.

Enterprise Applications and Business Process Improvement Opportunities

In FY2012, an estimated 18% of total central IT budgets (\$73M) across all PACE institutions was spent on ERP system maintenance, staffing, and infrastructure upgrades (approximately \$13M). This represents a significant portion of total IT spending. In addition, PACE schools spent at least \$2.2M in FY2012 for vendor maintenance of their respective LMS.

Our analysis identified opportunities to gain efficiencies and cost savings from better utilization of software and applications that are used across the PACE institutions. There is also opportunity for PACE schools to eliminate redundant business processes and streamline functions when considered over a longer period of time. This section presents opportunities for both near-term cost savings and longer term benefit. These opportunities will require intentional planning and thoughtful consideration by the PACE community.

11. Eliminate 901 Reporting

On average, PACE institutions stated that the redundant state requirement for “901” financial reporting requires approximately ½ FTE per school to process and report out on financial data using the State form. Current bill H.1064 seeks to eliminate this annual reporting requirement: <https://malegislature.gov/Bills/188/House/H1064>.

*SECTION 1. Chapter 15A of the General Laws, as so appearing, is hereby amended by striking out section 15C and inserting in place thereof the following section:-
 "Section 15C. Each institution within the system of public higher education shall annually produce audited financial statements in accordance with generally accepted accounting principles, generally accepted auditing standards, and generally accepted governmental auditing standards. The statements shall be in accordance with procedures for timeliness and for disclosures as proscribed by the office of the state comptroller and approved by the state auditor. The statements shall include all expenditures and revenues from all appropriated and non-appropriated funds and be filed with the governor, office of state comptroller, the board of higher education, the house and senate committees on ways and means, and the joint committee on higher education no later than October 15 each year."*

According to participants that we met with, including many CFOs, this information provides no additional value to either the Commonwealth or the PACE schools, as all parties already have annual financial statements prepared by a qualified third-party.

Stakeholder Impact	These opportunities will require coordination with the finance offices and human resource offices respectively.
Investment Considerations	There is no additional investment required.
Time to Implement	Dependent upon passage of legislation or some other act that eliminates the need for this requirement.

11. Eliminate 901 Reporting	
Analysis	
<ul style="list-style-type: none"> Based on site interviews with CFOs, our estimate is that on average, saving ½ FTE time to do annual 901 reporting could result in annual savings of ~ \$763,800 per year based on an estimate of \$50,000 +27.3% fringe per FTE per year for the equivalent of 12 FTEs. 	
Anticipated Value	
<ul style="list-style-type: none"> Better use of existing resources Cost avoidance for unnecessary processes 	
Risks	
<ul style="list-style-type: none"> Some schools are concerned that by removing 901 reporting, the Commonwealth will develop more onerous requirements, negating any gains from its elimination. By not addressing this, the PACE schools will continue to pay for extensive audited financial statements that they cannot deliver to the State, but instead will continue to additional redundant reporting. 	
Next Steps	
<ul style="list-style-type: none"> Monitor progress of legislation. Work with Department of Higher Education to eliminate this requirement. 	

12. Strengthen Enterprise Resource Planning Utilization (ERP)

The PACE institutions have invested millions into their respective ERP platforms and are concerned about changes given this level of investment.

In the short term, institutions should consider opportunities to align software upgrades and maintenance processes, better coordinate projects, share best practices and develop common data standards that will help all the schools more effectively deliver services and support their institutional needs.

PACE schools should create formal mechanisms for sharing information and addressing their ERP support needs and vendor maintenance. There is precedence for this amongst the PACE schools already. The *SunGard Massachusetts Advisory Resource Team (SMART)* was a loosely based organization of the 13 Banner schools that operated in the 2009-10 timeframe, but it was disbanded after key personnel retired. As a first step, PACE schools should consider recreating some level of coordination of their existing ERP services and support and consider opportunities to strengthen ERP utilization and effectively leverage their respective investments.

PACE institutions should focus on the following two areas in the near term:

1. Determine if those institutions that have licensed and utilized HR modules need to retain this functionality. All of the PACE institutions are using the Commonwealth’s PeopleSoft HR/CMS for core human resources functions: personnel administration, benefits administration, payroll and time and labor. At least nine institutions have licensed HR modules in either Colleague or Banner for additional HR functionality beyond what is provided by HR/CMS.
2. Five of the six Colleague schools remain on the older Unidata database and will need to convert to an SQL server database at such time that Ellucian may announce that it will no longer support the Unidata platform. It is estimated that the cost for this conversion could range from \$100,000 to \$250,000 per school representing a total possible outlay of \$500,000 to \$1.25M over the course of the next 2-3 years.

In addition, it is expected that Banner will be migrating to release level 9.x in the next 12-24 months. Based on our high-level analysis of existing Banner environments amongst PACE schools, many of the institutions may need to carry forward a large number of custom modifications or interfaces that will cost a substantial amount of money in addition to the basic software upgrade costs that will be incurred.

Stakeholder Impact	Any changes to the status quo could have far-reaching impact. ERP systems are intended to be the “system-of-record” within an organization.
Investment Considerations	Although costs will be incurred by schools to participate in a revitalized “SMART” effort, this should be relatively low impact on a per institution basis.
Time to Implement	1-2 years, ongoing.

12. Strengthen Enterprise Resource Planning Utilization (ERP)

Analysis

- Regarding the HR modules, the majority of reported need is pertaining to Recruiting and Time and Attendance functionality. If there is a need for these applications across all institutions, there may be an opportunity for a shared system that could potentially feed into the Commonwealth’s PeopleSoft HCM system to reduce the need for dual entry and streamline the process. In addition, the current HR/CMS system may have functionality that is not currently being utilized that could address these needs.
- Given that HR solutions for these functions are primarily offered in an SaaS model, with some vendors supporting distributed configuration options, the institutions could implement the functionality with no investment in physical infrastructure beyond integration to existing systems.

Anticipated Value

- The value of strengthening ties across the PACE ERP community is self-evident. Schools that previously had participated in the SMART project spoke well of the effort and would like to see it revitalized.
- Improved coordination amongst PACE schools will allow for greater leverage in negotiating with ERP vendors.
- PACE schools would benefit from the shared knowledge of multiple schools using similar systems.

Risks

- Although overall costs to support ERP are not excessive today, PACE schools are facing a number of major upgrades over the next 2-3 years, including, but not limited to:
 - Colleague SQL server conversion
 - Banner upgrade to v9.x
- PACE institutions should seek to streamline the software licenses and ERP modules that are utilized to meet long term objectives of reducing administrative overhead and making a strategic choice to focus limited resources on their supporting academic mission.
- Implement the Data Standards Opportunity (#10) as a stepping stone to greater coordination across the 24 PACE schools.

Next Steps

- Revitalize the “SMART” group that served the 13 Banner schools until 2010 as a central resource to serve not only Banner schools, but as an ERP working group for all 24 schools to share common practices, business process improvement efforts, and learn more about the pros and cons of each respective ERP platform. This could also require sub-groups to serve each ERP systems unique needs.

12. Strengthen Enterprise Resource Planning Utilization (ERP)

- Investigate the possibilities for developing a shared governance model that would help schools better coordinate activities and align operational and maintenance cycles.
- Begin to develop a long-term strategy to consider moving the 24 schools to a shared ERP platform and fundamentally change the way these services are delivered and supported.
- As PACE institutions consider long-term strategies, all viable options should be explored, including Open Source products such as Kuali.

13. Shared ERP Platform for all PACE Institutions

Total aggregate spending on ERP for staffing, vendors, and infrastructure is estimated at \$13M annually. Based on FY2012 data, it is estimated that the PACE schools are spending approximately \$5M annually on direct vendor maintenance costs to support their respective ERP systems. This reflects less than 7% of annual expenditures out of a total central IT spend of \$73M. This compares favorably with national averages of 8-9% according to 2012 data contained in the Campus Computing Project.

A high-level analysis of IT positions across the 24 schools leads to an estimate that approximately 100 PACE FTEs are directly involved in supporting the current ERP environments. These functions include database administrators, system analysts and other positions. As was reported in the Trends section of this document and in Opportunity #2, a significant portion of the IT community in the PACE schools is likely nearing retirement over the next 10 years.

One scenario that should be considered over a long-term horizon would call for moving the PACE institutions (or a large percentage of them) to a single ERP platform. PACE institutions would not be the first ones to attempt this type of change and there is precedence amongst similarly sized groups. For example, the Tennessee the Board of Regents (TBR), which serves approximately 200,000 students (PACE schools serve 190,000), made a strategic decision in 2005 to migrate its 19 schools (6 state universities and 13 community colleges to a shared ERP platform.²⁰ In addition, another group of state institutions that have successfully moved in this direction are the Colorado’s community colleges.

The TBR project was complex and took almost 4 years to implement a common ERP platform. According to estimates provided by its CIO, however, the project has resulted in over \$16M of direct cost savings to the state. TBR continues to work on improving business processes and streamlining administrative functions in that state, as a result of migrating the colleges and universities to a single platform.

Stakeholder Impact	This effort would have far-reaching impact across all campuses and would require support and sponsorship from the highest levels of state government.
Investment Considerations	<p>The long-term investment considerations are significant. Based on our analysis of the TBR project, direct vendor implementation costs were in excess of \$76M over a four year period.</p> <p>We have analyzed potential vendor costs in two ways. One method was the usage of the TBR example to provide a relevant and similarly sized organization to PACE schools that has moved to a shared ERP platform.</p> <p>Another methodology takes the current spend of \$5M on vendor maintenance costs and extrapolates this using the following high level</p>

²⁰ In addition to the 19 schools, the TBR oversees 27 Community Technology Centers (CTCs), but the CTCs’ overall impact on the ERP system administration is not extensive and they focus on providing workforce development services to a regional audience.

13. Shared ERP Platform for all PACE Institutions	
	<p>formula for estimating and planning ERP implementation costs:</p> <ul style="list-style-type: none"> • 55% for Services • 35% for Software • 10% for Hardware/Infrastructure <p>In addition, 20% of total software costs should be anticipated for ongoing support costs. Using this approach, we would estimate vendor costs to be approximately \$71M for a shared ERP implementation.</p> <p>For analysis purposes, we estimate \$75M in ERP vendor implementation costs if all PACE schools were to participate in a migration to a shared platform.</p> <p>There are several factors that would impact actual costs for a project of this magnitude. These include, but are not limited to:</p> <ul style="list-style-type: none"> • Project scope • Vendor selection • Vendor negotiations • Hosting model (in-house, outsourced)
Time to Implement	<p>This effort would require significant lead time and up-front planning of multiple years. Once initiated, it is likely that the migration to a single platform would require 3-4 years to implement the entire suite of modules and ERP functionality.</p>
Analysis	
<ul style="list-style-type: none"> • A significant portion of PACE IT staff are expected to retire in the next 10 years. For this analysis, we estimate that 25% of current PACE IT staff will be expected to retire over the next 10 years. • It is estimated that if the number of IT staff positions in PACE institutions supporting current ERP operations (~100 positions) would be reduced to ~30 positions with the implementation of a shared platform for ERP, the schools could realize over \$5.2M in annual cost avoidance. This is arrived at by using a number of \$76,000 per IT employee (including fringe of 27.3%) 	
Anticipated Value	
<ul style="list-style-type: none"> • Long-term cost saving • Improved contracts for ERP support and maintenance • Better reporting and more streamlined services • Improved funding and support model • One maintenance contract 	

13. Shared ERP Platform for all PACE Institutions
<ul style="list-style-type: none"> More leverage with the vendor Better vendor management
Risks
<ul style="list-style-type: none"> Requires collaborative decision-making and shared IT governance over ERP functions. A significant portion of the current workforce will be retiring over the next 10 years and many institutions will be impacted by the loss of these skills in support of their enterprise systems. Complexity and cost of shared platform make this a high risk/high reward option, but other options should be considered in planning. Most PACE institutions have operated with a high level of autonomy. The change in culture and business practices should not be underestimated.
Next Steps
<ul style="list-style-type: none"> Address considerations identified in Opportunity #12 to strengthen information and best practice sharing for ERP support. There is an increasing range of options to consider for addressing ERP services and support. Specific prioritization and planning will be needed to determine how best to proceed with further evaluation of this opportunity, but increasing coordination amongst PACE schools of existing ERP functions and support is a first step.

14. Gain Business Process Improvements

Across the 24 PACE schools, most administrative operations and processes are handled on a per school basis. The one common exception to this practice is the statewide function of payroll that is done via the State’s Human Resources and Compensation Management System (HR/CMS). This independent processing reflects the traditionally autonomous nature of each school as well as the single instance of ERP that each school operates and maintains with its own database and administrative support functions.

A longer term vision for administrative technologies and back office operations should be established that could result in the following:

- More focus on student services and customer facing processes
- Invest more dollars in teaching and learning
- Reduce administrative overhead

ERP improvements and migration to a consistent and shared system should be considered as the first step in more significant business process improvements. Coordinated effort should be undertaken to streamline, collaborate, and consolidate administrative functions in the following areas:

- Accounts Receivable/Student Accounts
- Accounts Payable
- Financial Aid
- General Ledger
- Budget
- Purchasing
- Registration/Transcripts
- Admissions
- Fixed Asset/Inventory
- Reporting

Although it is beyond the scope of this effort to estimate the cost savings of specific process improvements, it can be expected that moving in this direction would result in greater efficiencies, which would most likely be absorbed through retirements, attrition, and redirection of efforts to better align with the strategic mission of the institution.

Stakeholder Impact	This effort would require a multi-year planning and implementation effort that, at some level, would involve many administrative roles of the institutions participating.
Investment Considerations	The most significant costs are associated with moving to a shared ERP platform (see Opportunity #13). However, additional costs to plan for, design, and train on improved business processes. This is estimated to be \$2M or more.
Time to Implement	The move towards a single ERP platform and subsequent efforts to consolidate back office functions will require an extended horizon. The ERP move could happen in less than five years with consolidation efforts coming after a shared ERP platform. After implementation of a shared ERP, it could take four to five years to realize projected cost savings. Hence, a 10-year perspective is appropriate for analysis.

14. Gain Business Process Improvements

Analysis

- Today, PACE institutions spend approximately \$178M on administrative staffing functions. We have analyzed this number based on a conservative breakdown of the following data on FTE headcount and using a number of \$51,000 per employee (including fringe of 27.3%):
- Full-Time Administrative Staff totals across PACE schools according to FY2012 data provided by PACE:
 - Executive/Administrative/Managerial \$1,455
 - Technical and Paraprofessionals 488
 - Clerical and Secretarial 1,555

 - Total \$3,498 x \$51,000 = \$178,384,230
- As stated in prior sections, it is likely that a significant portion of the PACE workforce will be seeking retirement in the next 10 years. This shift provides opportunity to review administrative functions and begin to streamline operations in conjunction with the introduction of a shared ERP.
- For this analysis, we have estimated a 7.5% reduction of administrative staff headcount over the course of 10 years. Anticipating the first four years of the 10-year projection would be spent on implementing a new ERP, the analysis does not realize any reductions until year five. Accordingly, we estimate a 1.25% reduction in staff year over year through year 10 to get to 7.5%. This equates, on average, to an impact of less than two FTEs per PACE school per year.
- The effective savings would be \$7.7M per year over a 10 year period. Please refer to Appendix #1 to see additional detail. In order to realize this savings, PACE institutions would share and consolidate some functions, train people in standardized policies and procedures, and meaningfully change the way some business processes are handled today.

Anticipated Value

- The long term trends for ERP support and maintenance are moving towards a consolidated model that leverages the economies of scale that multi-campus implementations can realize.
- An overall reduction in administrative overhead that can be re-directed to academic and direct student support functions.
- Improved reporting, reduced process times, and streamlined functions

Risks

- Schools are facing continuing pressures to reduce costs and improve student outcomes.
- This effort will require that continued leadership and a clear vision for the future be established and articulated.
- Business process improvements can occur at the institution level. However, without a major collaborative initiative, such as ERP, each institution is more likely to move in its own direction

14. Gain Business Process Improvements

and efforts may not capture economies of scale and other benefits desired.

Next Steps

- This opportunity should be considered in conjunction with investigating the opportunity to move to a shared ERP platform.
- Specific and detailed analysis and planning should be undertaken. The result of this should be a business and operational plan that will guide future decisions and development of specific action plans for the institutions and the PACE collaborative.

15. Investigate a Shared Learning Management System (LMS) Platform

The number of college students taking at least one online course nearly doubled, from 23% to 45%, over the last five years according to the 2013 College Explorer, a report from market research company [re:fuel](#). Students taking online courses are also enrolled in an average of two per term, according to the report. Although LMS is only one component of delivering robust and effective online courses, it is a central component of academic technology.

In FY2012, PACE schools spent in excess of \$1.8M on Blackboard maintenance costs alone and in total spent over \$2.2M with vendors to maintain multiple LMS environments across the PACE schools. A significant majority of the PACE schools remain on the Blackboard LMS, but many have voiced concerns about escalating costs and the long term viability of the product for their institution. However, schools continue to weigh their options and many PACE schools are considering a change in their LMS environment.

At the same time UMASS Online (UMOL) has developed a single instance, shared LMS platform using Blackboard Learn. They have made a significant investment to stand up an LMS that has the capacity to serve the entire higher education community in the Commonwealth (UMASS and PACE schools). Other states such as NY are launching “OpenSUNY” which will serve as a common platform for all 64 SUNY schools to deliver and share online course delivery.

PACE schools should investigate the potential options to move to a hosted LMS platform to strengthen online course management and reduce administrative overhead associated with these systems. In addition, unlike ERP systems, more than 40% of colleges and universities (and 50% of community colleges) had moved to a cloud-based LMS service as of 2012.

Stakeholder Impact	LMS changes will impact a large cross-section of campus stakeholders.
Investment Considerations	<p>It is expected that there would be considerable startup costs associated with moving to a shared LMS platform.</p> <p>We did not collect enough information about LMS staffing support and overall current costs to provide a comprehensive cost consideration, but it can be expected that any preliminary planning effort will require \$500k to \$750k for a feasibility study to weigh the many options that PACE schools have to choose from.</p>
Time to Implement	2-4 years once agreement has been reached on how to proceed.

Analysis

- As indicated in the Important Trends section of this report, the LMS industry continues to see change at a rapid pace. In particular, the market share of Blackboard continues to decline, but at the same time, it remains the largest vendor in the LMS space by a more than a 2:1 margin over Moodle.

15. Investigate a Shared Learning Management System (LMS) Platform

- As of fall 2012, Blackboard’s overall market share had declined from 71% in 2006 to 45%, including the customers that it acquired during acquisitions of Angel and WebCT. Other key vendors include Moodle at 20% and Desire2Learn (D2L) at 11%. In addition, Instructure (Canvas) has an overall 5% market share, but higher percentages in the community colleges and public universities space.
- Based on current vendor spending, it is estimated that schools could potentially reduce their maintenance costs 30% by moving to a model similar to UMASS online with a single, shared platform for LMS services; however, this will require further analysis and assessment.

Anticipated Value

- Reduce administrative costs associated with delivering online courses.
- Support the fastest growing area for most institutions.
- Streamline LMS service delivery across PACE schools.
- Potentially improve the student experience by providing a single platform from which students can take classes even if they take classes at multiple institutions.

Risks

- Governance for LMS will pose significant challenges to making a shared platform viable.
- Many schools will see the LMS experience as too close to strategic mission although the intent is to streamline the technology not the academics.
- Requires coordination of faculty and administrative resources to make decisions as well as central IT and academic technology groups, which may not have the same reporting structure.

Next Steps

- Develop a multi-institution team from PACE schools to investigate LMS opportunities, including but not limited to
 - Evaluate the UMass Online project to determine if could be repeated for PACE or if PACE schools could join the UMass consortium
 - Determine if Massachusetts Colleges Online (MCO) should be a partner in this effort
- Identify challenges and opportunities with moving towards a single platform and lessons learned from the UMass experience.

Section #5 | Success Factors for Strengthening Collaboration and Efficiency

This section identifies critical success factors for PACE to strengthen collaboration and efficiency efforts.

Certain practices will benefit the successful implementation of our previously identified opportunities. These will serve as a foundation to help strengthen collaboration and efficiency efforts. For many of the PACE-wide opportunities to be effective, individual institutions should consider and evaluate where they stand in regards to these IT practices, as these are important at both institution and collaborative levels.

- IT Planning
- IT Governance
- Service Catalog
- Technology Refresh and Reassessment

These general practices are fundamental to higher education, but not specific to PACE institutions.

IT Planning

IT planning is intended to inform and guide strategic decisions about technology, and will therefore require ongoing communication, evaluation, monitoring, and support in order to remain a relevant and valuable resource.

Sustainable planning should be a collaborative effort that targets outcomes that are supported by the College/University community. In order to maintain this support, it will be important to continually engage the right blend of individuals in the governance and planning process.

Gaining and maintaining the support of the campus will require clear, consistent, and accurate communication on behalf of University leadership throughout the implementation process. Effective communication begins with listening and understanding. It is important to note that ongoing communication about technology planning efforts will be important as technology planning becomes integrated into the governance and budgeting cycle.

IT Governance

IT governance describes who makes which decisions, who provides inputs and analyzes issues, who sets priorities, and who settles disputes when there is no clear consensus. Good governance processes are actively designed and well understood by participants, and foster timely decisions that are communicated effectively.

We observed various IT governance structures at PACE institutions, from well-developed structures to no IT governance at all. PACE schools need to establish a technology governance model that facilitates decisions that are informed by stakeholders that enable the institution to assess needs, make decisions, and execute plans in a coordinated and collaborative manner.

The governance structure should yield decisions that are aligned with and help achieve institutional strategic goals. IT governance is focused on the entire technology function (across the institution) and is not intended to replace day-to-day operations.²¹

IT Service Catalog

Institutions should establish an IT service catalog that includes planned services, current services, and identifies retired services. The catalog should enable users to easily determine the appropriate course of action to successfully initiate a service or gain access to an IT resource.

The institution should consider establishing both a technical service catalog, which is viewable by the IT department, and a business service catalog, which is visible to the public. The service catalog should identify the following components for each service:

- Service description
- Service provider/owner
- Who the service is available to
- When the service is available
- Service cost, if applicable
- Process for requesting service
- Service level objectives

The process of developing the service catalog will facilitate decisions about what distinguishes baseline IT services from those services that have an associated chargeback model or SLA. Those services associated with SLAs should hold IT to specific timetables for deliverables. By establishing baseline enterprise IT services, the ITS department can proactively allocate existing resources and will have mechanisms for securing additional resources when necessary.

By establishing a service portfolio and a service catalog, the institution can better manage and plan for customer demand, develop clear service fulfillment workflows, maintain compliance with service level agreements, and identify opportunities for service delivery efficiencies and better plan for collaborative efforts.

Technology Refresh and Reassessment

Institutions should establish a comprehensive IT assessment and refresh program that includes computers, network devices, servers, and other peripherals.

A successful Refresh Program requires a recurring technology refresh budget and an effective asset management program. Accordingly, the program will need the support of institution leaders and should operate within the established IT Governance model. The following parameters should guide the refresh process:

1. Annual reassessment of the appropriate technology should inform technology refresh.

²¹ Source: <http://net.educause.edu/ir/library/pdf/ekf/EKF0805.pdf>

2. The IT Governance committee should inform but not dictate decisions.

Standardizing work stations, servers, operating systems, and database environments greatly simplifies support and troubleshooting. Industry best practices for higher education institutions suggest that PCs should be replaced at a minimum of every four years, or as required. As part of the refresh program, the institution will document, update, and publish minimum standards each year that align with the IT Governance model.

A technology refresh plan helps to guide and control the overall cost of technology by planning for upgrades, replacements, support, and training in a holistic manner. BerryDunn has worked with several clients to plan for a more consistent refresh cycle. For example, please consider the following lifecycles when considering this success factor:

Computers

- Windows PCs and Macs: 4-5 year refresh
- Windows Laptops and MacBook Pro: 3-5 year refresh
- Mobile Devices (iPhone and iPad): 2-3 year refresh
- Printers (all multifunction printers): 5-8 year refresh
- Thin Clients (Virtual Desktop Infrastructure): 6-8 year refresh²²

Classroom Equipment

- Projectors: 4-6 year refresh
- Interactive Whiteboards: 6-9 year refresh

Network Equipment

- Servers: 3-5 year refresh
- Wireless Access: 3-5 year refresh
- Security Equipment: 3-5 year refresh

VoIP Phones: 5-7 year refresh²³

Many technical issues are caused by using devices that have exceeded their expected life. A refresh program should result in fewer of these inherently difficult to remediate support requests. It will be important to have a systematic ability to monitor the age of technology assets to ensure that all assets are within the acceptable range once implemented.

²³ Gunza, Nancy. High Tech, High Stakes Business Officer. September 2012

Section #6 | Next Steps/Roadmap

This section identifies a high-level summary of the Opportunities identified and suggested next steps in addressing this report.

Not all of the opportunities identified focus on cost savings and many require no significant investment, but all opportunities will require leadership and vision from the PACE Presidents if this is to gain traction.

We recommend that PACE institutions should consider the following immediate next steps:

- Understand this report in its entirety. It contains some opportunities that can be quick wins, and others that are significantly complex and will require substantial resources and effort.
- Set priorities and develop a plan for action. Planning will be important and impactful for collaborative efforts and the initiatives of individual institutions.
- Establish a formal structure to support increased collaboration, communications, and coordination of IT services for PACE institutions. In order for PACE to move forward with this effort, dedicated resources will be required.
- Investigate opportunities to utilize available resources that may kick-start these efforts as well as provide funding mechanisms that will not divert additional dollars away from other work being done at PACE schools.

The basic premise of collaboration is to identify and leverage shared opportunities that can take advantage of economies of scale to be achieved when the PACE institutions work together. That is why this effort is so important and why it will have a largely positive outcome for those involved.

PACE institution IT organizations are working hard to support their respective community and to meet the needs of students, faculty and staff. The IT departments realize the pervasive nature of technology and the ever-increasing demand for technology support and services that strain the resources schools have at their disposal.

Many schools are proactively addressing one or more of the opportunities in this assessment. It will be necessary to realize and build upon institutional efforts to date as schools understandably desire not to move backwards in some areas. A thoughtful approach to considering the full capacity that exists today amongst the PACE community during the planning process will be important.

The following table presents a summary of each opportunity identified along with associated benefits, time to implement, and a high-level cost impact.

Table 10: Summary of Opportunities

#	Opportunity	Primary Benefit	Time to Implement	10 Year Average Realized Benefits
1	Coordinate and Share Professional Development Opportunities	Increased value	1 year, but ongoing	Cost Neutral
2	Increase Collaboration to Meet Changing IT Organizational Needs	Improved resource management, Alignment of skills and services	1-2 years	Cost Neutral
3	Establish a Shared IT Purchasing Function	Direct cost savings	1-2 years	\$2.2M/year
4	Establish Coordinated Purchasing of Network and Telecom Services	Increased capacity, cost savings	1-2 years	\$1.2M/year
5	Develop a Collaborative Approach to Meeting Information Security Needs	Strengthen service delivery, cost avoidance	2-3 years	\$1.5M/year
6	Design a Collaborative Approach to Provide 24/7, Tier 1, IT Help Desk Support	Strengthen service delivery, cost avoidance	2-4 years	\$810k/year
7	Build a Shared Approach to Data Backup and Disaster Recovery	Strengthen risk management and cost avoidance	2-4 years	Cost Neutral
8	Create a Central Repository to Support Increased Collaboration	Knowledge sharing, improved communications	1 year, ongoing	No Direct Cost Savings
9	Adopt Shared Tools and Practices to Strengthen IT Project Management	Improved coordination of IT projects, better project outcomes, long-term cost avoidance	2-3 years	No Direct Cost Savings
10	Develop Common Data Definitions and Align Data Standards	Improved ability to analyze and share data, Addresses increased reporting needs and demands	2-3 years	\$146k/year
11	Eliminate 901 Reporting	Better use of resources, cost avoidance	1-2 years	\$764k/year
12	Strengthen Enterprise Resource Planning Utilization (ERP)	Improved use of systems, cost savings	1-2 years, ongoing	No Direct Cost Savings
13	Shared ERP Platform for all PACE Schools	Improved use of systems, cost savings	3-4 years	\$5.3M/year
14	Gain Business Process Improvements	Improved services, greater consistency, long-term cost avoidance	4-5 years	\$7.7M/year
15	Investigate Options to Implement a Shared Learning Management Systems (LMS) Platform	Better service delivery, consistency, long-term cost savings	2-4 years	\$660k/year

Explanation of Cost Savings vs. Cost Avoidance

Our analysis has identified both cost savings and cost avoidance opportunities across the PACE institutions. Cost savings represents a reduction in current spending on key areas. In contrast, cost avoidance represents a reduction in future procurement costs by implementing a better strategy when procuring certain services or goods.

Section #7 | Overview of Appendices

Appendix #1 PACE IT Assessment 10-Year Analysis

This appendix presents analysis on estimated investments and cost savings and/or cost avoidance over a 10-year horizon for the 15 PACE opportunities identified.

Appendix #2 PACE Charter

This appendix presents the PACE charter, updated as of March 2013.

Appendix #3 Summary of the Top 30 IT Projects as Reported by PACE Institutions

This appendix ranks IT projects as reported by PACE schools by cost.

Appendix #4 Top 5 Vendor Contract Expiration Dates

This appendix identifies the top five vendors as reported by PACE institutions, presenting the vendor contract's expiration dates by year.

Appendix #5 Sampling of Consortia in Massachusetts and other States

This appendix presents research on consortia in Massachusetts and in other states.

Appendix #6 List of Participants

This list captures the names and departments of stakeholders BerryDunn interviewed in order to understand the IT concerns and issues campus wide at PACE institutions. This list also includes individuals outside of the PACE organization.

Appendix #7 Glossary of Acronyms

The following glossary provides brief definitions of key terms and concepts that are included in this report.

Appendix #1: PACE IT Assessment 10-Year Analysis

This appendix provides a summary 10-year analysis of the estimated investment and potential cost savings and/or cost avoidance for the 15 Opportunities identified in this report. The figures are for purposes of this opportunity analysis only, and are intended to be a starting point for further consideration. In addition, we have presented the summary table in a chronological format to help the reader understand the sequence when opportunities might reasonably be implemented.

PACE IT Assessment
10 Year Analysis of Opportunities

#	Opportunity Title	Current or Projected Spend	Estimated Investment	Potential Annualized Cost Savings and/or Cost Avoidance										Totals	
				Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10		
1	Coordinate and Share Professional Development Opportunities	\$ 550,000	Cost-Neutral	Cost-Neutral	Cost-Neutral	Cost-Neutral	Cost-Neutral	Cost-Neutral	Cost-Neutral	Cost-Neutral	Cost-Neutral	Cost-Neutral	Cost-Neutral	Cost-Neutral	Cost-Neutral
8	Create a Central Repository to Support Increased Collaboration	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings	No Direct Cost Savings
12	Strengthen Enterprise Resource Planning (ERP) Utilization	Cost-Neutral	Cost-Neutral		Cost-Neutral										
11	Eliminate 901 Reporting	\$ 763,800	Cost-Neutral		\$ 763,800	\$ 763,800	\$ 763,800	\$ 763,800	\$ 763,800	\$ 763,800	\$ 763,800	\$ 763,800	\$ 763,800	\$ 763,800	\$ 6,874,200
2	Increase Collaboration to Meet Changing IT Organizational Needs	No Direct Cost Savings	No Direct Cost Savings		No Direct Cost Savings										
3	Establish a Shared IT Purchasing Function	\$ 28,000,000	\$ (350,000)		\$ 2,240,000	\$ 2,240,000	\$ 2,240,000	\$ 2,240,000	\$ 2,240,000	\$ 2,240,000	\$ 2,240,000	\$ 2,240,000	\$ 2,240,000	\$ 2,240,000	\$ 20,160,000
4	Establish Coordinated Purchasing of Network and Telecom Services	\$ 3,000,000	\$ (100,000)		\$ 1,200,000	\$ 1,200,000	\$ 1,200,000	\$ 1,200,000	\$ 1,200,000	\$ 1,200,000	\$ 1,200,000	\$ 1,200,000	\$ 1,200,000	\$ 1,200,000	\$ 10,800,000
5	Develop a Collaborative Approach to Meeting Information Security Needs	\$ 550,000	\$ (560,000)			\$ 1,531,000	\$ 1,531,000	\$ 1,531,000	\$ 1,531,000	\$ 1,531,000	\$ 1,531,000	\$ 1,531,000	\$ 1,531,000	\$ 1,531,000	\$ 12,248,000
9	Adopt Shared Tools and Practices to Strengthen IT Project Management	\$ -	\$ (500,000)			\$ (35,000)	\$ (35,000)	\$ (35,000)	\$ (35,000)	\$ (35,000)	\$ (35,000)	\$ (35,000)	\$ (35,000)	\$ (35,000)	\$ (280,000)
10	Develop Common Data Definitions and Align Data Standards	\$ 146,000	\$ -			\$ 146,000	\$ 146,000	\$ 146,000	\$ 146,000	\$ 146,000	\$ 146,000	\$ 146,000	\$ 146,000	\$ 146,000	\$ 1,168,000
6	Design a Collaborative Approach to Provide 24/7, Tier 1, IT Help Desk Support	\$ 1,500,000	\$ (250,000)				\$ 810,000	\$ 810,000	\$ 810,000	\$ 810,000	\$ 810,000	\$ 810,000	\$ 810,000	\$ 810,000	\$ 5,670,000
7	Build a Shared Approach to Data Backup and Disaster Recovery	Cost-Neutral	\$ (100,000)				Cost-Neutral								
15	Investigate Options to Implement a Shared Learning Management Systems (LMS) Platform	\$ 2,200,000	\$ (750,000)				\$ 660,000	\$ 660,000	\$ 660,000	\$ 660,000	\$ 660,000	\$ 660,000	\$ 660,000	\$ 660,000	\$ 4,620,000
13	Shared ERP Platform for all PACE Institutions	\$ 13,000,000	\$ (75,000,000)				\$ 5,270,000	\$ 5,270,000	\$ 5,270,000	\$ 5,270,000	\$ 5,270,000	\$ 5,270,000	\$ 5,270,000	\$ 5,270,000	\$ 36,890,000
14	Gain Business Process Improvements	\$ 178,000,000	\$ (2,000,000)					\$ 2,200,000	\$ 4,400,000	\$ 6,600,000	\$ 8,800,000	\$ 10,900,000	\$ 13,000,000	\$ 13,000,000	\$ 45,900,000
Totals		\$ 226,396,000	\$ (79,610,000)		\$ 4,203,800	\$ 5,845,800	\$ 12,585,800	\$ 14,785,800	\$ 16,985,800	\$ 19,185,800	\$ 21,385,800	\$ 23,485,800	\$ 25,585,800	\$ 25,585,800	\$ 144,050,200

10 Year Projected Savings and/or Cost Avoidance \$ **144,050,200**
 Estimated Investment \$ (79,610,000)
 Potential Net Savings after Estimated Investment \$ **64,440,200**

10 year average cost savings \$ **6,444,020**

Footnotes:
 1) Estimates are for analysis purposes only.
 2) Inflation rates were not included in the above calculations.
 3) Unless otherwise noted analysis is based on FY2012 data provided.
 4) Numbers have been rounded.

Appendix #2: PACE Charter

This appendix presents the PACE charter, updated as of March 2013.

Massachusetts State Universities & Community Colleges
Partnership Advancing Collaboration and Efficiency (PACE)
Charter – (updated March, 2013)

PREAMBLE

Being a signatory of this Charter reflects the shared belief that a systematic mode of cooperation among Massachusetts state universities and community colleges carries with it tremendous benefits for each institution, its students and the public at large. By working together, signatories can bolster levels of efficiency, increase productivity, and improve the delivery of services to constituents. A collective commitment to collaboration and efficiency generates savings for every campus – savings that can be strategically redeployed as each institution deems appropriate in bolstering student success, improving the quality of academic programs, and making a college education both affordable and accessible.

While the policies, strategies and infrastructure necessary to realize these benefits are varied, all must operate under the auspices of a Partnership led by the presidents of the 24 institutions. All the while, it is both understood and respected by all signatories that, each institution has a unique history, overarching set of needs, and slate of existing and evolving relationships. As such, the Charter affirms that institutional participation in the Partnership and its initiatives is entirely voluntary, and further recognizes that institutions need not participate in every collaborative effort to be a full partner in the greater effort.

ORGANIZATIONAL STRUCTURE

The Partnership Advancing Collaboration and Efficiency (PACE) will have the following organizational structure:

- I. Steering Committee on Collaboration and Efficiency** to oversee major policies, initiatives and direction. The Steering Committee will have the following members:
 - a. Three state university presidents, chosen periodically by their peers;
 - b. Three community college presidents, chosen periodically by their peers;
 - c. The chair of the Community College Council of Presidents;
 - d. The chair of the State University Council of Presidents;
 - e. The Executive Officer of the State University Council of Presidents;
 - f. The Executive Officer of the Community College Council of Presidents;
 - g. A representative of the Massachusetts Department of Higher Education, chosen periodically by the Commissioner of Higher Education (ex officio); and the
 - h. Co-Executive Directors of PACE (convener(s), ex officio).

NOTE: One of the eight presidents will be elected annually by the members of the Steering Committee to serve as chair.

- II. Council on Collaboration and Efficiency** to oversee the system-wide implementation of initiatives advanced by the Steering Committee. The Council will have the following members:
 - a. One delegate from each of the 24 campuses, chosen periodically by the president of each institution; and
 - b. Co-Executive Directors of PACE (convener(s) ex officio).
- III. Campus Task Forces on Collaboration and Efficiency** to oversee each campus' implementation of initiatives advanced by the Steering Committee. Each Task Force will have the following members:
 - a. Institutional delegate to the Council on Collaboration and Efficiency (convener); and
 - b. Representatives of relevant functional areas, as appointed by the president of each institution.
- IV. The Executive Officer** of the Community College Council and the **Executive Officer** of the State University Council will oversee day to day operations.
- V. Co-Executive Directors of PACE** report to the Executive Officer of the Community Colleges and the Executive Officer of the State Universities and manage the day-to-day operations of the organization. The Steering Committee has authority to hire, terminate, and evaluate the professional performance of the Co-Executive Directors.

A SHARED COMMITMENT OF RESOURCES

- VI.** All signatories to this Charter agree to contribute an annual sum to fund the administrative and operational needs of PACE.
- VII.** The Co-Executive Directors of PACE will be co-located with the Executive Officers of the State University/Community College Councils of Presidents or in a suitable location to be determined by the Steering Committee.
- VIII.** To the extent feasible, PACE will share operating, administrative, and support costs with the State University/Community College Councils of Presidents.

Appendix #3: Summary of Top 30 IT Projects as Reported by Institutions

Below is a rank ordering of reported projects by costs. This shows that 21 of the top 30 planned capital projects (gray shading) as of April 2013 are infrastructure related when computer refresh, VDI, and video surveillance systems are included.

Table 11: Upcoming IT Projects

#	School	IT Project Reported	Amount
1	Mass Bay	PeopleSoft Upgrade	\$ 1,700,000
2	Mass Bay	Network Upgrades to Wire/Wireless	\$ 900,000
3	Springfield	Cisco Enhance Communication	\$ 800,000
4	MCLA	Replace Phone System with VoIP	\$ 766,000
5	Middlesex	Computer Replacements	\$ 728,400
6	Middlesex	VDI	\$ 550,000
7	Berkshire	Network Infrastructure Upgrade	\$ 500,000
8	Springfield	Cisco Security Access and Video Surveillance	\$ 500,000
9	Westfield State	Paperless Admissions DBMS	\$ 500,000
10	MCLA	Replace Network Infrastructure	\$ 400,000
11	Fitchburg State	Replace Network Core	\$ 379,500
12	Quinsigamond	Security Camera Install	\$ 375,000
13	Bunker Hill	Computer Refresh	\$ 280,000
14	Bunker Hill	Implement CRM Solution	\$ 250,000
15	MA Maritime	Recruiter Implementation	\$ 250,000
16	Quinsigamond	Network Infrastructure	\$ 250,000
17	Salem State	Library Computer Refresh	\$ 250,000
18	Salem State	Website Redesign	\$ 250,000
19	Worcester State	Upgrade phone system to VoIP	\$ 250,000
20	Framingham State	Avaya Telephone System Upgrade	\$ 208,000
21	MA Maritime	Access Layer Switch Upgrade	\$ 200,000
22	MCLA	Implement Institutional Information System	\$ 200,000
23	Westfield State	Luminis 5	\$ 200,000

#	School	IT Project Reported	Amount
24	Northern Essex	Avaya Phone System Upgrade	\$ 195,000
25	Holyoke	DegreeWorks	\$ 167,000
26	Fitchburg State	Fiber Replacement	\$ 161,000
27	Bunker Hill	Disaster Recover Expansion Site Capability	\$ 160,000
28	Middlesex	PBX System Upgrade	\$ 160,000
29	Worcester State	Website Redesign	\$ 160,000
30	Framingham State	Installation of new/upgraded technology	\$ 155,000

Appendix #4: Top 5 Vendor Contract Expiration Dates

This appendix identifies the top five vendors as reported by PACE institutions, presenting the vendor contract’s expiration dates by year.

Table 12: Expiring Vendor Contracts

	2013	2014	2015	2016 -2021
Blackboard	Middlesex North Shore Springfield Bridgewater Fitchburg Salem Worcester	Northern Essex Mass Maritime Mt. Wachusett	Framingham	Bristol Bunker Hill Mass Bay
Ellucian	Worcester Middlesex North Shore MassArt MCLA Salem Westfield	Bridgewater Mass Maritime	Greenfield Mt. Wachusett	Bristol Bunker Hill Massasoit Northern Essex Fitchburg Framingham Holyoke
Cisco	Greenfield Holyoke North Shore Bridgewater MassArt Framingham Westfield	MCLA		
Microsoft	Bristol Bunker Hill Greenfield Mass Bay Middlesex North Shore Quinsigamond Springfield Bridgewater MassArt MCLA Worcester	Massasoit Fitchburg Framingham Salem Westfield Mt. Wachusett		
Oracle	Bristol Bunker Hill Holyoke Middlesex North Shore Bridgewater Fitchburg MCLA Framingham Salem Westfield	Northern Essex Mass Maritime Mt. Wachusett		

Appendix #5: State Systems Referenced and Other Consortia

This appendix presents two examples of statewide systems and consortia in Massachusetts and in other states.

Open SUNY – New York			
Who	64 Schools	Objective	
		To bring all online courses offered at each of the system’s campuses onto a shared and comprehensive online environment, making them accessible to all of the system’s 468,000 students and 88,000 faculty members.	
		Recent Projects/Initiatives	
		Advances in Online Learning	Utilized to offer co-operative education, internship/practicum, research, service learning, and international study opportunities.
		Explore and Evaluate Strategies	Boost innovation and reduce cost barriers by exploring open education resources, open access journals, open e-textbooks, open courseware.
Licensed Content	Faculty are encouraged to openly license instructional content they produce to build capacity, offer more programs online.		

Tennessee Board of Regents			
Who	<ul style="list-style-type: none"> 6 State Universities 13 Community Colleges 27 Applied Technology Institutions 	Objective	
		Raise education and skills levels in Tennessee throughout quality programs and services, efficiently delivered.	
		Recent Projects/Initiatives	
		ERP Consolidation	Banner hosting; DBA collaboration; common data repository.
		Online Campus Collaborative	Cooperative online enterprise with combined enrollment.
TBR Mobilization	Mobilizing for new innovations of emerging technology for recruiting, retention, graduation rates, improved teaching, learning, and workforce development.		

A Sampling of Higher Ed. Consortia

Colleges of the Fenway – Boston, MA			
Who	<ul style="list-style-type: none"> • Massachusetts College of Art and Design • Wentworth Institute of Technology • Emmanuel College • Simmons College • Massachusetts College of Pharmacy and Health Sciences 	Objective	
		To add academic and social value to students, seeking innovation for investing in new services, and containing the costs of higher education.	
		Recent Projects/Initiatives	
		Joint Academic Opportunities	Dual degree programs; student cross registration; employee cross registration; inter-library sharing.
		Teacher and Learning Collaborative	Collaborative faculty and staff newsletter; workshops and training; annual resource sharing conference; summer teaching institute.
		Joint Purchasing	Collaboration of IT services, employee recruitment, and property and liability insurances.

CONNECT: A Southeastern Massachusetts Higher Education Partnership			
Who	<ul style="list-style-type: none"> • Bridgewater State University • Bristol Community College • Cape Cod Community College • Massachusetts Maritime Academy • Massasoit Community College • University of Massachusetts Dartmouth 	Objective	
		To improve the quality, accessibility, and affordability of higher education and to advance the economic, educational, and cultural life of the southeast region of Massachusetts.	
		Recent Projects/Initiatives	
		Accessibility of Student Records	Enhance academic programs and ease the transfer of students among the institutions.
		Regional Development	Foster economic development throughout the region; promote cultural programs and projects.
		Resource Sharing	Share expertise and resources.

Colleges of Worcester Consortium, Inc. – Worcester, MA Area			
Who	<ul style="list-style-type: none"> • Anna Maria College • Assumption College • Becker College • Clark University • College of the Holy Cross • Cummings School of Veterinary Medicine • MCPHS University • Nichols College • Quinsigamond Community College • UMass Medical School • Worcester Polytechnic Institute • Worcester State University 	Objective	
		To enhance benefits to members through programs and services that provides cost savings and efficiencies.	
		Recent Projects/Initiatives	
		Education Opportunity Centers	Provides education access services to low-income adults who are interested in returning to school.
		Reorganization	Separating member services and higher education access services.
Joint Purchasing	Enables members to make greater use of scarce or limited resources through cooperative relationships.		

Southern Maryland Higher Education Center (SMHEC)			
Who	<ul style="list-style-type: none"> • Johns Hopkins University • University of Maryland College Park • University of Maryland University College • George Washington University • The Catholic University • Towson University • Notre Dame of Maryland University • Gratz College • Capital College • Webster University 	Objective	
		To expand the region’s creative and technology-based economy through access to an array of professional academic programs at state-of-the-art facilities.	
		Recent Projects/Initiatives	
		Performance Based Funding	Ensures that funding decisions are based on a transparent assessment of results against time-bound targets.
		Data System Expansion	Development of segmental working groups for making reporting, research, and accountability measures more efficient.
Online Applications	Enhancing the out-of-state online registration process.		

State University of New York North Country Consortium			
Who	<ul style="list-style-type: none"> • SUNY Canton • SUNY Empire State • SUNY Institute of Technology • SUNY Jefferson • SUNY Oswego • SUNY Potsdam • SUNY Upstate Medical 	Objective	
		To meet the need for broadening higher education opportunities in the Watertown/Fort Drum area, specializing specifically in supporting active duty military members, veterans, and military families.	
		Recent Projects/Initiatives	
		Veteran's Services	Future integration of blended or hybrid learning in new or existing courses.
		Teacher Education Network	Partnership of library directors and CIOS on six campuses exploring issues and developing projects to create sharing.
Cradle to Career Network (STRIVE)	Provides students with practical, hands-on, educational technology experiences in an IT environment.		

New York Six Liberal Arts Consortium			
Who	<ul style="list-style-type: none"> Colgate University Hamilton College Hobart and Williams Smith Colleges Skidmore College St. Lawrence University Union College 	Objective	
		Through the sharing of expertise and resources, the Consortium enhances options for students, faculty, and staff, while reducing colleges' individual and collective operating and capital costs.	
		Recent Projects/Initiatives	
		Blending Learning Project	Future integration of blended or hybrid learning in new or existing courses.
		Faculty of Color Conference	Recruitment and retention of diverse faculty; faculty workload, mentoring, and interactions.
		MediaShare	A joint library-IT initiative designed to facilitate media sharing, leverage resources, and enhance services through cooperation and coordination.
		Instructional Technology Apprenticeship	Provides students with practical, hands-on, educational technology experiences in an IT environment.

New England Higher Education Recruitment Consortium			
Who	73 Schools	Objective	
		To advance member institutions' ability to recruit and retain the most diverse and talented workforce and to assist dual-career couples.	
		Recent Projects/Initiatives	
		Diversity Recruitment Conference	Committing to the hiring of diverse candidates.
		Job Fair Booths	Enhancing the spectrum and quality of candidates.
Dual-Career Partners	Providing networking tools and employment support for the spouse or partner of the candidate.		

Appendix #6: List of Interview Participants

This list captures the names and departments of stakeholders BerryDunn interviewed during our campus visits and follow-up work.

Table 12: List of Interview Participants

Institution	Name	Title
Berkshire Community College	Ellen Kennedy	President
Berkshire Community College	Dori Digenti	Director, Center for Teaching & Learning
Berkshire Community College	Frances Feinerman	VPAA
Berkshire Community College	Tom Curley	Dean, Humanities
Berkshire Community College	Charles Kaminski	Dean, Business, Science, Math, and Technology
Berkshire Community College	Don Pfeifer	Registrar
Berkshire Community College	Mitch Saviski	Comptroller
Berkshire Community College	John Law	CFO
Berkshire Community College	Mark Sumy	Database Administrator
Berkshire Community College	Rick Wixson	Director, IT
Berkshire Community College	Jeff Dupuis	Network & System Administrator
Berkshire Community College	Tom Warner	Network & System Administrator
Bridgewater State University	Raymond Lefebvre	Assistant VP, Applications & Development
Bridgewater State University	Patrick Cronin	VP, IT / CIO
Bridgewater State University	Bryan Baldwin	VP, Advancement & Strategic Planning
Bridgewater State University	Michael Young	Associate Provost, Academic Planning & Administration
Bridgewater State University	Miguel Gomes	VP, Administration & Finance
Bridgewater State University	Dana Mohler-Faria	President
Bridgewater State University	Eric LePage	Director, Computing Support
Bridgewater State University	Steven Zuromski	Acting Assistant VP, Infrastructure Services
Bristol Community College	Jo-Ann Pelletier	VP, IT
Bristol Community College	Jane Kitchen	Senior Programmer
Bristol Community College	Scott Francis	Assistant Director, Academic Technology Support Services
Bristol Community College	Shawn Tivnan	Assistant Director, Web Services & Technology Training
Bristol Community College	Paul Jefferson	Director, Network & User Services
Bristol Community College	Steve Kenyon	VP, Administration & Finance/CFO
Bristol Community College	Greg Sethares	Acting VPAA
Bristol Community College	John Sbrega	President
Bunker Hill Community College	Jesse Thompson	Executive VP & CFO
Bunker Hill Community College	Ramon Delacruz	EDP Systems Analyst IV
Bunker Hill Community College	John Bertone	Director, Network Operations
Bunker Hill Community College	Maria Leite	Director, Administrative Systems
Bunker Hill Community College	Ken Kozikowski	Director, Technology Support Services

Institution	Name	Title
Bunker Hill Community College	Bret Mueller	CIO (From Campus Works)
Bunker Hill Community College	James Canniff	VPAA
Bunker Hill Community College	Mary Fifield	President
Cape Cod Community College	Greg Banwarth	CIO
Cape Cod Community College	John Cox	President
Cape Cod Community College	Sue Miller	VPAA
Cape Cod Community College	Dixie Norris	CFO
Colleges of the Fenway	Debbie Pepper	Director, Shared Services
Executive Office of Education for Massachusetts	Sharon Wright	Secretariat Chief Information Officer
Fitchburg State University	Ronda Thompson	Assistant Director, IT
Fitchburg State University	James Roger	Director, Auxiliary Services
Fitchburg State University	Cheryl Johnston	Business Manager
Fitchburg State University	Brion Keagle	Assistant Director, IT & Core Services
Fitchburg State University	Joe Turner	Director, IT
Fitchburg State University	Steve Swartz	Assistant VP & CIO
Fitchburg State University	Sherry Horeanopoulos	ISO
Fitchburg State University	Robin Bowen	VPAA
Fitchburg State University	Jay Bry	VP, Finance & Administration
Fitchburg State University	Robert Antonucci	President
Framingham State University	Mike Zinkus	Director, Systems & Network Services
Framingham State University	Robin Robinson	Director, Education Technology & Support
Framingham State University	Patrick Laughran	CIO
Framingham State University	Marsha Bryan	Director, Administration & Student Information Systems
Framingham State University	Deborah Saks	Director, User Services
Framingham State University	Dale Hamel	CFO / Senior VP, Administration, Finance & Technology
Framingham State University	Linda Vaden-Goad	CAO, VPAA
Greenfield Community College	Mike Assaf	CIO
Greenfield Community College	Debra Washer	Application Manager
Greenfield Community College	Robin Howard	Computer Operator
Greenfield Community College	Kathy Mielnikowski	Systems Analyst
Greenfield Community College	Supreeth Chandrashekar	Systems Analyst
Greenfield Community College	Steve Harris	Network Manager
Greenfield Community College	Anthony Gasperini	Systems Analyst
Greenfield Community College	Deanna Lovett	Assistant Manager, Computer Operations
Greenfield Community College	David Charbonneau	Assistant Network Manager
Greenfield Community College	Karen Phillips	Comptroller
Greenfield Community College	Sheryl Hurska	CAO & Student Affairs
Greenfield Community College	Bob Pura	President

Institution	Name	Title
Holyoke Community College	Linda Szalankiewicz	CIO
Holyoke Community College	Edward Murch	Media Services
Holyoke Community College	Mary Ellen White	Administration Support
Holyoke Community College	Roger Thornton	Director, IT Services
Holyoke Community College	Tristan Simonds	Director, IT Infrastructure
Holyoke Community College	Bruce Kellogg	Systems Analyst
Holyoke Community College	William Messner	President
Holyoke Community College	William Fogarty	CFO
Holyoke Community College	Matt Reed	CAO
Massachusetts Department of Higher Education	Jonathan Keller	Associate Commissioner for Research, Planning, and Information Systems
Massachusetts Bay Community College	Michael Lyons	CIO
Massachusetts Bay Community College	Deni Budd	Staff Assistant
Massachusetts Bay Community College	Anthony Vecchione	Assistant Technical Director
Massachusetts Bay Community College	Judi Kenney	Web Developer
Massachusetts Bay Community College	Terry Kramer	Director, Administration Computing
Massachusetts College of Liberal Arts	Curt King	CIO
Massachusetts College of Liberal Arts	Peter Allmaker	IT Administration
Massachusetts College of Liberal Arts	John Bromback	Administrative Services
Massachusetts College of Liberal Arts	Mary Grant	President
Massachusetts College of Liberal Arts	Cindy Brown	VPAA
Massachusetts College of Liberal Arts	Monica Joslin	Dean
Massachusetts College of Liberal Arts	Jim Stakenas	VP, Administration and Finance
Massachusetts College of Liberal Arts	Jerry Desmarais	Treasurer
Massachusetts Maritime Academy	Aaron Valentine	Network Support Technician
Massachusetts Maritime Academy	Margie Williams	Database Administration
Massachusetts Maritime Academy	Chris Chagnon	Media Services
Massachusetts Maritime Academy	Rob MacGregor	Director IT
Massachusetts Maritime Academy	Kim Barrett	Administration Assistant
Massachusetts Maritime Academy	William Delano	Network Support Technician
Massachusetts Maritime Academy	Chris Fegela	Systems & Web
Massachusetts Maritime Academy	Admiral Richard Gurnon	President
Massachusetts Maritime Academy	Rose Cass	CFO
Massachusetts Maritime Academy	Brad Lima	Dean & VPAA
MassArt	Eric Bird	VP, Technology / CIO
MassArt	Kurt Steinberg	Executive VP
MassArt	Meg Young	Director, Academic Support Services
MassArt	Matthew Burfeind	Deputy CIO
MassArt	Maribeth Macaisa	Director, Client Services & Strategic Initiatives
MassArt	Dawn Barrett	President

Institution	Name	Title
MassArt	Maureen O'Kelly	Senior VPAA
Massasoit Community College	Barbara Finkelstein	Senior VP & VP, Faculty & Instruction
Massasoit Community College	Charles Wall	President
Massasoit Community College	Bill Mitchell	VP, Administration / CFO
Massasoit Community College	Al Williams	CIO
Massasoit Community College	Jack Barrett	Deputy CIO
Massasoit Community College	John Gardell	Manager, User Services
Massasoit Community College	Ed Krasnow	Director, Instructional Media Services/TV/Radio
Massasoit Community College	Bill Morrison	Director, Enterprise Systems
Middlesex Community College	Lee Shurtleff	Help Desk Manager
Middlesex Community College	Al Keniston	Director, IT
Middlesex Community College	Gina Spaziani	Director, Budget & Financial Services
Middlesex Community College	Jay (James) Linnehan	Executive VP
Middlesex Community College	Brad Yoder	CTO
Middlesex Community College	Ellen Ricca	Knowledge Base Coordinator
Middlesex Community College	Josephine Gorman	Manager, Application Services
Middlesex Community College	Carole Cowan	President
Middlesex Community College	Philip Sisson	Provost & VP, Academic & Student Affairs
Middlesex Community College	James Linnehan	Executive VP
Mount Wachusett Community College	Shane Mullen	Director, Enterprise Systems
Mount Wachusett Community College	Jim Miller	Network/System Administrator
Mount Wachusett Community College	Donnie Kitzmiller	Technical Services Manager
Mount Wachusett Community College	Vincent Ialenti	Dean
Mount Wachusett Community College	Susan McHugh	Executive Director
Mount Wachusett Community College	Bob Laconte	VP, Administration and Finance
Mount Wachusett Community College	Ann McDonald	Executive Vice President
Mount Wachusett Community College	Dan Asquino	President
Mount Wachusett Community College	Melissa Fama	Vice President
North Shore Community College	Jan Forsstrom	VP, Administration & Finance / CFO
North Shore Community College	Nancy Sherwood	Director, IT Applications
North Shore Community College	Gary Han	CIO
North Shore Community College	Brian McDonald	Director, Network & User Services
North Shore Community College	Wayne Burton	President
North Shore Community College	Paul Frydrych	VPAA
North Shore Community College	Michael Badolato	Dean, Academic Technology
Northern Essex Community College	Jeff Bickford	CIO
Northern Essex Community College	David Mcaskill	Director, Information Technology Network
Northern Essex Community College	Bill Heineman	VPAA / Provost
Northern Essex Community College	Lane Glenn	President

Institution	Name	Title
Northern Essex Community College	David Gingerella	VP, Administration & Finance / CFO
PACE	Sheila Sykes	Co-Executive Director
PACE	Betty Ann Learned	Co-Executive Director
Quinsigamond Community College	Patricia Toney	VPAA
Quinsigamond Community College	Steve Marini	VP, Administration Services / CFO
Quinsigamond Community College	Ken Dwyer	CTO
Quinsigamond Community College	Robert Sarao	Deputy CTO
Quinsigamond Community College	Leo Burgess	IT Service Manager
Quinsigamond Community College	Wayne Brink	Director, Information Systems
Quinsigamond Community College	Deb Downen	Director, Academic Computing & Instructional Technology
Quinsigamond Community College	Jesse Bottcher	Director, Network Infrastructure
Quinsigamond Community College	Gail Carberry	President
Roxbury Community College	Maryam Mirza	Director, Help Desk
Roxbury Community College	Jean-Bernard Nicolas	Director, Computer Labs
Roxbury Community College	Khari Alexander	Network Director
Roxbury Community College	Fred Tahmasian	Director Enterprise Applications
Roxbury Community College	Patrick Jean-Louis	CIO
Roxbury Community College	Linda Turner	Interim President
Roxbury Community College	Chuks Okoli	VP, Administration & Finance
Roxbury Community College	Brenda Mercomes	VPAA
Salem State University	Mike Rose	Deputy CIO
Salem State University	Davor Blazevic	Data Center Architect
Salem State University	Brian Helman	Director, Networking
Salem State University	Matt McAuliffe	Deputy CIO
Salem State University	Daniel Lee	Associate Director, Client Support
Salem State University	Patricia Ainsworth	CIO / CISO
Salem State University	Patricia Maguire Meservey	President
Salem State University	Kristin Esterberg	CAO / Provost
Salem State University	Andrew Soll	CFO / VP, Finance & Facilities
Springfield Tech Community College	Catherine Olson	Senior Director, Finance & Budgets
Springfield Tech Community College	Michael Suzor	Assistant to the President
Springfield Tech Community College	Joseph DaSilva	VP, Administration / CFO
Springfield Tech Community College	Jonathan Tudryn	Controller
Springfield Tech Community College	Robert Trusch	Senior Director, IT Infrastructure
Springfield Tech Community College	Cliff Porter	Senior Director, IT Applications
Springfield Tech Community College	Michael Cipriano	Technology Consultant
Springfield Tech Community College	Robert LePage	VP, Foundation & Workforce Training
Springfield Tech Community College	Theresa Remillard	Registrar

Institution	Name	Title
Springfield Tech Community College	Myra Smith	VP, Student & Multicultural Affairs
Springfield Tech Community College	Steve Keller	EVP / CAO
Springfield Tech Community College	Matthew Gravel	Dean, Curriculum
Springfield Tech Community College	Barb Chalfonte	Dean, Institutional Effectiveness
Springfield Tech Community College	Leona Ittleman	Dean, Business, IT, and Academic Program
State Universities of Massachusetts	Vincent Pedone	Executive Officer
UMASS	Robert Solis	VP & CIO
UMASS Online	John Cunningham	CEO
UMASS Online	Patrick Masson	CTO
Westfield State University	Aaron Childs	Director, Infrastructure
Westfield State University	Mark St. John	Assistant Director, Television Production
Westfield State University	Scott Clark	Assistant Director, Help Desk
Westfield State University	Nick Wojtowicz	Associate Director, Academic Services
Westfield State University	Rudy Herbert	Director, Administrative Systems
Westfield State University	Chis Hirtle	CIO
Westfield State University	Milton Santiago	Vice President
Westfield State University	Liz Preston	Vice President
Worcester State University	Eihab Jaber	CIO
Worcester State University	Joyce Danelius	End User Services
Worcester State University	Sopheap Chhoeuk	Administration Assistant / Budget Manager
Worcester State University	Kelly Laviolette	Administrative Services
Worcester State University	Thomas White	Multimedia
Worcester State University	Charles Cullum	Provost & VPAA
Worcester State University	Brian Maloney	President
Worcester State University	Andrea Bilics	Professor & Director, Center for Teaching & Learning
Worcester State University	Kathleen Eichelroth	CFO
Worcester State University	Nancy Ramsdell	Director, Outreach & Technology Development
Worcester State University	Jack Reardon	Associate Director, Network & Infrastructure Services

Appendix #7: Glossary of Terms

The following glossary provides brief definitions of acronyms, key terms and concepts that are relevant to this report. Most definitions were provided by *Computer Desktop Encyclopedia*, Version 26.3, The Computer Language Company Inc., Point Pleasant, Pennsylvania, 2013.

Term/Concept	Definition
Active Directory	An advanced, hierarchical directory service that comes with Windows servers and is used for managing permissions and user access to network resources
AV	Audio visual
Banner	An ERP system by Ellucian
Blackboard Learning System	A widely used education system from Blackboard Inc., Washington, D.C., www.blackboard.com
Business Objects	(SAP Business Objects, San Jose, CA, www.sap.com) An enterprise software company specializing in business intelligence with over 46,000 customers worldwide
BYOD	(Bring-Your-Own-Device) Refers to employees taking their own personal device to work, whether laptop, smartphone or tablet, in order to interface to the corporate network
Campus Computing Project	Largest continuing study of IT in higher education; conducts an annual, national survey to identify trends in the industry
CampusWorks	(CampusWorks, Inc., Bradenton, FL, www.campusworksinc.com) An information technology management firm that specializes in higher education, founded in 1999
CAO	(Chief Administrative Officer) High-level executives who supervise the daily operations of a business and are ultimately responsible for the performance of the departments they manage
Carnegie Classification	Developed by the Carnegie Foundation for the Advancement of Teaching, this is the leading framework for recognizing and describing institutional diversity in U.S. higher education
Carrier Service	The function of supplying communications and networking services
CATV	The original name for cable television
CFO	(Chief Financial Officer) Oversees the overall financial risks of a business, pursues positive business ventures, prepares financial reports, and communicates with other executives to ensure the maximum growth of the company
CIO	(Chief Information Officer) The executive in charge of information processing in an organization

Term/Concept	Definition
Cisco	(Cisco Systems, Inc., San Jose, CA, www.cisco.com) A leading manufacturer of networking equipment, including routers, bridges, frame switches and ATM switches, dial-up access servers and network management software
CISO	(Chief Information Security Officer) The person in charge of all staff members who are responsible for promulgating, enforcing and administering information security policies for all systems within an enterprise or division
Cloud	A communications network. The word "cloud" often refers to the Internet. However, the term "cloud computing" refers to the services that have enabled the cloud to become so prominent in everyday life.
Colleague	An ERP system by Ellucian
CollegeNet	(CollegeNET, Inc., Portland, OR, www.corp.collegenet.com) A higher education web technology developer that provides SaaS applications for administrative functions
Comcast	(Comcast Corporation, Philadelphia, PA, www.corporate.comcast.com) The largest cable company in the U.S. Also one of the biggest mass media and home Internet service providers, and third largest home telephone service provider.
Connect Consortium	A partnership of the six public higher education institutions in Southeastern Massachusetts established to improve quality, accessibility, and affordability of higher education; to advance the economic, educational, and cultural life of the region
CRM	(Customer Relationship Management) An integrated information system that is used to plan, schedule and control the presales and post sales activities in an organization
Cross-training	Training someone in another activity that is related to their current work in an effort to enhance efficiency
CTO	(Chief Technology Officer) The executive responsible for the technical direction of an organization
Data Mining	Exploring and analyzing detailed business transactions; uncovering patterns and relationships contained within the business activity and history
Data Standards	Standards that provide consistent meaning to data shared among different information systems, programs, and agencies throughout a product's life cycle
Data Standards Committee	Establishes standards for the entry of shared information at an institution
DBA	(Database Administrator) A person responsible for the physical design and management of the database and for the evaluation, selection, and implementation of the DBMS

Term/Concept	Definition
DBMS	(Database Management System) Software that controls the organization, storage, retrieval, security, and integrity of data in a database
DR	(Disaster Recovery) A plan for duplicating computer operations after a catastrophe occurs, such as a fire or earthquake
E.O. 504	MA Executive Order 504 issued by Massachusetts Governor Deval Patrick on September 19, 2008 requiring agencies and higher education institutions to appoint an Information Security Officer
EDUCAUSE	A nonprofit association whose mission is to advance higher education through the use of information technology
E-learning	(Electronic-Learning) An umbrella term for providing computer instruction (courseware) online over the public Internet, private distance learning networks, or in-house via an intranet
Ellucian	Formerly comprised of two educational technology leaders, Datatel and SunGard Higher Education, Ellucian provides technology solutions and strategic guidance for more than 2,400 institutions in 40 countries.
Enterprise Software	Software used in an organization as opposed to software used by individuals
Enterprise Strategic Procurement	The acquisition of products and services through streamlining and integration
E-portfolio	(Electronic Portfolio) A collection of electronic evidence assembled and managed by a user, usually on the Web
ERP	(Enterprise Resource Planning) An integrated information system that serves all departments within an enterprise. Evolving out of the manufacturing industry, ERP implies the use of packaged software rather than proprietary software written by or for one customer.
EVP	(Executive Vice President) Vice president holding executive power
Fiber Optic Network	A method of transmitting information from one place to another by sending pulses of light through a series of optical fiber cables
FTE	(Full-Time Equivalent) Number of working hours that represents one full-time employee during a fixed period of time
HEIRS	(Higher Education Information Resource System) A data warehouse into which each Massachusetts public higher education institution submits data at regular intervals during the year
Help Desk	A source of technical support for hardware or software. Help desks are staffed by people who can either solve the problem directly or forward the problem to someone else. Help desk software provides the means to log in problems and track them until solved.

Term/Concept	Definition
Homegrown	Software developed by the institution to meet specific needs usually because no suitable commercial package is available
HR	(Human Resources) The human resources department within an organization manages the administrative aspects of the employees
HRCMS	(Human Resources Compensation Management System) An application used by 149 departments and 2000+ end users to process personnel and payroll transactions in Massachusetts
In-house Training	Training programs for learning opportunities developed by the organization in which they are used
ISO	(Information Security Officer) In charge of setting security policy while informing, advising, and alerting the general management on matters of information security
IT	(Information Technology) Processing information by computer, which encompasses "information management" and "computer science"
ITD	(Information Technology Department)
ITS	(Information Technology Services)
Jenzabar	(Jenzabar, Inc., Boston, MA, www.jenzabar.com) An enterprise software provider serving more than 1,000 higher education campuses worldwide
Joint Cost Savings	The collaborative effort to reduce common operation costs of joint products and joint-product processes
Joint Purchasing	A method of purchasing particular commodities for two or more departments
KnowledgeLink	(KnowledgeLink, Inc., Aurora, IL, www.knowledgelinkinc.com) A training a consulting firm that offers technical training, technical writing, documentation production, and market development consulting
LAN	(Local Area Network) A communications network that is typically confined to a building or premises
LMS	(Learning Management System) An information system that administers instructor-led and e-learning courses and keeps track of student progress
Logistics Matrix	An organization and coordination tool allowing decision makers to solve their problem by evaluating, rating, and comparing different alternatives on multiple criteria
LPN	(Licensed Practical Nurse) A term used to refer to a nurse who cares for people who are sick, injured, convalescent, or disabled under the direction of registered nurses and physicians
MassArt	(Massachusetts College of Art and Design)
MB	(Megabyte) Approximately one million bytes (1,048,576 bytes)

Term/Concept	Definition
Mb	(Megabit) 131,072 bytes
MBI	(Massachusetts Broadband Institute) The Broadband Act of 2008 gives authority to extend affordable high-speed Internet access to all homes, businesses, schools, libraries, medical facilities, government offices, and other public places in Massachusetts.
mbps	(Megabits per Second) One million bits per second. Mbps is a measurement of peripheral data transfer or network transmission speed.
MCCEO	(Massachusetts Community Colleges Executive Office)
MCLA	(Massachusetts College of Liberal Arts)
MITI	(Massachusetts Information Turnpike Initiative) Provides access to educational services throughout Massachusetts serving University campuses, libraries, and state agencies
Mobile Application	A software application that runs in a smartphone, tablet, or other portable device
NECC	(Northern Essex Community College)
Network Connectivity	The measurement of a physical and logical connection of a computer network or an individual device to a network, measured in megabits per second (mbps)
Network Core	The central part of a telecommunication network that provides various services to customers who are connected by the access network
Open-access	The practice of providing unrestricted access via the Internet to peer-review scholarly journal articles
Oracle	(Oracle Corporation, Redwood Shores, CA, www.oracle.com) The world's largest database and enterprise software vendor founded in 1977 by Larry Ellison. The Oracle database has been Oracle's flagship product, which was the first DBMS to incorporate the SQL query language.
PACE	(Partnership to Advance Collaboration and Efficiency) An effort led by the MCCEO and the State University System Councils of Presidents to address the recent recommendations made by the Department of Higher Education's Task Force on Collaboration and Efficiency. Consists of fifteen community colleges and nine state universities.
PBX	(Private Branch Exchange) An in-house telephone switching system that interconnects telephone extensions to each other as well as to the outside telephone network (PSTN). A PBX enables a single-line telephone set to gain access to one of a group of pooled (shared) trunks by dialing an 8 or 9 prefix.
PeopleSoft	(PeopleSoft, Inc., Pleasanton, CA, www.peoplesoft.com) A software company that specialized in enterprise-wide applications for client/server environments. Acquired by Oracle in 2004.

Term/Concept	Definition
PM	(Project Management) Provides IT services with a set of standards to initiate and manage individual projects
PMI	(Project Management Institute) One of the world's largest not-for-profit membership associations for the project management profession
PON	(Passive Optical Network) An optical point-to-multipoint access network designed for local loop transmission rather than long distance and serve to bring fiber closer to the customer in order to obtain higher speed
Portal Application	A software tool available through a secured website which has the ability for the service provider to track users' web activity once they log onto the portal
Project Portfolio Management	A discipline that seeks to better manage resources and project work, and to improve collaboration on like projects using specialized software
Record Retention Group	A group that deals with storing historical documentation for a set period of time, usually mandated by state and federal law
Refresh	To continuously charge a device that cannot hold its content; the upgrading and replacing of computer systems, peripherals, and other technologies to ensure the access to the most basic services and efficiency of existing resources
RFI	(Request for Information) A standard business process whose purpose is to collect written information about the capabilities of various suppliers, used to help make a decision on what steps to make next
RFP	(Request For Proposal) A document that invites a vendor to submit a bid for hardware, software and/or services
RN	(Registered Nurse) RNs provide and coordinate patient care, educate patients and the public about various health conditions, and provide advice and emotional support to patients and their family members.
RTS	Vendor providing DBA services
SaaS	(Software-As-A-Service) Capability to move files to an offsite location
SAN	(Storage Area Network) An array of disk drives in a self-contained unit. In large enterprises, SANs serve as pools of storage for the servers in the network. Compared to managing disks attached to each server, SANs improve system administration.
Scope	The parameters in an assessment, including scale and nature of specific environments and components
Self-service Application	A software application that allows a user to obtain information or complete a business transaction on a computer that has traditionally required the help of a human representative

Term/Concept	Definition
Service Catalog	A list of IT services that an organization provides or offers to its employees or customers
Shared Administrative Service	An initiative that focuses on helping departments control costs and improve service delivery by improving administrative processes and procedures
SharePoint	A family of Windows software from Microsoft that is used to set up internal Web portals (intranets) for document sharing and search, team collaboration, blogs, wikis, and company news
SIG	(Strata Information Group, Inc., San Diego, CA, www.sigcorp.com) SIG supports the effort of colleges and universities to manage information technology to improve services to faculty, staff, and students
SIP	(Session Initiation Protocol) An IP telephony signaling protocol that is widely used to start and terminate voice calls over the Internet
SLA	(Service Level Agreement) A contract between the provider and the user that specifies the level of service expected during its term. Used by vendors and customers as well as internally by IT shops and their end users, SLAs can specify bandwidth availability, response times for routine and ad hoc queries, response time for problem resolution (network down, machine failure, etc.), as well as attitudes and consideration of the technical staff.
SMART	(SunGard Massachusetts Advisory Resource Team) Consisted of state and community colleges located in Massachusetts that utilized the SunGard Banner ERP system from 2009-2010. They were dedicated to sharing information, lessons learned resources and best practices to enhance the use of Banner and 3rd party applications associated with it.
SQL	(Structured Query Language) A language used to interrogate and process data in a relational database. SQL commands can be used to interactively work with a database or can be embedded within a script or programming language to interface to a database.
Stackable Certificates	A process that certifies an individual has specific skills needed for the workplace by connecting pre-college academic work to credit-bearing career and technical coursework, ultimately leading to a college degree
Staffing Review Policy	Policy that assists IT leader/hiring positions in determining how to fill the role of personnel who retire, leave, etc.
Stakeholder	Any individual who may be affected by a business decision. The term may refer to just about anyone who has some interest in a company or its products; however, it specifically excludes shareholders, who are officially part owners of the company.
Stand-alone	Refers to a device that works on its own without requiring additional equipment

Term/Concept	Definition
Strategic Plan	An organization's statement defining its strategy, direction, and decisions to allocate resources in order to pursue this strategy
System of Record	A data management term for an information storage system that is the authoritative data source for a given data element or piece of information
Systems Analyst	A person responsible for the development of an information system. Systems analysts design and modify systems by turning user requirements into a set of functional specifications, which are the blueprint of the system. They design the database unless done by a data administrator.
TBR	(Tennessee Board of Regents) Consists of 46 institutions, making it one of the nation's largest systems of public higher education
TeamDynamix	(TeamDynamix, Inc., Columbus, OH, www.teamdynamix.com) Produces web-based project portfolio and service desk management solutions for leading colleges and universities across the U.S
terabyte	Approximately one trillion bytes (1,099,511,627,776 bytes)
The Vision Project	An initiative headed by the MA Department of Higher Education to demonstrate that public higher education can act in a unified and focused way to ensure the future well-being of Massachusetts as well as providing accountable results to the people of the state
Third Party	Typically a company that provides an auxiliary product not supplied by the primary manufacturer to the end user
Ticketing System	Also known as an issue tracking system, these computer software packages are usually used at an IT help desk to manage and maintain lists of issues.
Tier 1	Tier 1 is the first line of support; typically student workers assisted by the technology knowledge base and trained to provide basic assistance that does not require technical expertise or hands-on trouble shooting.
Title III Grant	A federal grant program that provides funds to improve the education of limited English proficient students, including immigration children and youth
Train the Trainer	The concept of lifelong learning, which purports that all employees can continually improve upon their skills through workplace training programs
Trunking	Using multiple transmission paths between network devices in order to increase transmission speed
UITs	(University Information Technology Services)
UMASS	(University of Massachusetts System)
VDI	(Virtual Desktop Infrastructure) Used generically for desktop virtualization, in which client desktops are run in virtual machines in a server

Term/Concept	Definition
VoIP	(Voiceover Internet Protocol) A digital telephone service that uses the public Internet and private backbones for call transport. Support for the public switched telephone network (PSTN) is also provided so that VoIP calls can originate and terminate from regular telephones.
VPAA	(Vice President of Academic Affairs)
WAN	(Wide Area Network) A long-distance communications network that covers a wide geographic area, such as a state or country. The telephone companies and cellular carriers deploy WANs to service large regional areas or the entire nation.
WAP	(Wireless Application Protocol) A base station in a wireless LAN. Although there are other wireless technologies that use access points, the term generally refers to a Wi-Fi network.
WLAN	(Wireless Local Area Network) A communications network that provides connectivity to wireless devices within a limited geographic area. "Wi-Fi" is the universal standard for wireless networks and is the wireless equivalent of wired Ethernet networks.