CASTLETON UNIVERSITY
COMMUNITY COLLEGE OF VERMONT
JOHNSON STATE COLLEGE
LYNDON STATE COLLEGE
VERMONT TECHNICAL COLLEGE

VERMONT
— STATE COLLEGES SYSTEM —

OFFICE OF THE CHANCELLOR
PO BOX 7
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February 7, 2018

TO: Long Range Planning Committee
        Jerry Diamond, Chair
        Lynn Dickinson
        Church Hindes
        Tim Jerman
        Karen Luneau, Vice Chair

FROM: Jeb Spaulding, Chancellor

RE: Long Range Planning Committee Meeting on February 12, 2018

The Long Range Planning Committee of the VSC Board of Trustees will hold a regular meeting on Monday, February 12th starting at 10:00 a.m. in Room 101 at the Chancellor's Office in Montpelier. The agenda and materials are attached.

I can be reached at (802) 224-3036 if you have any questions.

Thank you.

cc: VSC Board of Trustees
        Council of Presidents

VERMONT STATE COLLEGES
BOARD OF TRUSTEES
Long Range Planning Committee Meeting

February 12, 2018 at 10:00 a.m.

AGENDA

1. Call to order

2. Approval of the October 25, 2017 meeting minutes. (document attached)

3. Expectations for next steps in the consideration of awarding Associates degrees to certain students when warranted and beneficial.

4. VSCS Risk Analysis – Committee input and discussion. (document attached)

5. Follow-up on the 9/16 CampusWorks VSCS IT report - refresher on findings and recommendations, review of what has been done and accomplished since the report, and OC's thoughts about where to go from here. (document attached)

6. Strategic planning Updates from colleges and universities - what is currently underway and how these plans will be in sync with the six Board adopted strategic priorities. (document attached)

7. Other business

8. Comments from the Public

Meeting Materials:

Item 1: Minutes of the October 25, 2017 Meeting

Item 2: VSCS Risk Analysis

Item 3: CampusWorks VSCS IT Report

Item 4: Kevin Conroy's Narrative IT Update

Item 5: Board's Strategic Priorities

Item 1:

Minutes of the October 25, 2017 Meeting

UNAPPROVED Minutes of the VSC Board of Trustees Long Range Planning Committee meeting held Wednesday, October 25, 2017 at the Office of the Chancellor, Montpelier, VT

Note: These are unapproved minutes, subject to amendment and/or approval at the subsequent meeting.

The Vermont State Colleges Board of Trustees Long Range Planning Committee conducted a meeting Wednesday, October 25, 2017 at the Chancellor's Office in Montpelier.

Committee members present: Jerry Diamond (Chair), Karen Luneau (Vice-Chair), Lynn Dickinson, Church Hindes, Tim Jerman, Aly Richards (via phone)

Other Trustees: Bill Lippert, Linda Milne, Jim Masland (via phone)

College Presidents: Elaine Collins, Joyce Judy, Pat Moulton

Chancellor's Office Staff: Jeb Spaulding, Chancellor
                               Steve Wisloski, Chief Financial Officer
                               Tricia Coates, Director of External & Governmental Affairs
                               Todd Daloz, Associate General Counsel
                               Yasmine Ziesler, Chief Academic Officer
                               Kevin Conroy, Chief Information Officer
                               Harriet Johnson, Executive Assistant

From the Colleges: Scott Dikeman, Dean of Administration, Castleton University
                       Laura Jakubowski, Director of Finance, Castleton University
                       Barbara Martin, Dean of Admissions, Community College of Vermont
                       Sharron Scott, Dean of Administration, Johnson State College
                       Lit Tyler, Dean of Administration, Vermont Technical College
                       Lisa Cline, President, Faculty Federation
                       Maurice Ouimet, Dean of Enrollment, Castleton University
                       Toby Stewart, Controller, Johnson State and Lyndon State College

Other: Lucas Seelig, Director, Business Development, Apogee

Chair Diamond called the meeting to order at 11:19 a.m.

1. Approval of the minutes of the May 31, 2017 meeting

Trustee Luneau moved and Trustee Jerman seconded the approval of the minutes. The minutes were approved unanimously.

2. <u>Vermont Tech Strategic Planning update</u>

- Potential executive session to discuss real estate purchase and contracts

Vermont Technical College President Pat Moulton introduced Allan Rogers, Interim Dean of Academic Affairs and Strategic Planning, and Lit Tyler, Dean of Administration. President Moulton presented her Status of Vermont Technical College Strategic Planning looking at the future of the institution.

President Moulton indicated VTC will be looking for approval of their FY2017 carry forward at the Board of Trustees meeting in December and outlined her plan for that allocation.

President Moulton answered various questions from the Committee regarding timeline and the overall future of the various VTC campuses. The committee suggested VTC look at alternative ways for financing and expanding these facilities.

3. <u>Discussion and prioritization of strategic risks</u>

Chair Diamond postponed discussion of this item due to time constraints.

4. <u>Discussion of "automatic associate degree award" concept</u>

The committee discussed the issues associated with the 2 year degree program. Chief Academic Officer Yasmine Ziesler discussed how VSC can better support students in becoming successful and updated the Committee on other strategies available. Ziesler also briefed the Committee on the current issues and methods on how to reach out to the students for support and a current initiative, *Start to Finish*. It was suggested these ideas may be presented by the EPSL Committee at the December Board Meeting.

At this time Trustee Hindes left the meeting.

Trustee Jerman moved that the Committee enter executive session to discuss negotiating or securing real estate purchase or lease options for the purpose of discussing Contracts. Committee invites Chancellor, other Trustees present, President of Vermont Technical College, Vermont Technical College Dean of Administration, Vermont State Colleges General Counsel, and Vermont State Colleges Associate General Counsel to join the Committee.

5. <u>Review of 6 system strategic priorities and progress updates</u>

This agenda item was postponed due to time constraints.

6. <u>Other business</u>

No other business

7. <u>Comments from the public</u>

There were no comments from the public.

The meeting was adjourned at 12:30 p.m.

Item 2:

VSCS Risk Analysis

VSCS Risk Analysis, January 2018
(This is a continually evolving document to reflect changes in our environment)

1) FINANCIAL SUSTAINABILITY – Low state support, high tuition, minimal reserves, intense competition, and declining numbers of traditional customers require a special focus on short to intermediate term (2-5 year) liquidity and positive operating results. (O) (M) (S)

2) DEMOGRAPHICS – Continued decline in numbers of high school seniors in Vermont and the Northeast. In 2016, the number of births in Vermont was the lowest since the mid-1800s. (M)

3) OUR PRODUCT AND REPUTATION – Does our product meet public, market and customer needs and expectations? Are we planning for and developing a product for the future? Are we proactive enough in anticipating bad PR and exploiting good PR opportunities? (S)

4) NIMBLENESS OR LACK THEREOF – Are we sufficiently prepared to respond to changing conditions, including disruptive technologies, changes in federal and state policies and regulations, etc., proactively and reactively? Are we to stay focused on our highest priorities and risks? Do we have the capacity and culture to make the best decisions we can, when we need to make them? (S) (O)

5) DATA AND CYBER SECURITY – Is our IT governance system, investment, and accountability adequate to minimize the risk of interruption to operations, protect against data breaches, and meet customer and meet regulatory expectations? (S) (O)

6) REGULATORY AND COMPLIANCE – Shifting landscape with increasing scrutiny and escalating consequences of noncompliance. This is an area where a "we've always done it this way" mentality is especially problematic. (O)

7) FINANCIAL MODEL – Key considerations include heavy reliance on tuition, intensifying competition (in and out of state, online, etc.), and limited ability to control expenses. Are underlying incentives aligned for success? (S)

8) HUMAN CAPITAL – Is supervisory and management training support adequate? Are we proactive about addressing key person risk, cross training, and the need for succession planning? (O)

9) INFRASTRUCTURE – Are we able to make the necessary investment in physical plant and information technology? What happens if we can't? (O)

(M) Macroeconomic (Risk)   (S) Strategic Risk   (O) Operational Risk

Item 3:

CampusWorks VSCS IT Report

VSC

OFFICE OF THE CHANCELLOR
575 STONE CUTTERS WAY
PO BOX 7
MONTPELIER VT 05601

VERMONT STATE COLLEGES
CASTLETON UNIVERSITY
COMMUNITY COLLEGE OF VERMONT
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MEMORANDUM

FROM: Jeb Spaulding

DATE: September 7, 2016

RE: CampusWorks Report

Please find attached a report by CampusWorks which assesses the information technology environment of the Vermont State Colleges and makes recommendations thereto for our consideration. We engaged this particular consultant, based on their excellent reputation, to help us better serve our students, faculty, and staff. They have analyzed our business processes, technology and software, human resources, and IT governing system. Clearly, CampusWorks sees a lot of room for improvement at the system and campus level. Their report identifies many issues and makes many specific recommendations that we must carefully consider. Status quo is not acceptable. Getting to where we need to go will take time, determination, and flexibility.

From here it will be contingent upon us together to determine which recommendations to pursue and the best means to do so. We look forward to working with our campus partners as we forge the path before us.

Business Performance Optimization Roadmap

Vermont State Colleges

August 31, 2016

CAMPUSWORKS

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Introduction

CampusWorks was engaged by Vermont State Colleges (VSC) to conduct a Business Operations & IT Gap Analysis to address prioritized business process improvements and to identify an IT strategy that will best meet VSC's needs in the most cost-effective manner possible, aligned to enable long-range strategic initiatives.

This engagement was comprised of four distinct assessments:
1. Office of the Chancellor (OCIT) Information Technology systems, staff, and operations
2. Gap Analysis and Organizational Assessment of the IT Team
3. Colleague Functionality throughout the VSC System
4. Online Programs across VSC

From June 6-July 14, several CampusWorks teams conducted onsite interviews and data collection activities in support the engagement, including: a two-day onsite IT assessment at the Chancellor's Office (27 interviews of OCIT staff), a one-day onsite online program assessment (17 interviews of faculty and administrators), and two-day listening sessions at each of the five VSC colleges (over 90 sessions with significant representation of both technical and functional staff). During the same period of time, an IT skills inventory survey was conducted, gleaning feedback from 43 IT staff members across the System. Our research also included a review of the documentation provided in advance of and during the onsite visits.

The following figure depicts the key focus of the engagement and each component.

IT Assessment
- Technology environment
- Infrastructure, network and overall security
- Customer support and services

Online Program Assessment
- Online program technology enablement assessment
- LMS and alignment to goals and strategic objectives
- Assess readiness for growth via online and distance education

IT Skills Gap Analysis & Org. Assessment
- IT skills inventory and gap analysis
- VSC IT staffing and organizational structure assessment
- Recommendations including improved alignment across all colleges

Colleague Functional Assessment
- Colleague functional assessment
- Review of key business processes shared across VTSC
- Overall effective use and return on the Colleague investment

Outcome
- Report of findings and recommendations
- Presentation on campus to leadership and community as desired

All of the efforts involved in this engagement focused on identifying strengths in the existing environment and opportunities for improvement. When viewed collectively, they can provide a comprehensive overview of all key areas reviewed by CampusWorks.
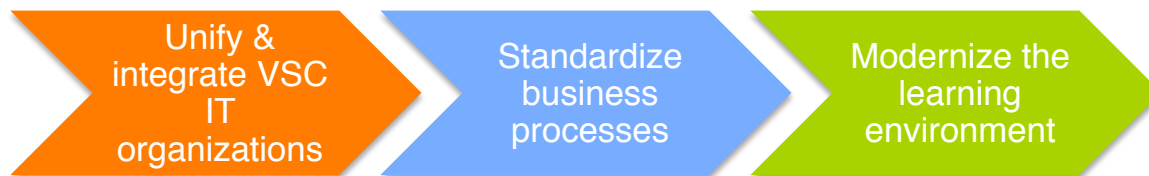
The Business Performance Optimization Roadmap summarizes CampusWorks' findings and recommendations and provides a strategy that will best meet VSC's needs in the most cost-effective manner while aligning with strategic initiatives. The appendices include the individual detailed reports for the four assessment initiatives.

Executive Summary

Vermont State Colleges, like many other institutions, is facing challenges driven by both internal and external factors in attempting to improve the student experience. The result of these pressures is that the System must examine its operations and how it's positioned for both immediate effectiveness and long-term alignment and success. Technology is fundamental to an institution—it is a key component both short- and long-term that can have a profound positive (or negative) impact on an institution's strategic and operational activities.

Fortunately, VSC's IT organization and related functions are not irreparably broken, but they have been allowed to deteriorate to a point where immediate action is critically important. There are many areas that could become more effective and efficient in their ability to align and enhance the student experience, as well as to provide an optimal level of efficiency in the utilization of precious human and financial resources. To be successful, VSC must address critical short- and long-term needs and commit to the steps necessary to meet the agreed upon goals. Now is the time to do this; VSC is ready for transformation.

VSC should take the following critical actions:

Unify & integrate VSC IT organizations	Standardize business processes	Modernize the learning environment

- ➢ Establish strong collaborative, visionary IT leadership across the System to lead a 21st century service organization. Re-calibrate and align IT to support the business vision of a unified model.
- ➢ Standardize business processes across the system to streamline and optimize business functions, and then re-deploy a single instance of Colleague or an alternative ERP to leverage technical, human, and financial resources.
- ➢ Improve adoption and align support for online and classroom technologies to improve the student and faculty experience.

CampusWorks has had the privilege of working with many higher education institutions around the country. With the perspective this assessment has provided, it seems clear that with a shared, unwavering commitment to enhancing the student experience, VSC can position itself to achieve the level of greatness your faculty, staff, students, alumni, and state citizens desire.

Key Themes

The following themes are fundamental to VSC's ability to fully and effectively leverage the human and financial resources invested in IT across the System. These themes are further supported by the detailed reports found in the appendices.

> ➢ Transformational IT Leader: VSC needs a transformational IT leader to develop a thriving and effective IT organization across VSC. This leader will align IT resources to work collaboratively and with a shared IT vision to best support all of VSC, bringing together the System and its colleges to create a unified, collaborative, integrated support and services IT organization.
> ➢ Realign Business Processes to Effectively Leverage a Single Administrative System: The organization's business processes need to be approached jointly to most effectively leverage a single instance of Colleague, which was the initial goal when the system was implemented. The lack of standardized business practices across the system provides an inconsistent student experience, increases the cost of maintaining significant customizations, and diminishes the opportunity to leverage resources across VSC.
> ➢ Academic Systems and Approach Aligned: To effectively grow the online courses and programs for all institutions of VSC, the existing instructional technology solutions must be leveraged across the system to provide a consistent and engaging student and faculty experience.

Key Findings & Recommendations

IT Assessment

Recommendations: Customer Service

IT Service's mission is to improve the effectiveness and efficiency of college operations. High quality customer service is critically important to achieve a positive experience for students, faculty, and staff. Increasing the focus on student and staff technology needs should result in higher customer satisfaction.

1. Implement a system-wide unified help desk structure and system with appropriate branch locations at colleges, as deemed necessary, for hands-on resolution:
   a) Develop a system-wide unified help desk, including creating a user support team across the individual college campuses focused on end-user support.
   b) Establish service level agreements for help desk tickets.

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c) Develop and conduct quarterly user satisfaction surveys, establish and report metrics, and identify areas for improvement.

2. Not all perceived weaknesses in customer service are the result of communication errors, processes and escalation methods, and analyzing metrics. Some may be the result of OCIT not being able to complete the projects deemed most critical to various user areas. Therefore, OCIT should re-prioritize IT projects to give priority to those that are focused on the chancellor's strategic objectives and ensure that the resources are available to complete these projects. This process may be aided by contracting with an organization that has specialized knowledge and skills to assist in completing these projects.

3. Improve the communications strategy between OCIT and the colleges to reach a wider audience on a timely basis. In some cases, problems may have been resolved (or perhaps cannot be resolved at this time) but various user personnel are not informed of actions taken or status.

4. Establish accurate service tracking and computer equipment monitoring through the use of an appropriately configured asset management system. There can be perceived problems with the age and fairness of distribution of computer equipment—whether at a server, switch, or PC level—which can then be blamed for service and functionality problems.

5. Provide a consistent "Bring-Your-Own-Device" (BYOD) policy to identify devices and services that can be supported by IT staff, whether at the OCIT or college level. Establishing a blog, FAQs, or other means of communication for collaboration among students and staff can address items not covered by IT. Although OCIT may not be providing direct support for many of these devices, having a centralized policy and vetting issues can be of great service to all colleges and save a great deal of wasted individualized effort.

Recommendations: Infrastructure

Today's technology allows users to access secure network systems and files from any location with reliable WiFi and network access. Network connectivity was considered satisfactory in some locations while declining in others. It is important to continue to meet user expectations during a time when the number of wireless or networked devices and the bandwidth they require continues to proliferate.

Network reliability and security are required to prevent sensitive data from unauthorized access and exposure to unauthorized users. Backup or redundant equipment is needed to prevent outages or connectivity loss. Implementing reliable and failover networks provide users with faster, more dependable, highly secure connectivity to perform their tasks from any access point.

1. Prioritize and identify resources to complete network and security remediation and/or expansion projects.

2. Develop and publish a prioritized system-wide ongoing network infrastructure upgrade plan in collaboration with the colleges.

3. Complete a full IT security audit to identify system-wide risks and vulnerabilities to network, data, user accounts, and compliance status.
4. The work that has begun on the PCI compliance audit and remediation must continue in earnest.
5. Examine and pursue options to partner with externally-funded organizations to improve connectivity to Wide Area Networks (WANs), including running fiber from Level 3 or other entities to all VSC locations.
6. Improve remote connectivity, both in terms of physical links as well as applications needed for students and employees for "access-from-anywhere" and "work-from-anywhere" concepts.

Recommendations: Technology Environment

Providing a modern, scalable, and flexible server foundation with failover capability is critical to achieve maximum computing uptime. While VSC should be proud of their success in the past, it is not universally and consistently applied to all systems or colleges and is becoming increasingly difficult as budgets tighten. A modern technology environment will improve students' access to System/college resources and will increase staff efficiency.

1. Develop and implement a system-wide equipment life cycle replacement plan to ensure consistent and reliable computing technology throughout VSC. Ideally, this should include servers, switches, computers, classroom equipment, access points, and other critical infrastructure or service delivery components.
2. Establish a single enterprise Content Management System (CMS) to address inconsistencies and improve overall information delivery across all websites.
3. Establish a system-wide committee to develop standardized procedures for managing web content and structure, thus enabling standardized messaging and services/event descriptions across all websites.
4. Increase the number of conference rooms that are videoconferencing-enabled and have video streaming capabilities for large occupancy meetings, whether for system-wide or external purposes.
5. Prioritize Ellucian-delivered functions that have not been configured, and add them to the analysis process for implementation consideration.

Students desire on-demand availability when it comes to essential services, such as eServices, the Moodle learning management system (LMS), computer labs, printing services, and the help desk. However, these services have reduced hours of availability at night, which hinders students from completing their tasks on their own schedule. While many aspects of service availability may be primarily the responsibility of the individual colleges, the System could conceivably offer many of these services in a more cost-effective manner for extended hours.

For the vast majority of students, the help desk at their home college is their first step in seeking assistance, but since there are limited hours of availability and limited expertise on such topics as the Colleague administrative system, students are often forced to wait until the next business day to get answers. Technology support is neither centralized nor well-promoted, which results in students being unsure of where to go for help and unaware of the resources available to them.

Websites across the System were found to be inconsistent when it comes to content, organization, and navigation; many were seen as dated. Most sites lack features that are compliant with the Americans with Disabilities Act (ADA) and do not employ responsive design, which allows for optimal viewing and interaction on mobile devices. This may negatively impact the visitor's first impression of VSC and could make finding information difficult. While each college has primary responsibility for their own website, it would seem that pooling resources, knowledge, modules, web objects, and other assets, could result in a more useful, cost-effective product for students, prospects, donors, and other public users.

There are only a few mobile apps available for students, and the current web access for administrative and academic functions often does not render effectively on mobile devices. As a result, students can't use their preferred device to perform basic tasks like registration or accessing the LMS. This issue will be compounded in the future as student expectations for effective mobile access become the norm. In some cases, administrative decisions have discouraged students from using mobile apps for registration and other purposes, instead urging them to seek face-to-face communications with advisors or other administrative offices.

While OCIT staff is not responsible for the deployment or reliability of WiFi at the individual colleges, the unification of some colleges may make it desirable to have a consistent approach and availability of WiFi. The acquisition of switches and access points may be made more cost-effective by using combined purchasing power, and deploying identical technologies may offer some relief in terms of sharing primary and secondary staff knowledge and support.

While some of the hardware and software inventory serving the System is reasonably current, partially as a result of effective planning after Hurricane Irene a few years ago, that is not a guarantee that funding sources for replenishment will be available in the future. Furthermore, as is true of some items above, hardware and software acquisition at the college level may not be the responsibility of OCIT at this time, but efficiencies, cost savings, and support advantages may be realized, particularly with college unification.

There does not appear to be a mechanism in place, or even a desire, to gather input from students regarding their technology needs. This results in an incomplete picture of

the technology needs and opportunities across the System and misses an opportunity to make students feel more involved in the System's decisions.

## IT Team Skill Gap and Organizational Assessment

Recommendations: IT Organization & Team Skill Development

The current alignment of IT across VSC has created a lack of clarity regarding responsibility and authority and has made the overall organization less effective. Clear lines of roles and responsibilities in supporting technology between the System and colleges is lacking.

Existing System IT Organizational Structure

The following organizational structure is no longer viewed as effective, given the increasing reliance on technology to support the student experience, teaching, learning, and overall business operations. IT must be viewed from a pervasive system-wide perspective. A lack of system-wide management of IT services, systems, and staffing coupled with a strong enterprise governance structure creates challenges for IT project prioritization, standardization, and support.

Figure 1: Existing System-Wide IT Organizational Structure
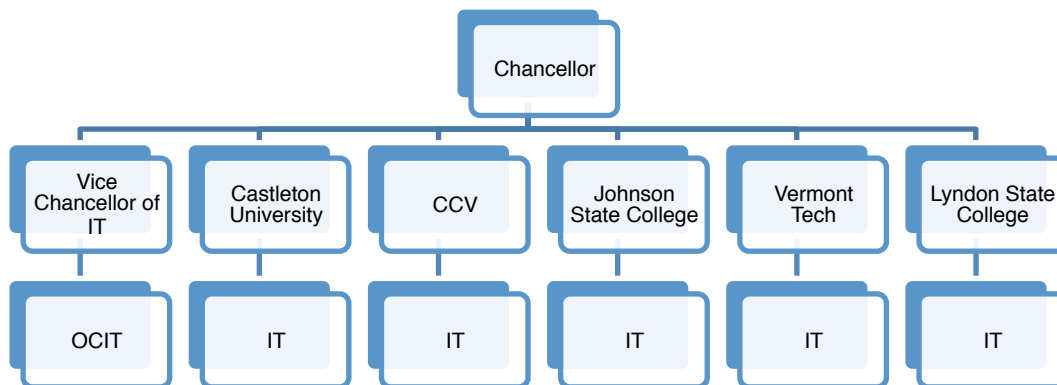
Proposed System IT Organizational Structures

The proposed IT organizational structure would provide VSC with the potential for an overall institutional technology resource that can respond and complete projects and tasks more effectively and efficiently. This organizational change would allow for more consistent policies, guidelines, standards, and procedures in the use of IT resources. Project priorities would be guided by a system-wide IT governance structure that is sensitive to system-wide strategic initiatives and operational goals. Most importantly, this organizational structure would provide the essential IT services that will result in a more consistent experience regardless of which college the student attends.

Since this organizational change is quite significant, a two-phase transition plan is advocated to provide sufficient time to realign positions and responsibilities. In the
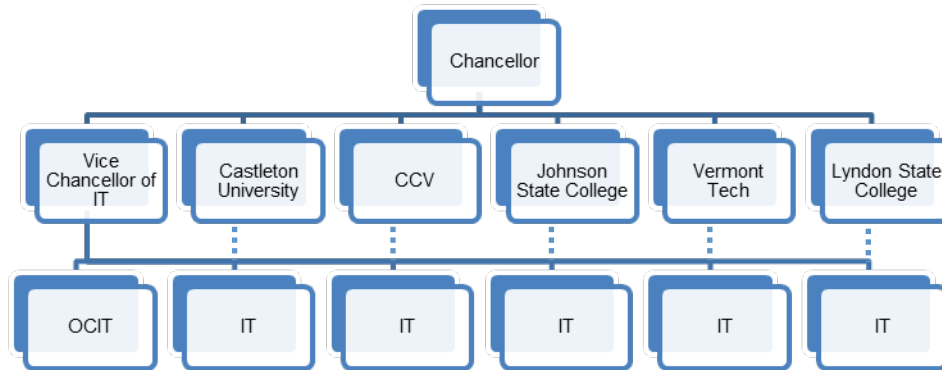
process of making this transition, a Vice Chancellor for IT should be appointed to provide strategic leadership and direction across the entire System. This position would report directly to the chancellor of VSC.

Phase 1

1. In order to ensure OCIT and the colleges all move in a more coordinated manner, the system-wide information technology resources should be re-aligned to have each college IT departments report to the OCIT organization. Where common positions exist, the goal would be to develop consistent position descriptions.
2. Such an approach would help ensure that the colleges' common needs are met with a standard, cost-effective, and cross-supported set of technology platforms and services. This approach supports a stronger collaborative effort in communicating the colleges' needs to OCIT and prioritizing projects. The colleges' IT teams would remain at their respective campuses.
3. Establish a permanent Project Leadership/Management position in OCIT to oversee all IT projects and ensure they are carried out in a consistent manner and completed on time and within budget. This position would focus on:
    *   Preparing each project's justification, including: budget, critical staffing resources, schedule, and ROI.
    *   Organizing, communicating, and consistently executing key initiatives in OCIT.
    *   Developing and implementing consistent project management practices, including: updating electronic communications to the campus communities about the projects that are underway and their status, projects that are next in line, and projects in the longer-range queue.
4. Closely supervise OCIT staff through effective line management to ensure all resources are being used and allocated dynamically to meet the most pressing needs with minimal impact on projects in progress.
5. Optimize effective use and development of IT staff by increasing the functional knowledge available to the application teams. This can be accomplished by either developing this capability through functional training of current OCIT technical analysts and/or adding Business Analysts to support the functional business areas in OCIT.

The college IT teams will be aligned and stabilized under the Vice Chancellor for IT and each college IT team would remain on their respective campus. The next logical step is to align those individual college IT teams into Centers of Excellence.

Figure 2: Phase 1 Realignment of the System-Wide IT Organization

Phase 2
The individual college IT teams and the OCIT would create Centers of Excellence across the System to provide support for one or more specific business and/or technical functions or services for the entire VSC System. For example, one institution could process Payroll or Financial Aid for the entire VSC System.

Figure 3: Phase 2 Proposed System-Wide IT Organization with Centers of Excellence
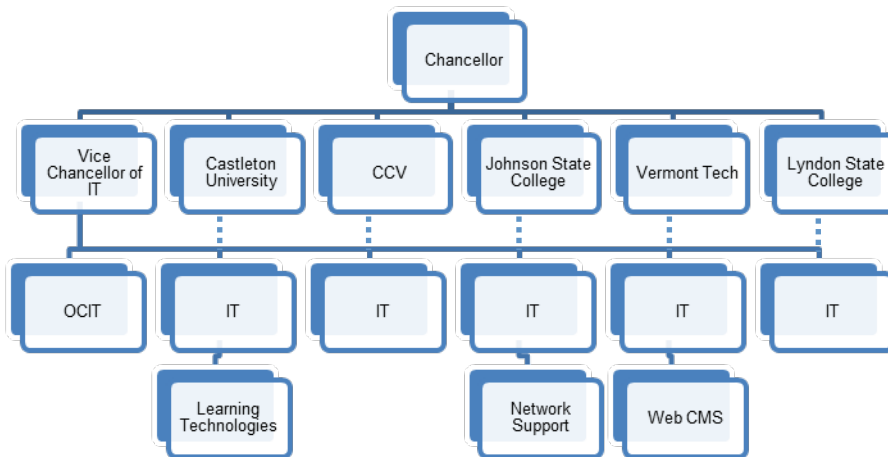
Colleague Assessment
Throughout higher education, the need for an integrated, modern, intuitive enterprise resource planning system is essential to not only an institution's day-to-day operations but also to the strategic planning process imperative to its growth. In order to operate VSC colleges and share common data attributes among them, the System implemented Colleague over a decade ago.

However, the current ERP is no longer able to serve the System in an efficient manner that will lead the institutions through the next decade.

Recommendations: Colleague Assessment

1. Conduct comprehensive business process redesign to develop standardized processes, enable automation and consistent workflows, and gain efficiencies across the colleges. Consider beginning the process with the following two areas:
   - The Student Experience—including admissions, registration, financial aid, student records, advising, and student accounts
   - The Employee Experience—including recruiting, onboarding, orientation, benefits, and payroll
2. Issue a Request for Proposal (RFP) for a new ERP system, or piggyback on Green Mountain Higher Education Consortium's effort. If VSC decides to continue using Colleague, analyze the delivered Colleague functionality to ensure offices are leveraging all capabilities offered, identifying the needs, and turning them into business-focused projects for implementation across all colleges.
3. IT structure and staffing levels must be addressed.
   - A leader who is capable of providing direction, strategic thinking, resource planning, and effective communication and collaboration is vitally important to VSC's success.
   - Staffing levels at the central IT office are not adequate to support the complex nature of the various technological tools in place across the colleges. There is minimal cross-training on Colleague modules within central IT and if someone leaves the organization, the void created has a substantial impact on the day-to-day operations of the entire organization. When one particular staff member goes on vacation, any activity in that functional module may come to a halt.
   - Campus IT offices should receive Colleague training.
   - Initiate Service Level Agreements with central IT staff and open lines of communication designed to keep the users better informed and employ accountability measures for the staff.
4. Enact an IT governance structure. Create an initial committee designed to involve members of leadership and power users. Include representation from the individual institutions and empower them to serve in collaboration with the central IT leadership to establish priorities, plan for the future, and ensure that users' needs are being addressed, greatly enhancing campus buy-in and opening lines of communication. This committee can assist in evaluating new technologies, integrating needs, and helping the entire community realize the true benefits of the implementation, as well as assist in the development of plans for training and ongoing support throughout a product's life cycle.
5. Implement project management standards for all projects within IT. Projects must be put on a schedule that is adhered to, evaluated, and measured throughout the process.
6. Define the critical management reporting and metrics across the system. Develop appropriate benchmarks and accountability standards and align those to the operational

areas to continually assess and make informed decisions as the operations are altered to address the organization's changing needs.

7. Continue to establish shared business processes to leverage ImageNow consistently throughout the VSC System. Sharing data and documents electronically makes business processes more accurate, provides faster service, and enables accountable tracking. These processes can reduce paper and develop automated workflows to manage online data forms, enabling student and staff records to be processed faster and with greater accuracy. This process ties directly to the business process reviews.

8. Implement an end user training program (on-boarding process) for all enterprise systems, and leverage this across the entire System to inform new users of the effective use of all enterprise systems.

9. Establish a reporting strategy and invest in the tools necessary to support that strategy.

Online Programs Assessment

Recommendations: Online Programs Assessment

To fully support a robust set of online program offerings, CampusWorks recommends addressing the following online infrastructure components at the System and college level:
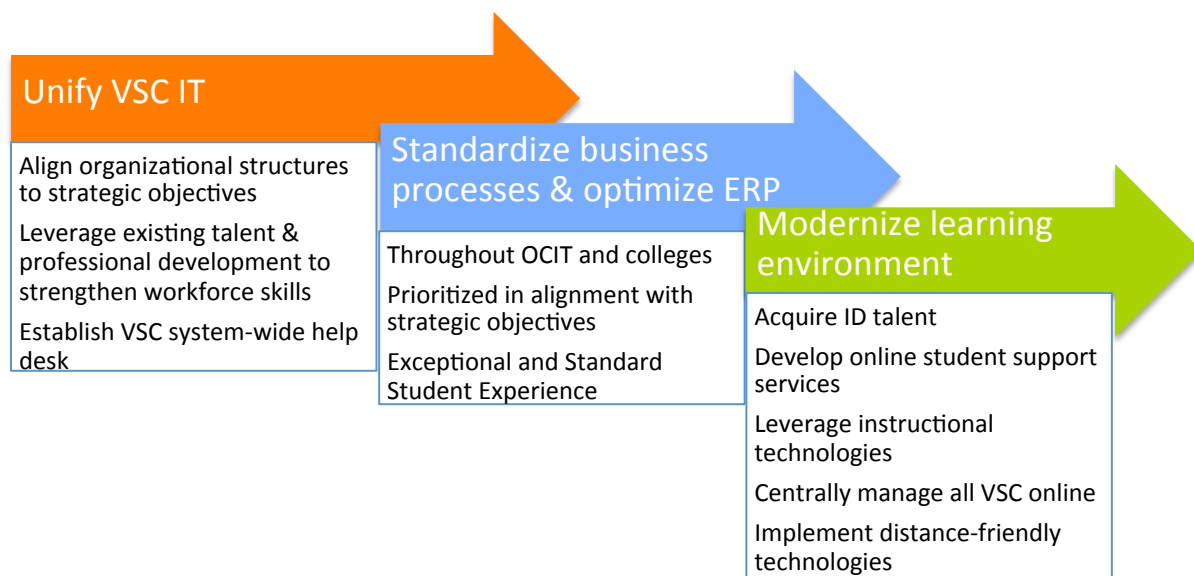
1. Instructional Design Model and Process
   - Acquire instructional design expertise
   - Articulate and implement online course design standards
   - Acquire additional local instructional technology assistance

2. Student Support Services
   - Develop a system for online tutoring services
   - Enhance online student advising services
   - Implement a Moodle-based student retention system
   - Investigate technologies and services for remote exam proctoring
   - Review and improve student services for online students

3. Faculty Support Services
   - Create a series of online faculty development courses
   - Leverage instructional technologies to support faculty work

4. Administrative Support Services
   - Designate a service unit to manage all VSC online learning
   - Perform a needs assessment and market study for online programs
   - Experiment with learning analytics

5. Access to Academic Resources
   - Ensure all library resources are fully available remotely
   - Investigate solutions to make required software available to distance learners

6. Academic Community
   - Develop online student communities

7. Enabling Technologies
- Implement an enterprise web conferencing system
- Create multimedia recording facilities for faculty
- Implement Moodle Mobile
- Investigate instructional technologies

Strategic Roadmap

The following figure provides a high-level roadmap to engage and transform VSC for the future. The strategic initiatives build upon each other providing a strong foundation.

Unify VSC IT

Align organizational structures to strategic objectives

Leverage existing talent & professional development to strengthen workforce skills

Establish VSC system-wide help desk

Standardize business processes & optimize ERP

Throughout OCIT and colleges

Prioritized in alignment with strategic objectives

Exceptional and Standard Student Experience

Modernize learning environment

Acquire ID talent

Develop online student support services

Leverage instructional technologies

Centrally manage all VSC online

Implement distance-friendly technologies

Acknowledgement

We thank you for the opportunity to assist VSC and its colleges in understanding the current state of information technology and allowing us to help you prepare for the future based on your goals and aspirations. The Vermont State Colleges community was welcoming and open with our team, and we experienced a high degree of positive energy during our visit.

Appendix A – IT Assessment Report

Executive Summary

CampusWorks was engaged by Vermont State Colleges to provide an IT Assessment of the Chancellor's Office as part of the overall engagement. The goal of this assessment was to assess the IT systems, staff, and operations and evaluate their ability to effectively enable the organization's operations and strategic direction. The focus included customer service, technology infrastructure, and the overall technology environment. The areas that comprise an IT assessment include the following:
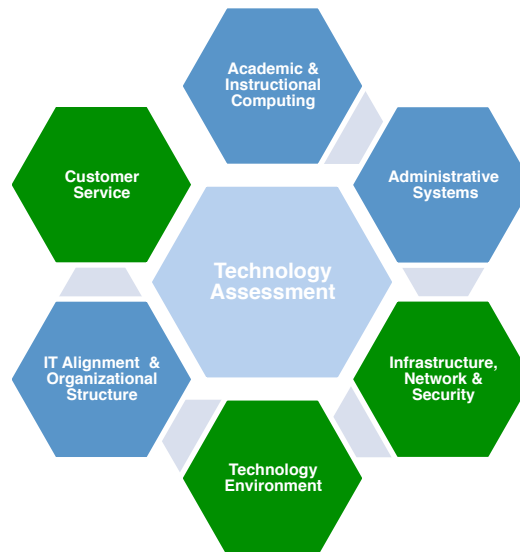
When it comes to information technology at VSC, there are many positives. Even in categories in which improvements are needed, there are many aspects of the IT operation that are working well, which is often a result of your dedicated staff's efforts. Since CampusWorks' role was to identify opportunities to improve operations, support, and direction, this report will focus more on areas of concern rather than your many positive accomplishments.

The broadest challenges in leveraging technology throughout VSC are:

- Need for improved alignment of IT resources across the entire System
- A commitment to project execution and completion
- Need for process redesign and improvement to standardize approaches across VSC
- Lack of system-wide technology standards
- Lack of IT governance
- Engaging in IT audits and controls related to security, disaster recovery, and compliance

Assessment Approach

The CampusWorks team reviewed over 100 documents provided by the Chancellor's Office and the five colleges in advance of and during the onsite assessment visits. This discovery included organizational structures, current IT projects and IT budgets, and services and operations within OCI as well as the colleges. Although much of the discovery efforts relating to the colleges are

covered in other documents, such as the Colleague assessment, they are also mentioned here since it was critical to grasp the nature of the customers' needs and expectations to assess effectiveness of the OCIT area.

It should also be noted that, in some cases, in addition to reviewing what OCIT currently does, the assessment includes recommendations based on what a central IT organization could or should be doing. Comments that suggest additional duties for OCIT, presumably with a properly aligned and funded staffing complement, are therefore based on best practices at institutions across the country and functions that, in many cases, are not being done anywhere in the VSC System. In most cases, these additional functions can be accomplished in a more cost-effective and efficient manner in a unified or centralized model.

During seven separate onsite visits, the CampusWorks team held nearly 200 meetings and focus groups with individuals and departments and met with over 375 people across the System, including faculty, executives, staff at all levels, and students.

For the Chancellor's Office Information Technology and Colleague Functionality and Operations portions of the engagement, CampusWorks used a qualitative analysis approach and methodology. Through listening sessions, consultants strove to gain answers to three basic questions:

1. What is working well today?
2. What does not work well or needs improvement?
3. In a perfect world, what would you like to see to assist in delivering the desired experiences efficiently and effectively?

All responses were documented by topic and comment only—no individual names were associated with comments. The responses were grouped by major themes that emerged throughout the interview process. The strategic themes, along with some tactical approaches, were compared with relevant best practices for higher education institutions. These findings and comparisons served as a basis for the recommendations offered in this report. A description of the methodology used for the Online Program Assessment and IT Skills Gap Assessment portions of the engagement are included at the beginning of those report sections.

The CampusWorks team recognizes that a single complaint or comment does not constitute a finding. Feedback was analyzed against and across the groupings and cross-checked for validity. CampusWorks' team members who conducted the interviews are subject matter experts in the areas reviewed. The CampusWorks team involved in this engagement included:

*   Karen Boudreau-Shea, Senior Director of Assessment & Optimization
*   Joe Traino, Director of Technology Leverage
*   Rich Zera, Senior IT Executive
*   Nick Laudato, Senior Assessment & Optimization Executive Leader
*   Teresa Fort, Senior IT Executive
*   Jamey Palmieri, Senior Assessment & Optimization Executive Leader
*   Peter Lundberg, Senior IT Executive
*   Pamela Deaner, Director of Administration

What is Working Well?

As VSC has enabled its institutions to leverage technology to meet their individual needs, there has been increasing complexity across VSC and the enterprise-wide systems leveraged by all. The increased complexity brings increased demands and even with these increased complexities and demands, the community has been very supportive of the central IT operations and their limitations. Some key areas identified as working well today include:

- Most staff members at the Chancellor's Office as well as at the institutions are sympathetic towards individual OCIT staff given the magnitude of tasks handled by a very small staff.
- Local IT staff members at each institution were recognized for providing timely and effective support.
- Faculty opinions of technology and support functions at the classroom level are generally positive.
- Following major problems from the destruction caused by Hurricane Irene in 2011, major infrastructure components were replaced and many kept current. There has also been close attention paid to having redundancy in key systems and electronic pathways.

Factors that Impact VSC

A key theme identified in the IT Assessment as well as the other efforts conducted by CampusWorks, is that individually there are many challenges for the System and the institutions; however, approached jointly with a unified approach, these challenges can be minimized or eliminated which would positively impact student and employee experiences across VSC. The following challenges were identified in the IT Assessment and may be negatively impacting students, faculty, and staff.

Student Experience

- ***Service availability***
  Students desire on-demand availability when it comes to essential services, such as eServices, the Moodle learning management system (LMS), computer labs, printing services, and the help desk. However, these services have reduced hours of availability at night, which hinders students from completing their tasks on their own schedules. While many aspects of service availability may be primarily the responsibility of individual colleges, the VSC System could conceivably offer many of these services in a more cost-effective manner for extended hours.

- ***Help desk***
  For the vast majority of students, the help desk at their home college is their first step in seeking assistance, but since there are limited hours of availability and limited expertise on such topics as the Colleague administrative system, students are often forced to wait until the next business day to get answers. Technology support is neither centralized nor well promoted, which results in students being unsure of where to go for help and unaware of the resources available to them.

- ***Websites***
  Websites across the System were found to be inconsistent when it comes to content, organization and navigation; many were seen as dated. Most sites lack features that are

compliant with the Americans with Disabilities Act (ADA) and do not employ responsive design, which allows for optimal viewing and interaction on a variety of devices. This may negatively impact the visitor's first impression of VSC and could make finding information difficult. While each college has primary responsibility for their own website, it would seem that pooling resources, knowledge, modules, web objects, etc., could result in a more useful and cost-effective product for all students, prospects, donors, and other public users.

The work begun by the TLT should continue to ensure ADA compliance.

- *Mobile capabilities*
  There are only a few mobile apps available for students, and the current web access for administrative and academic functions often does not render effectively on mobile devices. As a result, students can't use their preferred device to perform basic tasks, like registration or accessing the LMS. This issue will be compounded in the future as student expectations for effective mobile access become the norm. In some cases, administrative decisions have discouraged students from using mobile apps for registration and other purposes, instead urging them to seek face-to-face communications with advisors or other administrative offices.

- *WiFi*
  While the OCIT staff is not responsible for the deployment or reliability of WiFi at the individual colleges, the unification of some colleges may make it desirable to have a consistent approach and availability of WiFi. The acquisition of switches and access points may be made more cost-effective by using combined purchasing power, and deploying identical technologies may offer some relief in terms of sharing primary and secondary staff knowledge and support.

- *Hardware and software*
  While some of the hardware and software inventory serving the System is reasonably current, partially as a result of effective planning after Hurricane Irene a few years ago, that is not a guarantee that funding sources for replenishment will be available in the future. Furthermore, as is true of some items above, hardware and software acquisition at the college level may not be the responsibility of OCIT at this time, but efficiencies, cost savings, and support advantages may be realized, particularly with college unification.

- *Students' technology needs*
  There does not appear to be a mechanism in place, or even a desire, to gather input from students regarding their technology needs. This results in a less complete picture of the technology needs and opportunities across the System and misses an opportunity to make students feel more involved in the decisions of the System.

Organizational Structure

Although a more complete assessment of the organizational structure and issues is provided as a separate report, the following was noted as part of the IT assessment efforts.

- *Roles, responsibilities, and authority*

In some situations, the roles, responsibilities, and authority between the OCIT and the colleges are inconsistent and not clearly defined. This results in some redundancy of functions, unclear processes, and inefficiencies in resource allocation.

- **_Project execution_**

  The status of prioritized IT projects indicates that some projects are incomplete, not started, and/or have been in progress or backlogged for several years. In perhaps more cases, some users have indicated they don't submit requests anymore because of the long waiting period and lack of responsiveness. As a result, students, faculty and staff are not able to experience the benefit of these projects. Certainly, the small staff size of OCIT is a major factor in this situation, but there also does not seem to be an open and collaborative process in terms of priority setting, project management, or project status reporting.

Processes and Procedures

Processes and procedures for IT and functional areas across VSC are approached independently and not collaboratively, which limits the shared learning across VSC and also increases complexity as each organization may have a different approach to the same process, yet they are using the same system, features, and functionality. In some cases, this has led to increased customization of the Colleague system to enable the desired business processes and procedures, again increasing the complexity of the enterprise technology environment for everyone.

- **_Business process review & optimization_**

  Business processes are not regularly evaluated and improved to position core functions for optimal efficiency. It is critical to review and optimize ongoing business processes and leverage existing technology investments across the System to increase efficiency, reduce costs, and enhance services.

- **_Manual processes_**

  There are a number of standard business functions that could be automated but are performed manually. This includes the combination of multiple reports manually to achieve desired information; "shadow" systems to ensure information is captured and maintained in an accessible manner; and manual processes to verify or correct Colleague system data, such as in Payroll.

- **_IT governance_**

  IT governance is not clearly defined across the System. While there are committee or communication structures in existence, they are not always used. The result is unclear expectations in key areas, such as: IT communications, equipment life cycle replacement plans, project prioritization, website development, new technologies, planning for more efficient support structures, and accessibility. Projects should routinely undergo collaborative review, communication, and coordination across the System, and need to include not only the technology officers at each College, but also the primary functional areas that may be affected.

- **_IT security_**

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A System-wide IT security audit has not been performed. As a result, the VSC System is not positioned to identify risks, minimize their potential impact, and implement preventive measures. Furthermore, the System is at risk of being out of compliance.

VSC IT Assessment Observations and Recommendations

The assessment findings are arranged by key focus area. Many issues and recommendations are interdependent and require a collaborative and integrated approach driven by the student experience desired at Vermont State Colleges.

The sections that follow include CampusWorks' observations and recommendations. As with any assessment, CampusWorks encourages the VSC to use this information as a starting point for more in-depth conversation and actions.

Customer Service

Observations

Customer service challenges can be the result of any of a number of situations, including:
- Lack of sufficient IT staff to understand and respond quickly to user queries.
- Communication shortcomings from technical staff, which may partially be based on a lack of understanding of functional needs.
- Lack of technical knowledge from functional staff to communicate needs.
- Lack of a help desk systemic approach to capturing and responding to issues.
- Long-standing issues, clashes, or differences of opinion between users and IT personnel.

At OCIT, like many organizations, some combination of the above to varying degrees may be present. Moreover, without the effective use of a modern problem reporting and tracking help desk system and an analysis of the metrics that can be gained from such a system, it is difficult to gauge, analyze, and remediate perceived shortcomings in customer service.

It should be noted that not all of these areas are currently within the responsibilities of OCIT; however, since some recommendations are also not consistently being addressed at the colleges they are submitted for consideration.

Recommendations

OCIT's mission is to improve the effectiveness and efficiency of college operations, and high quality customer service is critically important to achieve a positive experience for students, faculty, and staff. Increasing the focus on student and staff technology needs should result in higher customer satisfaction.

6. Implement a system-wide unified help desk structure and system, with appropriate branch locations at colleges as deemed necessary for hands-on resolution:

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      d) Develop a system-wide unified help desk, including creating an integrated user support team across the college campuses focused on end-user support.

      e) Establish service level agreements for help desk tickets.

      f) Develop and conduct quarterly user satisfaction surveys, establish and report metrics, and identify areas for improvement.

7. Not all perceived weaknesses in customer service are the result of communication errors, processes and escalation methods, and analyzing metrics. Some may be the result of OCIT not being able to complete the projects deemed most critical to various user areas. Using an integrated technology governance process, IT projects should re-prioritized to give higher priority to the chancellor's strategic objectives and ensure that the resources are available to complete these projects. This process may be aided by contracting with an organization that has specialized knowledge and skills to assist the System in completing these projects.

8. Improve the communications strategy between OCIT and the colleges to reach a wider audience on a timely basis.

9. Establish accurate service tracking and computer equipment monitoring through the use of an appropriately configured asset management system. There can be perceived problems with the age and fairness of distribution of computer equipment—whether at a server, switch, or PC level—which can then be blamed for service and functionality problems.

10. Provide a consistent "Bring-Your-Own-Device" (BYOD) policy to identify devices and services that can be supported by IT staff, whether at the OCIT or college level. Establishing a blog, FAQs, or other means of communication for collaboration among students and staff can address items not covered by IT. Although OCIT may not be providing direct support for many of these devices, having a centralized policy and vetting issues can be of great service to all colleges and save a great deal of wasted individualized effort.

11. Use a common survey tool to capture student, faculty and staff experience data regarding the use of technology, and share it across all colleges.

12. Acquire or develop a simple project management tool to foster communications with all users, particularly those who have submitted project requests. Ideally, this tool could also be used to communicate and decide priorities, whether through the chancellor, presidents, IT Council, or other advisory committee structure.

13. There are times when perceived weaknesses in customer service are really the result of inadequate communications. For example, plans for upgrades of key systems or the timing of new version releases from Microsoft, Ellucian, or other vendors, could all be communicated more effectively if there were a regularly scheduled and published online newsletter from OCIT distributed to users at all levels.

14. Developing a comprehensive document describing the state of and need for training system-wide could help establish a prioritized list of training objectives. This study should include the options and benefits associated with training on:
    a) Third-party packages (Microsoft, Ellucian, Moodle, etc.),
    b) Use of newer equipment to capitalize on it fully, including collaboration features of software, classroom or academic-oriented hardware and software, etc.)
    c) Local packages or adaptations (Colleague as it is implemented at each college, ImageNow, etc.)
    d) Cross-training between functional areas and IT
    e) Training of backup personnel for mission-critical functions within IT
    f) Increased training in soft skills such as improving communication, providing better customer service, working more effectively with stress, etc.

Infrastructure, Network, and Security

Observations

While there is always room for improvement, most of the basic network, servers, and other key infrastructure components were in reasonably good condition and of a recent generation. While some may attribute this to the replacement of most items resulting from Hurricane Irene a few years ago, OCIT and the colleges should be commended for working to keep the replenishment of equipment moving forward in the subsequent years. This is particularly significant since there does not appear to be an equipment master plan, published replenishment cycle, or identified consistent funding source for such upgrades. While some have characterized this as a "feast or famine" approach to equipment replacement, it has worked reasonably well for the past five years. However, given the challenging financial outlook in the next few years, it is critical that VSC not dig itself into a deep hole in terms of equipment currency and abandon the priority it has generally given to technical infrastructure in the past.

- Standardized equipment life cycle replacement plans at the colleges, as well as at central facilities, are either inconsistent or lacking.
- Where not present, upgrading and building redundancy into the primary network links and switches is needed to ensure connectivity and performance for the community.

Recommendations

Today's technology allows users to access secure network systems and files from any location with reliable WiFi and network access. While network connectivity was considered satisfactory in some locations and declining in others, it is important to continue to meet user expectations during a time when the number of wireless or networked devices and the bandwidth they require continues to proliferate. Network reliability and security are required to prevent sensitive data from unauthorized access and exposure to unauthorized users. There is a need to have backup or redundant equipment in place to prevent outages or connectivity loss.

Implementing reliable and failover networks provides users with faster, more dependable, highly secure connectivity to perform tasks from any access point.

7. Prioritize and identify resources to complete network and security remediation and/or expansion projects.
8. Develop and publish a prioritized system-wide ongoing network infrastructure upgrade plan in collaboration with the colleges.
9. Complete a full IT security audit to identify system-wide risks and vulnerabilities to network, data, user accounts, and compliance status.
10. The work that has begun on the PCI compliance audit and remediation must continue in earnest.
11. Examine and pursue options to partner with externally-funded organizations to improve connectivity to Wide Area Networks (WANs), including running fiber from Level 3 or other entities to all VSC locations.
12. Improve remote connectivity, both in terms of physical links as well as applications needed for students and employees for "access-from-anywhere" and "work-from-anywhere" concepts.

Technology Environment

Observations

Many users interviewed identified the need for greater consistency when interacting with other System institutions. While each college desires to retain its independent marketing brand, IT services should provide the flexibility needed to achieve efficiencies with sensitivity to the colleges' individual preferences, as long as a common system-wide student experience is not jeopardized.

a) Maintenance, type, and equipment life cycle replacement plans for classroom and lab equipment varies by college, limiting the ability to share resources and efficiencies across the colleges.
b) Website content management systems (CMS) vary for the colleges, which constrains staffing and does not meet growing web needs.
c) The work begun by the Teaching and Learning Technology (TLT) group to ensure compliance should continue in earnest and an annual review of the ADA requirements and institutional compliance should be conducted.
d) There clearly seems to be instances when mandates from OCIT are viewed as suggestions by some of the colleges and are either ignored or overruled by local college administration.

Recommendations

Providing a modern, scalable, and flexible server foundation with failover capability is critical to achieve maximum computing uptime. While VSC should be proud of their success in the past, it is not universally and consistently applied to all systems or colleges, and is becoming increasingly difficult as budgets tighten. A modern technology environment will improve students' access to System/college resources and will increase staff efficiency.

6. Develop and implement a system-wide equipment life cycle replacement plan to ensure consistent and reliable computing technology throughout VSC. Ideally, this should include servers, switches, computers, classroom equipment, access points, and other critical infrastructure or service delivery components.
7. Establish a single enterprise Content Management System (CMS) to address inconsistencies and improve overall information delivery across all websites.
8. Establish a system-wide committee to develop standardized procedures for managing web content and structure, thus enabling standardized messaging and services/event descriptions across all websites.
9. Increase the number of conference rooms that are videoconferencing-enabled and have video streaming capabilities for large occupancy meetings, whether for system-wide or external purposes.
10. Prioritize Ellucian-delivered functions that have not been configured, and add them to the analysis process for implementation consideration.
11. Electronic document imaging is in place for some offices to capture and store, reducing the physical space needed in processing areas; however, other office staff could use this to automate paper processes. It would be most efficient to implement it centrally.
12. Some key business processes are still manual and do not fully leverage the Colleague system.
13. Many users identified needs for automated workflows to make processes less labor-intensive, reduce errors, and increase efficiency.

Conclusion

Vermont State Colleges, like many other institutions, is facing challenges driven by both internal and external factors. The result of these pressures is that the System must examine its operations and how it's positioned for both immediate effectiveness and long-term alignment and success. Technology is fundamental to an institution—it is a key component both short- and long-term that can have a profound positive (or negative) impact on an institution's strategic and operational activities.

Fortunately, VSC's IT organization and related functions are not irreparably broken, but they have been allowed to deteriorate to a point where immediate action is critically important. There are many areas that could become more effective and efficient in their ability to align and enhance the student experience, as well as to provide an optimal level of efficiency in the utilization of precious human and financial resources. To be successful, VSC must address some critical short- and long-term needs and commit to the steps necessary to meet the agreed upon goals.

The most critical actions VSC should take include:

- Implement the recommendations in the "IT Skills Gap and Organizational Assessment" document.
- Conduct a comprehensive review of all major business processes to improve system-wide operations in serving students. Optimize revised business processes by

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implementing best practices and leveraging untapped or poorly aligned functionality within the Colleague ERP.

- Establish a more effective system-wide IT help desk organization that includes extended hours of operation. We recommend that this be an internal function in the short-term until more detailed metrics are collected on the types of calls, hours, and demand. Longer-term consideration for an outsourced vendor should then be discussed with a more specific list of objectives.

- Conduct a formal IT security audit to identify system-wide risks and vulnerabilities to network, data, user accounts, and compliance status.

- Optimize and integrate the System and colleges' IT organizations to complete projects on schedule; prioritize new projects; and establish IT policies, mandatory guidelines, standards, and procedures.

- The work begun by the Teaching and Learning Technology group to ensure ADA compliance should continue in earnest and an annual review of the ADA requirements and institutional compliance should be conducted.

CampusWorks has had the privilege of working with many higher education institutions around the country. With the perspective this assessment has provided, it seems clear that with a shared, unwavering commitment to enhancing the student experience, Vermont State Colleges can position itself to achieve the level of greatness your faculty, staff, students, alumni, and state citizens all desire.

Appendix B – Online Programs Assessment Report

Executive Summary

Vermont State Colleges contracted CampusWorks to conduct a one-day Online Program Assessment, which evaluated the current System and its five colleges related to the teaching and learning technologies needed to deliver fully-online degree programs and programs jointly delivered by colleges within the System.

CampusWorks assigned this task to Senior Assessment & Optimization Executive Leader Dr. Nick Laudato. Dr. Laudato visited the Chancellor's Office in Montpelier and conducted 10 meetings with 17 individuals either in-person or via conference call. These meetings included individuals from each of the five VSC colleges, the Chancellor's Office and students. Dr. Laudato also had an opportunity to visit the campuses of Castleton University, Lyndon State College, Johnson State College, and Vermont Technical College in association with the staff and Colleague assessment efforts that were part of the overall IT Gap Analysis Services performed by CampusWorks.

This document contains the findings and recommendations for the Online Program Assessment portion of the engagement only.

Assessment Approach

This document provides an assessment of the infrastructure in place to support online teaching and learning at the System and its five colleges.

The infrastructure required to support online education parallels the infrastructure in place at physical campuses to support face-to-face instruction. With few exceptions, all of the student, faculty, and administrative services offered in support of face-to-face instruction should have analogs to support online instruction. This online education infrastructure consists of the following seven components:

1. Instructional Design Model and Process: Online education implies that the teacher and learner are not present in the same location and/or at the same time. This basic fact implies that instructional sequences and materials must be developed in advance, as they cannot be created remotely in an ad hoc manner. This development, in turn, implies the need for a course development process that can be facilitated and informed by instructional design expertise. An instructional designer is a professional trained in learning and instructional theory and practice and is an expert in the process of course development. An instructional technologist (i.e. a professional trained and experienced in the application of instructional technologies to support instruction) can also provide valuable support.

2. Student Support Services: Students who take classes online have unique needs. At some institutions, the existing on-campus student services do not translate well to online education. Each service that has been created to serve on-campus students must be examined to determine if it can adequately serve online students. These student

services include admissions, financial aid, billing, scholarships, veteran services, academic advising, counseling, tutoring, career services, grade and transcript services, disability services, diversity services, wellness and fitness activities, technology support, supervised testing services, etc.

3. Faculty Support Services: As is the case with online students, instructors who teach online also have unique support needs. For distance education initiatives to be successful, an institution must:

   ➢ Provide access to an easy-to-use instructional management system environment to render the online content, create and administer quizzes and surveys, etc.

   ➢ Provide secure online grade books and tools to facilitate the grading process for non-objective evaluation measures.

   ➢ Facilitate communications between faculty and students by providing them with group and individual student e-mail addresses and collaborative tools (web conferencing, wikis, blogs, discussion boards, etc.).

   ➢ Provide copyright clearance advice and services to faculty members.

   ➢ Provide technical training and support for content and test authoring tools.

4. Administrative Support Services: An effective online education program requires a supporting organizational structure to manage online educational needs assessment, program planning and development, funding, marketing, recruitment, admissions, course development, and course delivery support services.

5. Access to Academic Resources: To be effective, an online education program must provide students with access to online library resources, including: encyclopedias, dictionaries, thesauruses, articles, journals, etc. Online students should not be at a disadvantage to those with regular access to campus academic resources.

6. Academic Community: A successful online education program should also provide opportunities for online students and faculty to participate in the academic community, including student/faculty groups, clubs, events, memberships, and governance.

7. Enabling Technologies: Many institutions make the mistake of equating online education with a particular technology, such as video or web conferencing, or online instruction via a learning management system. Instead, online education should be viewed more generically as a method of serving students who cannot be in the same room at the same time as the instructor. Online education is enabled by whatever technologies can allow the instructor and students to achieve the instructional goals and objectives of the course.

The degree to which these components support online students depends on the institution's distance education aspirations. Institutions that seek to reach new populations beyond their local, county, state, or regional boundaries must design solutions that will work for students who will never physically visit a campus. Those who use online education to provide their existing constituencies with additional scheduling options can often implement less robust systems that depend upon the students' occasional presence on campus.

In general, online courses and programs clearly play an increasingly important role in VSC's array of offerings. However, each institution's online aspirations and infrastructure readiness vary greatly. The next section reviews each of the seven areas of infrastructure.

Findings

The current infrastructure, initiatives, and future aspirations for online course and program offerings vary greatly across VSC's five colleges.

- At Castleton University (CU), faculty and administrators have traditionally eschewed online learning in favor of face-to-face instruction. Three years ago, Castleton had no interest in online courses or programs and faculty were "mostly hostile" towards online teaching and learning. More recently, faculty have begun to embrace hybrid courses, and Castleton is now developing and offering a "low residency" graduate program.

- At Community College of Vermont (CCV), administrators take pride in being "the first of VSC to deliver courses online, beginning in 1996." Now, 12 different academic units serve 200-2,500 online students each, making it the largest online provider in Vermont. About one third of CCV's 1,000 course offerings per semester are online courses. While very few CCV students are online-only, most take a mix of online, face-to-face, and hybrid course offerings.

- Johnson State College (JSC) has been offering online courses for 15 years. The External Degree Program (EDP) is a mix of face-to-face, hybrid, and online courses; the JSC Online program, which recently went live, is intended to reach a national audience. In theory, JSC Online will not require students to physically visit campus. JSC is also setting up an HD video conferencing room to enable shared programs with LSC.

- Lyndon State College (LSC) is beginning one new online program (early childhood education) this fall term. Historically, LSC faculty have felt that education should be face-to-face, but a "major shift" occurred over the past few years. LSC administrators recognize that they currently do not have a strong supporting structure in place for online programs. For Fall 2016, 10 online courses, 27 hybrid courses, and approximately 400 face-to-face course sections are scheduled.

- Vermont Technical College (VTC) is offering statewide one- and two-year nursing programs online and is aggressively building a network of high-definition interactive video conferencing facilities at a dozen locations throughout the state.

The remainder of this section will explore each of the seven components of online infrastructure at the System and its five colleges.

1. Instructional Design Model and Process

In order to function as a teacher in higher education, an instructor must possess advanced subject matter expertise, i.e., knowledge and skills in an academic discipline encompassing theory, content, concepts, context, process, procedures, methods, rules, and supporting

technologies. However, subject matter expertise alone does not make an effective instructor. The instructor must also possess skills in management, assessment, communication, and presentation, and advanced knowledge of instructional technologies, instructional theory, and learning theory. The last three are critically important for online teaching and learning because the students and faculty are not in a face-to-face environment nor are they actively engaged simultaneously.

Most new faculty come to higher education with subject matter expertise and develop teaching skills by emulating effective instructors, by trial-and-error in the classroom, and through institutional faculty development programs. Because trial-and-error learning is an extremely challenging way to become proficient in online teaching, online course development is best conducted by facilitating the process through collaboration with professionals who possess expertise in the application of learning and instructional theory and practice. Such individuals are known as instructional designers.

An instructional designer assists the instructor/course-developer to:
- Determine appropriate course goals and objectives to address target learning outcomes.
- Articulate instructional objectives and analyze them for dependencies and prerequisites.
- Select appropriate instructional strategies and methods.
- Select and design self-instructional learning materials.
- Design appropriate course assessments and grading rubrics.
- Design interactive course components.
- Create summative and formative evaluation measures and instruments.
- Ensure the alignment of instructional objectives, assessments, and learning activities.

This role is distinctly different than that of an instructional technologist (a technical professional who is an expert at applying instructional technologies to instructional materials and activities). The difference between an instructional designer and technologist is analogous to that between a systems analyst and programmer. Both roles are necessary in the creation and support of online learning initiatives and few faculty possess these skill sets.

Today, across VSC, neither the System nor its colleges provide faculty course developers with expert instructional designer assistance, though some VSC colleges provide expert local instructional technology support. The colleges do not appear to utilize a formally articulated instructional design model and process. There was no evidence to support VSC formally embracing course development quality standards such as the Quality Matters rubric.

When faculty across VSC develop online courses within the Moodle environment, most start with a "blank slate" and do not adhere to any established course design template. This situation typically results in student "scavenger hunts" for course requirements and components as they

attempt to navigate across differently structured online courses. Some limited course design template components are available in the form of boilerplate material for things like "netiquette."

Recommendation: Instructional Design

The System should recruit, hire, and train at least one professional instructional designer. This instructional designer can work with individual faculty in a series of collaborative meetings throughout the course development life cycle and dramatically improve the structure, quality, and effectiveness of the course development effort.

Based on CampusWorks' experience, a "pure" instructional designer who is focused on process, pedagogy, and collaborating with an Instructional Technologist to build the course components in the LMS can develop a course in 20-40 hours, depending on the nature of the course, the definition of the life cycle, and the instructor's experience. A centrally-placed instructional designer, utilizing web conferencing (video) and group collaboration tools, can effectively serve faculty at all VSC colleges.

Recommendation: Online Course Design Standards

VSC and its five colleges should articulate and adopt a system-wide standard course design model, process, and life cycle and align these with course design templates, course development checklists, and course design quality standards, such as Quality Matters.

Recommendation: Instructional Technology

Currently, not every VSC college provides its faculty with local instructional technology support. In order to be successful in effectively utilizing the System's investments in instructional technologies, faculty must have additional technical support. Each of the five colleges should have at least one local instructional technologist available to train and support faculty in applying enterprise instructional technologies.

2. Student Support Services

Of the five VSC colleges, CCV has developed the most sophisticated and complete infrastructure to deliver support services to students studying online. This includes:
- Online advising services (nursing program)
- 24x7 online tutoring services (eTutor) in writing, math, and the sciences
- Registration and related functions via Colleague Web Services
- Other student services delivered via telephone

The other four VSC colleges do not seem to have fully embraced the support implications associated with offering online programs. In general, students cannot accomplish a full degree online without being physically present at a campus site for some support-service-related purpose.

The System does not effectively leverage its investments in instructional technologies—such as Moodle and Adobe Connect (or Skype for Business)—to provide student support services. These technologies should be thought of as effective online collaborative work tools and should be leveraged to provide support for advising, tutoring, and more.

Also, the System's online education offerings and programs do not utilize a systemic solution for supervised testing, i.e., they cannot positively affirm that the student who is being granted course and degree credit is the same individual who completed the course requirements. If a fraudulent situation occurs (and becomes public) whereby a student uses a substitute to take an exam or fulfill a course requirement, yet is still given academic credit for the other's work, the System's academic credibility can be severely compromised.

Recommendation: Tutoring Services

Online students' need for tutoring services is similar to that of their on-campus counterparts. To address these needs, the colleges can either create an online analog to their existing on-campus tutoring services, outsource tutoring to an external service, or pursue a combination of both approaches. The most effective solution will be to use technology (the LMS and web conferencing solution) to extend the existing tutoring services to serve online students, but also supplement these services with eTutor or a similar 24x7 service contract to handle late evening and weekend hours and provide additional resource availability during peak times.

Recommendation: Student Advising Services

Online students have equivalent or greater needs for advising services compared to those who are enrolled in face-to-face classes. The colleges should enhance their advising services to better accommodate online students who may not be able to visit campus. This can be accomplished using the instructional technology tools available across VSC today. Advisors can use Moodle "courses" to communicate to their advisees, and they can use Adobe Connect or Skype for Business to offer virtual real-time face-to-face advising sessions.

Recommendation: Student Retention System

Implement a Moodle-based student retention system. Modern learning management systems collect and store a wealth of information about students' progress through their course materials, activities, quizzes, discussions, and assignments. Add-on systems—such as AspirEDU's Dropout Detective and Hobson's Starfish—mine this information and make it available to faculty, advisors, and academic administrators to help improve student success and retention.

Recommendation: Remote Exam Proctoring

Online education programs are often plagued by fraudulent behavior whereby students pass off the work of others for their own and consult with others when completing course requirements. For this reason, many institutions offering online programs require that most or

all courses contain at least one course requirement for which the student fulfilling the requirement is positively identified as the student receiving the credit. The System should formally investigate service-based and technology-based supervised testing systems such as SecureExam's Remote Proctor Now or Verificient Technologies' Proctortrack.

Recommendation: Student Services for Online Students

The System and its colleges should conduct a thorough business process review of the services provided to online students throughout the entire life cycle—from recruitment/application to alumni relations—with the goal of improving availability to students with self-service offerings that are efficient, effective, and available 24x7. This is the expectation of today's students, whether they attend online or on campus.

3. Faculty Support Services

Faculty support services vary widely across the system. For example, Castleton retains a staff member, Sarah Chambers, who provides technical support to Castleton faculty and has limited administrative access to Moodle, including the ability to modify the Castleton brand and themes. At CCV, Sarah Corrow fulfills a similar function, while also supporting VTC, LSC, and JSC, as they currently have no staff with equivalent capabilities, beyond Amy Beattie, who supports JSC campus faculty using Moodle.

The System has implemented a "Moodle Medics" program, staffed by volunteers who are available between 9:00 AM and 7:00 PM (limited hours during the summer) via an Adobe Connect "room" for consultations with faculty using Moodle. Moodle Medics has been seen as valuable; however, a more dependable and sustainable approach should be considered to provide faulty support that can be readily available when needed.

Recommendation: Online Faculty Development Courses

When an institution believes in the efficiency and effectiveness of its online instructional technologies, the organization will utilize those technologies to teach faculty how to effectively use them. A team of faculty should be engaged with an instructional designer to develop exemplary online courses for VSC faculty in areas such as:
- VSC's Instructional Design Model and Process (not yet articulated)
- Using Moodle Effectively
- Engaging and Interacting with Students in Moodle
- Using Outcomes, Rubrics, and Assessments in Moodle
- Using Web Conferencing Effectively

VSC should consider requiring faculty to engage in such courses as a prerequisite to teaching online, as is currently the standard at CCV.

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Recommendation: Instructional Technologies to Support Faculty Work

Utilize instructional technologies, such as Moodle and Adobe Connect (or Skype for Business), to facilitate faculty service delivery and collaboration, such as providing copyright clearance assistance, supporting faculty committees and working groups, and more.

4. Administrative Support Services
Many of the online courses offered at VSC colleges are virtual islands in that they are not connected to any online academic program. Online courses and programs require unique support mechanisms for needs assessment, program planning and development, funding, marketing, course development and course delivery services.

Recommendation: Managing VSC Online Learning

VSC should consider creating a Director or Dean of Online Learning position with the responsibility and resources to perform online program planning, development, funding, faculty contracting, and delivery services. The Director/Dean will be responsible for selecting, contracting, developing, scheduling, and supporting all VSC online program and course offerings in order to allow students to declare and complete fully-online academic degree programs in a timely fashion. This position should be assigned the responsibility and resources to perform online program planning, development, marketing, funding, faculty contracting, and delivery services.

Recommendation: Needs Assessment and Market Study

In order to provide input and direction as to the potential demand for online degree programs and to help select the highest priority programs, the System should design and conduct an online programs needs assessment and market study. This would allow the System to ensure the efforts put forth for online course development and faculty support would be focused on the programs and courses with the highest potential for enrollment.

Recommendation: Learning Analytics

Consistent with several years of recommendations from the annual Horizon Reports (a joint project of the New Media Center Consortium and the EDUCAUSE Learning Initiative), the System should plan and implement experiments in harvesting and analyzing Colleague ERP and Moodle LMS data in order to improve student retention using data and trends to provide high quality learning experiences.

5. Access to Academic Resources

Online students must have access to library resources (including encyclopedias, dictionaries, thesauruses, articles, journals, etc.) equivalent to that of on-campus students. Through this effort, CampusWorks did not meet with Library staff specifically; however, those who did meet with CampusWorks indicated that online students have less access to these resources than on-campus students.

Recommendation Library Resources

Review all library resources to ensure that they are available remotely to all students.

Recommendation: Required Software

Explore and implement solutions (such as licensing, key servers, etc.) to enable distance learners to access and utilize specialized software that may be required for their academic programs.

6. Academic Community

Online students should have the opportunity to participate in the academic community, including student groups, clubs, events, memberships, and governance.

Recommendation: Online Student Communities

To enable online students to become full-fledged members of the VSC academic community, the colleges should create online supplements to their existing student groups, clubs, and committees by utilizing their academic technology infrastructure. VSC should develop a system for hosting online components of student groups, clubs, committees, and student governance using Moodle "course" sections and the Adobe Connect conferencing tool. These same tools will increase the likelihood that students will leverage these technologies in study groups and other collaborative efforts.

7. Enabling Technologies

The primary enabling technology for distance education at VSC is the Moodle course management system, which is occasionally supplemented by web and video conferencing. Other non-enterprise solutions also play a role and are described in more detail below.

Learning Management System

Moodle is the primary tool for delivering online education at the five VSC colleges. Moodle has been implemented and is managed by CCV, with one instance used by all five institutions, each of which has the ability to brand its individual presence. CCV runs three Moodle environments: (1) the production environment, (2) a training sandbox, and (3) a test server (this is a new environment that will periodically be updated to be a clone of the production environment).

Course shells are automatically built for every course section in Colleague, enabling every VSC instructor to use Moodle. Estimates of actual faculty adoption vary greatly—from 10% to 99%. Individuals with administrative access to the system suggest that adoption varies by institution with a System average of about 30% "robust" adoption (i.e. courses that use discussion boards, assessments, etc.) and another 20% "limited" adoption (i.e. courses that include at least one uploaded document and have been set to "available" by the instructor).

Moodle Mobile is not available due to an incompatibility with VSC's current identity management system (an idiosyncratic customization of Active Directory with Shibboleth).

Electronic Portfolios (ePortfolios)

The Mahara environment is being used at CCV to support a Fine Arts course and at Lyndon for a certificate program in Education. Castleton is going to contract with TaskStream for their ePortfolio system.

Interactive Video Television (ITV)

VTC has an extensive telepresence system (high-definition compressed interactive video), created as a successor to the former VIT (Vermont Interactive Television) system that was terminated two years ago. That system was studio-based and operator assisted. Two HD video conferencing systems are currently in place at LSC, one at JSC, 10 at VTC, and two at CCV.

Web Conferencing

Web conferencing systems allow an instructor to hold a virtual class or conduct virtual office hours by using an Internet connection for audio, video, whiteboard, application sharing, etc. Web conferencing systems can supplement learning management systems by adding a synchronous component to the online course. Ideally, the web conferencing system should be integrated with the LMS, allowing the instructor to quickly and easily launch a session with his or her class.

Although VSC currently licenses Adobe Connect web conferencing, online courses typically do not have a synchronous component. Many interviewees believed that the System's Adobe Connect license is intended for administrative purposes, not for courses. Some faculty expressed the desire to use web conferencing to improve collaboration between students and their instructors.

VSC colleges currently use at least five different web conferencing systems to support instruction:

- **Adobe Connect**: A limited system-wide license appears to be available to any instructor who requests it; although several individuals who participated in the interviews believed Adobe Connect was limited to administrative applications. Only a small number reported using it in courses.
- **Skype for Business**: Through its system-wide implementation of Office 365, all VSC faculty, staff, and students have access to the enterprise Skype for Business

application. Few interviewees were aware of this application and no course-related uses were uncovered.

- **Zoom**: At least one academic program has its own license to use the Zoom Web conferencing system for course delivery.
- **Skype**: Although not institutionally endorsed, several faculty reported using Skype in their courses.
- **Google Hangouts**: Although not institutionally endorsed, several faculty reported using Google Hangouts (and other Google products) in their courses.

Other Instructional Technologies

Some faculty reported using Google Drive and Google Docs. Few, if any, use the System's Office 365 analogs of OneDrive, Word Online, Skype for Business, etc. Faculty reported that support and training have not been proactive. Local IT staff reported some unreliability with Office 365 that they attributed to authentication problems to VSC's idiosyncratic Active Directory implementation.

No enterprise lecture capture application is available to faculty; some reported using "free" web-based applications such as TechSmith's Jing. Some use of TechSmith's Camtasia application was reported for authoring interactive applications.

Recommendation: Enterprise Web Conferencing System

VSC currently pays for a (limited) Adobe Connect license as well as an (unlimited) license for Skype for Business. In addition, at least one college also purchased a limited Zoom license. Nonetheless, faculty continue to use non-enterprise applications like Skype and Google Hangouts to support web conferencing. The System should carefully articulate its web conferencing requirements and investigate systemic enterprise solutions in this niche (for example, Blackboard Collaborate, Zoom, WebEx, Adobe Connect, Skype for Business, and others). VSC should select and fully implement an enterprise web conferencing solution, integrate it with the Moodle Learning Management System, and leverage it across the full range of institutional academic, student services, and administrative applications.

Recommendation: Multimedia Recording Facilities for Faculty

At each of the five VSC colleges, create a room with sufficient lighting and sound that are equipped to enable faculty to capture quality video and audio recordings. Implementing a multimedia recording facility will enable faculty to enhance their web-based course materials with quality personalized audio and video resources. An ideal facility will include lights and sound/noise reduction and will be equipped to capture video and audio recordings. The ideal facility should contain:

- Teaching station, height adjustable from seated to standing position, equipped with a computer, SMART Podium (or other annotation device), high-end

microphones (such as those manufactured by Heil), camera controls, video camera controls, and a document camera

- Acoustic wall treatments for sound and noise control
- Large monitor to preview recording or show remote site for video conferencing
- Remote-controllable pan/tilt camera for video conferencing or recording
- Changeable backgrounds, including green screens

Recommendation: Moodle Mobile

VSC staff should replace the existing custom developed identity management system and implement a standards-compliant replacement provided and supported by a vendor that will enable mobile applications for Moodle and Colleague.

Recommendation: Instructional Technologies

Each category of instructional technology can typically be served by many competing solutions offered by different vendors. For example, web conferencing tools include offerings such as: Blackboard Collaborate, BigBlueButton, Microsoft Lync (now Skype for Business), Skype, Blue Jeans, Google Hangout, WebEx, Adobe Connect, ON24, LogMeIn, GoToMeeting, and many more. Higher education institutions simply cannot afford to support a wide variety of redundant solutions in any particular technology niche, so they must utilize a process to carefully select solutions that are stable, reliable, supportable, and systemic.

VSC should create a function and process to investigate new and emerging instructional technologies with a goal of assessing which technologies hold promise for integrating well into the VSC instructional technology infrastructure. The solutions should be investigated as formal collaborative projects, involving faculty and support staff from all VSC institutions, and should result in practical pilot evaluation programs. Each pilot project should have an approved project plan, including clearly stated project deliverables, budget, timeline, responsibilities, and procedures to assess its success. For example, the System should select and implement an enterprise rich media (lecture) capture solution. Such a solution will greatly enhance the faculty's ability to harvest their classroom presentations and repurpose the recordings to support their online and hybrid course initiatives. Some leading contenders in this market niche include Panopto, MediaSite, Echo 360, Tegrity (McGraw Hill), and Accordant.

Summary

The current infrastructure, initiatives, and future aspirations for online course and program offerings vary greatly among the five VSC colleges—some embrace online courses and programs as an indispensable component of their offerings, some view online courses as a way to provide their current constituents with scheduling options, and some view online programs as niche initiatives to satisfy specific target audiences. All of the colleges seem to recognize that students' needs are growing, as are their demands for more flexible and accessible course and program offerings.

To fully support a robust set of online program offerings, CampusWorks recommends addressing the following components of the online infrastructure at both the System and college level:

1. Instructional Design Model and Process
   - Acquire instructional design expertise
   - Articulate and implement online course design standards
   - Acquire additional local instructional technology assistance
2. Student Support Services
   - Develop a system for online tutoring services
   - Enhance online student advising services
   - Implement a Moodle-based student retention system
   - Investigate technologies and services for remote exam proctoring
   - Review and improve student services for online students
3. Faculty Support Services
   - Create a series of online faculty development courses
   - Leverage instructional technologies to support faculty work
4. Administrative Support Services
   - Designate a service unit to manage all VSC online learning
   - Perform a needs assessment and market study for online programs
   - Experiment with learning analytics
5. Access to Academic Resources
   - Ensure all library resources are fully available remotely
   - Investigate solutions to make required software available to distance learners
6. Academic Community
   - Develop online student communities
7. Enabling Technologies
   - Implement an enterprise web conferencing system
   - Create multimedia recording facilities for faculty
   - Implement Moodle Mobile
   - Investigate instructional technologies

CAMPUSWORKS

Appendix C – IT Skills Gap Assessment Report

Executive Summary

CampusWorks was engaged by Vermont State Colleges to assess the IT team across VSC through a Gap Analysis and Organizational Assessment as part of the overall IT Gap Analysis effort. The objectives of this assessment were to evaluate the information technology skills and the necessary skills of the organization to effectively align the IT staff resources to most effectively meet VSC's needs. The IT Team Gap Analysis is primarily focused on improving the alignment of IT resources across the System.

Assessment Approach

The CampusWorks team, working with OCIT, put together a survey with 24 questions rating 108 IT technical skills, such as: Moodle, Colleague, and Microsoft SQL server. The survey also rated the importance of 24 soft skills, such as: communication, willingness to collaborate, and attitude.

Overall, the rate of response of survey completion was 43 of 48 staff members, which indicates a high level of cooperation.

Organization Group	Response Percent	Response Count
Castleton University	14.0%	6
Community College of Vermont	30.2%	13
Johnson State College	4.7%	2
Lyndon State College	9.3%	4
Vermont Technical College	16.3%	7
Office of the Chancellor IT	25.6%	11

Analysis, Findings, & Recommendations

The sections that follows includes CampusWorks' findings and recommendations from the IT Skills Gap Analysis; they are arranged in order of significance. Many issues and recommendations are interdependent and require a collaborative and integrated approach as desired at Vermont State Colleges.

The IT Skills Gap Analysis showed that even though the total IT staff size is small, there is a great deal of technical skill at both the OCIT and campus level. There is a surprisingly high level of technical strength in Network Infrastructure areas as well as Colleague, Moodle, Office 365, and Informer. For example, about 16% of IT employees have significant skill in both Moodle and Colleague and 12% of employees have skill in Informer. The rankings also show that employees have a high level of skill in major technical areas.

It is important to note that the survey only captured technical staff and that some responses indicated that there may be functional weaknesses at a non-IT level that should be addressed with Informer, Moodle, Office 365, and Colleague.

The survey shows also significant awareness of skills necessary to the basic success of VSC. When looking at IT teams' required day-to-day skills, there is understanding of the need for expertise surrounding core technologies required to provide the technology foundation, including Networking, Active Directory, Microsoft SQL and Windows, as well as the technical skills required to support applications such as Moodle and Colleague.

Likewise, the overall IT staff has substantial soft skills. We report that the survey shows that every IT employee identified integrity, responsibility, and teamwork as either extremely important or very important. The survey shows that IT employees strive to do their jobs professionally. When asked what is important to employees, many positive trends can be observed. The overall results also show:
- A desire to collaborate with others outside of their group
- A willingness to communicate both in writing and verbally
- A high level of courtesy and flexibility on the part of IT employees

The picture of IT leadership seen throughout the gap analysis is one of a fragmented, highly disorganized group of willing and skilled employees. Evidence of this can be seen in the somewhat random distribution patterns of skills coupled with a lack of resource sharing. The pattern also shows no single top skill present across all campuses. Because of the lack of a clear chain of command this random skill placement will cause significant resource issues and delays to both operational and developmental IT projects.

The details of the survey point to the current System IT leadership in what could be classified as "laissez-faire" leadership. Laissez-faire leadership is a style of leadership where employees end up doing whatever they think is important; however, this is often considered the least effective type of leadership and is not recommended.

Recommendation: Strong IT Leadership

IT needs a strong transformational leader. One who is able to inspire, challenge, change and collaborate across all colleges and OCIT. This leader needs to be a confident change agent to build a highly coordinated, unified, and collaborative IT organization with shared resources across the entire system. This leader would provide a clear chain of authority that emanates from VSC to the colleges and fully integrates and leverages the IT resources for the benefit of all across the System.

The survey also showed the current ratio of workers to managers as 3:1 while an ideal ratio is between 5:1 and 8:1. The 3:1 ratio indicates that significant changes in organizational structure need to occur. This ratio is inclusive of both "hands-on" and "hands-off" managers. Too many leaders can create a confusing chain of command, differing standard operating procedures, mismatches in reporting and analytics, and work slowdowns. This condition exacerbates productivity in an already inadequately-sized IT organization.

Q8 Do you manage other staff?

Answered: 43   Skipped: 0
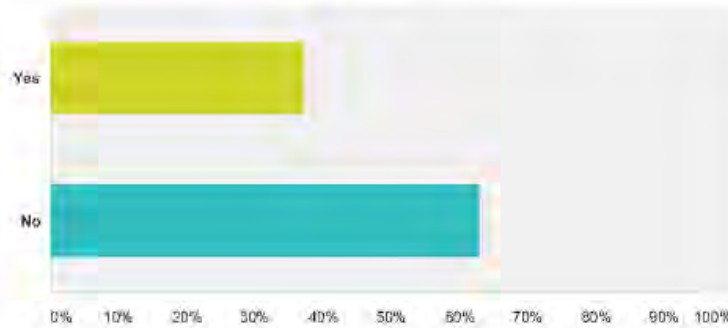
Answer Choices	Responses	
Yes	37.21%	16
No	62.79%	27
Total		43

The gap analysis showed a significant lack of understanding on the part of employees as to what their job actually was. A comment in the survey from an IT employee stated, "Honestly, I don't know what is in my JD (Job Description). HR was unable to supply my JD upon my request." This is typical of a "laissez-faire" IT organization, the employee either tries to please the loudest voice or they simply decide what to do based on the moment.

Recommendation: Alignment of IT Resources

It is important to clarify roles and expectations so that employees are clear about their job duties and how their roles and responsibilities integrate for the overall success of VSC and the IT team.

When looking at the answers to the question, *"What jobs do you do that are not in your job description?"*, we noted that several of the most important skills that are used by IT employees were not in their job descriptions. Following is a chart showing some of the skills listed as not being part of the job.

What IT skills are not in your job description but are necessary to perform your job?			
Skill	**Number of employees who say the skill is not in their job description.**	**Skill**	**Number of employees who say the skill is not in their job description.**
SQL Server	5	Colleague	3
Adobe Connect	4	Informer	2
Video Conferencing	3	Office 365	3

The analysis showed that VSC has a great number of IT skills. However, upon closer examination there is an indication that the IT organization is disjointed and not effectively organized to:

- Solve issues quickly through internal collaboration system-wide.
- Manage projects and issues involving major applications and across functional areas in an effective manner.
- Effectively standardize to reduce complexity.
- Provide adequate support to all campuses.

Recommendation: Sharing IT Resources

The IT Skills Gap Analysis showed that resources, in this case, mostly the skills that employees have, are not being shared across the System. What happens when you look at the big picture is that a pattern emerges where every institution lacks resources or skills that other institutions in the system already have. Sometimes the OCIT group is able to handle the need, but sometimes, as is the case with Moodle, they lack the necessary expertise. Sharing IT resources system-wide best solves this problem. Reporting metrics help to align and inform an organization. Developing key metrics for IT is recommended.

An example of this is using Informer skills to support Colleague reporting needs across VSC. The analysis shows the current spread is two Informer IT experts at the Community College of Vermont and three IT Informer experts at OCIT. So, in this case, one institution has two experts, and the rest share three. Although an argument could be made that more experts are needed, you could pool them as a team of five system-wide resources who can work on projects outside of their geographical area, aligning them to work together. The result should increase productivity while improving the quality of reporting (by standardizing as many reporting metrics as possible).

The advantages of sharing resources, which are managed centrally include:

- Cost containment and potential savings
- Reduction in duplicated efforts
- Increased communication
- Shared understanding across VSC when standardized reporting metrics are used

Recommendation: Project Execution and Coordination

One particular project, the conversion of Colleague from Unidata to SQL was brought up in the first listening session as being troublesome and drawn out for years. Not surprising is that Microsoft SQL server was identified as the number one technical skill that IT employees desire to acquire or improve skills in. What was equally surprising was that only one manager noted the need for a project manager in the survey. With employees it was a different story, five other IT employees across most campuses and OCIT noted the need for project management.

The need for project planning is very important considering the status of prioritized IT projects, which indicates that some projects are incomplete, not started, and/or have been in progress

or backlogged for several years. In perhaps more cases, some users have indicated they don't submit requests because of the very long waiting period and lack of responsiveness.

Recommendation: Project Management

The Gap Analysis shows that internal communication within the group appears on the surface to be good with a high level of interaction when issues occur. However, one particular question dealt with how often communication of various sorts happened. The responses to the question, *"On average how often do …"* indicates the need to increase the frequency of communications.

Formalized system-wide group meetings led by OCIT need to occur at least on a monthly basis. An example of this is a virtual meeting with all desktop employees regardless of location. When feasible and appropriate, IT staff should be located in common areas to increase communication. For many IT groups short AGILE and SCRUM-like meetings should be an everyday occurrence.

Several key aspects of the meetings:

1. They are non-threatening. Issues are raised and then solved outside the meetings.
2. They are about commitment. Today I will…
3. They directly involve all work.
4. They occur often and are short in duration.
5. The agenda asks the following questions:
    a. What did you do yesterday?
    b. What will you do today?
    c. Are there any impediments in your way?

Recommendation: Agile Methodologies

23. On average, how often do you. . .						
	Never	Seldom	Quarterly	Monthly	Weekly	Daily
Meet with your immediate supervisor?	0	2	1	5	13	14
Report on the status of a project you are working on?	0	0	2	7	21	5
Have a team meeting?	0	3	2	11	19	0
Send an email reporting status or detailing your work?	0	5	2	6	13	9
Meet with members of other departments or colleges to discuss a project?	0	7	3	13	9	3
Interject a new idea or improved solution to the team or business?	1	5	5	10	11	3
Communicate when you run into an issue that may impact others?	0	0	0	6	11	18
Communicate with non IT to give the status of an ongoing project?	1	2	5	9	12	6
Collaborate with others on a project?	0	2	1	6	14	12

Recommendation: Ongoing Training

Make ongoing training a part of every IT employee's job. There are also indications from the survey that new ideas may be stifled or the status quo is accepted. Since it is very important for technology groups to change with technology, an environment respecting new ideas should be established. This will also lead to better project completion. IT leadership should always encourage and ask for innovative solutions.

Recommendation: Advanced SQL Skills

Overall, the results of the total survey point out that the technological skill that VSC most needs is Microsoft SQL expertise. Responses show that IT employees both see and want to remedy the need for SQL expertise perceived by others outside of IT. When asked what type of training is needed, employees answered "SQL" more than anything else. One stated "SQL…What we currently have the most (need) [sic] of with probably the least training."

The listening sessions identified the conversion of Unidata to Microsoft SQL as a significant issue. The results of the survey indicated that a significant need for SQL expertise still exists. When asked, *"What IT skills do you not possess, but desire to learn?",* seven employees answered "SQL", which was the highest ranking response. This response shows that IT employees both see and want to remedy a need perceived by others outside of IT. In a similar fashion when asked, *"What IT skills are not in your job description but necessary to perform your job?",* five respondents answered "SQL". Again, this was the highest-ranking answer.

Recommendation: Ongoing Training for Moodle, Office 365, Colleague and Informer

Other skills for which managers showed significant need for were Moodle and Office 365. With regards to Moodle, the perceived lack of skill may be partially due to the fact that expertise resides at the institution level but not with OCIT. Office 365 is a technology that should be addressed by training existing employees to add to their skill set.

Likewise, employees show the same concerns as managers, but add Colleague and Informer to the list. Colleague actually has one of the largest skill bases to support it. The survey does show that Colleague requires constant training, so this could explain why it is on the list, as well as the fact that an ERP system such as Colleague is expansive with many functional areas dependent on it.

Informer skill is also found in several employees but distributed in a non-effective manner. We suggest sharing skills among all institutions wherever possible.

Recommendation: Advanced IT Skills

The System should provide training on advanced IT skills. The survey did not note a high level of proficiencies and/or adequate numbers of employees with advanced data technologies such as data warehousing, advanced Microsoft business intelligence skills, and widely used programing

languages. This presents challenges in reporting and analytics and will be required in a unified IT organization across the VSC system.

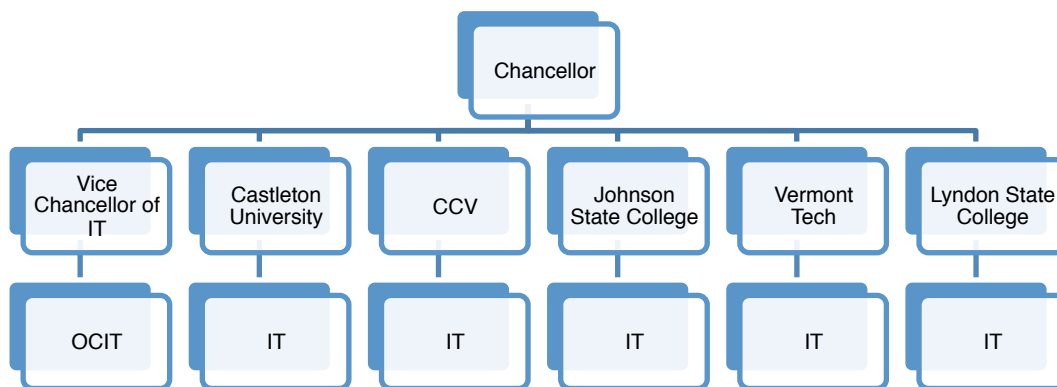## Organizational Assessment

Summary and Recommendations

The current alignment of IT across VSC has created a lack of clarity regarding responsibility and authority and has made the overall organization less effective. There is lack of clear lines of roles and responsibilities in supporting technology between the System and colleges.

Existing System IT Organizational Structure

The following organizational structure is no longer viewed as effective, given the increasing importance of technology to support the student experience, teaching and learning, and overall business operations. A lack of system-wide management of IT services, systems, and staffing coupled with a strong enterprise governance structure creates challenges for IT project prioritization, standardization, and support.

Figure 1: Existing System-Wide IT Organizational Structure

```
                          Chancellor
                              |
  ┌──────────┬──────────┬──────────┬──────────┬──────────┐
  Vice      Castleton    CCV       Johnson    Vermont    Lyndon State
  Chancellor University            State      Tech       College
  of IT                            College
  |          |           |          |          |          |
  OCIT       IT          IT         IT         IT         IT
```

Proposed System IT Organizational Structures

The proposed IT organizational structure would provide VSC with the potential for an overall institutional technology resource that can respond to and complete projects and tasks more effectively and efficiently. This organizational change would allow for more consistent policies, guidelines, standards, and procedures in the use of IT resources. Project priorities would be guided by a system-wide IT governance structure that is sensitive to the System's strategic initiatives and operational goals. Most importantly, this organizational structure would provide the essential IT services that will result in a more consistent experience regardless of which college the student attends.

Since this organizational change is quite significant, a two-phased transition plan is advocated to provide sufficient time to realign positions and responsibilities. In the

process of making this transition, a Vice Chancellor for IT should be appointed to provide strategic leadership and direction across the entire System. This position would report directly to the chancellor.
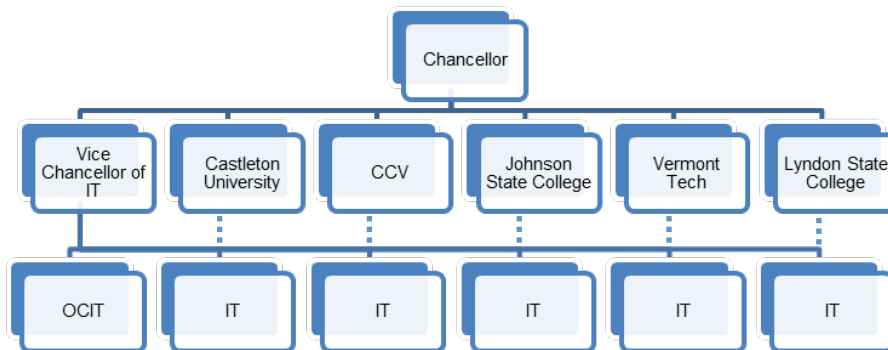
Phase 1

1. In order to ensure OCIT and the colleges move in a more coordinated manner, the system-wide information technology resources should be re-aligned to have the respective college IT departments report to the OCIT organization. Where common positions exist, the goal would be to develop consistent position descriptions.

   Such an approach would help ensure that the colleges' common needs are met with a standard, cost-effective, and cross-supported set of technology platforms and services. This approach supports a stronger collaborative effort in communicating the colleges' needs to OCIT and prioritizing projects. The college IT teams would remain at their respective campuses.

2. Establish a permanent Project Leadership/Management position in OCIT to oversee all IT projects, to ensure they are carried out in a consistent manner and completed on time and within budget. This position would focus on:
   - Preparing each project's justification, including budget, critical staffing resources, schedule, and ROI.
   - Organizing, communicating, and consistently executing key initiatives in OCIT.
   - Developing and implementing consistent project management practices, including updating electronic communications to the campus communities about projects that are underway and their status, projects that are next in line, and projects in the longer-range queue.

3. Provide close supervision of OCIT staff through effective line management to ensure all resources are being used and allocated dynamically to meet the most pressing needs with minimal impact on projects in progress.

4. Optimize effective use and development of IT staff by increasing the functional knowledge available to the application teams. This can be accomplished by either developing this capability through functional training of current OCIT technical analysts and/or adding Business Analysts to support the functional business areas in OCIT.

The college IT teams will be aligned and stabilized under the Vice Chancellor for IT and each team would remain on its respective campus. The next logical step is to align those individual college IT teams into Centers of Excellence.
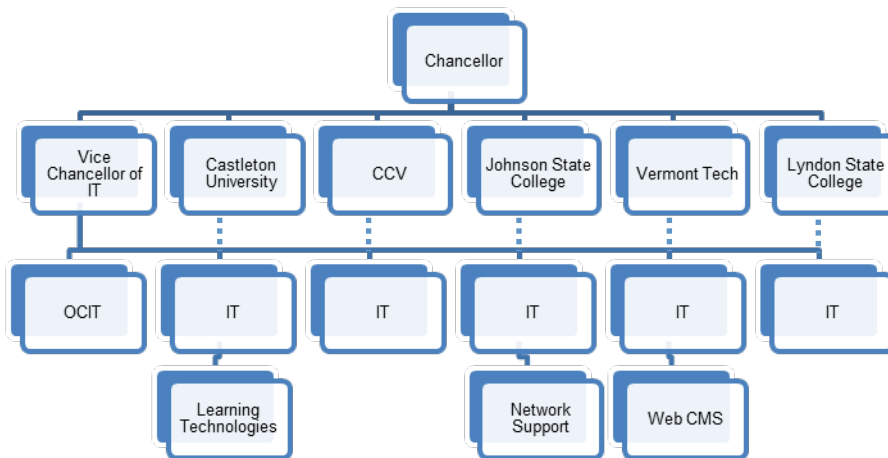
Figure 2: Phase 1 Realignment of the System-Wide IT Organization

Phase 2

The individual college IT teams and the OCIT would create Centers of Excellence across the System to provide support for one or more specific business and/or technical functions or services for the entire VSC System. For example, one institution could process Payroll or Financial Aid for the entire VSC System.

Figure 3: Phase 2 Proposed System-Wide IT Organization with Centers of Excellence

Conclusion

Vermont State Colleges, like many other institutions, is facing challenges driven by both internal and external factors. The result of these pressures is that the System must examine its operations and how it's positioned for both immediate effectiveness and long-term alignment and success. Technology is fundamental to an institution—it is a key component both short-

and long-term that can have a profound positive (or negative) impact on an institution's strategic and operational activities.

Fortunately, VSC's IT organization and related functions are not irreparably broken; they have been allowed to deteriorate to a point where immediate action is critically important. There are many areas that could become more effective and efficient in their ability to align and enhance the student experience, as well as to provide an optimal level of efficiency in the utilization of precious human and financial resources. To be successful, VSC must address some critical short- and long-term needs and commit to the steps necessary to meet the agreed upon goals.

The results of the IT Skills Gap Assessment show that the most critical actions VSC should take include:

1. Improve IT leadership and the chain of command.
2. Improve the alignment of IT resources across the System by clarifying roles and expectations and sharing all IT technical resources.
3. Improve project execution and coordination by obtaining a project manager(s) and increasing communication while encouraging innovation.
4. Make ongoing training a part of every IT employee's job. Build up advanced SQL skills and provide training on advanced IT skills.

CampusWorks has had the privilege of working with many higher education institutions around the country. With the perspective this assessment has provided, it seems clear that with a shared, unwavering commitment to enhancing the student experience, Vermont State Colleges can position itself to achieve the level of greatness your faculty, staff, students, alumni, and state citizens all desire.

CAMPUSWORKS

Appendix D – Colleague Assessment Report

Executive Summary

CampusWorks was engaged by Vermont State Colleges to conduct a comprehensive assessment of the Ellucian Colleague administrative system. The purpose of this assessment was to determine if Colleague, the staff who support Colleague, and the related business processes are being utilized effectively throughout the System while paying special attention to these items:

- How does the current implementation and use of Colleague and third-party systems align with VSC's strategic objectives? What are the strengths and weaknesses?
- To what extent is Colleague functionality in use at VSC and where are opportunities to better leverage the technology?
- What opportunities are there to increase VSC's return on its current ERP investment?
- Are business processes and procedures aligned and leveraging the ERP system to deliver the desired student experience across VSC?
- Where does VSC need to go with the enterprise systems over the next 3-5 years to achieve the desired strategic and operational outcomes?
- What priority should be assigned to further assess existing business processes and optimize those that are re-engineered in combination with optimizing Colleague to provide the best gains in services delivery, efficiency, and cost avoidance and reduction?
- What governance structure will guide the VSC community through the overall process to improve enterprise systems currently and ongoing?

During visits to all five of the VSC institutions, a two-person CampusWorks team conducted over 200 interviews and focus groups with 375 people, representing all of the individual colleges' functional areas and campuses. The VSC community was welcoming and open, and displayed a high degree of candor and hope regarding the anticipated outcomes of CampusWorks' efforts. This positive feedback was present despite many discussions and frustrations regarding current burdensome and time-consuming manual processes involved in their daily operations.

The VSC community believes that there are more efficient ways to operate and manage the colleges using the current ERP system and resources from across the colleges, but they feel hampered by a lack of leadership, direction, ownership, and communication. As a result of a lack of strategic, collaborative direction, there is significant manual processing throughout the system, troubling data integrity issues, a lack of buy-in for new technologies and, oftentimes, frustratingly long wait times to have Colleague-related issues answered. In many cases, the VSC staff and faculty desire to leverage more of the system's functionality and related technology to continually improve and enhance the student and employee experiences.

Recent projects launched by the central IT office have not been successful and have caused a burdensome amount of additional manual work as well as a sense among the institutions that the data that currently exists in Colleague is not accurate. The recent migration from the Unix

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Unidata platform to the SQL platform is an example. Data is still not correct throughout the system, and reports from the new platform do not match the same reports based on the same data prior to the migration. Reporting is another area of great concern as users are not able to access the data that they need to perform their jobs, thereby hampering the ability to make informed decisions.

Having all five institutions share one database with disparate business processes presents challenges that are unique to VSC. Should the VSC embrace unification, there is an opportunity to increase services and reduce costs through the use of standardized business processes across all five colleges.

Throughout the engagement, several themes surfaced among the sessions and are discussed in this report. The major areas of concern that prevent VSC from strategically achieving stellar student, faculty, and staff experiences are the following:

- The single use of Colleague for all of the institutions without a shared approach for how they operate has resulted in each institution doing things their own way as opposed to establishing best practices among the group and reinforcing that those agreed upon procedures must be followed.
- With the one database, VSC has the opportunity to centralize many of the administrative functions that are currently being performed on each campus.
- Colleague has been customized at the college level. As a result, central IT must manage an enormous number of customizations that can be affected every time there is a new patch or upgrade to the software.
- There are data integrity concerns throughout the system that must be addressed. The System must be able to rely on accurate data from the ERP system for decision making.
- There is a prevalent need for strategic direction from the central IT office to fully leverage the significant financial and human investments that have been made in Colleague over the last almost 15 years

The college community appeared ready to make a change to create an improved student and employee experience.

Assessment Objectives & Approach

Assessment Objectives

The purpose of the Colleague Assessment is to provide senior executives with a comprehensive evaluation of all aspects of the System's current use of Ellucian's Colleague solution and related third party systems. CampusWorks' Colleague Assessment is a holistic approach to reviewing the effective use of technology, business processes, and human resources to support and advance the System's strategic objectives. As VSC considers its future needs and the direction of its enterprise-wide systems, it is beneficial for the Chancellor's Office to assess the current state and identify opportunities to provide enhanced services, efficiency, and cost reduction and avoidance efforts while building an approach for the next 3-5 years.

Assessment Approach

The CampusWorks team reviewed the information received from VSC prior to the team's visits as well as additional information received from the community during the visit. This review covered an extensive list of the Ellucian Colleague modules currently in use, third-party applications used, and a survey of IT staff skills and gaps.

Throughout the onsite visits, the CampusWorks teams held nearly 200 meetings with individuals, departments, and focus groups and met with over 375 members of the VSC community, including administrators, faculty, and staff—ranging from front-line employees to the executive leadership team.

Using a qualitative analysis approach and methodology, the CampusWorks team facilitated each interview and focus group discussion based on the following questions:

1. What is working well today?
2. What does not work well or needs improvement?
3. What types of third-party or shadow systems are you currently using to perform your job?
4. What types of manual processes are currently in place?
5. Are there any types of restrictions that you feel hamper your effectiveness?
6. How efficient are your business practices?
7. Are there commonalities or distinct differences between business processes and the experience received by the students at each institution?

All responses were documented by topic and comment only, with no individual names associated with comments. Throughout the seven separate onsite visits and interviews of the community, common themes emerged and were validated by CampusWorks' team members through continuous questioning and by documenting responses from end users, managers, and IT staff. These strategic themes, along with tactical approaches, were compared with the relevant best practices for higher education institutions. These findings and comparisons served as a basis for the recommendations and opportunities offered in this report.

Findings & Recommendations

Overview

As VSC began their journey with the combined Colleague ERP system, there was a clear vision for shared governance, shared best practices, and overall sharing of administrative functions. As the years have passed, however, the organization has moved to a more decentralized model, enabling each institution to establish independent processes and procedures, which has led to a highly-customized Colleague environment that has become overly complex and difficult to effectively manage and maintain. In considering how to improve the effectiveness of Colleague for all of VSC, it will be important for the System and its institutions to reassess the goal of the shared environment and the need to align operations for the greatest efficiency.

The following sections highlight key aspects that were reviewed during this effort with VSC and provide concrete examples for VSC leadership to understand the impact on students and

employees as well as the overall effectiveness of the organization. The fundamental goal of unifying VSC for the betterment of all should be the focus as you move forward with Colleague, or any enterprise investment, to ensure the return on that investment.

The Shared Database

Ellucian's (formerly Datatel) Colleague system was implemented in 2002 as the Enterprise Resource Planning (ERP) system for finance, human resources, and students throughout Vermont State Colleges. At that time, Colleague was implemented with the vision of utilizing a shared database and shared processes across the system—this is a unique configuration of Colleague that presents some challenges to the system, but if there were standard business processes and procedures throughout the system that are reinforced, the issue of one shared database would not pose the level of complexity that it currently does. Despite the existence of the initial vision of a shared database, shared processes, and shared resources during the implementation, over the last 14 years the needs of the colleges and the knowledgebase and skill set of the central IT staff changed. Current practices are vastly different and despite some areas of shared processing, the individual institutions are operating differently across the board. This lack of standardized and shared processes causes immense additional work by the central IT staff to maintain, learn, and support these differences. The benefits of these individual processing preferences do not outweigh the work that must be expended to manage them.

The uniqueness of the shared database also presents additional challenges to utilizing the ERP efficiently and with assured data integrity. In the current configuration, each institution has access to every other institution's data, and the data is not protected nor are there agreed upon policies and guidelines that prevent the institutions from utilizing another institution's information in direct competition with the other institution. This also presents unnecessary confusion and challenges for students. For example, if a student applies to three VSC institutions and is accepted by all three, the current setup could recalculate the student's academic record three times in Colleague based upon how each institution's admissions office weighs certain admissions criteria (i.e., if one institution uses a 4.0 GPA scale to compute high school GPA while another uses a 5.0 scale, the student's record could be overwritten in Colleague by whichever institution evaluated the student last.)

This same example can be used to illustrate how a student's financial aid package may be revised. Let's say all three institutions accept the same student and Institution A offers him a merit-based award of $5,000. Institution B has access to that financial aid data and can then go back to the student and offer him additional aid to further entice him to attend Institution B as opposed to Institution A. Students have been trying to get better financial aid packages from colleges since the inception of financial aid and often pit colleges against each other to achieve the best deal—the difference here is that the institutions involved are all part of the same system and the staff has the ability to change data elements that directly affect other institutions within the System. No one is challenging the integrity of any of the staff involved in this process, but it is human nature, especially in times when enrollments are declining, for the enrollment services staff to utilize the data at their fingertips in an attempt to secure a student's enrollment.

Another layer of complexity with this scenario gets added for the student. In this case, if the student were to log in to the VSC portal to view his financial aid package, the student would see all three packages in one place—causing significant confusion. In addition, that student will also see a combined Cost of Attendance for all three institutions and could potentially see three bills at the same time.

Colleague has been set up using "Smart Coding" to distinguish the data of the individual institutions. It is a common perception throughout the VSC system that this cryptic naming convention makes the advising and registration processes harder for the students. One of the greatest benefits of a System of multiple colleges is that a student is able to attend one primary institution but also take classes at the other institutions. As a result of internal processes, a student can only have one active academic program in Colleague. This academic program belongs to a particular institution. If a student then wants to take a class at another VSC institution, he has to have his active academic program changed so that he can register and be billed by the second institution. This layer of complexity that's put on the student and the registration/advising staff is unnecessary. It's a common perception throughout the System that the setup of this shared system is not serving the needs of students and the individual institutions and should be reevaluated.

In addition, each time central IT plans an upgrade or patch to Colleague, the functional users are apprehensive because they fear that something will break as a result of the updates and they will undoubtedly experience significant downtime and/or process errors. Because of the enormous number of customizations that have been added to Colleague, it is an arduous task to ensure that all of the customizations are cataloged, maintained, and tested properly. Unfortunately, all five institutions are not performing adequate testing locally when there is an update, and this leads to additional downtime and more problems experienced by the users.

Configuration Errors and Manual Processes

As a result of the current Colleague configuration and the recent SQL migration, data integrity concerns have arisen and become prevalent throughout the System. These two factors have created a considerable amount of additional manual work as the staff do not trust Colleague data. The staff are checking and double checking the data, increasing the human labor cost and delaying access to accurate information.

One example of this is found in Payroll processing. Each VSC institution has experienced significant issues when processing payroll. Each time payroll is run, multiple rounds of manual data validation must occur with numerous corrections of the payroll calculations having to be performed. Because of the current Colleague configuration, the system cannot calculate payroll correctly using the Colleague functionality if an employee's record has been changed in any way since the previous payroll. In addition, anyone who is eligible to receive overtime is processed by the system, but incorrectly, and must be manually corrected before the payroll process is executed. This manual data validation often occurs on reports that are over 200 pages in length, with substantial human intervention required in order to have the employees correctly paid. The staff know that the data that coming from Colleague is not accurate and only through their due diligence and commitment to their responsibilities can they ensure that the payrolls are correct and employees are paid accurately.

Another area where the standardization of practices could produce significant time savings and help simplify processing is in changing the Academic calendar. Currently, each institution sets and operates its own academic calendars, and there are multiple academic calendars at each institution predicated by the type of academic program. There is no consistency in the standard academic programs' academic calendars across the System. This is confusing for students and staff. One of the best-selling points of being part of a college "system" as opposed to being a student at one independent institution, is that you have the ability to take classes at another college. This benefit is being hampered by the varying academic calendars and lack of consistency across the system.

SQL Migration

The recent Colleague platform migration from the Unix Unidata platform to the SQL platform was lacking clear communication, comprehensive testing, and training across the institutions. Any time an institution engages in such a significant change, it is imperative that consistent communication occurs throughout the process. Users uniformly reported that this did not occur with this migration. Users said they were not given clear guidance on what to test, how to test, what the pros and cons of the SQL migration would be, or how their everyday lives were going to change after the migration.

An additional layer of complexity that was unique to the VSC configuration of Colleague but was not appropriately recognized and accounted for is that all five institutions' business processes are different and each institution has unique customizations for their institution in Colleague. The direction from the central IT office was to have administrative representatives from only two institutions involved in the testing. If, for example, Castleton and CCV staff were involved in testing an area, they would not have known to test specific customizations or processes that only exist at Lyndon State. This resulted in a multitude of additional errors and process slowdowns at the campuses. In addition, the changes to the reporting structure in Colleague as a result of the SQL migration were not communicated to users and have caused inaccurate data to be extracted from the system.

The Student Experience

The VSC System is faced with recruiting challenges inherent to the geographic location of the institutions, the climate, and a diminishing local high school age population from which to draw. One challenge VSC can control is the experience a student has with the System and its institutions from the point of inquiry throughout the life cycle.

Today's VSC student experience can be clunky, not user friendly, frustrating, and significantly different depending on which institution the student attends. This is not to say that each institution does not have its own unique programs and student life and that is, of course, important as well. But the student's experience with the various technological tools is not consistent and in many aspects not indicative of the positive experience that the institutions want to portray to students and families.

One example of this is at Castleton. Because Castleton was the pilot school to implement Ellucian Recruiter, their students' application process was very different. This is to be expected with a new implementation, but because the implementation failed in large part because of the

lack of expertise and support needed to maintain and properly run a system as intricate as Recruiter, workarounds had to be created. Even during the implementation, when Castleton staff requested updates to their website, they either did not happen in a timely manner or at all. Simple changes, such as updating the name of the institution, have still not been completed and the name change has been in place for several years.

Earlier in this report we discussed some of the registration, financial aid, and billing challenges that students may face during their tenure in the VSC system. It cannot be overstated how important a student's administrative experience is during the student life cycle. The student and her family will not forget a negative, confusing, and frustrating experience. Today's generation of students has only known life with a cell phone and the internet at their immediate disposal. The ability to perform administrative tasks with relative ease is paramount.

Throughout the VSC system, each institution is using a custom version of Ellucian's Colleague WebAdvisor product and the Ellucian portal creating different experiences for students throughout the VSC system. Each institution has created independent admissions applications designed to meet institutional admissions policies and procedures. This customization and disparate business processes eliminates potential efficiencies that could be realized by having one shared database.

Recommendations

Throughout higher education the need for an integrated, modern, intuitive enterprise resource planning system is essential to not only the day-to-day operations of an institution but also to the strategic planning process imperative to its growth. In order to operate VSC institutions and share common data attributes among them, the System implemented Colleague over a decade ago; however, the current ERP is no longer able to serve the System in an efficient manner that will lead the institutions through the next decade.

As a result of this and the other findings listed throughout this report, the following recommendations are put forth for consideration.

1. Conduct comprehensive business process redesign to develop standardized processes, enable automation and consistent workflows, and gain efficiencies across the colleges. Consider beginning the process with the following two areas:
   - The Student Experience—including admissions, registration, financial aid, student records, advising, and student accounts
   - The Employee Experience—including recruiting, onboarding, orientation, benefits, and payroll
2. Issue a Request for Proposal (RFP) for a new ERP system, or piggyback on Green Mountain Higher Education Consortium's effort. If VSC decides to continue using Colleague, analyze the delivered Colleague functionality to ensure offices are leveraging all capabilities offered, identifying the needs, and turning them into business-focused projects for implementation across all colleges.
3. IT structure and staffing levels must be addressed.

- A leader who is capable of providing direction, strategic thinking, resource planning, and effective communication and collaboration is vitally important to VSC's success.
- Staffing levels at the central IT office are not adequate to support the complex nature of the various technological tools in place across the colleges. There is minimal cross-training on Colleague modules within central IT and if someone leaves the organization, the void created has a substantial impact on the day-to-day operations of the entire organization. When one particular staff member goes on vacation, any activity in that functional module may come to a halt.
- Campus IT offices should receive Colleague training.
- Initiate Service Level Agreements with central IT staff and open lines of communication designed to keep the users better informed and employ accountability measures for the staff.

4. Enact an IT governance structure. Create an initial committee designed to involve members of leadership and power users. Include representation from the individual institutions and empower them to serve in collaboration with the central IT leadership to establish priorities, plan for the future, and ensure that users' needs are being addressed, greatly enhancing campus buy-in and opening lines of communication. This committee can assist in evaluating new technologies, integrating needs, and helping the entire community realize the true benefits of the implementation, as well as assist in the development of plans for training and ongoing support throughout a product's life cycle.

5. Implement project management standards for all projects within IT. Projects must be put on a schedule that is adhered to, evaluated, and measured throughout the process.

6. Define the critical management reporting and metrics across the system. Develop appropriate benchmarks and accountability standards and align those to the operational areas to continually assess and make informed decisions as the operations are altered to address the organization's changing needs.

7. Continue to establish shared business processes to leverage ImageNow consistently throughout the VSC System. Sharing data and documents electronically makes business processes more accurate, provides faster service, and enables accountable tracking. These processes can reduce paper and develop automated workflows to manage online data forms, enabling student and staff records to be processed faster and with greater accuracy. This process ties directly to the business process reviews.

8. Implement an end user training program (on-boarding process) for all enterprise systems, and leverage this across the entire System to inform new users of the effective use of all enterprise systems.

9. Establish a reporting strategy and invest in the tools necessary to support that strategy.

Conclusion

Vermont State Colleges, like many other institutions, is facing challenges driven by both internal and external factors. The result of these pressures is that the system must examine its operations and how it is positioned for both immediate effectiveness and long-term alignment and success. Technology is fundamental to an institution—it is a key component to both short

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and long-term success that can have a profound positive (or negative) impact on an institution's strategic and operational activities.

There are many areas that could become more effective and efficient in their ability to align and enhance the student and employee experiences. To be successful, Vermont State Colleges must address some critical short- and long-term needs and commit to the steps necessary to meet the agreed upon goals.

CampusWorks has had the privilege of working with many higher education institutions around the country. With the perspective this assessment has provided, it seems clear that with a shared, unwavering commitment to enhancing the student and employee experiences, Vermont State Colleges can position itself to achieve the level of greatness your faculty, staff, students, alumni, and state citizens all desire.

Item 4:

Kevin Conroy's Narrative IT Update

Actions Initiated or Planned Since Receipt of CampusWorks Report/February 5, 2018

The engagement of CampusWorks focused on the following:

1) IT
   a. Technology Environment
   b. Infrastructure
   c. Customer Support Services
2) Online Programming
   a. Online Program Technology
   b. Learning Management system alignment to organizational goals and objectives
   c. Readiness of growth in online and distance learning
3) IT Skills Gap Analysis
   a. IT skills gap
   b. IT staffing and organizational structure
   c. Recommendations and improved alignment across colleges
4) Colleague Functional Assessment
   a. ERP Functionality
   b. Key business processes
   c. Overall effective use of and return on Colleague investment

CampusWorks presented three critical actions/first steps:

1) Establishment of strong visionary IT leadership and alignment of IT to support the business of education in a unified colleges model
2) Standardization of the business processes across the system to streamline and optimize business functions
3) Alignment of support for classroom technology that should be utilized both online and in the classroom to improve the student and faculty experience

At the time this report was published we made some significant changes in IT leadership. These changes have served us well over the course of the last year as we worked to resolve a number of the foundational issues described in this document. The next step, working to streamline and optimize business functions may need us to strengthen the leadership oversight by the Chief Information Officer Position, formalizing the position as the lead of the Information Technology Council (IT Council). Doing so would facilitate the rollout of the new technology infrastructure required to advance the implementation & design of the business process changes necessary in the coming year in order to improve efficiency across the board.

A review of a 2013 article presented by Hanover Research, Consolidation and Shared Services in Higher Education, described the opportunities available in higher education for streamlining of business processes:

1. Lower the total cost of ownership for new technologies
2. Enhance service quality for the university community
3. Create more agile organizations that can readily adapt to changes in business needs
4. Improve institutional flexibility
5. Build economies of scale and partnership opportunities

6. Broaden access to individuals and divisions with valued expertise
7. Facilitate the distribution of best practices
8. Allow for consistent key performance indicators to track quality across units

Technology is the foundation of many of these actions that can and should be taken to reduce costs and improve delivery of education. Certainly that is what CampusWorks was telling us.
In that same Hanover Research article, the display below was presented in order to suggest potential areas for consolidated business functions to allow for reduced cost and improved education.

INFORMATION TECHNOLOGY

Application Development/Implementation
Application Server Administration
Critical File Backup
Database Administration/Database as a Service
Disaster Recovery
Email Administration
Emergency Notification
End User Help Desk
Identity Management
Infrastructure Development/Management
Operating System Administration
Project Management
Risk Management
Server as a Service
Shared Technicians/Analysts
Software Licensing/Support
Web Content Management

CAPITAL PROJECTS

Capital Project Management
Real Estate

HUMAN RESOURCES

Benefits/Retirement
HR Data Management
Immigration/Relocation/Exit
New Employee Registration/Onboarding
Payroll
Professional Development
Recruiting
Time/Leave Administration

STUDENT SERVICES

Admissions
Financial Aid
Online Tutoring
Registration
Residential Services
Study Abroad/Multicultural Programming

PUBLIC RELATIONS

Development
Governmental Relations
Publications/Print Services
Public Relations

PROCUREMENT

Audio Visual
Computer Hardware
Electrical Supplies
Food
Furniture
IT Hardware Maintenance
Janitorial/Sanitation Supplies
Lab Supplies and Gases
MRO (Maintenance, Repair, Operations)
Office Supplies
Peripherals
PPVF (Plumbing, Pipes, Valves, Fixtures)
Relocation
Servers

FINANCIAL SERVICES

Accounting
Accounts Payable/Accounts Receivable
Collections
Compliance Management
Financial Database
Travel/Expense Reimbursement

Created by Hanover Research

With the need for action delineated, the goal of reducing cost, improving technology and student/staff/faculty satisfaction was the point at which the Information Technology Department started this endeavor.

There were three components to this project,

1. Which software system(s) will we use to develop the envisioned future? Should we stay with Ellucian Colleague as our core software system?
2. How solid and secure is the technology foundation upon which so much else is built?
3. How will we support this high-tech environment from both a business and student perspective knowing we need to stay lean, and with the difficulties we have already faced hiring staff with experience when turnover occurs?

Which Software System(s) will take us into the future?

In September of 2016, shortly after the CampusWorks presentation, we reached out to the Green Mountain Higher Education Consortium. (The GMHEC is a collaborative endeavor of three Vermont Higher Education Institutions: Champlain College, Middlebury College and Saint Michael's College) Our intention was to explore the possibility of participation in their Enterprise Resource Planning (ERP) project. Two of the colleges, Champlain and Saint Michael's use Ellucian Colleague as we do, Middlebury uses Ellucian Banner. We were invited to participate and our CIO, Kevin Conroy, attended the presentations and review meetings. Four vendors were chosen to present: Unit 4, Oracle, Campus Management and Workday. These were intensive 3-day presentations followed by discussion and further communication with the vendors, concluding in early 2017. During the presentations it became clear that Ellucian Colleague and Banner were both more advanced student software systems than the others. GMHEC made a decision late spring 2017 to have each college stay with their current ERP system for student processing and to further investigate Oracle as a business and finance system for the group. The final decision was made in December 2017 and announced this past January.

The following information is from the consortium's webpage:

https://www.gmhec.org/colleges-share-oracle-erp-system-effort-cut-costs/

"The consortium went through a request-for-proposal process and picked Oracle ERP systems. They will use Oracle's Human Capital Management Cloud, its ERP Cloud and the Enterprise Performance Management Cloud."

"A goal for the three schools was to implement best practices in a SaaS environment and to take advantage of using shared services."

"Using best practices "has nothing to do with your culture and nothing to do with your special niche as a school," Noelke said."

"Education systems require specialized software related to student needs, such as registration, class schedules and financial assistance. Oracle is developing a new student system using the knowledge they have on needs and requirements from the PeopleSoft product. This work is still in development. The consortium is likely to use Oracle's approach, but will make a final determination once the development work is completed."

As stated above they formally decided to stay with their current student ERP systems since the vendors were not yet ready to deliver a quality student data product that could replace the Ellucian Software.

Using the information gained through participation with the GMHEC we invited Ellucian in early 2017 to make an executive presentation; challenging them to present their direction and goals in our effort to

decide our future ERP provider. That presentation occurred during two days in late January of 2017 and our conclusion was very similar to the one reached by GMHEC; their student system was a viable option to support our future goals.

We then contracted with Ellucian to conduct "deep dives" into each of our functional areas of Colleague system utilization and make recommendations for improvements. These reviews were done on-site, at the Office of the Chancellor, and included staff from each of the college's respective functional areas. The expectation was set that Ellucian would report back and make recommendations around improvements.

4/4-4/7/2017	3 Day Admission Module review
4/45-4/27/2017	3 Day Registration and Academic Record Module review
5/2-5/4/2017	3 Day Finance Module Review
6/6-6/8/2017	3 Day Human Resource and Payroll Module review
6/20-6/22/2017	3 Day Accounts Receivable Module review
6/27-6/29/2017	3 Day Financial Aid Module review

After completion of the review we received a concluding document and presentation delineating projected next steps

8/15-8/16/2017	2 Day overview on discoveries and suggested next steps

We concluded that staying with Colleague, at least for the near future (5 years), would be the best business decision. The student processing aspects of Colleague were competitive, and with a much smaller investment (not moving to a new ERP system) we could conduct a software update and yield some significant results. We were disappointed in the HR and Payroll modules (a very similar conclusion to the one reached by GMHEC) and decided to look at options to replace those modules. We are currently in the process of developing an RFP for a new HR and Payroll system.

There were also a number of weak systems and technology short comings discovered outside of Colleague that were foundational in nature and needed to be addressed before considering a full ERP upgrade.

Our Customer Relationship Management (CRM) product for recruiting and admissions was a failing product. We worked with the admissions teams at, NVU, CSU and VTC to look for a replacement product. The RFP went out and the selection process was completed by early 2017. That product, SLATE, was brought live for the colleges to use for the September 2017 recruitment of students for the fall of 2018 starting class. Feedback from the colleges has been excellent. It was a significant project and included interfacing with Colleague for student registration and TouchNet for secure Deposit Payments.

Our Library System was not serving our Colleges well and was at the end of both contractual agreements and the expected life of the system. We put out an RFP for a new system and concluded the selection process by September 2017. That installation is in process.

During the Ellucian review meetings it became obvious that an Ellucian product, Elevate, would improve our ability to register and track non-degree course attendance and progress. We contracted with Ellucian for that product in late fall 2017 and that installation is in process.

With the onboarding of the new Institutional Research team at the Office of the Chancellor we began to realize our reporting capabilities would not serve us well in the future. In the fall of 2017 we contracted for Business Intelligence Data, ETHOS, from Ellucian and that has just gone live this January. We also started the process of moving to newer version of our reporting software, Informer 5.

Most of the work around the Northern Vermont University unification, although consuming significant time, has not required new or upgraded software. We did find two pieces of software that required major upgrading during the unification design process. The Event Management System (EMS) used for class and event scheduling needed to be upgraded to allow them to efficiently manage the two campuses. ImageNow, their Enhanced Document Management System, needed a redesign to function efficiently for all colleges. The EMS upgrade was completed over the recent Christmas Holiday and ImageNow is in process.

How solid and secure is our technology foundation?

As we began the process of reviewing our technology we realized that we needed to look at the foundation we would be building upon.

Our initial findings were that we needed to update our Identity Management System (IDM), expand and improve our backup capabilities, take on Payment Card Industry (PCI) security technology standards, update our policies and processes and renew our network connectivity contracts as part of increasing network security and segmentation.

Early 2017 an RFP was put out for a new IDM system. Selection was completed by June of 2017 and the change-over to the new system was completed 1/2/2018. This new system replaced a "Home Grown" scheme developed by a staff member who has been gone for over 2 years. It was a significant project.

With expected growth and increased utilization of our data systems, the team needed to review our backup capabilities and decided in 2017 to replace our existing End of Life (7/1/2018 EOL) hardware. The RFP and selection is complete and the new system will be in place this spring.

Working with finance we have begun the move to a fully PCI compliant credit card processing environment. Those reviews are complete and we are working with the vendors, TouchNet and Heartland, to meet a late spring compliance goal. Updating of all policies and processes is underway and should be completed early spring.

Our network contracts expire July 2018 and the RFP is out for responses. Part of the new connectivity will be to improve security and also enable us to move some systems to a "Cloud Environment" in the future.

How will we support this high-tech environment from both a business and student perspective knowing we need to stay lean and with the difficulties we have already faced hiring experienced staff when turnover occurs?

In order to continue to support advanced technology in education we will need to move some of our core system to a Software as a Service (SaaS) model. This type of "Cloud Technology" offers some significant advantages. See bullets below from a Huron Consulting Article:

https://www.huronconsultinggroup.com/resources/higher-education/fohe-september-2017

1) Cloud Enables Institutions to Meet Student Expectations
2) Early Cloud Adoption Puts Institutions Ahead
3) The Right Cloud Vendor can Provide Good Security
4) Cloud Reduces Complexity and Increases Efficiency
5) Cloud Gives Students Unlimited Access

The Huron article also pointed out the need to develop a plan that accounts for the following steps as central to accomplishing a move to a Cloud Environment:

1) Build an inventory of all current business processes.
2) Understand out-of-the-box functionality.
3) Identify any manual steps that must be completed outside the system.
4) Define business process participants.
5) Define performance indices, policies and standards.

Finally they cautioned against moving to the Cloud with existing flawed processes and to "Question Everything!"

These are the guidelines and principles we have followed in the last year to build toward our future:

- We have already rolled out generic (out-of-the-box) implementations of new systems in the Cloud
- Our new admissions software (Slate) is Cloud based
- Our new IDM system is Cloud based
- TouchNet for PCI compliance is Cloud based
- Elevate is Cloud Based

After our Ellucian review last fall, we met with the Ellucian team to plan the eventual move of Colleague to the Cloud as a hosted system.

These types of moves to the Cloud will require us to standardize utilization of our system processes. The advantages of this type of move will be increased ability to maintain desirable uptimes, decreased response times to issues and reduced stress because we are only one level deep with onsite expertise.

Overview of some of the action taken since the completion of the Ellucian Review:

1. We have installed and are testing the Colleague Self Service Module
2. We are installing the new Colleague Financial Aid Self Service Module
3. We purchased Ellucian Elevate to enable better tracking of non-degree oriented students; that module is currently in test
4. The Installation of Slate, a Technolutions Application, Cloud Based, for admissions

5. We decided to move away from the Colleague HR and Payroll Modules and have completed a review with an outside consultant on our current payroll processes and are finalizing an RFP for new vendor selection
6. We have begun to make adjustments to student payment processing to meet the new 1098-T reporting requirements

Some of the foundational projects needed and discovered during the review of our systems that we have undertaken this past year:

1. Our Identity Management System for user access control was written in-house and would not serve us well in the future. We put out an RFP for a new vendor and selected a cloud-based product from an award-winning provider that has been implemented successfully
2. Our backups were in need of improvement and we finalized the RFP process and selected a new vendor to replace the current systems by 7/2018
3. Our credit card processing did not meet industry standards and we have elected to move forward with a current vendor to meet the industry standards. This project is underway and should result in yearly savings in excess of $100,000 along with making us PCI compliant
4. Our network contracts were up for review and an RFP has been developed and went out at the end of January
5. Our Event Management System was behind current versions and needed to be upgraded to allow more efficient scheduling of classes and events. That project has been completed
6. Global data security processes - We have some issues with email addressing and mobile security that is being addressed

New Projects Undertaken

1. NVU coding for the new University
2. Informer Version 5 for all reporting (in process)
3. Ethos Business Intelligence Reporting (in process)
4. The EIT team along with CCV and others led a review this past summer of Canvas as a Cloud Based LMS system for our future. This project was significant and expensive, so no final decision was made but the team did upgrade Moodle this winter vacation to improve LMS functionality

Item 5:

Board's Strategic Priorities

Six Priorities to Support the Mission
of the Vermont State Colleges

For the benefit of Vermont, the Vermont State Colleges system provides affordable, high quality, student-centered, and accessible education, fully integrating professional, liberal, and career study, consistent with student aspirations and regional and state needs.

Strategy 1: Increase the continuation rate of high school students on to postsecondary education.

- Provide effective leadership and advocacy, with partners, on the urgent need to increase postsecondary affordability and attainment while sustaining program quality.
- Expand strategies (e.g. Introduction to College Studies, dual enrollment, "try a major" events) targeted at current populations of high school students who are not continuing with postsecondary education.
- Expand existing and create additional flexible academic pathways into and through our degree programs, including providing meaningful certificates and associate degrees.

Strategy 2: Improve the retention and graduation rates at our colleges.

- Implement degree maps to create clear curriculum paths to graduation.
- Improve access and use of data and advising technologies.
- Develop multiple delivery models for degree completion, including online, connected classrooms, and flexible schedule options.
- Continue to increase comprehensive and strategic approaches to student support services.

Strategy 3: Become a more attractive destination for Vermont high school graduates.

- Create a positive brand at the VSCS system level that supports the unique characteristics of each college and is rooted in the sustained quality of the academic experience.
- Continue to improve technological and physical infrastructure.
- Enhance relationships with school counselors statewide.
- Establish VSCS celebration and support of academic excellence (e.g. VSCS Hall of Fame).

Strategy 4: Serve well more working age Vermonters.

- Improve and expand flexible and online delivery of programs across the VSCS to increase number of degree programs available to students statewide.
- Work with employers on needs assessment and flexibility of delivery.
- Improve the entire technology infrastructure of the system to ensure that it is user friendly and competitive.

Strategy 5: Operate as a more integrated system to expand student opportunities and achieve operational efficiencies.

- In addition to maximizing productive collaboration and integration across the entire system, develop strategic alliances between Johnson and Lyndon State Colleges, as well as Vermont Technical College and Community College of Vermont, intended to complement and/or supplement their individual strengths and weaknesses.
- Improve the entire technology infrastructure of the system to ensure that it is user friendly and competitive.
- Review the financial model of the system to ensure institutional stability and explore financial incentives that support collaboration and system interconnectedness.
- Reduce transferability and course-sharing barriers to expand the diversity of student academic and co-curricular learning opportunities.

Strategy 6: Increase state financial support and other supplemental revenues.

- More effectively advocate for state support.
- Increase grant-writing capacity in the system.
- Collaborate on shared fundraising resources.