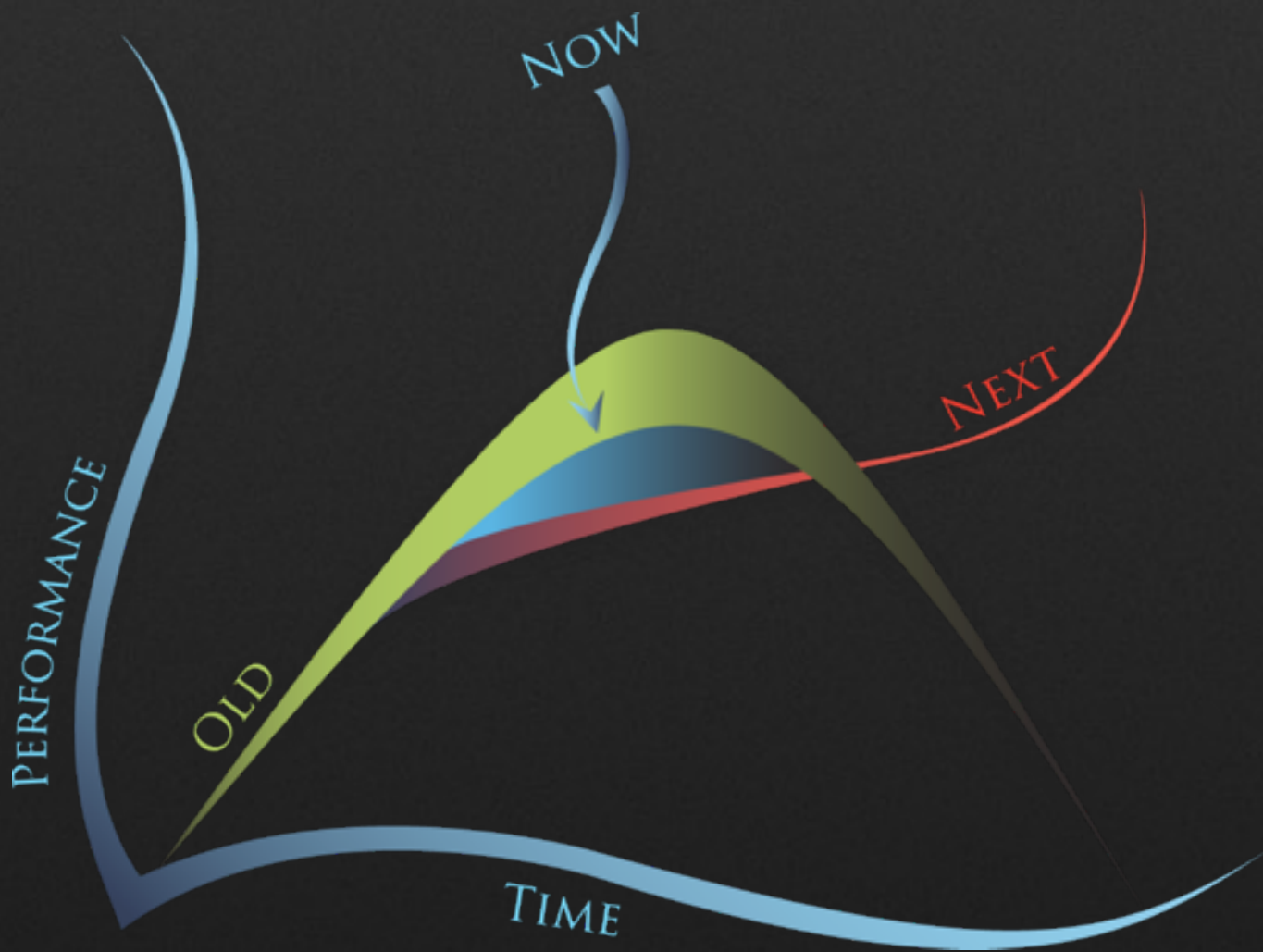


Moving From Now To Next...

Achieving A Sustainable Technology Future



Strategic Technology Plan

Southern Connecticut
State University

Robert J. Rennie, PhD

About



“Perhaps the most important responsibility of IT leaders is to craft a compelling vision of what the future can be and then set out to bring that future to their organization. This leadership team is focused on those responsibilities and will undoubtedly reap great success because of it.”

-Thornton A. May

*Noted Futurist, Researcher, Author, and C-level Adviser
Named one of Fast Company’s ‘Top 50 Brains in Business’*



Dr. Mary A. Papazian was appointed as the 11th president of Southern Connecticut State University in December 2011. She has enjoyed a notable career

as an educator, administrator, and scholar of English literature. A native Californian, she completed her graduate and undergraduate education at the University of California, Los Angeles (UCLA), where she received her B.A., M.A., and Ph.D. in English literature.



Dr. Robert J. (Rob) Rennie became Vice President, Technology & Chief Information Officer (CIO) for Southern Connecticut State University in July 2014 after retir-

ing from over 30 years as a CIO in California and Florida. Rob is known for building the reputations of organizations on a foundation of innovation, performance excellence, value creation, and tech leadership. Dr. Rennie was honored in 2004 as one of Computerworld’s Premier 100 IT Leaders. He received his B.S. from Rollins College, M.A. from the University of Oklahoma, and Ph.D. from the University of Florida.

This publication is designed to provide information regarding technology plans and initiatives at Southern Connecticut State University. No warranties or guarantees are implied or offered.

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Moving from Now to Next...

achieving a sustainable technology future.

This document serves as the 2016 Strategic Technology Plan for Southern Connecticut State University (SCSU, Southern). The purpose of this ten-year plan is to establish a technology direction in support of the university's newly published ten-year master plan. The larger objective of this plan is to provide a framework for the rejuvenation of the technology organization, environment, and related functions, such that the university may secure a leadership position in higher education technology, support competitive differentiation in the University's market space, and provide a superior computing experience for faculty and staff.

Robert J. (Rob) Rennie, Ph.D.
Vice President, Technology &
Chief Information Officer

June 2016

Southern Connecticut State University

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Dennis Reiman-Associate CIO & Chief Technology Officer (CTO)

John Jaser-Director of IS-Systems & Applications

Ray Kellogg-Director of IS-Computing & Infrastructure

Edward L. (Rusty) May-Director of IS-Technology Administration

Foreword

“...we are actively looking for new cliffs to jump off...” –Chris Albrecht, HBO CEO



The faculty and staff at Southern Connecticut State University have collaborated to create a new ten-year strategic plan that will serve the university well as it transforms itself for sustained success. This technology plan was developed in parallel to the university plan to support and complement its strategic initiatives as well as dramatically improving the overall state of technology at Southern.

Significant analysis and extraordinary collaboration, on campus as well as externally, have resulted in plans that meet the needs of all of the university's constituencies. I am confident that both plans will lead to continued success and establish a foundation for

enhanced scholarship, innovation, and improved operational capabilities as the university faces the many challenges before it.

Technology, done well, serves as a force multiplier and allows for the achievement of far reaching aspirational goals as well as serving to enhance the university brand and image. I am optimistic as we embark on this journey to the future of Southern.

Mary A. Papazian, Ph.D.

President

Southern Connecticut State University

Introduction

“Nothing quite new is perfect.” –Cicero



The creation of any strategic plan is a significant effort. Those created for technology require even greater consideration due to the tremendously rapid change in technologies and the tight integration of technology solutions with an ever-changing business and political climate. However, for Southern Connecticut State University, the timing couldn't be better. The University has a relatively new leadership team in place, the new CIO and Associate CIO came on board in July 2014, and the university is in the process of implementing its recently completed ten year strategic and facilities master plans.

In the midst of all the attendant chaos a sense of order will emerge through the propositions of new ways of conducting business, modernization and stabilization of the university's applications portfolio, the establishment of systems and practices for managing information technology (IT), the initiation of a new IT governance process, the establishment of new technology standards, creation of a technology administration and fiscal management function, and re-structuring of the technology department to improve execution of operational responsibilities. These substantial changes will coincide with specific IT initiatives designed to support the university's new strategic plan.

This document serves as a snapshot of the plan at a point in time. Once the plan is operationalized it will transition to its 'living' stage and will be managed through the new management systems currently being implemented within IT. These systems are project based and will be updated in real time as projects evolve and are completed. The data from the system will be presented in a dashboard format for management, analysis, supervision, and reporting of project status.

The theme for this period in Southern IT is "curve jumping," that is *moving from now to next*. This concept is described in the vision and strategy section of chapter two.

Executive Summary

“Power corrupts. Absolute power is kind of neat.” –John Lehman



This ten-year strategic technology plan is designed to serve as the lever of change for the improvement of technology at Southern as well as a framework for a comprehensive view of technology-related projects across the university. With the rapid and dramatic scale of change in all areas of information technology a ten-year plan can only be presented at the most superficial level with greater detail for the immediate future.

However, it can set long-term direction based on macro trends in the field that are unlikely to change dramatically. We know, for example, that the trend towards more personalized, mobile, always on computing will neither stop nor reverse itself. Preparing for the soon-to-emerge technologies is really a problem of orientation, that is, aligning

in the general direction of the most probable path, but remaining agile so as to take advantage of unanticipated advances or disrupters.

We have made tremendous progress in modernizing the IT landscape at Southern and are well on our way to a modern architecture and a future ready workforce and culture. The single greatest challenge is neither a lack of a vision nor talent. Rather, it is the shortage of fiscal resources here at Southern and in the Connecticut university system generally. The only rational approach is to plan for varying resource levels and to emphasize initiatives and projects that produce efficiencies and savings while still enabling an improved user experience that creates and defends strong brand. Each of the hundred plus items detailed in chapter three of this plan is specifically designed for this purpose.

Chapter one describes the trends affecting higher education at the macro level. Chapter two presents the vision, strategy, and guiding principles that serve as the foundation for this plan as well as our everyday operating philosophy.

Chapter four describes the management and organization of information technology while chapter five describes the fiscal environment as well as the 21st Century Classrooms process. Chapter six lays out the new IT governance process. Chapter seven presents the technical architecture while various appendices provide reference information such as standards and proposed acquisitions.

In summary, we have come a long way in the past two years but still have a long way to go. This plan will help us navigate to our desired future.

The theme for this period in Southern IT is “curve jumping,” that is moving from now to next. This concept is described in the vision and strategy section of chapter two.

Technology & Higher Education – The Future

“The future ain’t what it used to be.” –Yogi Berra



Introduction

The purpose of this chapter is to provide the future view of technology that serves as the foundation of the strategic planning resulting in this plan. It is presented in the form of a multi-year outlook of the technologies, trends, and issues that are likely to have the most significant effects on the university.

In CHEMA’s 2006 report on the future of higher education, Goldstein introduced the two dominant views of the effect of massive forces for change on higher education.

“Undeniably significant forces for change are growing, changing demographics, the rise of global competition, technological change, and constrained budgets have already become significant forces for change. Some view these forces as *dark clouds* on the horizon *that threaten* higher education. *Others* view them as *agents of change* that will enable higher education to reinvent itself in positive ways.”¹ The University’s technology leadership agrees with the latter interpretation. The global forces of change at play represent a tremendous opportunity for substantial redesign and improvement of our processes, practices, and operations. We have, therefore, committed ourselves to the creation of a strategic technology plan that will support the university in its efforts to optimize opportunities for effecting positive change.

The dynamic nature of technology and the rapid introduction and absorption of culture-changing behaviors make futuring a risky venture. Neils Bohr is quoted as saying “Prediction is very difficult, especially of the future.” While George Will points out “the future has a way of arriving unannounced.” Futurists generally, advise that there are four distinct futures:

- The future extrapolated from current trends, *the forecast*
- The future consisting of bad things that will happen to us, *unwanted surprises*
- The future consisting of good things that will happen to us, *delightful surprises*
- The future we cause to become reality, the product of our *dreams*, and conjuring.²

Of course, the future that actually occurs is a combination of all four types, but the power we have to alter our experience is in the fourth type: the future we cause to happen from our dreams. This future has the potential to alter the other three in very significant ways. By forecasting the things that are likely to happen to us, and deliberately modifying the current observed trends in positive ways, we can, to a very large degree, determine much of our future. At a minimum, we can mitigate the effects of unwanted surprises.

This chapter presents many of the trends and assumptions that resulted in the development of the strategies, plans, initiatives, standards, and recommendations contained in this strategic technology plan. It is a very specific purpose and objective of the planning process to create, to the extent possible, an extremely positive and rewarding vision of the future for the University and its constituent communities. We have, quite deliberately, attempted to follow the model developed by Rubenstein and Firstenburg to “bring the future to the present.”³

Technology Trends

DIGITAL CONTENT

Currently, and for the foreseeable future, there will continue to be enormous shifts in the area of digital content. Ever-more user-created content is being developed. In its 2007 Horizon Report (and reinforced in its 2011 report⁴), EDUCAUSE’s New Media Consortium cited user-created content⁵ and new scholarship (encompassing collaborative research and publication as well as alternative instructional resource development, as in digital assets⁶) as two of its six biggest trends to affect higher education. Further it suggests the trend towards more user-created content is currently underway, while new scholarship had a horizon of up to five years.

Spurred by powerful new tools and virtually limitless bandwidth, faculty and students have embraced the design and development of digital content, self-publication of intellectual property (IP), collaborative IP creation, and the idea of shared ownership. This trend is likely to accelerate rapidly. Additionally, traditional publishers and content providers have expanded their commitment to the (somewhat cannibalistic for their current models) business of digital content provision, ultimately eating away at their very own traditional distribution and economic models.

These powerful trends come together to form an inevitable transition towards dramatically different, and likely contentious, revolutionary models in the areas of digital rights, distribution, consumption, and licensing.

Scenarios where faculty and students engage in the teaching, learning, and research processes that are the core of higher education, employing a mix of open source, creative commons-style content, traditional media from traditional content providers, digital subscriptions, and publication assets aggregated into a learning management or other delivery system are currently in play. This will only become more prevalent over time. Universities will need to develop technological and process support for these major trends. These will include robust and highly available delivery platforms with rigorous content management and digital rights facilities and high quality tools for the design, creation (including shared collaborative spaces), storage, tagging, and distribution of massive amounts of user-created content including leveraging emerging cloud-based solutions and resources. The establishment of extensive licensing deals and integration of systems in support of subscribed and licensed content that includes license and legal compliance for multiple models and forms of content ownership and use-rights will be essential.

HARDWARE

Over the past thirty or more years there has been a steady advancement of technology driven by the evolution of hardware, software, and the architectural models used to forge them together into functional computing environments. This trend is going to continue and will accelerate at an accelerating pace.

Hardware will continue to advance and improve and the extremely rapid adoption of tablets, especially iPads, will continue to drive a complete transformation of content

creation, consumption, and computing. Storage continues to advance in speed, density, reliability, and cost-per-unit of storage making centralized and/or cloud-based data storage with virtualized access practical for most enterprise environments.

OPERATING SYSTEMS SOFTWARE

Operating and other systems software is becoming better integrated, more versatile, more stable, and more easily integrated with every new release. Broad adoption and compatibility with accepted standards serves to expand the developer community and its ability to create products for multiple environments without the requirement for significant redesign.

SOFTWARE APPLICATIONS

Applications development is still a primitive process but it is slowly improving in terms of the quality of tools available for developers and the usefulness of standards, due to broader adoption within the industry, to ensure interoperability. The focus of most development activity will be on systems integration, services enablement, greater personalization of the computing experience, and facilitation of the post-pc era.

Individualization is achieved by taking advantage of user profiles linked to federated identity management systems providing secure authentication and access to all appropriately available services and resources. HTML5 applications, to a large extent deployed through the use of AJAX (asynchronous JavaScript and XML) technologies, provide a richer, more interactive online experience for the user and further advance the personalization of the experience. The ability to develop and deliver highly interactive web experiences with integrated simulations and event-driven functions is now a reality. The complexity and cost of such development continues to trend down.

ARCHITECTURE

Much like the construction of a city or neighborhood, technology environments with a well-planned and executed architecture are more appealing and just seem to work better. The persistent challenge in developing a long-term successful computing architecture is the dynamic nature of technology. Constant advances in hardware, evolving standards across all technologies, operating system upgrades, price-performance advancements, versioning and release management, interoperability and compatibility issues, and user demand all contribute to the complexity and difficulty of architecture development.

The architectural models presented in this plan are designed to leverage standards, provide the greatest possible amount of flexibility throughout the environment, and position the university to take advantage of the phenomenal technology advancements that will be seen in the next few years and beyond. This agile architecture emphasizes openness, a services-based architecture, and deployment of the most powerful mix of tools available.

TELECOMMUNICATIONS AND NETWORKS

Changes in telecommunications and network technologies represent improved price-performance, broader ubiquity, greater bandwidth, better reliability, and better manageability. This provides the fundamental infrastructure for extensive content delivery, provisioning of scalable computing capacity, fast and voluminous data transfer, real-time simulation, complex communication structures, and large-scale collaboration. Voice over Internet Protocol (VoIP) and ubiquitous wireless coverage have been significant enablers of integration of converged devices throughout leading organizations and are central to the proposed computing architecture. Wireless network coverage, while currently available throughout university facilities and certain public spaces, will become more pervasive, faster, and more reliable in most areas.

Coverage gaps in wireless networks will eventually be covered by the expansion and improvement of commercially offered wireless networks operated by cellular service providers. The university will pursue 100% wireless coverage and upgrade the speed and performance of the network as resources permit. Additionally, the migration to VoIP network is intended to cover 100% of the university's facilities, positioning the university to take advantage of new service offerings designed for up-to-date environments.

CARBONWARE

Despite the importance of hardware, software, architecture, and networks, the most critical element will continue to be the carbonware, the humans, employed in the technology environment. The emphasis on hiring for pure intellectual horsepower will prove to be the most significant factor in the University's aspirations to achieve a leadership position in technology.

The department will be structured to be a learning organization so as to prepare staff to deal with the massive changes predicted for the future. Noted and prolific author and social commentator Eric Hoffer admonished "In times of change, learners inherit the Earth, while the learned find themselves beautifully equipped to deal with a world that no longer exists."⁷

Glaser and May posit, "The educational background, the skill set profile of next generation IT leaders (the stuff you are supposed to know), is the greatest single source of competitive differentiation available to enterprises today."⁸ This reality is the genesis of the technology leadership team's emphasis on the development of technology staff and training in leadership skills.

It is the intent of the technology leadership team to create an environment suitable for the achievement of excellence. In a meeting with Apple's head of design, the generally acknowledged as brilliant, Sir Jonathan (Jony) Ive, described the factors that have led to his team's phenomenal success in creating Apple products:

- A supportive 'listening' environment
- Space to think
- An impossibly curious culture
- A team that is completely prepared to be wrong
- Prolific prototyping
- Courage to throw away perfectly good designs to achieve the best.

This description serves as the model for the technology team's target environment and cultural aspirations. It is the responsibility of leaders to create and sustain a creative, productive, well equipped, and healthy environment in which value is created through the efforts of technology professionals.

VIRTUAL REALITY AND GAMING

Included as two of the six major trends for the future of higher education in the 2007 Horizon Report are the closely related, and somewhat interdependent, advances in virtual worlds⁹ and new gaming technologies, estimated to be a major focus.¹⁰

There is no doubt that gaming technology has advanced beyond the wildest dreams of most early gamers. The interfaces, sense of reality, suspension of disbelief, and highly interactive virtual environments offer a powerful environment for experiential and collaborative learning.

Massively multiplayer online (MMO) solutions have become affordable and readily available online. These systems provide highly scalable, richly immersive, experiential environments for learners. Universities must take advantage of these opportunities to enrich the learning environment by ensuring computing and network infrastructure systems and the culture of the university community are ready for the application of advanced virtual environments.

However, beyond the technological environments of virtual reality and gaming is the broader application of ‘game theory’ across the organization, particularly in academic areas. In the Predictioneer’s Game, game theory is described as “...a fancy label for a pretty simple idea: that people do what they believe is in their best interest.”¹¹ The power of game theory is the ability to leverage self-motivated self-interest to a desired outcome. Applying the principle of game theory leads to predictable outcomes, “by estimating carefully people’s wants and beliefs, anyone can make a reliable forecast of what (a person) will do...”¹²

In terms of predicting social and behavioral trends “...we can use the same logic for prediction and for engineering the future.”¹³ This provides solid ground for planning.

CLOUD SOLUTIONS

There has been rapid growth of cloud-based solutions that provide application and systems services. Cloud as used in this document represents the full range of service models defined by Babcock; Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS) as well as public, private, community, and hybrid deployment models.¹⁴

The benefits of implementing cloud solutions include: higher availability and security; best-in-class capabilities and features; federated support services; enhanced disaster

recovery and business continuity; reducing local enterprise server footprint; and hardware lifecycle management. In *Cloud Revolution*, Babcock points out “In the Cloud, the computer becomes a shape shifter. It is not limited by the box it arrived in, instead, it is elastic.”¹⁵ Cloud solutions should be implemented wherever the value, quality of experience, functionality, and security are appropriate.

MOBILITY

The continual improvement and advancement of mobile devices that provide a variety of mail, messaging, contact, calendaring, and custom applications have led to the creation of highly functional and practical converged devices. There will continue to be divergence in mobile technologies that leverage traditional web-browsing experience versus native application capabilities. Over time, web standards will significantly reduce or possibly eliminate the need for developing and managing native applications.

Mobility and the ‘bring your own device (BYOD),’ infrastructure, and management challenges that come with it creates a significant leadership opportunity for IT. Muller in *The Transformational CIO* remarks that what makes leadership of IT in the future different from the present is “...the willingness to work outside the comfort zone of IT and embrace the (new) challenges...”¹⁶ In no area is this more true than mobility.

Social And Behavioral Trends

Perhaps the most significant trend that will have long-lasting impact on higher education, and society in general, is the expansion and advancement of social networking; facilitated through the adoption of new applications and services. This trend toward greater social networking is cited in *The Horizon Reports* as one of the most important future trends. It is noted in the report that this social interaction model is already sec-

ond nature to students and provides them with a virtual gathering place in support of their educational experience.¹⁷ Students currently network and collaborate through a variety of tools such as Facebook (850+ million users)¹⁸ and Twitter (300+ million users).¹⁹

Social networking platforms provide a venue for members to communicate, collaborate, share digital resources, and build personal and virtual relationships-communities that are self-organizing and, to a very large degree, self-managed. Student use of social networking and their comfort in the virtual world of the communities built there is one of several differences of perspective between students and faculty regarding technology and its application to scholarship, research, and daily life.

EXPERIENCE ECONOMY

Pine and Gilmore introduced the concept of the experience economy in their 1999 book of the same name.²⁰ It is based on the belief that as services become commoditized the experience of the service becomes a vital part of the value proposition for the customer or service consumer.

The experience as a value-added element of the transactions or relationship between students and their colleges was introduced by Rennie in the 2012 Strategic Technology Plan at Florida State College²¹ and served as the driver for much of the systems development work that occurred there. This included the introduction of personalization, advanced web technologies, and enhanced mobile experiences. This represented a deliberate “de-commoditization” of experience.²²

Marketing and branding guru Andrew Zollie has advanced the idea that as the customer’s exposure to an organization is, in ever-greater frequency, with its systems (web sites, automated telephone navigators, etc.) the systems become the de-facto

brand of the organization.²³ He advocates a close relationship between marketing and technology to ensure the creation and defense of strong and desirable brands.

The effects of the experience economy are deepening and the trend will continue. The result is a continuous ratcheting-up of expectations on the part of customers, students, faculty, and the community at large.

The university will focus on the quality and consistency of the technology experience and forge a close collaboration of marketing and technology staff to leverage its reaction to the experience economy into a competitive differentiator.

The technology team will also continue to evaluate best practices as well as engage in innovative systems and process designs to enrich the overall experience with the university's technology.

Schank, et al, remind us that “the more intuitive the process is, the more usable the software.”²⁴ This philosophy lies at the very core of the solutions strategy being employed by the technology leadership team.

ENVIRONMENTALISM

The attention being drawn to climate change and related environmental issues will result in an ever-greater ‘green’ awareness throughout the general public and will most likely generate significant action-oriented groups and behaviors in the cause for environmentalism. This is a trend likely to present challenges for organizations that lack environmentally responsible behaviors, infrastructure, and/or operations.

Although it is difficult to predict the scope or veracity of such movements, it is prudent to be prepared to respond to inquiry and to incorporate environmental concerns into the planning decisions being made today. The technology leadership team will be examining environmentally friendly computing and infrastructure as it engages in its planning activities and will recommend environmentally sound courses of action whenever practicable.

Political And Economic Trends

RISING COSTS

Although Moore's Law can be observed across the technology landscape rising demand and transactional volumes continue to grow exponentially such that anyone who has experience in the technology environment understands there is a continually increasing cost of doing business. In many cases this has resulted in technology organizations and their leaders being preoccupied with the business of cost cutting. In a January 2011 survey of CIO's published by CIO Magazine, 45% of respondents reported cost cutting to be a primary focus.²⁵ Although responsible stewardship of technology and fiscal resources is a given in the management of technology, it is unfortunate that so much attention is placed on pure cost containment.

The philosophy of technology leaders at the university should be to define technology, and all that it does, as a value creation engine. In such a model the focus is on creating value and ensuring positive value propositions. This approach results in a richer computing environment that is fiscally responsible but still extremely innovative. The trend of increasing costs will continue; however, emphasizing a value creation philosophy in the technology department should serve the university well in terms of effectiveness of investments and efficiencies of cost.

REDUCED RESOURCES

The anvil against which rising costs are hammered is the general shortage of resources that is so prevalent in higher education, particularly public higher education. It is anticipated that resource shortages, limitations of funds, staff, and facilities, will continue for the foreseeable future. The most effective strategies for dealing with this trend will continue to be the multi-faceted approach that includes; focusing on value creation, increasing market space/share, improving cost-effectiveness and efficiency of operations, fundraising to secure private funds, political action and lobbying to secure more public funds, and the creation of new revenue sources.

The university is engaged in this full range of activities and the technology team will support each of them to the extent possible. Additionally, technology leadership will constantly pursue innovative strategies for providing extremely efficient technology services including a comprehensive sourcing strategy.

However, as Sherman notes, “there must be a willingness to challenge the ‘way things have always been done’ with a healthy disregard for the norm as part of a quest to make things better, more desirable, more marketable, more efficient, and more profitable (value creating).”²⁶ This approach demands the presence of a culture of innovation “...places where creativity is celebrated, rewarded, and cherished at all levels in the organization.”²⁷

To the extent such an environment exists, technology will continue to innovate on a grand scale. We do recognize it can be difficult for organizations to support innovative climates, especially when under stress. As Schank, et al, point out “...a rules-driven culture has difficulty giving people the freedom to trust their instincts. It prefers a false certainty to following a hunch.”²⁸

The business of higher education has become highly competitive. This trend will continue and will result in the failure of many institutions to maintain their status and/or economic viability. The university has experienced strong competition in its markets and has suffered declining enrollment over the past few years and is in the process of implementing responses to these challenges.

Technology's role in addressing this trend is to ensure, on a continuous and sustainable basis, that the user experience is of the highest quality, that all systems create and defend strong positive brand, and that technology creates value for Southern and its constituent communities. It is the deliberate intent of the technology team to empower the university through the provision of systems and technologies that produce competitive differentiation and enable a drive toward market domination.

Conclusions

The trends and forecasted futures discussed in this chapter are those expected to have the most significant effect on the university and which have had the greatest influence in the technology decisions presented in this plan. There are many others that have been researched and for which strategies have been developed that are not included in this discussion.

CHEMA, in its report on the future of higher education cited the most significant threats to the future of higher education as identified in a 2006 survey of a broad range of higher education leaders:

- Resistance to change - 55.8%
- Lack of resources - 43.7%
- Increased costs - 34.7%

Other factors of concern included complacency (21.1%) and insufficient leadership (17.9%) and just slightly more than a third of respondents believe their institutions are prepared to capitalize on change.²⁹ While the threats of resource shortages and increased costs are obvious and understandable, the issues of resistance to change, complacency, lack of preparedness to capitalize on change, and insufficient leadership are particularly disturbing as they are evidence of systemic dysfunction.

Although this research was conducted over eight years ago, informal surveys and conversations would seem to suggest strongly that these findings still hold true today.

The latter four items are unnecessary challenges that represent a failure on the part of colleges and universities to demand excellence from their leaders and an inability to manage and change organizational culture. Although the University most certainly shares the concerns relating to reduced resources and increased costs, recent installation of a new leadership team should go a long way toward avoiding complacency, leadership, resistance, and preparation for change issues.

In researching successful revolutionary innovators, Gostick and Elton noted that successful teams “...share a belief in their ability to write the future.”³⁰

They found “...six core traits, and they were consistent across a range of diverse organizations.”³¹ The teams studied dream truly ambitious goals; they believe in each other; they take calculated risks; they measure results; they persevere; and they tell stories that exemplify what they are trying to achieve.”³² And the team members learn to genuinely cheer for each other’s success.³³

The technology team at the university is extremely future-focused and innovation-driven. The accurate interpretation of environmental scans, the full consideration of exogenous and endogenous influences, and the paying of particular attention to technology and social change have resulted in plans that should prove to be extremely successful.

Technology Vision And Strategy

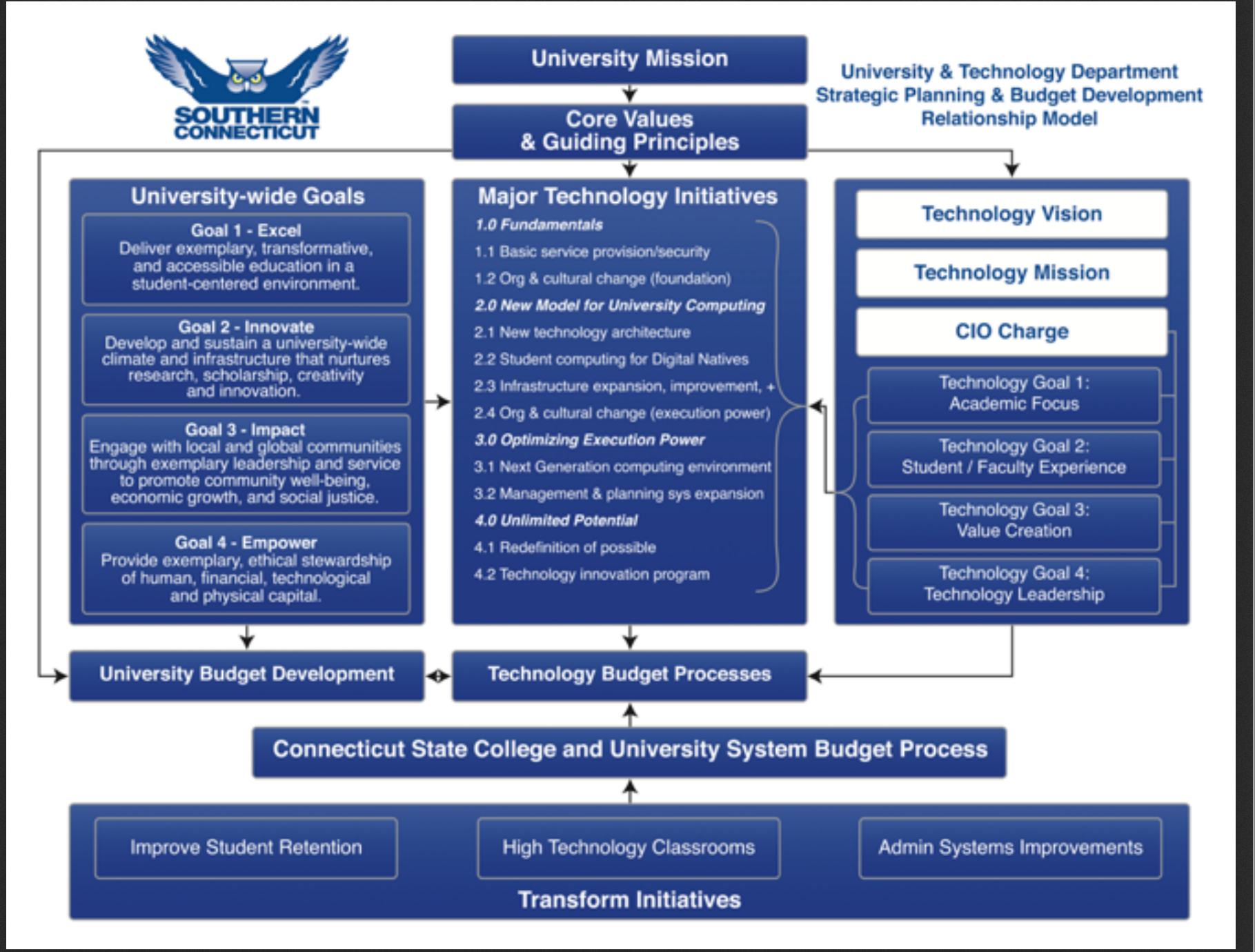
“Leadership is the capacity to translate vision into reality.” –Warren G. Bennis



Introduction

The university’s strategic technology planning is based on the technology vision, mission, CIO charge statement, and four technology team goals. Additionally, there are guiding principles that together with the vision, mission, and goals form a strategy for achieving the new technology vision. The relationships between the strategic planning of the university, Technology Department, the Board of Regents, and the resultant budget development processes are depicted in [Figure 2.1](#).

FIGURE 2.1



Vision And Mission

TECHNOLOGY VISION

Southern Connecticut State University will be viewed as a technological leader providing superior access to the resources of scholarship and research through the application of advanced technologies. The ten-year vision will be focused on supporting the four major university goals, which are to: excel, innovate, impact, and empower.

IT TEAM MISSION

The mission of Information Technology at Southern Connecticut State University is to provision the highest quality technology resources possible to support achievement of the university's mission, vision, goals, and objectives.

CIO Charge & Goals

CIO CHARGE STATEMENT

The Information Technology Department at Southern Connecticut State University will pursue every technological advancement of promise for the improvement of teaching, learning, research, and the student experience; engage in continuous improvement of service quality, conduct business in a professional and academically focused manner; and perform to the highest ethical standards and consistent with the university's core values.

IT GOALS

The university's technology vision will be achieved through the realization of four goals:

1. Achieve and maintain an academic focus
2. Create the best possible student & faculty experience
3. Ensure technology serves as a value creation engine
4. Empower the university through technology leadership and organizational agility.

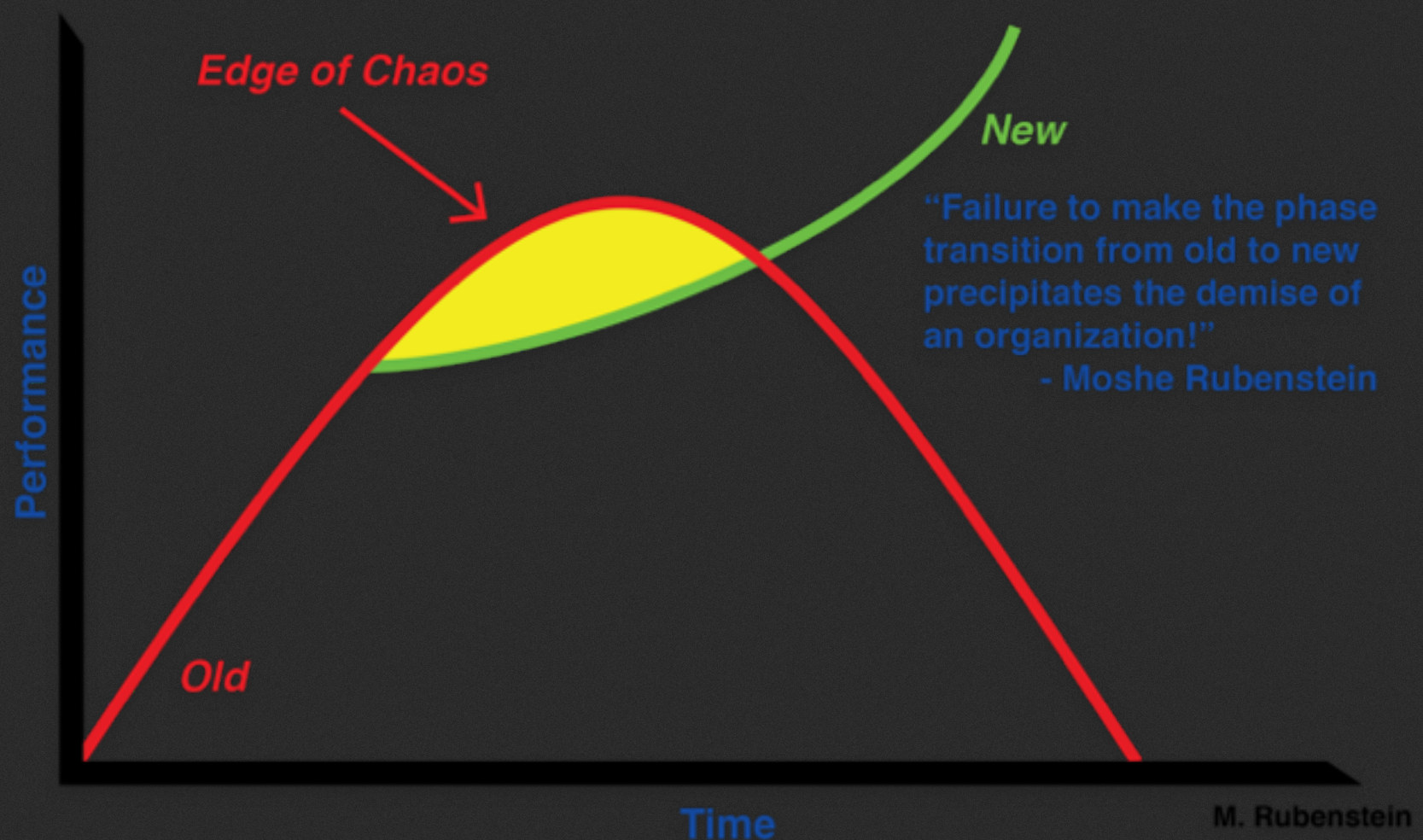
Guiding Principles & Strategy Drivers

GUIDING PRINCIPLES

The first, and perhaps most important of the guiding principles is to actively own and manage the organization's "curve jumping." Curve jumping is the concept of moving from one life cycle to the next by transitioning from a current path (or curve) to a new and more relevant path. The concept is visualized in [Figure 2.2](#).

FIGURE 2.2

The Curve Jumping Concept



The remaining principles include: Agility (the ability to move quickly and optimize new technologies and ways of doing business); Avoiding Death Magnet #9 (Guy Kawasaki identified death magnets, those things that prevent products and organization from being ideal. Death Magnet #9 is “our product sucks less” meaning being better than your competitor or your previous self just isn’t good enough anymore).

Value Creation (creating/enhancing value is the only true purpose of technology). Leverage (leverage is taking advantage of everything, digital natives, for example, are experienced on-line shoppers, so it only makes sense for university systems to provide a similar experience for them to conduct business, they need no training and see the university as a familiar interaction). Content is King (the creation, distribution, and consumption of content is the lifeblood of a university so the systems in the content ecosystem must be easy to use and reliable).

The last principle is Creating the Future. There are four basic futures, the extension of the current forward, happy surprises, unhappy surprises, and the future we deliberately create for ourselves. The essence of this principle is to take charge and willfully effect our own future through effective visioning, planning, and execution.

STRATEGIC DRIVERS

This plan is informed by a detailed analysis of strategic trends, drivers, that have significant influence over what our desired future state will be. The first of these drivers is the concept of *experience as brand, systems as experience*. Simply put, an organization’s brand is no longer what it deliberately communicates to its constituencies, rather it is the constituent’s experience in dealing with the organization.

The advent of the Internet and the Web have resulted in the majority of interactions with organizations being with their IT systems rather than a person. Thus the syllo-

gism: experience is brand, system is experience, therefore system is brand. This drives the need to have extremely friendly interfaces and efficient systems and processes as they become the brand of the university.

Social computing is another strong driver. Not only do the platforms used serve as a benchmark of the experiences with our systems but they also provide near immediate critical dialogue about the institution, good or bad, this is important to realize. Such systems are also powerful tools for many aspects of higher education and need to be leveraged for maximum advantage.

The lifeblood of higher education is content. This includes the creation, acquisition, dissemination, and consumption of content. Digital content ecosystems are a critical part of the higher education landscape and will become the single greatest differentiator for faculty.

Web next, is the concept that the Web is constantly advancing. We need to remain sufficiently agile and quick so as to take full advantage as new enhanced capabilities are available.

Integration from the edge is the proliferation of personal, bring your own, devices that access the university networks and content resources. This trend requires a hardened network security approach that is minimally invasive for users yet protects university resources and assets. Federated identity is related to this concept as it provides for combined credentials for access to applications, data, content, and resources based on an individual's role.

Hybridization of experience represents the balanced provisioning of in-person vs. on-line interaction with the university. While virtual and enhanced reality experiences are

now achievable and have tremendous potential value in the teaching and learning environment.

The last driver is the dominance of digital natives. Digital natives are people who have never lived in an environment without ubiquitous and pervasive technology. They transact, communicate, and find things through the use of technology and are not only comfortable with using technology in every aspect of their lives but expect it. And they compare the university's technology systems to their best experiences, like Google and Apple. This creates an imperative for world class user experiences.

Technology Initiatives & The University Strategic Plan

“Change in all things is sweet.” –Aristotle



Background

The initiatives proposed (many are currently underway) in this strategic technology plan are all directly related to the goals and objectives identified in the university’s new strategic plan. The four goals are; excel, innovate, impact, and empower. Each of the university goals has six objectives. Although there are initiatives for technology outside the plan, they are minor and all major initiatives have been included and organized within the framework of the larger university plan. It is important to note that although both are ten year strategic plans, they will become living plans and will be amended as appropriate as circumstances change. Technology, in particular, is a rap-

idly changing landscape and success requires agility. One of the initiatives included in the strategic technology plan is the implementation of a comprehensive IT management suite based on the Atlassian suite of products. This initiative creates the necessary platform for managing and revising IT initiatives in real-time as the plan is operationalized as well as providing university-wide transparency into the initiatives.

UNIVERSITY STRATEGIC PLAN GOALS

[Goal 1 - Excel](#)

[Goal 2 - Innovate](#)

[Goal 3 - Impact](#)

[Goal 4 - Empower](#)

University Goal 1 - Excel

Deliver exemplary, transformative, and accessible education in a student-centered environment.

Southern will enhance its academic culture and build upon its strong foundation in the liberal arts, professional disciplines, and deep commitment to social justice, by fostering these within a student-centered environment extending well beyond the classroom.

Southern encourages creative and effective pedagogy and embraces technological innovations to support student success. We pair talented and focused students with engaged and collaborative faculty and staff. Southern inspires intellectual, personal, and professional growth and provides the experiences necessary to become tomorrow's leaders.

GOAL 1: OBJECTIVE A

Become a recognized leader for student-centered learning and student success.

1. **IT Strategic Plan: Phase 2- A New Model for University Computing**

Section 2.1: New technology architecture

Group 2.1.3: Workflow

Workflow systems are designed to simplify, streamline, and standardize the execution of business processes. The University has many processes that are fundamental to operations that would benefit greatly from a modern, coherent, and effective workflow solution. Additionally, once a new workflow solution has been imple-

mented, there are a number of opportunities for efficiency improvements and innovations in edge and/or differentiating processes as well as in the measurement and reporting on the performance of all processes. The current Banner workflow solution is inadequate in many respects: the user interface is not user friendly, the development of any workflow scenario takes too much time to develop, and the established workflows break too frequently. The new workflow solution must be user friendly, dependable, scalable, and make it easy/quick to develop new workflows. This project is of the highest priority due to its potential to significantly improve university-wide processes, create value very quickly, and directly support student-centered initiatives.

2. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.1: New technology architecture

Group 2.1.4: Imaging (document management)

Document management functionality is currently provided through Banner BDM. The current system is difficult to use, very limited in capability, unreliable, and difficult to support. Additionally, the system is tied too tightly to Banner ERP and the content is hosted on premise. A new imaging solution that is easy to use is ERP/application agnostic by design, and hosted in the Cloud would be better suited to the university's needs. The acquisition of a new, and much more feature rich, imaging solution is a high priority due to its broad range of impact across the university and its direct effect on initiatives related to student success.

GOAL 1: OBJECTIVE B

Attract, retain, support, and recognize the highest quality teacher-scholars and staff who demonstrate an exemplary commitment to student-centeredness.

1. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.4: Organizational & cultural change (level 2-execution power)

Group 2.4.3: Ethically intelligent framework as IT standard

Cultural change on any scale is extremely difficult to achieve. It is even more challenging in an environment where entrenched staff are overwhelmed by expectations, fearful of anything new to the point of paranoia, and have had a history of inconsistent leadership. Employing basic value rule sets, such as the framework for ethical intelligence (Bruce Weinstein: Ethical Intelligence - Five Principles for Untangling Your Toughest Problems at Work and Beyond) provides a guide for assessing behavior for everyone in the team, including all leaders. Continuous measurement of action against the framework and encouragement for all employees to call-out behavior that is inconsistent with the stated principles will lead to a new positive cultural standard of acceptable and expected behavior in IT. The nature of technology, and technology leadership specifically, requires an overwhelming number of seemingly cold logical decisions and binary determinations. It is a fast moving, rapidly changing, challenging environment in which to work. What must remain in focus is the well being of the carbonware.

The first principle of the ethical intelligence framework is “do no harm.” It applies not only to the organization but to individuals as well. Although there will always be the reality of unavoidable harm to individuals, particularly from their perspective, a serious effort to minimize the negative effects of change, the consequences of poor individual performance or decision-making, and the pressure of ever-increasing expectations serves the organization and its staff well. By ensuring a focus on not causing harm, the effects of that which is inevitable can be mitigated. The second principle is “make things better.” Change should only be undertaken for the purpose of making things better. By adhering to this principle the IT team and its leadership can concentrate effort on those things that really need to be improved.

The third principle is to respect others. Every employee in an organization deserves to be treated with respect. There is no better way for leaders to demonstrate respect than by holding staff to high standards of performance and by sharing the high expectations held for them.

The fourth principle, “be fair” and the fifth and final “be kind” really build on each other. Fairness is essential to the development and sustainability of a high performing team. Staff must feel they are being treated as any other team member. Typically, fairness leads to kindness. Kindness is free. All IT staff are better served by an environment where being kind to others is an expectation. Disagreements, communications problems, and stressful periods often get the better of us, but reminding ourselves that kindness is still possible in the worst of circumstances helps maintain positive working relationships for the long term.

2. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.4: Organizational & cultural change (level 2-execution power)

Group 2.4.4: Forced rankings & actions to improve talent match

The practice of forced-ranking performance is a simple tool for assessing the talent on board. It provides insight into how staff are viewed by their managers and opportunities for improvement and best-fit matching of employee strengths to work assignments. This is one of “Rob’s Rules.”

3. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.4: Organizational & cultural change (level 2-execution power)

Group 2.4.5: Implement balance of Rob's rules

The so-called “Rob’s rules” are basic concepts and practices that have evolved over many years of IT leadership practice. They include: value creation is the only purpose of IT; hire for pure intellectual horsepower; when assessing talent look for problem solving, creativity, passion, energy, and fit; a vacancy is more valuable than an average employee; forced rank and do something about it; encourage risk-taking and achievement; focus on the future-it shows up really fast; learn to thrive on chaos; experience equals brand and brand equals value-so create and defend strong brand through strong experience; focus on the experience-not control; man-

age access and content-not devices; self sufficiency equals reduced support burden; leverage the behavior folks bring with them; predict the future by creating it.

4. **IT Strategic Plan: Phase 4- Unlimited potential**

Section 4.1: Redefinition of possible

Group 4.1.4: Strategic vision for technology

One of the most significant challenges to realizing a compelling vision for technology at the University is the inability of the University community in general to imagine the ideal. The purpose of this initiative is to enable the imaginations of faculty, students, and staff to expand to include a fully formed and functional technology environment and how that would affect their experience. This includes the creation of an aspirational vision, the development of scenarios, and the demonstration of possibilities.

GOAL 1: OBJECTIVE C

Attract high achieving students who are academically prepared for college, while retaining the university's mission of educational access.

1. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.1: Improvements to basic service provision/security

Group 1.1.2: Stabilization & modernization of environments

The university's current systems are unacceptably unreliable. The systems fail too frequently, fail to meet their performance expectations, and serve as a frustration for all who rely upon them. This level of performance damages the university's brand and is antithetical to enrollment development and retention. Under the leadership of the Associate CIO and CTO core university systems will be analyzed for stability improvements where possible and replacement in those cases where better solutions are practical.

2. **IT Strategic Plan: Phase 2- A New Model for University Computing**

Section 2.2: Student computing experience appropriate for Digital Natives

Digital natives (Marc Prensky: Digital Natives, Digital Immigrants) are now the core population served by the university. It is essential that the systems and environment provided by the University be digital native friendly. This includes the development of applications and services that work in ways consistent with other aspects of their lives, such as shopping and banking on-line, making travel arrangements, and maintaining their social networks. This includes the incorporation of principles of responsive design, plug-in free applications, and anytime-anywhere access and availability. The purpose of this initiative is to leverage the behavior that students bring with them for their success at the University and to provide a positive experience that supports the development and maintenance of a strong brand identity that is recognized as digital native-friendly. In the experience economy when systems are the primary interface, the system becomes the brand (Andrew Zolli: Z+ Partners).

3. **IT Strategic Plan: Phase 2- A New Model for University Computing**

Section 2.2: Student computing experience appropriate for Digital Natives

Group 2.2.2: Modern registration processes

The current registration process is the result of automating old traditional processes. A new modernized approach that resonates with digital natives needs to be developed. A process that leverages the everyday online behavior of students and effectively supports operational requirements will improve the student experience and the efficiency of the university.

4. **IT Strategic Plan: Phase 2- A New Model for University Computing**

Section 2.2: Student computing experience appropriate for Digital Natives

Group 2.2.3: Natively mobile apps

The provisioning of solutions that are natively mobile and responsive (Ethan Marcotte: A List Apart) is an essential element of ensuring an experience suited for digital natives. This requires the transition from systems and services built on old assumptions and standards to a modern framework specific to mobile devices.

5. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.2: Student computing experience appropriate for Digital Natives

Group 2.2.4: Communications platform

Content is the lifeblood of higher education, but a communications platform serves as the engine of most organizations and is essential for the transmission and creation of much a significant portion of content. The university's current communications platform lacks a coherent strategy, integration with collaboration tools, and has historically been unreliable. The purpose of this initiative is the identification and implementation of a comprehensive communications and collaboration platform for the university.

6. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.2: Student computing experience appropriate for Digital Natives

Group 2.2.5: Preferred Name

Students and staff expect to have control over their identity. Although legal names are required for many university purposes, the "brand" of a person, as to what they are called, should be in their control. By enabling a function to support students and staff in their determination of their preferred name, the university will better support a diverse student population in a welcoming environment.

7. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.2: Student computing experience appropriate for Digital Natives

Group 2.2.6: Social Video (YouTube)

Social video has evolved into a core functional requirement in higher education and is an important part of its lifeblood content. This initiative will result in the establishment of supported social video platforms and services as well as the network upgrades necessary to ensure access and availability.

8. IT Strategic Plan: Phase 3- Optimizing execution power

Section 3.1: Next Generation computing environment

Execution power (Geoffrey Moore: *Escape Velocity*) is the ability of an organization to outperform its competitive set under conditions that favor no one in particular. The purpose of developing execution power is to achieve “escape velocity” that point where an organization can innovate for competitive separation, institutionalize innovative improvements (deploy), and drive transition to a tipping point towards a new reality.

9. IT Strategic Plan: Phase 3- Optimizing execution power

Section 3.1: Next Generation computing environment

Group 3.1.4: Music Labs

This project represents the upgrading of the music labs and the development of a sustainable support plan.

GOAL 1: OBJECTIVE D

Foster university-wide inclusivity, and enable students to live fully engaged in an increasingly global and diverse society.

1. **IT Strategic Plan: Phase 2- A New Model for University Computing**

Section 2.2: Student computing experience appropriate for Digital Natives

Group 2.2.7: iTunes U

The iTunes U platform provides a perfect venue for student success, college prep, and loss-leader courses to help create a positive brand image for the University while helping students reach their full potential. This initiative is the establishment of a new iTunes U presence for the University including the provisioning of new meaningful content. This will support enrollment development and brand awareness.

2. **IT Strategic Plan: Phase 3- Optimizing execution power**

Section 3.1: Next Generation computing environment

Group 3.1.3: Smart classrooms

Initiative 3.1.3.2: BlueJeans, Vidyos, & Cisco Video Conferencing

Modern educational delivery methods, collaborative teaching and research, and student interaction has become dependent on modern digitally enabled, aka Smart, classrooms. This initiative is designed to expand the number and considerably improve the quality of the University's smart classrooms.

GOAL 1: OBJECTIVE E

Increase interdisciplinary and interdepartmental collaboration across the University.

1. **IT Strategic Plan: Phase 2- A New Model for University Computing**

Section 2.4: Organizational & cultural change (level 2-execution power)

Group 2.4.1: Vision-focused collaborative environment

This project represents the development and implementation of a collaborative platform and the creation of model collaboration spaces for faculty.

GOAL 1: OBJECTIVE F

Strategically review, strengthen, and enhance academic offerings.

1. **IT Strategic Plan: Phase 3- Optimizing execution power**

Section 3.1: Next Generation computing environment

Group 3.1.3: Smart classrooms

Initiative 3.1.3.1: Flipped Classrooms

Flipped classrooms (Tenneson & McGlasson: The Classroom Flip) support the capture of traditional in-class activities for student use in a time-shifted experience while supporting higher-order activities for deeper exploration of content and concepts in the classroom. Transformation of teaching and the instantiation of blended learning has been slow, flipped classroom capability enables a new teaching paradigm.

2. **IT Strategic Plan: Phase 3- Optimizing execution power**

Section 3.1: Next Generation computing environment

Group 3.1.5: Geography lab

This project includes the upgrade and support of the Geography lab to include new smartroom capabilities, updated hardware, and software upgrades as well as development of a self-sufficiency support model.

3. **IT Strategic Plan: Phase 3- Optimizing execution power**

Section 3.1: Next Generation computing environment

Group 3.1.7: Nursing lab expansion

This project is the expansion of the number of workstations available for the Nursing program to meet demand.

4. **IT Strategic Plan: Phase 3- Optimizing execution power**

Section 3.1: Next Generation computing environment

Group 3.1.8: 3d printing expansion

The 3-D printing currently being done at the University supports interdisciplinary initiatives. Expansion of this to a larger scale effort will support curricular and program objectives and provide an exceptional student experience.

University Goal 2 – Innovate

Develop and sustain a university-wide climate and infrastructure that nurtures research, scholarship, creativity and innovation.

Southern will become known as an institution that encourages, supports and celebrates innovative research, scholarship, creative activity and entrepreneurial initiatives. We will clear the obstacles that block the pursuit of creativity and innovation through the creation of a campus infrastructure that supports and encourages these activities across the university. By actively fostering relationships throughout the campus and with private organizations, government agencies and other institutions, Southern will create an environment in which creative ideas, scholarly pursuits and entrepreneurial endeavors are nurtured and applauded. Southern will be known as an institution in which creative thinking is always met with “why not”?

GOAL 2: OBJECTIVE A

Create an umbrella structure at the university that facilitates and supports all types of research, scholarship, creative activity and innovation.

1. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.3: IT as facilitator of innovation and change

Initiative 1.2.3.1: Facilitating faculty's increased use of open-instructional materials across academic programs to increase convenience for faculty and reduce students' costs

IT staff will develop a clearinghouse function for faculty to gain easy access to infor-

mation regarding the adoption of open course materials and a venue for providing access to students.

2. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.3: IT as facilitator of innovation and change

Initiative 1.2.3.2: Working with faculty to build cohort groups to pilot digital courses in the LEP

This pilot is to test the viability of a digitally-focused instructional design function for the university.

3. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.3: IT as facilitator of innovation and change

Initiative 1.2.3.3: Focusing on students' digital experience of the university from application to admissions, refocusing on students as digital natives

The experience economy (Pine and Gilmore: *The Experience Economy*) is in full play and a major part of the University's future success in this experience-driven age will be the ability to provide a superior digital experience. Given the significance of experience and the overwhelming proportion of interaction being digital, the systems students' use become the university's de facto brand (Andrew Zolli: *Z+ Partners*). This group of initiatives is designed to create an optimum digital native experience.

4. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.3: IT as facilitator of innovation and change

Initiative 1.2.3.4: Leveraging users' existing capabilities and behaviors to make

their experiences of the university's digital environment more comfortable

Designing university systems and processes that behave like the systems students use in their everyday lives is an important part of a digital-native experience. By leveraging their existing behaviors, knowledge, skills, and comfort level we create a positive experience that requires significantly less support.

5. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.3: IT as facilitator of innovation and change

Initiative 1.2.3.5: Establish a Center for Instructional Design and Support

Assisting faculty with the technology necessary to create compelling instructional assets is core to higher education IT. This initiative is the creation of a support resource on a larger scale than currently exists to support the development and distribution of content.

6. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.3: IT as facilitator of innovation and change

Initiative 1.2.3.6: Establish a method by which students can choose the manner in which the university communicates with them

This represents the establishment of a student profile function where they can select their preferred communication methods.

7. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.3: IT as facilitator of innovation and change

Initiative 1.2.3.7: Create a digital content ecosystem providing enhanced content

creation, distribution, and consumption capabilities and facilitate faculty content creation

Content truly is the lifeblood of education. This project is the formation of a comprehensive strategy for developing and implementing a digital content ecosystem for the creation, publication, consumption, management, and protection of content.

8. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.3: IT as facilitator of innovation and change

Initiative 1.2.3.8: Increase use of virtual reality and simulations instead of increasing physical lab spaces

Demonstration models of virtual labs for faculty evaluation.

9. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.3: IT as facilitator of innovation and change

Initiative 1.2.3.9: Develop support for multiple instructional delivery modes including traditional, fully on-line, and hybrid

Technology selections, particularly in smart classrooms, will be made to ensure support for a variety of instructional delivery methods.

10. **IT Strategic Plan: Phase 2- A New Model for University Computing**

Section 2.4: Organizational & cultural change (level 2-execution power)

Group 2.4.2: Healthy competition to create greatest value

Implementation of a recognition and rewards system for encouraging high performance.

11. **IT Strategic Plan: Phase 4- Unlimited potential**

Section 4.2: Technology innovation program

Once the computing infrastructure and environment are established to an appropriate level, programs to support and encourage technology innovation will be developed.

GOAL 2: OBJECTIVE B

Identify and foster opportunities for partnerships with external entities.

GOAL 2: OBJECTIVE C

Become a recognized leader in best practices relative to research, scholarship, creative activity and innovation.

1. **IT Strategic Plan: Phase 4- Unlimited potential**

Section 4.2: Technology innovation program

Group 4.2.2: Gamification

Gamification is a promising area for the improvement of student achievement. IT will develop resources and support for faculty efforts in the incorporation of gamification in instruction.

GOAL 2: OBJECTIVE D

Develop recognition and reward structures to sustain a climate of creativity and innovation.

GOAL 2: OBJECTIVE E

Support initiatives that foster hubs of intellectual activity and interdisciplinary/interdepartmental collaborations.

1. **IT Strategic Plan: Phase 3- Optimizing execution power**

Section 3.1: Next Generation computing environment

Group 3.1.6: Fabrication lab

There are requirements for a fabrication lab that cut across several departments.

2. **IT Strategic Plan: Phase 4- Unlimited potential**

Section 4.2: Technology innovation program

Group 4.2.3: IT fellowship program

The purpose of this initiative is to provide faculty with the opportunity to work in IT in support of important initiatives. The faculty fellowship would be a maximum of one academic year and would serve to improve collaboration and professional development.

3. **IT Strategic Plan: Phase 4- Unlimited potential**

Section 4.2: Technology innovation program

Group 4.2.4: Faculty collaboration spaces

The pilot project for collaboration space is in the communications faculty conference/work room. The concept is to create a model space, have faculty use the space, then amend the design as necessary. Ultimately, support for such spaces in all departments desiring them will be sought.

GOAL 2: OBJECTIVE F

Develop processes that allow and effectuate the institutionalization of successful creative and entrepreneurial endeavors.

1. **IT Strategic Plan: Phase 4- Unlimited potential**

Section 4.2: Technology innovation program

Group 4.2.1: Innovation budget

The new IT zero-based budgeting and consolidation effort should yield savings and cost avoidances that could be redirected toward supporting an innovation fund.

University Goal 3 – Impact

Engage with local and global communities through exemplary leadership and service to promote community well-being, economic growth, and social justice.

Southern will make meaningful and measurable differences in regional, state, national, and international communities through innovative partnerships, programs, and experiences. A strong and continued commitment to social justice and service for the public good remains a top priority. Honoring its mission as a public university, Southern is committed to enhancing the educational, political, environmental, economic, and health needs in the State of Connecticut and beyond.

GOAL 3: OBJECTIVE A

Become a recognized leader for best practices in supporting a culture of and infrastructure for local and global community engagement.

GOAL 3: OBJECTIVE B

Develop and implement measures to determine the scope and effectiveness of SCSU's civic engagement to inform the development of future initiatives.

GOAL 3: OBJECTIVE C

Develop innovative and comprehensive programs to cultivate a strong transition from student to alumnus and create a culture of engagement alumni.

GOAL 3: OBJECTIVE D

Define, assess, and promote SCSU's impact on the economy of the State of Connecticut.

GOAL 3: OBJECTIVE E

Identify and assess the impact of SCSU's service activities on members of the campus community.

GOAL 3: OBJECTIVE F

Leverage athletics for increased visibility, attention, and engagement with alumni, the university and regional communities.

University Goal 4 - Empower

Provide exemplary, ethical stewardship of human, financial, technological and physical capital.

Southern will build on its success and optimize its strong and diverse human, physical, technical, and financial networks and resources. Southern's commitment to its people, campus climate, processes, and products combine to make an exceptional learning and work environment. We seek to honor and cultivate the key values of civility, respect, excellence, efficiency, collaboration, innovation, balance, and sustainability.

GOAL 4: OBJECTIVE A

Foster a culture that encourages faculty, staff, and student success and enables the university to attract and retain diverse talent on a national scale.

GOAL 4: OBJECTIVE B

Continue to position the university as leader and nationally recognized expert in sustainability.

1. **IT Strategic Plan: Phase 3- Optimizing execution power**

Section 3.1: Next Generation computing environment

Group 3.1.9: Remote sensing software

The Geography department could significantly improve the scope of its research and field activity with the acquisition of remote sensing software. This directly supports the expansion of undergraduate research initiatives.

2. **IT Strategic Plan: Phase 3- Optimizing execution power**

Section 3.1: Next Generation computing environment

Group 3.1.10: Drone support

A drone would enable safer and more robust field activities for Geography and enable competitive research and grant proposals.

GOAL 4: OBJECTIVE C

Improve the physical environment and infrastructure of the University.

1. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.1: Improvements to basic service provision/security

Group 1.1.2: Stabilization & modernization of environments

Initiative 1.1.2.3: Computing

The overall conceptualization of the computing environment needs a refresh; The result will be an environment that leverages Cloud technologies, bring-your-own-device (BYOD) trends, and mobile device proliferation.

2. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.1: Reconceptualization of IT organization & management assignments

Initiative 1.2.1.4: Housing assessment & recommendations (President input)

The IT team is spread all over the University. This dispersion limits collaboration, communication, and results in a fragmented culture. The objective is to move towards central common housing for IT staff rationalized on function.

3. IT Strategic Plan: Phase 3- Optimizing execution power

Section 3.1: Next Generation computing environment

Group 3.1.3: Smart classrooms

This project represents the implementation of as many new smart classrooms as possible through the Transform 2020 smart classroom initiative, consistent with BOR standards.

GOAL 4: OBJECTIVE D

Provide a world-class digital experience for every member of the campus community.

1. IT Strategic Plan: Phase 1- The fundamentals

The fundamentals of IT include the provisioning of reliable, trustworthy, dependable, solutions that meet to business and operational requirements of an organization. There are several areas where this foundation is weak. This group of initiatives is designed to achieve the fundamental functions and standards of modern IT.

2. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

This includes the establishment of fundamental service provision standards and security requirements.

3. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.1: Help Desk re-engineering/re-structuring

Initiative 1.1.1.4: User self-sufficiency capability expansion

Development and implementation of self-help tools and the creation of the help-desk knowledge base. Support is very expensive, enabling self-sufficiency leads to reduced, or at least contained, costs and a more positive user experience.

4. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.1: Improvements to basic service provision/security

Group 1.1.1: Help Desk re-engineering/re-structuring

Initiative 1.1.1.5: Providing computer users administrative rights to machines

Wherever possible users should have administrative rights to their machines. The purpose of this initiative is to move from control to enablement and allow users to grow as computer users.

5. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.1: Improvements to basic service provision/security

Group 1.1.1: Help Desk re-engineering/re-structuring

Initiative 1.1.1.6: Increase Mac support

Support for Macs will be increased through a variety of means including development of support staff, creation of self help resources, and reorganization of the user support area.

6. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.1: Improvements to basic service provision/security

Group 1.1.2: Stabilization & modernization of environments

Initiative 1.1.2.2: Web

A university-wide task force has been established to re-envision and revitalize the web presence of the university to a level appropriate for digital natives.

7. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.3: Security/systems & process hardening

Establishment of modern security practices and procedures to harden the infrastructure and server environment and support expansion of services. Additionally, the development of migration to Cloud services where practical.

8. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

The IT staff has had a succession of leadership changes that have not served them well. A significant part of a team's success is derived from clear expectations, organizational/task alignment, and a common sense of purpose combined with the right tools. This initiative represents the establishment of the foundational culture necessary to successful IT teams.

9. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.1: Reconceptualization of IT organization & management assignments

The reorganization of Director assignments and teams based on function and expertise. This will be followed by position description improvements that represent modern IT.

10. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.1: Reconceptualization of IT organization & management assignments

Initiative 1.2.1.1: Scope & depth of responsibility assessment

Assessment of all IT staff is necessary to the development of an advancement plan. The identification strengths, weaknesses, and opportunities (staff SWOT) leads to an action plan for improvement and proper alignment.

11. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.1: Reconceptualization of IT organization & management assignments

Initiative 1.2.1.2: Skills to responsibilities match

Assessment of IT skills portfolio, identification of gaps, resulting in the creation of a strategy for closing gaps.

12. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.1: Reconceptualization of IT organization & management assignments

Initiative 1.2.1.3: Traditional gap analysis & remediation (HR support)

Development of approaches to develop missing skills.

13. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.2: Deliberate transition of IT culture

Establishment of standards for IT and a sense of identity.

14. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.2: Deliberate transition of IT culture

Initiative 1.2.2.1: Clear communication of new expectations

Development of a blueprint for IT expectations and performance. Mission, Vision, Charge, and value statements that reflect the desired end result.

15. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.2: Deliberate transition of IT culture

Initiative 1.2.2.2: Implement basic Rob's rules

“Rob’s rules” are basic concepts and practices that have evolved over many years of IT leadership practice. The most basic include: value creation is the only purpose of IT; hire for pure intellectual horsepower; when assessing talent look for problem solving, creativity, passion, energy, and fit; a vacancy is more valuable than an average employee; forced rank and do something about it.

16. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.2: Deliberate transition of IT culture

Initiative 1.2.2.3: Changing the current services model from control to enablement

Establishment of a new model of support that emphasizes user choice and flexibility.

17. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.2: Deliberate transition of IT culture

Initiative 1.2.2.5: Re-focus from "who you are/title" to “what you can do” mentality

Successful modern organizations rely less on hierarchical position or title than pure technological skill and wherewithal. De-emphasizing hierarchy provides for optimization of talent in an environment sufficiently complex to require dependence on the skills of every team member. Organizations should be as complex as their business requires (W.B. Ashby: The Law of Requisite Variety – aka Ashby’s Dictum), the structure of IT will be fluid and reform to the complexities of the university’s business environment.

18. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.2: Deliberate transition of IT culture

Initiative 1.2.2.6: Emphasize user experiences & differentiation vs. power & ownership

Creating value is the only valid purpose of IT and we find ourselves in an experience economy. This means the user experience holds the greatest potential for value-creation. Attempting to control or exercise power in the modern IT environment is counter-productive. Emphasizing enablement and differentiation must be the focus.

19. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.2: Deliberate transition of IT culture

Initiative 1.2.2.7: Establish IT as a value creation engine

Employment of a value-chains model (Michael Porter: Competitive Advantage: Creating and Sustaining Superior Performance) and the application of a future, or Violet, technology-vision lens (Pero Micic: The Five Futures Glasses) in the evaluation of IT projects and initiatives is critical to IT being relevant. Strong fiscal planning

and management combined with effective technology solution provision will ensure IT creates value and supports the university's mission.

20. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.3: IT as facilitator of innovation and change

Ensuring conversations about new ways of doing business and new ways of viewing the organization. Stimulating new thinking.

21. IT Strategic Plan: Phase 2- A New Model for University Computing

Development of a comprehensive future-oriented vision for technology that is achievable and sustainable.

22. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.1: New technology architecture

Design of a new comprehensive and future-oriented technology architecture and a foundation plan for implementation.

23. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.1: New technology architecture

Group 2.1.1: Visual integration map

Visual representation of the current state of technology and the newly imagined technology vision.

24. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.2: Student computing experience appropriate for Digital Natives

Group 2.2.1: New portal

The current portals are old and ineffective. New portal design will insulate users from the changes to back room systems and provide a simple and consistent high quality user experience.

25. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.3: Infrastructure expansion, improvement, & hardening

Establishment of a modern infrastructure appropriate for the next generation of digital natives. Improved bandwidth, segregation of Residence Hall traffic, isolation of high demand traffic, and active management of the environment and traffic patterns.

26. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.3: Infrastructure expansion, improvement, & hardening

Group 2.3.1: Cisco VoIP, Unity voicemail, expanded TelePresence

Network upgrades to naturally incorporate new high demand/high impact services such as TelePresence.

27. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.3: Infrastructure expansion, improvement, & hardening

Group 2.3.2: Faster bandwidth

Demand has met a level where service is unreliable, a larger Internet connection and the provisioning of Internet 2 will support current and future demands.

28. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.3: Infrastructure expansion, improvement, & hardening

Group 2.3.3: Traffic management & performance tuning

All networks require ongoing assessment, monitoring, and performance tuning. This project is the establishment of a network management approach that employs industry-standard tools and practices.

29. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.3: Infrastructure expansion, improvement, & hardening

Group 2.3.4: Internet2

Implementation of Internet@ through CEN.

30. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.3: Infrastructure expansion, improvement, & hardening

Group 2.3.5: Res Life Network

Offloading of Res life traffic and network services to Comcast.

31. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.3: Infrastructure expansion, improvement, & hardening

Group 2.3.6: Digital signage

Standards and support for digital signage.

32. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.4: Organizational & cultural change (level 2-execution power)

This represents the next level of execution power, often called agility. It is the ability to react very quickly and produce effective solutions that take advantage of opportunities as they present themselves as well as creating new opportunities where they did not exist previously.

33. IT Strategic Plan: Phase 3- Optimizing execution power

Development of the next technology vision, next order skill sets for IT staff, and re-defining the IT value proposition for the next ten years.

34. IT Strategic Plan: Phase 3- Optimizing execution power

Section 3.1: Next Generation computing environment

Group 3.1.1: Digital imaging & workflow

User-driven imaging and workflow extended throughout the University and across all functions.

35. IT Strategic Plan: Phase 3- Optimizing execution power

Section 3.1: Next Generation computing environment

Group 3.1.2: True BYOD support

Complete brand agnostic support for BYOD.

36. IT Strategic Plan: Phase 4- Unlimited potential

The realization of a future capable IT organization and infrastructure that is capable of fast and effective support in any variety of circumstances.

37. IT Strategic Plan: Phase 4- Unlimited potential

Section 4.1: Redefinition of possible

The realization of a future capable IT organization and infrastructure that is capable of fast and effective support in any variety of circumstances. Development of a capabilities matrix.

38. IT Strategic Plan: Phase 4- Unlimited potential

Section 4.1: Redefinition of possible

Group 4.1.1: External environmental scan

Full research of the most innovative, efficient, effective, and future-capable IT environments across industries and a comparison to university IT.

39. IT Strategic Plan: Phase 4- Unlimited potential

Section 4.1: Redefinition of possible

Group 4.1.2: Technology mega trends

Identification of IT megatrends (John Naisbitt: Megatrends) and their effect on university IT and development of strategy drivers and action plans.

40. IT Strategic Plan: Phase 4- Unlimited potential

Section 4.1: Redefinition of possible

Group 4.1.3: Emerging tech capabilities

Analysis and reporting of tech capabilities and their meaning as the next technology vision is formulated.

GOAL 4: OBJECTIVE E

Improve university-wide processes to maximize effectiveness and efficiency.

1. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.1: Improvements to basic service provision/security

Group 1.1.1: Help Desk re-engineering/re-structuring

Support services, including a high quality help desk, are essential to a successful IT environment. This initiative is designed to significantly improve the quality of help desk services.

2. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.1: Improvements to basic service provision/security

Group 1.1.1: Help Desk re-engineering/re-structuring

Initiative 1.1.1.1: User segregation & differentiated routing/escalation

The purpose of this initiative is to ensure appropriate handling and routing of help desk tickets and requests on the basis of requestor role and potential scope of effect of any outstanding problems. Historically, traffic to the help desk was dealt with in a first-come, first-serve model, which did not take into account the broad ranging effect of certain types of problems, nor the heightened significance of certain users having technology issues or outages. The traffic handling was re-designed to ensure a best fit between: the requestor, the nature of the problem, the priority of the issue, and the staff dealing with the ticket.

3. **IT Strategic Plan: Phase 1- The fundamentals**

Section 1.1: Improvements to basic service provision/security

Group 1.1.1: Help Desk re-engineering/re-structuring

Initiative 1.1.1.2: Increase first-call resolution rates on tickets

Implementation of tools and practices, combined with reorganization of duties to empower help desk staff to see and solve a problem end-to-end.

4. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.1: Help Desk re-engineering/re-structuring

Initiative 1.1.1.3: Call management analysis & reporting

Improvements are only possible with accurate measurement and reporting. This project implements help desk performance metrics on ticket closure as well as customer satisfaction survey data to support continuous quality improvement.

5. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.1: Help Desk re-engineering/re-structuring

Initiative 1.1.1.7: Evaluate tech support capabilities & change as required

Assessment of support capabilities and develop plan for improvement where necessary.

6. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.2: Stabilization & modernization of environments

Initiative 1.1.2.1: Directory & Exchange email

Upgrades and moves to best practices in account/directory management and migration to Office 365.

7. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.2: Stabilization & modernization of environments

Initiative 1.1.2.4: Systems, applications, & integration

Development of an applications integration strategy and standardized management platform.

8. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.3: Security/systems & process hardening

Initiative 1.1.3.1: Designation of IT security & compliance team

Development of security-related responsibility matrix.

9. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.3: Security/systems & process hardening

Initiative 1.1.3.2: Review/update/create security policies

Develop policies and procedures that reflect best practices and meet audit criteria.

10. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.3: Security/systems & process hardening

Initiative 1.1.3.3: Audit follow-ups

Formulate IT audit responses.

11. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.3: Security/systems & process hardening

Initiative 1.1.3.4: Ensure availability of IT security training modules

Provide relevant training material catalog for IT staff.

12. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.4: Management & planning systems adoption

Implement a comprehensive IT management suite based on the Atlassian suite of products.

13. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.4: Management & planning systems adoption

Initiative 1.1.4.1: Request & project management standards

Migrate request system and status reporting into the new management suite and incorporate into the IT Governance process.

14. IT Strategic Plan: Phase 1- The fundamentals

Section 1.2: Organizational & cultural change (level 1- getting the foundation right)

Group 1.2.2: Deliberate transition of IT culture

Initiative 1.2.2.4: Modernize environment, tools, & approaches to IT (some future \$)

Establish new IT development technology standards for tools, methodology, service, cloud, and data base products

15. IT Strategic Plan: Phase 3- Optimizing execution power

Section 3.2: Management & planning systems expansion

Expand tech admin management platform to entire IT team.

16. IT Strategic Plan: Phase 3- Optimizing execution power

Section 3.2: Management & planning systems expansion

Group 3.2.2: Improved documentation & transparency

Establish a project registry and platform for complete transparency into IT projects and the IT governance process.

17. IT Strategic Plan: Phase 3- Optimizing execution power

Section 3.2: Management & planning systems expansion

Group 3.2.3: Agile (or similar) development methodology

Determine and implement a standard development methodology and toolsets for applications developers.

18. IT Strategic Plan: Phase 3- Optimizing execution power

Section 3.2: Management & planning systems expansion

Group 3.2.4: IT Checklists moved into Dashboard Model

Implementation of IT management dashboard.

GOAL 4: OBJECTIVE F

Build a climate and infrastructure that supports and increases the University's financial well-being.

1. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.3: Security/systems & process hardening

Initiative 1.1.3.5: Contract for an IT risk assessment/correct as recommended (needs \$)

Acquire risk management analysis and report to develop an action plan for mitigating vulnerabilities of University systems and infrastructure.

2. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.3: Security/systems & process hardening

Initiative 1.1.3.6: DCL3/Protective Enclave

Comply with DCL3 requirements for a protective enclave.

3. IT Strategic Plan: Phase 1- The fundamentals

Section 1.1: Improvements to basic service provision/security

Group 1.1.4: Management & planning systems adoption

Initiative 1.1.4.2: Establish Technology Administration function

Create position and function to professionalize technology administration functions to include; budget and financial management, acquisition approvals, IT governance, project management and status reporting, audit compliance, and daily operations.

4. IT Strategic Plan: Phase 2- A New Model for University Computing

Section 2.1: New technology architecture

Group 2.1.2: Portfolio management (de-duplication)

Recommend portfolio reductions, de-duplication of functions, and more fully-functioned solutions.

5. IT Strategic Plan: Phase 3- Optimizing execution power

Section 3.2: Management & planning systems expansion

Group 3.2.1: Optimizing estimation & project management

Establish practices and implement systems to improve project estimation in support of IT governance.

Management & Organization

“When you have faults, do not fear to abandon them.” –Confucius



Background

The management and organizational structure changes being implemented as part of the technology plan are designed to reflect a rationalized approach to levels of responsibility, span of control, supervisory load, and synergies of purpose/function.

There will be five primary organizational domains. First, the Chief Information Officer (CIO), is responsible for executive leadership of all IT functions at the university and, as a member of the President’s Cabinet, the link to the rest of the university executive

team. Typically the CIO office will include the CIO and an administrative support function.

Second, the Associate CIO/Chief Technology Officer (CTO) is responsible for strategic initiatives, technology architecture, portfolio management, standards, the quality of user experience, and innovation. The ACIO office consists of the ACIO, Director of IT Strategic Initiatives & Special Projects, Director of Academic Technology, and Director of Data Integrity & Systems Integration, and their respective departments.

The third domain is the Director of IS- Technology Administration. This senior IT leader is responsible for all financial, business, governance, and process-based functions of the IT organization. The office includes the departmental administrative support staff.

Fourth, is the Systems and Applications Team, headed by the Director of IS- Systems and Applications. This domain includes enterprise applications, systems administration, data base management, data security and related functions and staff.

The fifth, and final, domain is Computing and Infrastructure. This area is led by the Director of IS- Computing & Infrastructure. It includes telecommunications, networks, customer support, help desk, IT-facilities, data center operations, deployments, A/V services, and all related functions and staff.

FIGURE 4.1 IT Organization Chart FY2017



Source: SCSU Office of the CIO

Fiscal Resources

“Love lasteth as long as the money endureth.” –Sir William Claxton



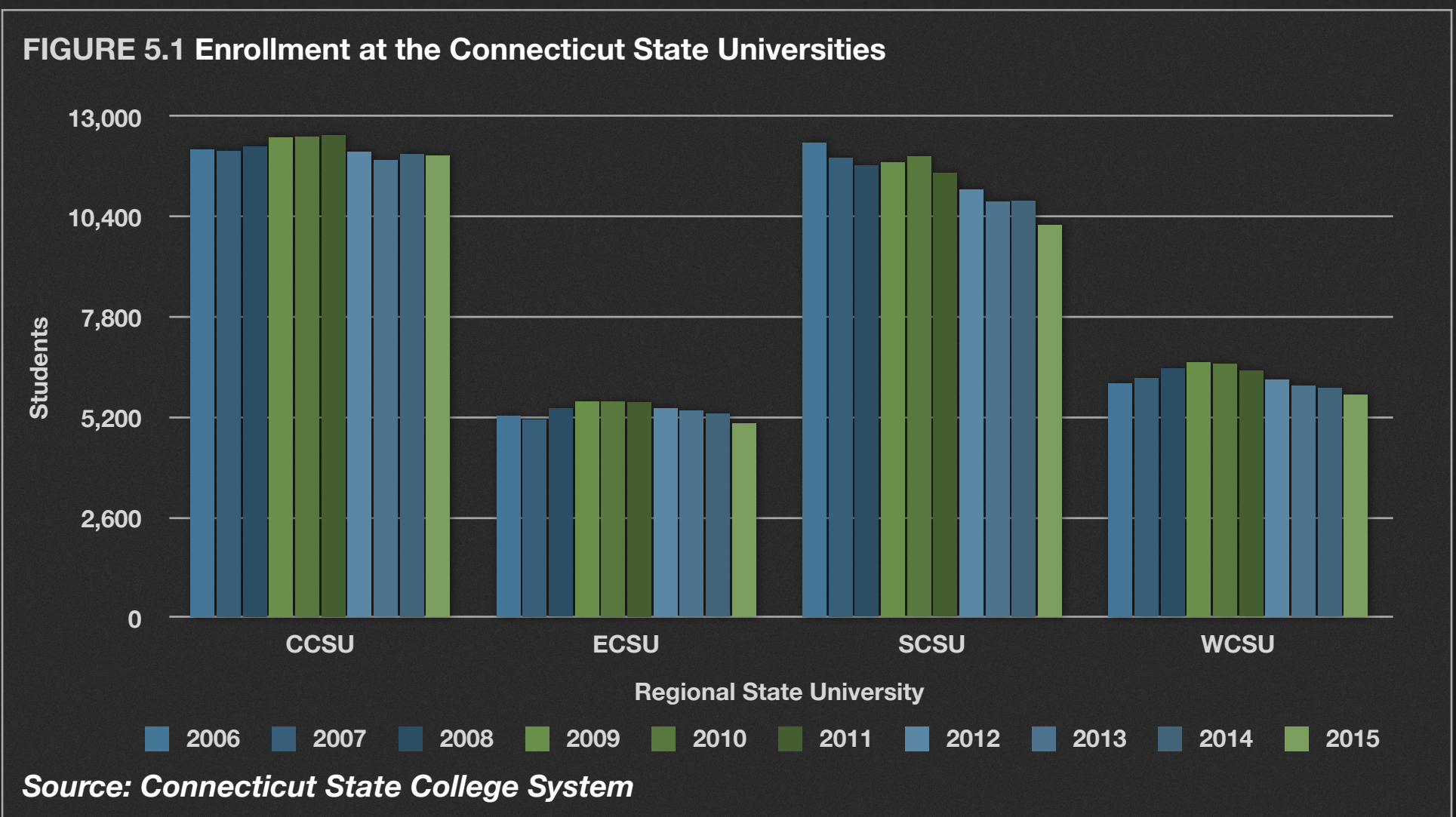
Overview

Southern Connecticut State University (SCSU), like most public institutions of higher learning, faces an uncertain financial future. Society is questioning how and to what degree public institutions of higher learning should be funded. The answers to these questions vary greatly depending upon economic confidence levels, especially the general economic situation in each state. Unfortunately, Connecticut’s financial situation in 2015 was dire and remains dire in 2016. The forecast for 2017 is dire, too. At this time, it is reasonable to assume that Connecticut’s budgets and SCSU’s will remain under stress for the next five years and beyond if systemic changes are not made. As a result,

funding options are being reviewed that will impact operations at SCSU and throughout the State.

“Historically the Connecticut model of funding higher education has been based upon enrollment. In the past budget reductions were often managed with the campus philosophy to increase revenue by raising tuition and/or increasing student enrollment. The solution is not enrollment growth as a means to generate revenue. The National Center for Educational Statistics (NCES) anticipates a steady decline in Connecticut high school graduates leading up to 2021-22. The data projects public high school graduates at 33,110 for 2021-22 well short of its peak of 38,450 in 2010-11. The impact of less high school graduates will be felt the greatest at the regional universities.”³⁴

The above projection is supported by the System Office’s enrollment numbers 2006-2015:



Connecticut is supposed to explore performance based funding for higher education per Substitute House Bill No. 6919 – Special Act No. 15-20 – An act establishing a task force concerning outcomes-based financing for higher education.³⁵

“Thirty-two states—Arizona, Arkansas, Colorado, Florida, Illinois, Indiana, Kansas, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, New Mexico, New York, Nevada, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, Wisconsin, and Wyoming—have a funding formula or policy in place to allocate a portion of funding based on performance indicators such as course completion, time to degree, transfer rates, the number of degrees awarded, or the number of low-income and minority graduates. Five states Connecticut, Georgia, Iowa, South Dakota, and Vermont—are currently, or are planning, transitioning to some type of performance funding, meaning the Legislature or governing board has approved a performance funding program and the details are currently being worked out.”³⁶

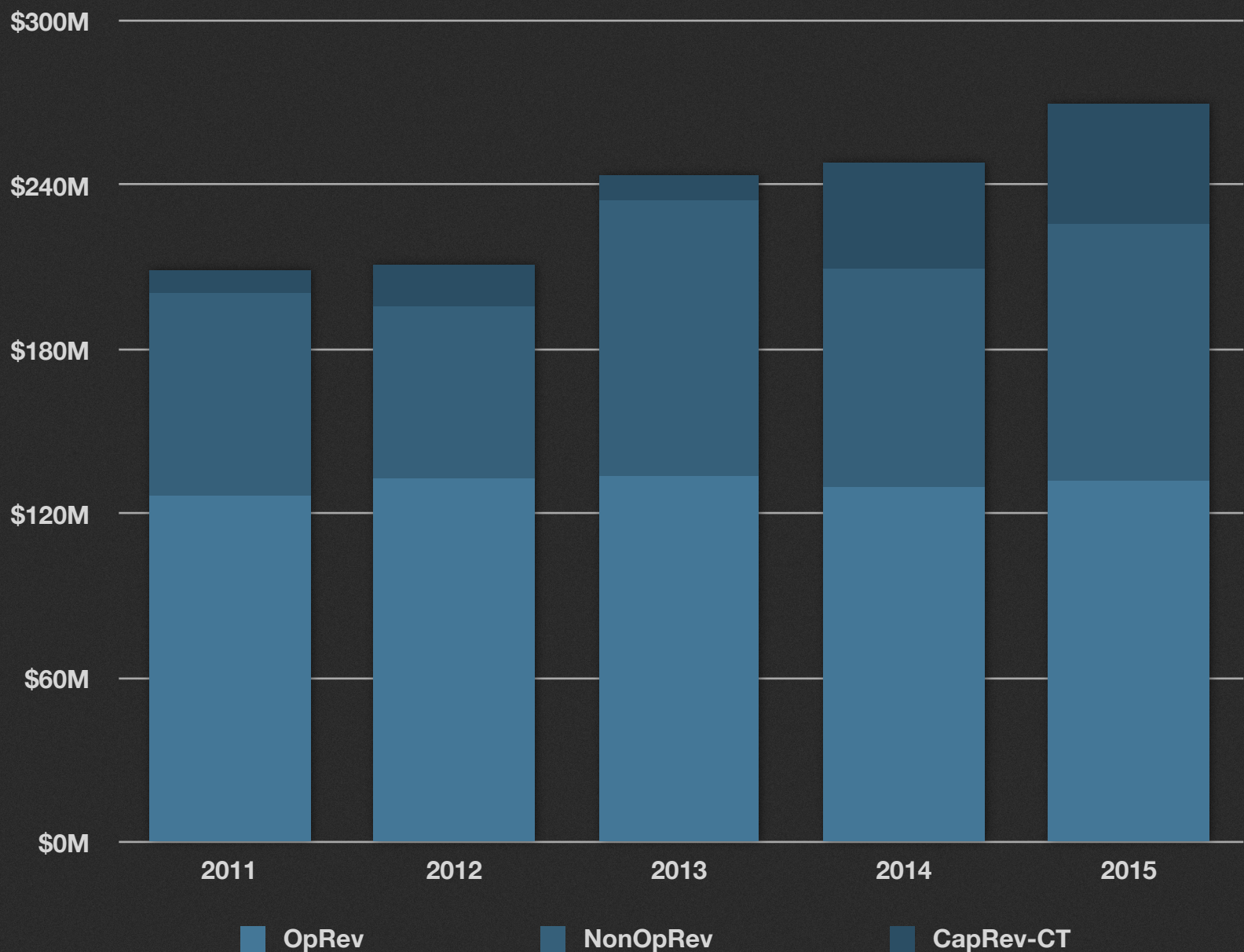
To make matters more confusing: “The report found that Connecticut’s support for higher education increased by just over 11% over the past 5 years (a number that includes stimulus funds).” From the same article, “An 11% increase sounds good, but the amount of money spent per full-time enrolled student (FTE) has decreased by almost 22% since 2009, according to a report from 2014 Connecticut Higher Education System Data and Trends Report.”³⁷

All of this information boils down to the fact that despite efforts to find a solution, funds will be tight for the foreseeable future. Tight funds mean that decisions will need to be made. These decisions and the quality of these decisions, no matter where they are made, State government, System Office, or at SCSU, represent change that will impact the entire higher education community in Connecticut and at SCSU.

Southern faces a variety of financial challenges, particularly dealing with predictability. After reviewing the annual reports published by the System Office for 2011 through 2015, budget reality becomes apparent.

The university predictably generates revenue of around \$130 million annually from operations with a \$2.5 million standard deviation. SCSU’s self-controlled budget theoretically varies between \$122.5 million and \$137.5 million. State funding is less predictable. The State supplied funds average around \$105.25 million/year, but with a \$22.5 million standard deviation. Theoretically, State funds vary greatly between \$37.75 million and \$172.75 million. Though State funding has not hit the extremes, it has varied greatly. The supposition is that greater predictability would aid the financial planning process for SCSU and its sister institutions. However, the impact on “jumping the curve” changes that should and must occur is less clear if greater predictability were achieved.

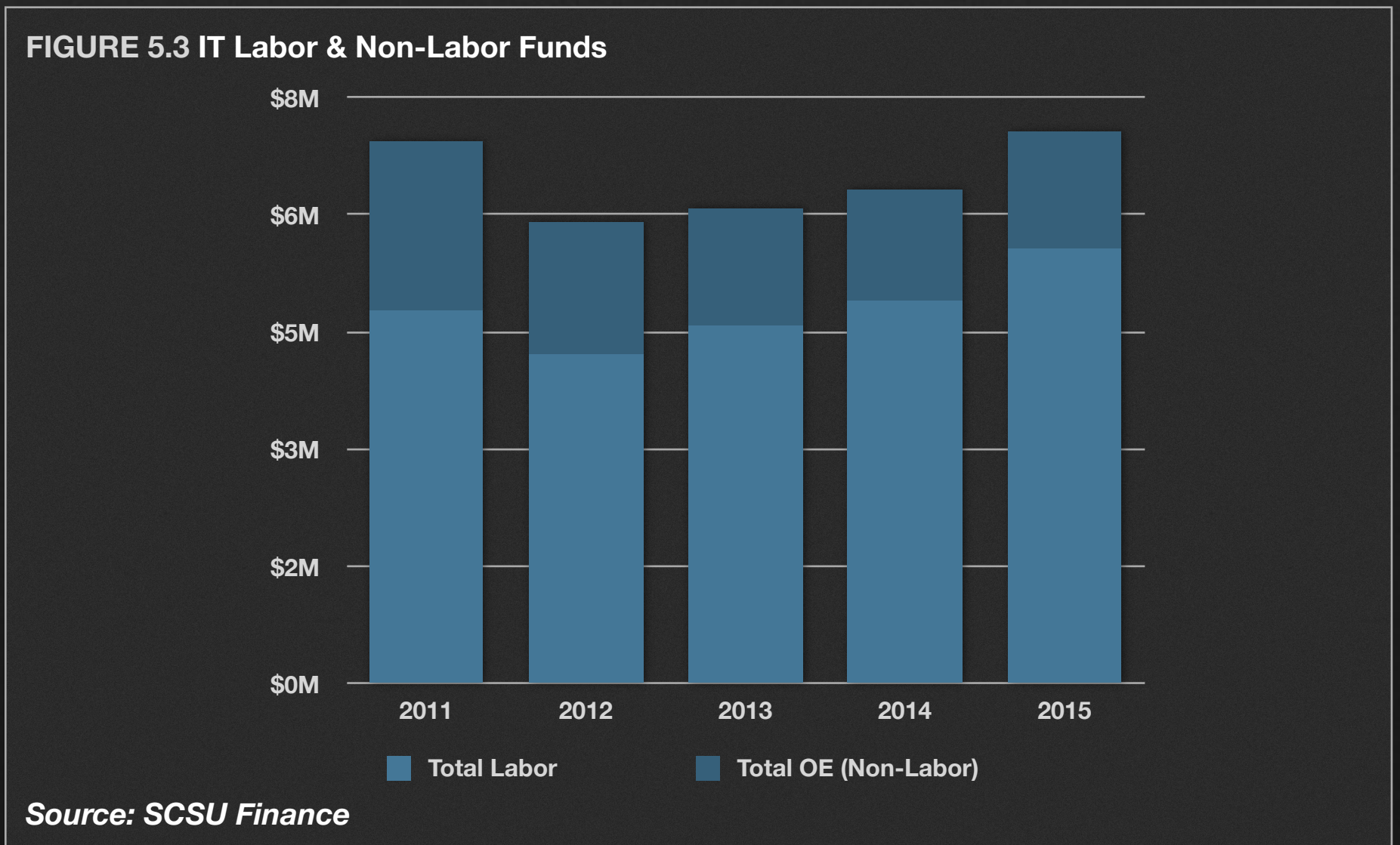
FIGURE 5.2 SCSU Funds By Year



Source: ConnSCU Annual Reports

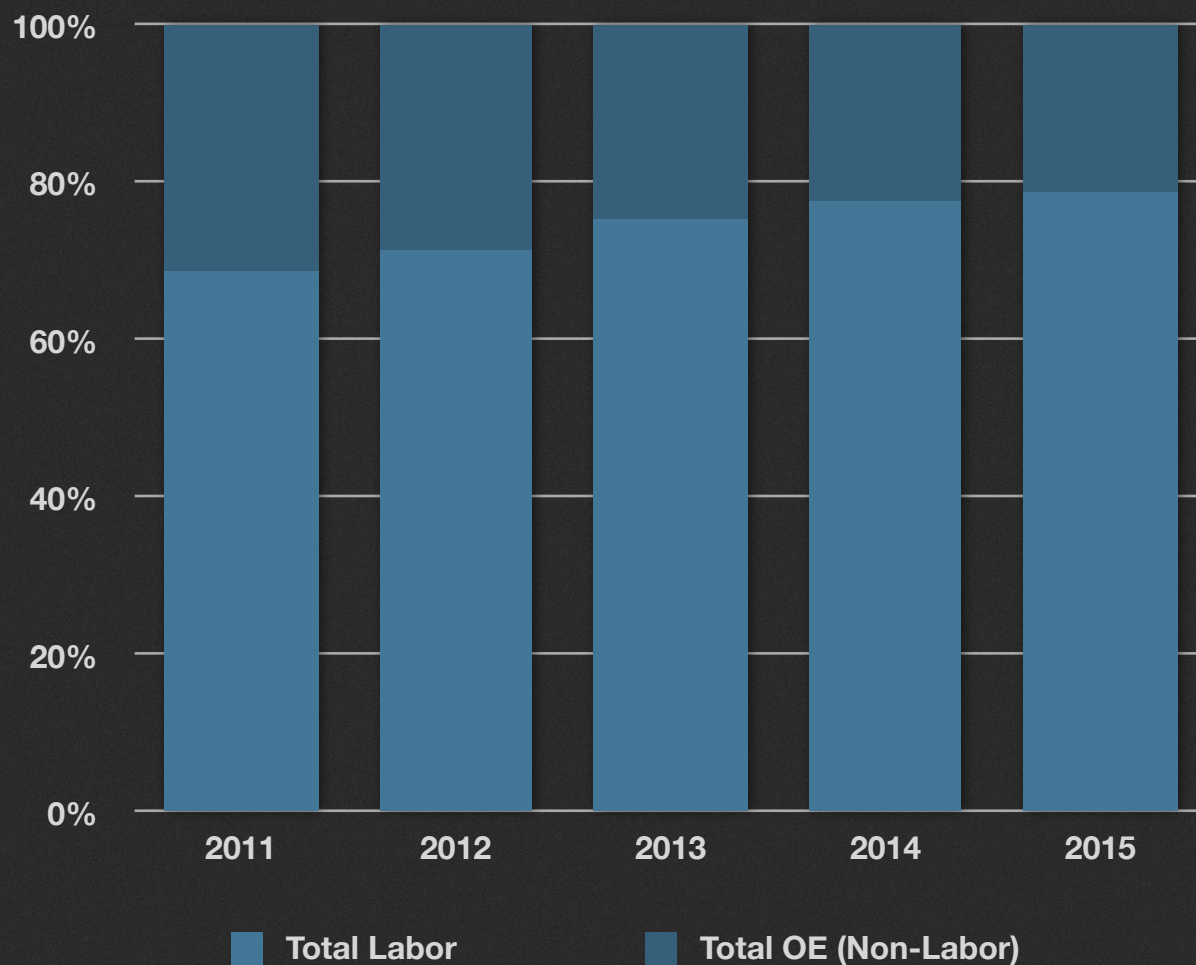
The IT budget at SCSU is equally challenging and disturbing. The operational expense (OE) averages \$1.7 million with a large standard deviation of \$289,000. Theoretical ranges are between \$833,000 and \$2.5 million. The current trend has been a declining OE IT budget year over year hovering around \$1.5 million. The employee, full time and part time, component averages \$5.1 million, also with a large standard deviation of \$473,000. Due to various employment rules and contracts, this budget has trended upwards and is based less on skill and market forces and more on seniority and duration of service. Potentially, this explains how higher education spending could increase overall with actual spending per student be less.

An analysis of this data indicates a linear progression over five years where labor costs steadily increased from 69% to 79% of IT funds. Correspondingly, non-labor costs shrank from 31% to 21% of IT funds.



Though this may be predictable and understood, a more stable ratio would be preferred for financial planning. The fear is that the reduction in OE funds will prevent the IT labor component from being used to its greatest advantage. The appropriate ratio between IT labor and non-labor is open for debate. This is especially true as technology continues to evolve without any long range stability in sight. The lack of stability in technology makes it a dynamic force that may determine who “jumps the curve” and who does not. Darwinian forces of evolution are in play throughout the system.

FIGURE 5.4 IT Labor & Non-Labor Percent



Source: SCSU Finance

SCSU is making changes to evolve financial management in Finance and IT. Some of these changes that may disrupt reporting numbers in the future. For example, Finance transferred the Telecom budget that hovers around \$500,000 to IT once IT established and demonstrated an ability for financial oversight. FY16 numbers were excluded from the charts because official numbers were not available towards the close of FY16.

Capital funds (2020) from the State have been equally unpredictable and their future is unclear even though SCSU and its sister institutions have become addicted to them. The best news for IT occurred at the start of FY16 in 2015 when SCSU's Finance Department settled on a \$1 million annual capital amount with the ability to retain funds across fiscal years for major projects. This will allow IT to plan for many near and long term capital projects in advance and allow for predictable execution of projects that are planned better. Though SCSU and IT has made a plan and commitment, these capital funds are tied to the State's 2020 initiative and their long term future is unknown. As 2020 approaches, the angst will rise if the State does not confirm ongoing capital funds.

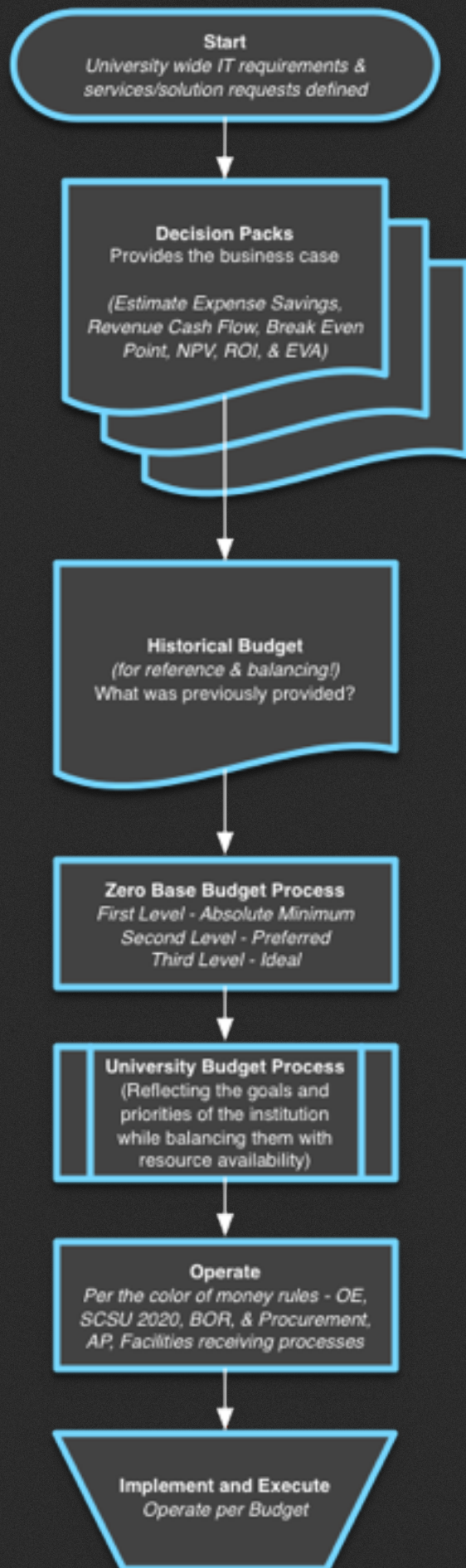
The System Office has stepped in and covered numerous project costs. SCSU and IT are very thankful for their involvement and interest. However, the model, as it currently exists, is not sustainable. Two problems exist. For capital expense projects (Please also refer to the addendum at the end of this chapter on 21st Century Classroom initiative – a color of money), the fear is that there will not be funds to replace the capital items once they retire within, for example, 5 years. For projects that involve annual expenses, the fear is that at some point, ongoing support & maintenance costs will be transferred back to the institutions without adequate warning. Those costs will become the responsibility of SCSU and IT and will thoroughly consume budgets. At these points, the balloon may burst and system deterioration may begin. Advance planning and modeling is in progress, but is in its infancy.

Responsible Stewardship

IT cobbles together funds from numerous sources and this has become known as the colors of money. Whenever the funds are somewhat predictable, IT employs Zero Based Budgeting (ZBB). Simply, this is when everything that is requested gets ranked until there is no money left. This is done for OE funds, 2020 Capital funds, and a vari-

ety of other funds. Due to the funding vagaries and anticipated ranges, IT is prepared for financial windfalls and for funding disappointments.

FIGURE 5.5 Zero Based Budget (ZBB) Process



Source: Office of the CIO

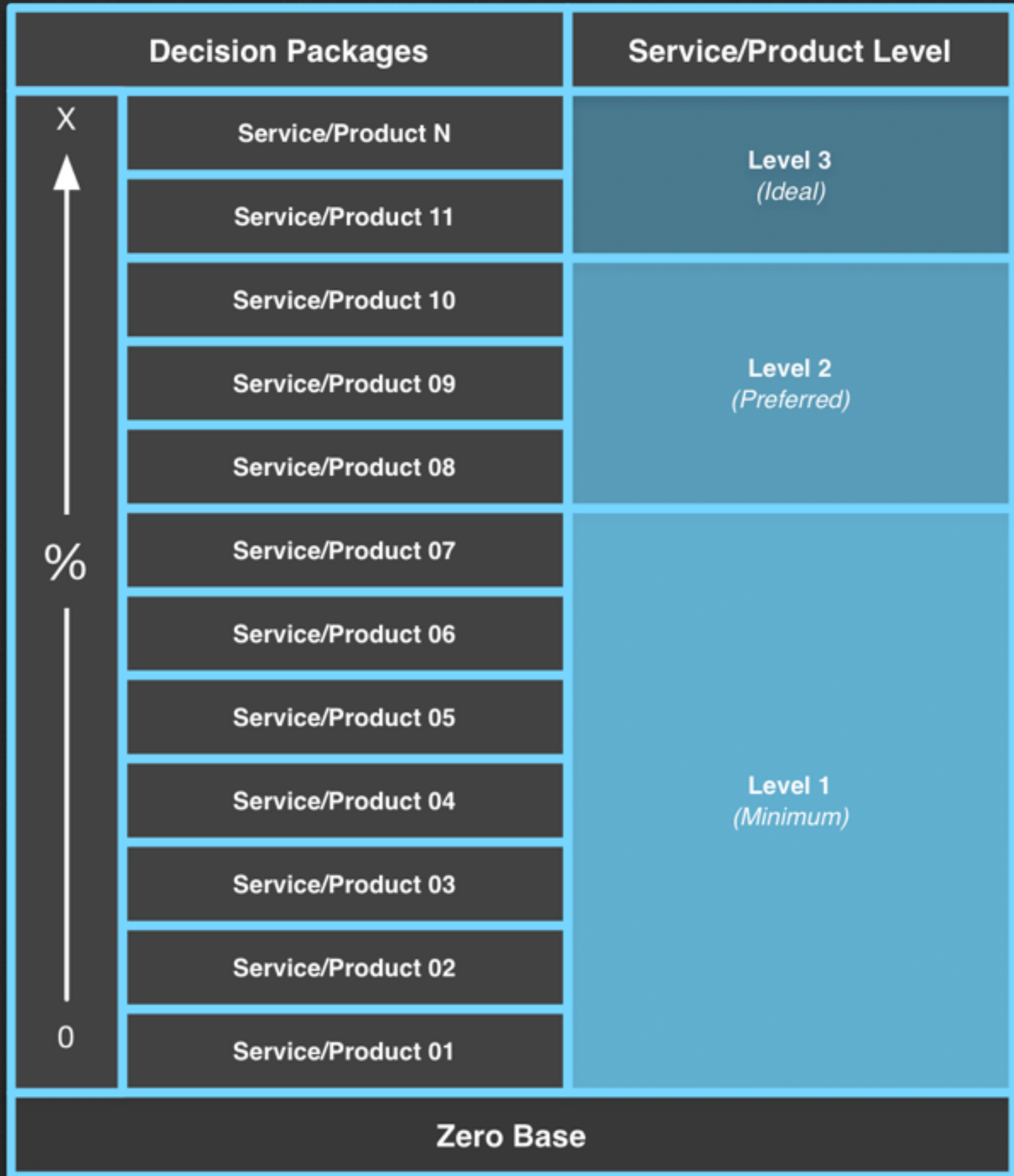
Contributions:

- Numerous meetings with university stakeholders
- IT Leadership meetings
- Associate CIO meetings
- Team planning sessions
- Group brainstorming
- Individual insights and inspiration
- Feedback loops

Contributors:

- University Leaders
 - Academic
 - Administrative
- University Subject Matter Experts (SME)
- CIO
- Associate CIO/CTO
- Directors/Managers
- Staff

FIGURE 5.6 ZBB Decision Package Concept



Source: Office of the CIO

FIGURE 5.7

	Vendor	Product Mfr	Description	Forced Rankings FY17	FY17 Budget = Full Request	FY17 Budget 100% of FY16	FY17 Budget 95% of FY16	FY17 Budget 93% of FY16	FY17 Budget 90% of FY16	FY17 Budget 85% of FY16	FY17 Budget 80% of FY16
139											
140	?	?	Hdw - Repair parts for Cisco & NetApp eqpt	3	\$ 15,000.00	\$ 15,000.00	\$ 15,000.00	\$ 15,000.00	\$ 15,000.00	\$ 15,000.00	\$ -
141	?	?	Hdw - 2-Factor AAA Server	3	\$ 25,000.00	\$ 12,500.00	\$ 12,500.00	\$ 12,500.00	\$ 12,500.00	\$ 12,500.00	\$ -
142			Hdw - ELK Stack or Splunk Log Corelation	3	\$ 15,000.00	\$ 7,500.00	\$ 7,500.00	\$ 7,500.00	\$ 7,500.00	\$ 7,500.00	\$ -
143	N/A		Hdw - Tech Eqpt & peripherals	3	\$ 10,000.00	\$ 5,000.00	\$ 2,500.00	\$ 1,250.00	\$ 625.00	\$ -	\$ -
144	Various		Hdw - maintenance on vehicles & golf carts and non-tech eqpt	3	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 2,250.00	\$ -	\$ -
145											
146	lgxGlobal		Maintenance & Support - MAG-Pulse SSL VPN -new VPN	3	\$ 2,300.00	\$ 2,300.00	\$ 2,300.00	\$ 2,300.00	\$ 2,300.00	\$ 2,300.00	\$ 2,300.00
147											
148	TBD		Prof Svcs - Upgrade, tune, etc	3	\$ 15,000.00	\$ 15,000.00	\$ 15,000.00	\$ 15,000.00	\$ 7,500.00	\$ -	\$ -
149	TBD		Prof Svcs - Atlassian / Salesforce App Admin	3	\$ 180,000.00	\$ 90,000.00	\$ 72,000.00	\$ 57,600.00	\$ 45,504.00	\$ -	\$ -
150	Various		Engineering & Dwgs	3	\$ 20,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 7,500.00	\$ 3,750.00	\$ -
151	Various -		Prof Svcs - Required expertise to move the meter.	3	\$ 30,000.00	\$ 15,000.00	\$ 15,000.00	\$ 15,000.00	\$ 10,050.00	\$ 5,025.00	\$ -
152											
153			Budgeted item to research and test new technologies.	4	\$ 7,500.00	\$ 3,000.00	\$ -	\$ -	\$ -	\$ -	\$ -
154			Self explanatory	4	\$ 5,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
155											
156	Digital Back O	HP	HDW - desktop or laptop replacement / specialty purchases (4	\$ 21,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
157	Apple	Apple	HDW - desktop or laptop replacement / specialty purchas	4	\$ 15,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
158											
159			Supplies - General	4	\$ -	\$ 30,000.00	\$ 30,000.00	\$ 30,000.00	\$ 25,500.00	\$ 20,145.00	\$ 15,008.03
160	misc		Supplies - Computer parts (hard Drives, adapters, incident	4	\$ 15,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

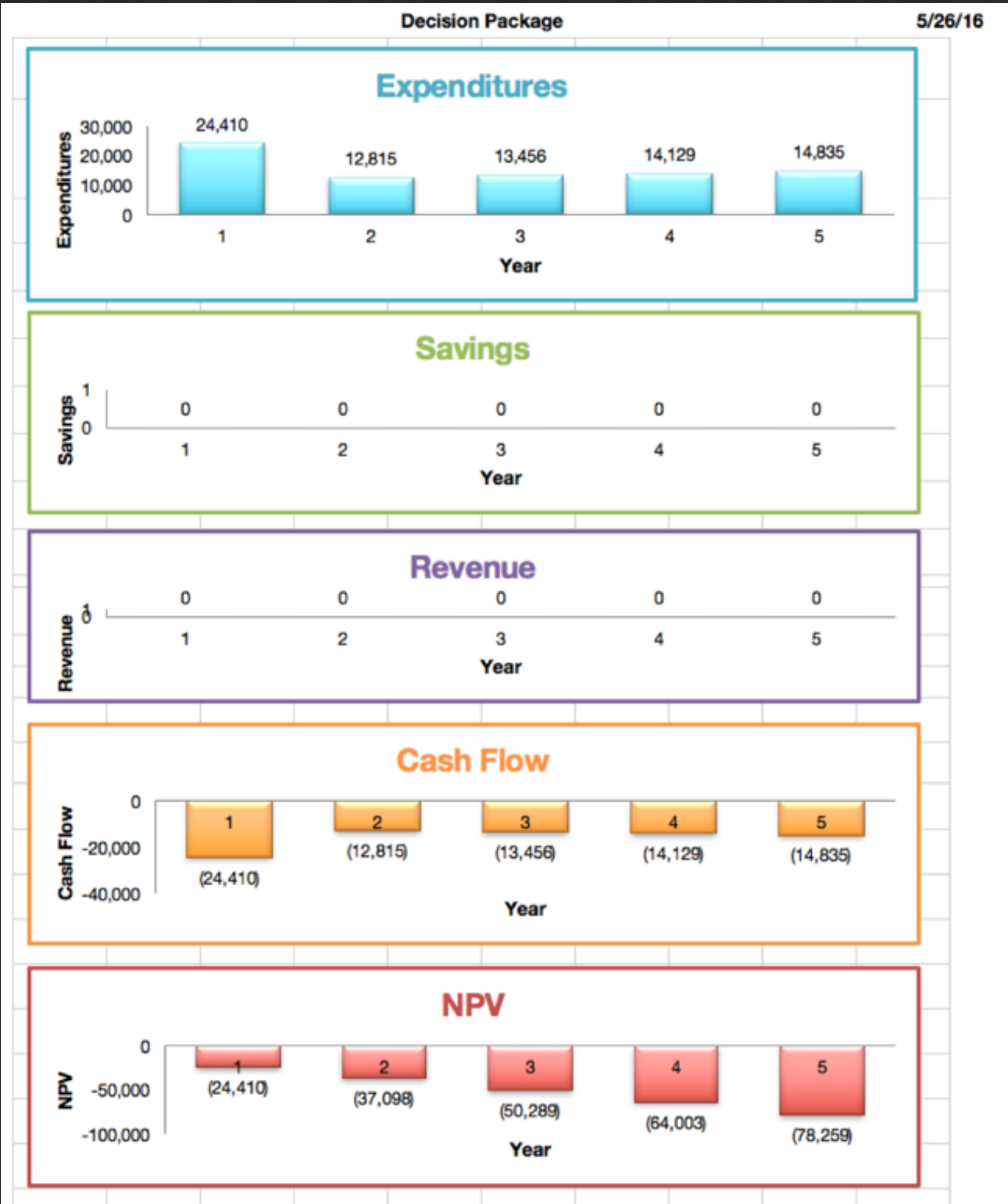
The small snapshot is just a portion of the ZBB spreadsheet used for preparing for FY17

Extracting value from ideas and proposals is not always clear. To help get a handle on the costs of a project that might involve several iterations or options, IT also uses a decision packet. This is a spreadsheet that allows one to record the anticipated costs and financial benefits over a five (5) year period. An actual sample of one appears in [Figure 5.8](#).

FIGURE 5.8

Decision Package						5/26/16	
Project Brand Name: <i>(if applicable)</i>	Atlassian Tools - 2K Users - On Prem				Project # <i>(if applicable)</i>	TBD	
Description:	These are the software tools necessary to build platforms for the IT Department and the University to facilitate collaboration, knowledge mgmt, and request tracking that is centrally located for easy access and easy use. (This is a small installation that may need to be expanded if well adopted.)						
Cost Estimate: <i>(Identify each by line item)</i>							
Confluence (collaboration component): 2,000 users; \$16,000 list (Year 0) with \$8,000 list support & maintenance; (Year 1-4)						26,103	
JIRA (task & tracking component): 2,000 users: \$16,000 list (Year 0) with \$8,000 list support & maintenance; (Year 1-4)						26,103	
Crowd (SSO component tying Confluence & JIRA together): 2,000 users; (Price breaks stop at 500 users.) \$8,000 list (Year 0) with \$4,000 list support & maintenance (Year 1-4)						13,051	
Gliffy for Confluence: 2,000 users: \$8,000 list (Year 0) with \$4,000 list support & maintenance (Year 1-4)						13,051	
Balsamiq for JIRA (Confluence is less) (mockups): 2,000 users: \$8,000 list (Year 0) with \$4,000 list support & maintenance (Year 1-4)							
Bamboo for JIRA (continuous integration, deployment, & release mgmt): 1 agent: \$800 list (Year 0) with \$400 list support & maintenance (Year 1-4)						1,305	
Stash (Git Code Repository Mgmt component): 10 users; \$10 list (Year 0) with \$5 list support & maintenance; (Year 1-4)						33	
Calculations include Atlassian's academic discount of 50%.						Ck & Bal	
Includes an industry standard 5% annual software escalation rate.						79,645	
Year	Expenditures \$	Savings/Cost Avoidances \$	Revenue \$	Cash Flow \$	Discount Factor (Set % below to mkt opp rate*) 1	NPV Net Present Value	
0	24,410	0	0	(24,410)	1.0000	(24,410)	
1	12,815	0	0	(12,815)	0.9901	(37,098)	
2	13,456	0	0	(13,456)	0.9803	(50,289)	
3	14,129	0	0	(14,129)	0.9706	(64,003)	
4	14,835	0	0	(14,835)	0.9610	(78,259)	
Total	\$79,645	\$0	\$0	(\$79,645)		(\$78,259)	
Breakeven:					N/A		
EVA (Economic Value Added - assumes opportunity costs):					(\$78,259)		
ROI (Five year):					-100%		

FIGURE 5.9



IT takes financial stewardship very seriously and invests monies that will support the objectives and goals of the institution.

CONCLUSION

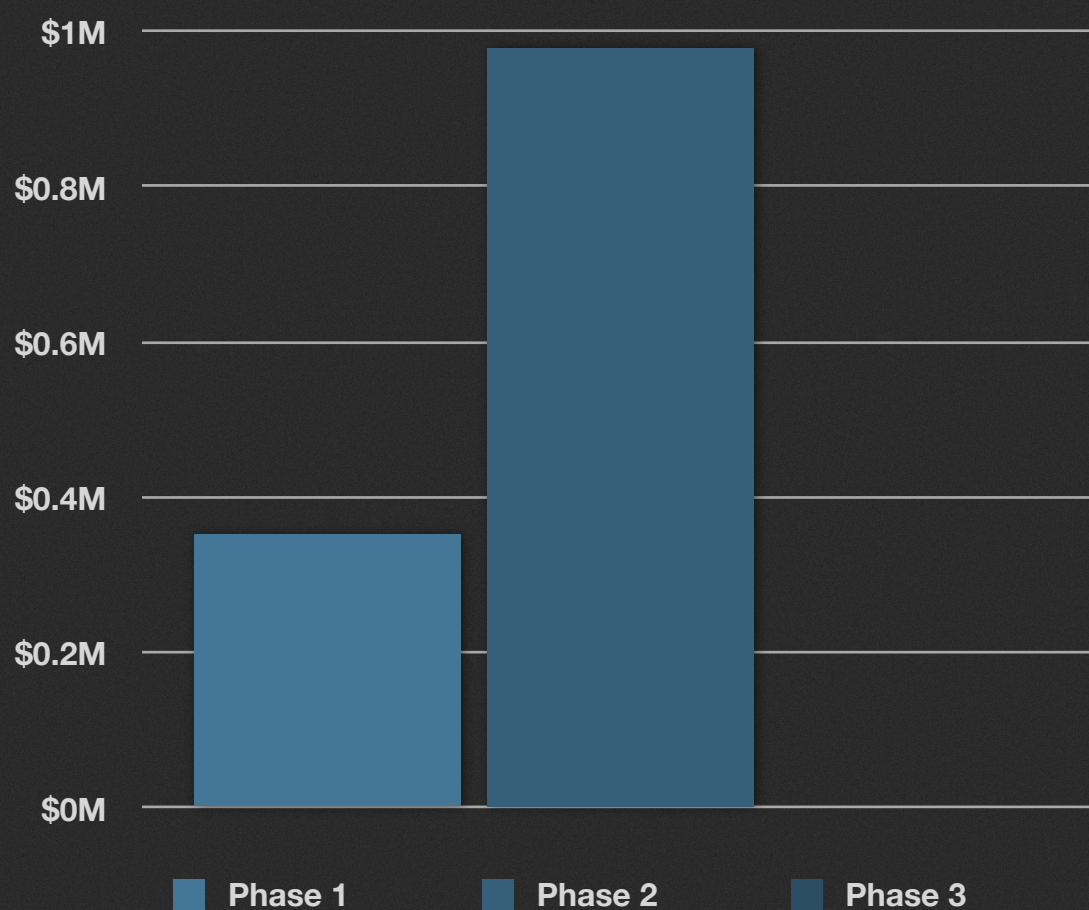
The financial resources and prospects for SCSU and IT are at a critical juncture. This situation is not unique to SCSU or the Connecticut State Colleges and University System (CSCU). To continue the patterns of the past decade may be a recipe for disaster. To think that the situation will magically improve without acting, without making good decisions, without 100% commitment is naive. There is little room for error. Some of the projects that are expected to help SCSU “jump the curve” are a more robust network, a more economical and powerful internet provider, a more economical VoIP phone system, a better managed supply of computers, up-to-date teaching technologies, new backup solutions, retirement and replacement of outdated systems, redesign of the student experience, increased system monitoring, and the establishment of enterprise redundancy to minimize the impact of single points of failure. Despite the efforts to “jump the curve”, significant risk remains that will require ongoing commitment.

Addendum

THE 21ST CENTURY CLASSROOM INITIATIVE: COMPLEX EXECUTION AND THE COLOR OF MONEY.

The 21st Century Classroom initiative from the System Office is funded with 2020 initiative funds. It is a wonderful opportunity to improve the learning environment at each institution in the system. The initiative provides funding that would be hard to secure otherwise. The initiative has three phases. Phase 1 was completed in 2015 and represented the “dream” phase. Phase 2 is in process during 2016 and represents improvements to learning environments. Phase 3 is scheduled for 2017. Phase 3 funds will be for improvements to learning environments just like Phase 2, but is meant to exhaust the budgeted funds for the 21st Century Classroom initiative. SCSU is very thankful to be entrusted with these funds to make a difference in student lives.

FIGURE 5.10 21st Century Classroom Budget - IT Managed Funds



Source: SCSU Finance

Phase 1 involved the opportunity to create a dream room at each institution in the Connecticut State College and University (CSCU) system. During 2015, SCSU created a unique educational environment in Davis 118 (DA 118). After completion, this room was handed over to the School of Education. (Ongoing support and maintenance for the room was not provided by the initiative. At this time, IT and the School of Education are unaware of how it will be maintained.)

The original team that envisioned DA 118 did not remain involved and/or left SCSU before it was completed in 2015. This led to some project management issues and some “vision” debates between those trying to complete the project. The project was completed and a great deal of thanks needs to go to IT’s Support Services, IT’s Network Team, and various representatives from the System Office and their sister institutions in Hartford.

Originally, Phase 1 had cost limitations on each institution’s dream room. At some point those cost restrictions were removed. The final cost to create DA 118 was \$223,715, not including the university supervision, planning, and management hours required.

SCSU was able to expand Phase 1 when the initiative temporarily broke from the original phase plan and wanted to accelerate progress. SCSU submitted funding requests to complete the technology needs in what became known as 2nd Floor Buley. These rooms were chosen because the budget to complete Buley had been exhausted and the rooms were not completed nor ready to receive students in the fall. IT Support Services needs to be recognized for going above and beyond to help the institution.

The final initiative cost to complete 2nd Floor Buley, which included BU 202, 204, 205, 206, & 207 was \$128,265.

Despite the temporary shift in the plan to accelerate progress and the promise of almost \$1.2 million dollars to SCSU's IT Department in 2015, the initiative reverted to the original phase plan. This hurt the university because plans were already made that could not be executed. The rooms left in limbo were:

EN B 111	EN C 136	DA 124
EN C 113	EN C 138	DA 211
EN C 132	EN C 140	DA 218
EN C 134	DA 120	DA 224

IT Support Services scrambled to create a solution in time for fall term. The solution proved unacceptable to the teaching community. IT Support Services quickly assessed the problems, garnered input, and came up with the best affordable temporary solution. The urgency was great enough to enact the Zero Based Budget (ZBB) and redirect more than \$10,000 of OE-IT for the temporary solution. The temporary solutions took the rooms through graduation 2016.

These rooms became the highest priority for 21st Century Classroom funding in Phase 2. Due to the delay from 2015, IT had to contribute additional funds to cover the cabling and electrical work. 21st Century Classroom funding was secured and work began in May 2016 with work completed in June 2016. The cost and budget was \$344,395, however the Finance-Facilities costs are unknown to IT and are not included.

Phase 2 of the 21st Century Classroom initiative involved the leftover rooms from 2015 listed above, numerous additional rooms, and some special projects.

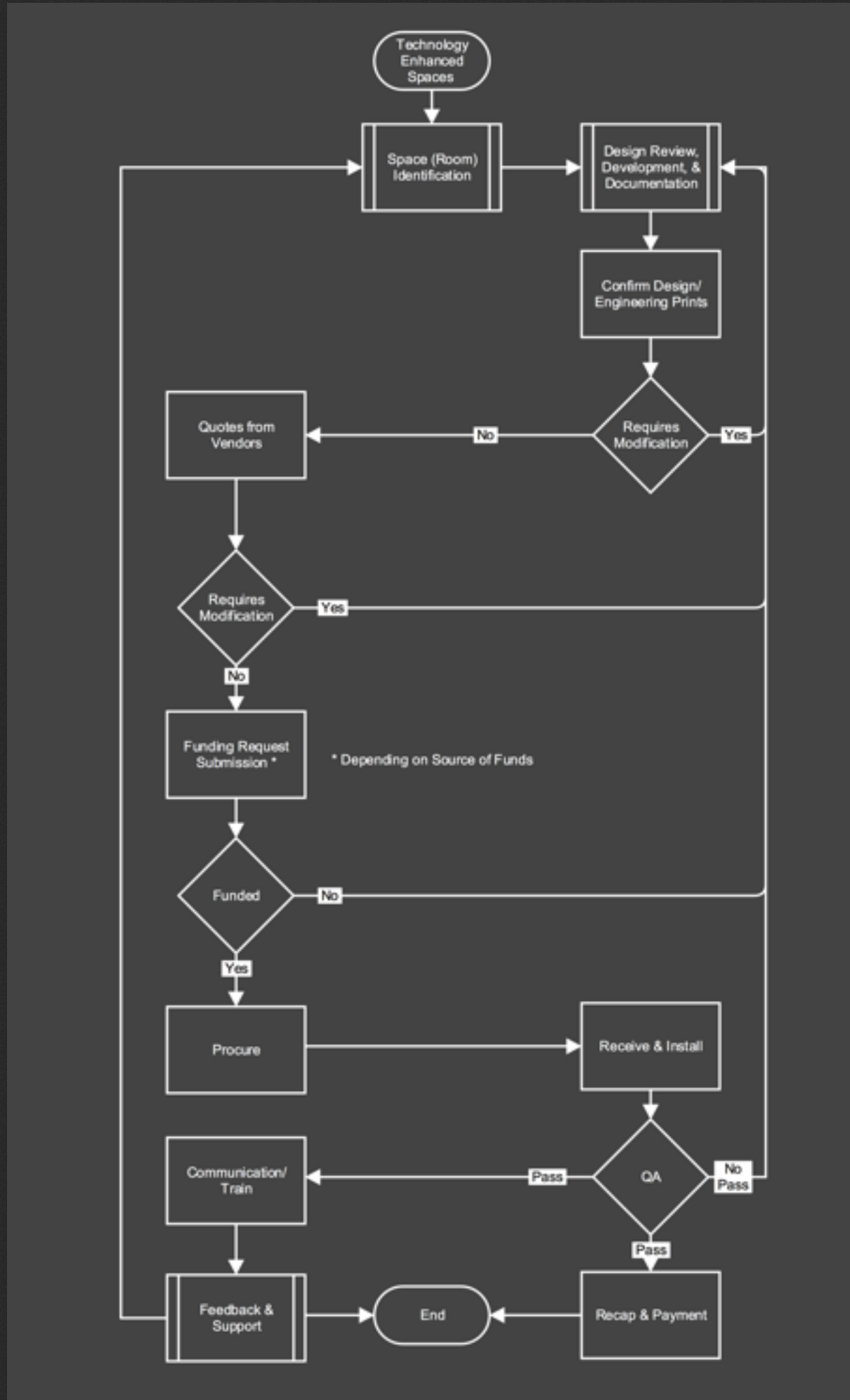
A group of stakeholders led by the university's staff architect identified which rooms were to be jointly worked on using 21st Century Classroom funds and funds from SCSU. IT submitted and received funding for:

EN A105	EN A113	EN Coo8
EN A107	EN A115	EN Co10
EN A109	EN A117	

The good news is that funding was received April 19, 2016. The bad news is that the rooms were not fully funded because in order to maximize the likelihood of getting funding in time, the original cost estimates were used. IT employed a much more rigorous engineering review process that will benefit the institution, but resulted in changes. Only ~10% of the original quote remained unchanged. Instead of putting funding and the rooms at risk, IT enacted ZBB and reprioritized projects to be able to make up the difference. These rooms are being renovated with a mix of funds that includes, 21st Century Classroom funds, funds from Finance-Facilities (Fit & Finish), and OE-IT funds. The 21st Century Classroom funding and OE-IT funds for these rooms comes to \$322,252, again however, the Finance-Facilities costs are unknown to IT and are not included.

The diagram below depicts the steps IT takes to complete a room improvement, particularly for the 21st Century Classroom initiative.

FIGURE 5.11 Technology Enhanced Spaces Implementation Process



Source: Office of the CIO

The project is on schedule and all vendors are engaged with various SCSU parties. The timeline is tight, especially for IT's portion, but vendors were apprised of this prior to submitting proposals. The removal of existing equipment is scheduled for June 02-08, 2016. The installation of the new equipment is scheduled for August 04-16, 2016. IT is not comfortable blindly believing vendor (internal and external) promises of compliance to timelines. IT will actively manage their vendors, but past performance does not suggest that all due dates will be met. Expectations are that the work will be done for fall term in 2016.

The amount and degree of joint funding and what could be done during the 2016 summer was not known from the outset. Fortunately, some numbers came in that allowed Finance-Facilities to add the next room on the list, which was JE 114. It was made part of Phase 2 of the 21st Century Classroom initiative. A separate request for funding by IT was made and received: 21st Century funding: \$45,453, however, the Finance-Facilities costs are unknown to IT and are not included.

JE 114 is on the same schedule as the 2016 summer group of rooms.

SCSU's IT was informally told it would be entrusted with \$958,000 of 21st Century Classroom initiative money in Phase 2 in 2016. That was never confirmed, but with that in mind, IT proceeded to make plans to use those funds.

IT-Support Services was aware of technical problems with EN A120. IT was initially informed that this space would not receive any additional funding from SCSU. That situation changed, but to what extent is not perfectly clear. IT intends to proceed with the renovations during summer 2016. A separate request for funding by IT was made and received: 21st Century funding: \$193,489, however, the Finance-Facilities costs are unknown to IT and are not included. Work on this room is currently scheduled for August 2016.

The remaining Phase 2 portion of the 21st Century Classroom initiative rooms and projects will be undertaken by IT without any additional financial support from SCSU.

In an effort to improve classroom technology support, IT decided to begin the process of implementing remote management. A separate request for funding by IT was made and received: Fusion - 21st Century funding: \$101,620.

The projects already listed essentially deplete the Phase 2 resources. IT realized the challenges that SCSU had with submitting actionable requests and decided to put a room into play in case there were unused funds. This was coordinated with the owner of the space and that department understood that no promise of completion was made.

The technology situation in this room was not ideal and should be upgraded. With all of the factors mentioned, this was the right room to put in play for possible and not guaranteed funding. Right before this went to publication, IT learned that the room was funded. EN B014 - 21st Century funding and OE-IT funding is \$33,554.

The furniture in this room was quoted, but funds were not available. The plan is to re-use some furniture from either JE 130 when it is disassembled or from storage. This does not fall under IT's purview or responsibility.

IT exceeded its 21st Century Classroom initiative budget by just over \$20,000. This was communicated in advance to the System Office and the funding was greatly appreciated.

Though the projects below are not part of Phase 2 of the 21st Century Classroom initiative, they will benefit from it. The larger 21st Century Classroom initiative projects listed earlier freed some equipment that should still have value to SCSU. A late request came from the Art Department to provide better AVTV to Earl Hall in rooms EA 104, 107, 202, 204, and 207. A feasible and economical solution was crafted that is scheduled for completion before June 30, 2016. OE-IT Budget: \$13,054.

IT was aware that EN C112 needed technology improvements. It was to be done with EN A120, but time and funding did not permit this for summer 2016. At some point SCSU personnel raised a fuss over its condition. As an interim fix, IT enacted ZBB and reprioritized projects to find funds to address the most egregious conditions. Realize that this is not the best investment because it is a bandage when surgery is needed. IT's perspective and hope is that what is learned from the EN A120 project will help create the solution for EN C112. The quick fix work on EN C112 is scheduled and to be done by June 30, 2016. OE-IT Budget: \$8,745.

These are the classroom renovations that are part of Phase 2 of the 21st Century Classroom initiative or are affected by them with work planned for summer 2016.

These projects are not simple and rely on numerous firms and people, all working and coordinating together. Some luck would be nice, too. These changes are meant to improve the educational experience at SCSU.

Phase 3 of the 21st Century Classroom initiative is being discussed. It is to take place in 2017. Rumors abound around how much funding will be available. It may be as much or more as what was provided in 2016 or it may be just a small fraction of it. Planning will proceed with optimistic numbers, but no commitments will be made until firm funding numbers are provided by the System Office. At this time, the 21st Cen-

21st Century Classroom initiative is to be closed with Phase 3. Funding sources for classroom upgrades beyond this are unknown.

SCSU and its IT department rely on numerous funding sources. The 21st Century Classroom initiative is an excellent example of how numerous types and sources of funds come together to make change happen. Numerous departments at SCSU and in the State work together to make this change happen.

IT Governance

“Innovation doesn’t come from ideas, per se, it comes from courage!”—Jerry Gregoire



Background

Between the last quarter of 2014 and the first quarter of 2015, Southern adopted an Enterprise and Administrative Systems Governance (Governance) plan. The governance plan formalized the process by which changes are made to enterprise and administrative systems (primarily Ellucian’s Banner ERP for higher education and any system that integrates with Banner) that support the business, administrative, and student operations of the university. With the oversight of an Executive Committee (EC) and the work of the Governance Committee (GC), requests for changes to systems are prioritized and implemented. Via Governance’s charter, principles, and documented proc-

esses, SCSU, as an institution, determines how best to use limited IT resources to achieve goals and objectives.

It is important to note that this particular governance structure and its related processes are unique to the governance of Southern's IT enterprise applications and should not be confused with any other governance structures or processes at Southern or within the Connecticut State College and University System. The EC is comprised of members of the President's cabinet. The GC is appointed by the EC. Each EC member is allotted a specific number of GC seats. EC and GC members have the ability to make requests in the Governance system. EC and GC members also identify individuals from their respective areas who need to be able to make requests. Currently, there are no limitations to the number of requestors because the number was set so high.

Charter

OBJECTIVE

This charter establishes a university-wide governance framework for the management of enterprise systems.

PURPOSE

Enterprise systems are applications that support the business, administrative, and student operations of the university. This charter defines the mechanism for the system owners, data stewards, data managers, and users of enterprise systems to work collaboratively to make decisions, establish priorities for resource utilization/assignment, and establish consistent practices in the development, maintenance, operation, and enhancement of the university's enterprise systems portfolio.

STRUCTURE

This charter calls for two (2) committees to manage governance.

1. The Executive Committee is comprised of university cabinet members.
2. The Governance Committee is comprised of system-owner/subject matter expert designees assigned by Executive Committee members, the Faculty Senate President, and the Administrative Faculty Senate President. The Executive Committee member, Faculty Senate President, and Administrative Faculty Senate President are allotted a specific number of appointments:
 - 4 from Academic Affairs
 - 4 from Finance & Administration
 - 4 from Student Affairs
 - 4 from Enrollment Management
 - 2 from Institutional Advancement
 - 1 from Human Resources
 - 1 from Faculty
 - 1 from Administrative Faculty

The Governance Committee has two decision-making methods to conduct business.

1. For expediency and collegiality, the Governance Committee may use consensus.
2. When requested by a Governance Committee member, formal voting and operational procedures may be used to make decisions and conduct business. Only appointed Governance Committee members hold voting rights and each Governance Committee member gets one vote.

The Director, Technology Administration will facilitate the Governance Committee meetings and will include additional IT representatives as needed. IT does not have voting privileges.

COMMITTEE MEETINGS, ROLES, AND DUTIES

The Executive Committee meets on an as-needed basis but must meet at least semi-annually. During these meetings the Executive Committee will:

- Formulate directions necessary to guide the Governance Committee's work.
- Determine any structural or membership changes to the Governance process.
- Review updates and reports provided by the Governance Committee.
- Address and resolve Governance Committee impasses.
- Conduct other business as necessary to ensure effective executive governance.

The Governance Committee meets at least quarterly. During these meetings the Governance Committee will:

- Implement governance directives from the Executive Committee.
- Execute the governance processes it adopts as a committee and amends/ documents in the Governance Charter.
- Review requests and status updates.
- Approve meeting minutes.
- Deliberate and discuss requests and updates for prioritization.
- Prioritize requests. Only Governance Committee members may vote in the prioritization process.

- Produce updates and reports on the Governance Committee’s work for the Executive Committee.
- Identify and confirm those who are authorized to submit IT requests.
- Develop a common practice for authorizing access to enterprise system modules including a common practice for access to Personally Identifiable Information data.
- Conduct other business as necessary to provide effective and efficient governance.

Principles

Enterprise systems are applications that support the business, administrative, and student operations of the university. The goal is to work collaboratively to make key decisions, establish priorities for resource utilization/assignment, while implementing consistent practices in the development, maintenance, operation, and enhancement of the university’s enterprise systems portfolio. These principles are closely aligned with the university mission and are intended to support the broader educational priorities that best benefit the students, the university, and the greater New Haven region.

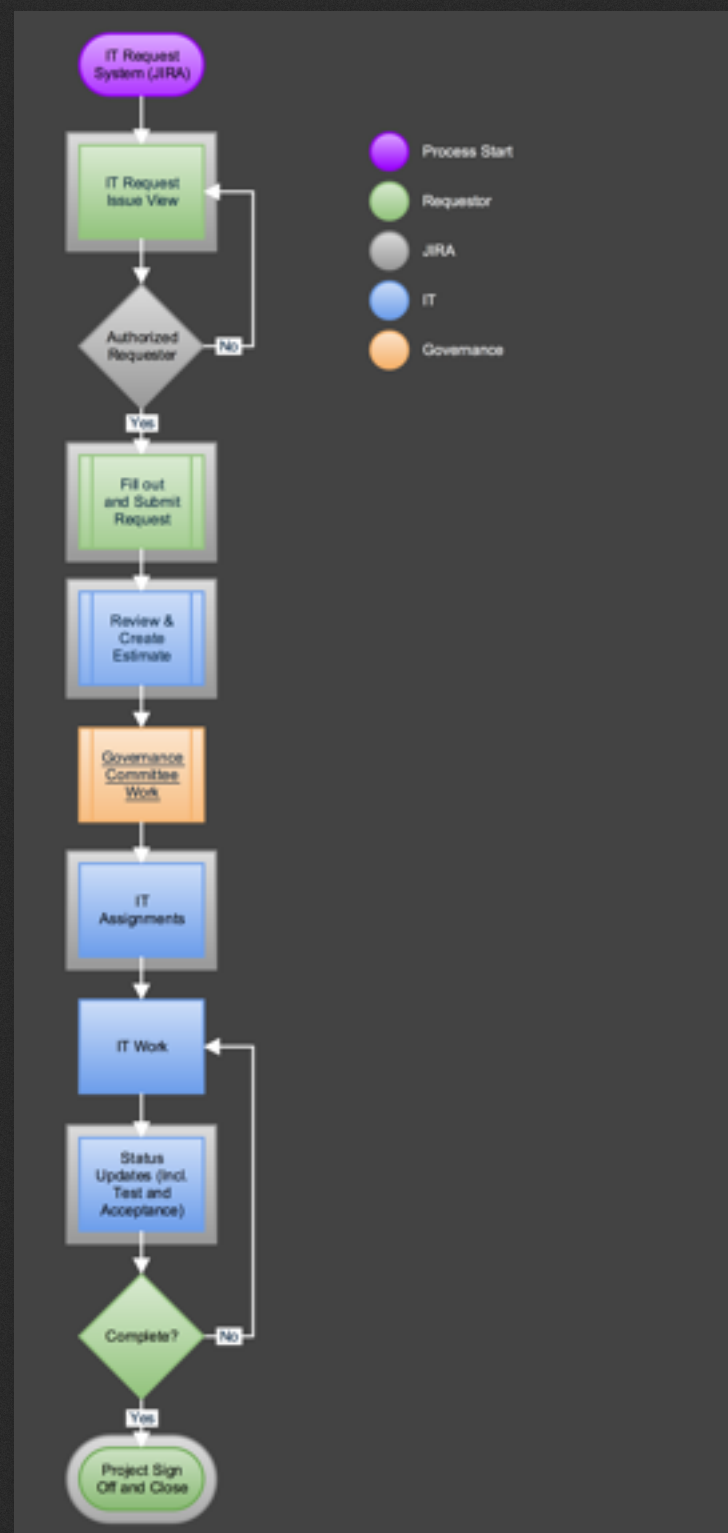
- Keep in mind the vision, mission, and strategic plan for the institution.
- Focus on the customer and always take into consideration impact on the student.
- While representing specific interests, balance them with what is right for the institution.
- Act and vote in such a way that you would be proud and eager to stand up for your choices while offering full transparency.
- Take into account time frames (short, intermediate, long) with emphasis on solutions that have the best and longest lasting positive impact and benefit.

These documents steer the governance process. To understand the governance process, please refer to the diagrams for the Governance Process, Governance Committee Work, and Request Workflow. The color of the shape identifies who handles the task and background colors indicate task contributors/facilitators.

These diagrams depict processes and the checks and balances incorporated to perpetuate systematic improvements with minimal risk.

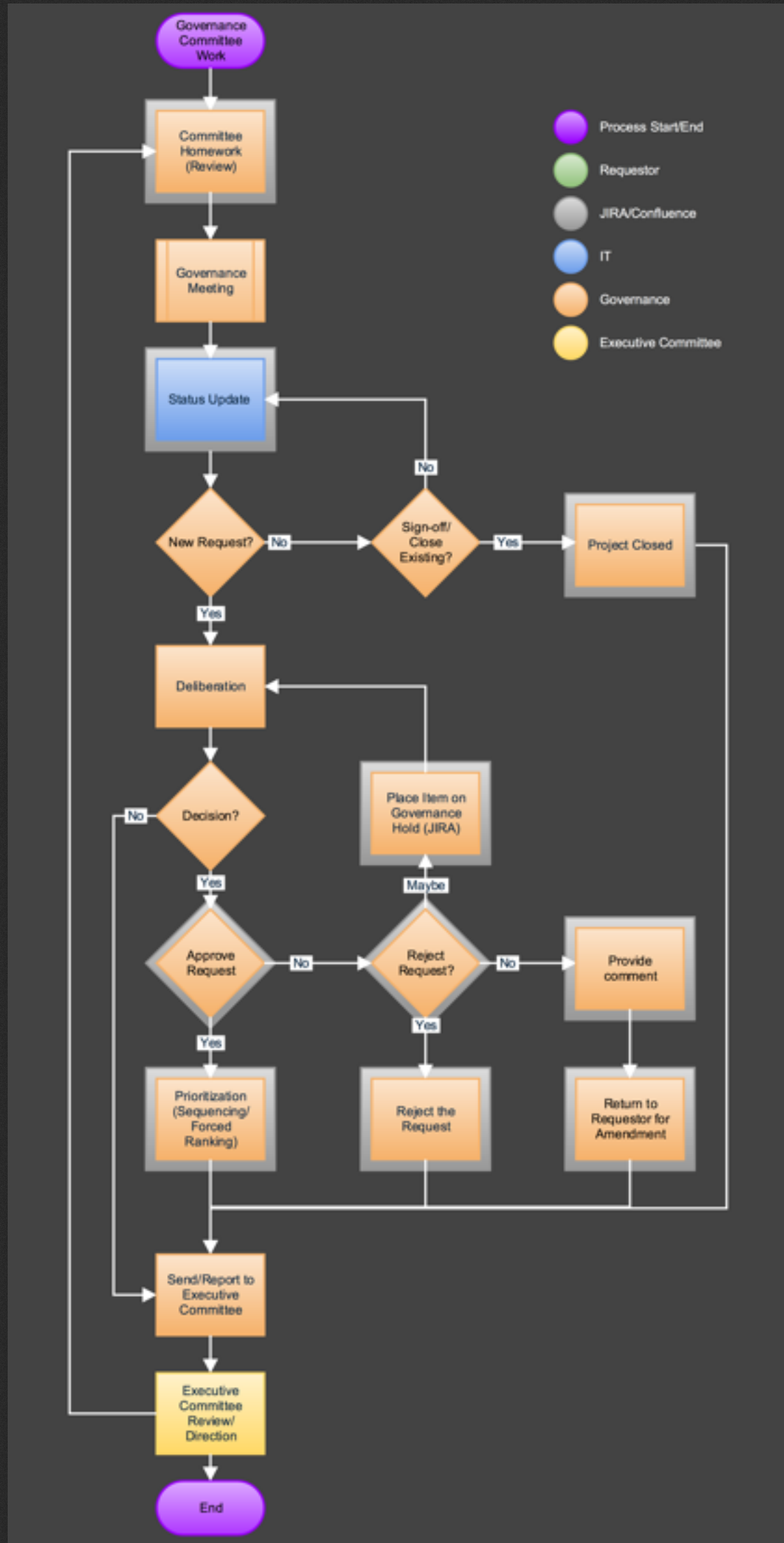
All of these documents are available and kept up to date online. Access is available, but must be authorized by EC or GC members.

FIGURE 6.1 Governance Process



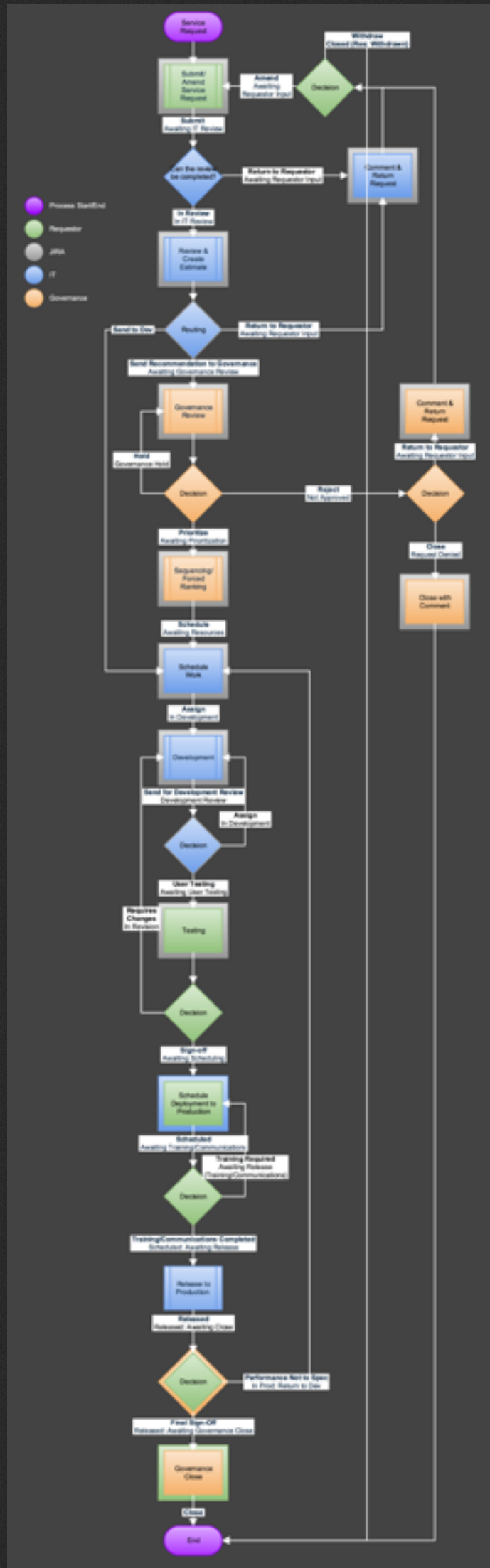
Source: Office of the CIO

FIGURE 6.2 Governance Committee Work



Source: Office of the CIO

FIGURE 6.3 Governance Request Workflow



Source: Office of the CIO

In support of enterprise systems, the GC also works to develop common practices for authorizing access to enterprise system modules including a common practice for access to Personally Identifiable Information (PII) data. These efforts are ongoing.

A side benefit of Governance is as a communication platform. With representation across the institution, it has become the preeminent way to disseminate information regarding enterprise and administrative systems.

Currently, the GC meets monthly. Visitors are welcomed. In fact, the GC encourages subject matter experts to be present to explain the impact of an issue undergoing prioritization.

Governance adds an important and necessary degree of professionalism and systemization as the institution develops and evolves.

Technical Architecture

“When I have understanding of computers, I will be the supreme being.” –Evil (Time Bandit)



Background

The Network Convergence project began in the Fall of 2013, an initiative approved by the ConnSCU BOR and led by the CIO at the BOR. Southern Connecticut State University has partnered with Presidio to upgrade the existing network infrastructure to streamline IT efficiencies and technologies across Connecticut universities. Presidio, working in conjunction with Cisco, provided network design, bill of materials, quotations, and professional services for the SCSU New Haven Campus.

Convergence Project

CSU BUSINESS REQUIREMENTS

Create a CSU Next Generation Network (NGN) Architecture to provide Mission Critical Services

- All CSU campuses should have identical networking functionality – the network should not be a differentiating factor between CSU schools
- Common, Scalable, Repeatable Architecture
- Consistent User Experience
- Wired or wireless on any device
- CAPEX/OPEX Efficiencies

CSU TECHNICAL REQUIREMENTS

Create a CSU NGN Architecture to provide Mission Critical Services

- High Availability – architecting for redundancy & resiliency
- Scalable – to meet both today and future network requirements
- Modular – architecture must be deployable from the Community College to the University level standardizing on network products and providing consistent capabilities
- Reduce CSU CAPEX and OPEX costs: Design once – deploy across multiple campuses

User Experience

- Seamless SECURE connectivity for all CSU schools

- Inter-school Wired/Wireless Access for student, staff & faculty
- Role Based Access Control – providing segmentation and authentication to user resources

Network Management/Monitoring

- Fault isolation
- Proactive vs Reactive network management
- Leverage built in technologies

DOCUMENTATION OVERVIEW

This document provides a capture of high level technical design elements of the SCSU network convergence upgrade implemented within the network Core, Distribution and Edge. The existing Distribution and Access networks were limited to one (1) Gigabit connections between the Access layer and Distribution/Core. Original network equipment in the Distribution and Access network included 6509's, 4500's, 3750's and older switches. The intent of the upgrade is to replace the existing switches with 4500x VSS technology for Distribution layer and 3850's stacks for Access layer and provide two (2) ten (10) Gigabit redundant connections between Access Layer to Distribution. The backbone between the Distribution and Core layers is four (4) ten (10) Gigabit connections. The network convergence is composed of the following projects:

CORE

The Core has been extended into 3 buildings with 2 6807 Cisco switch pairs providing full redundancy on a 40 Gig backbone. The Core is routed using OSPF protocol. Virtual routing and Forwarding (VRF) instances are employed to maintain separation between the zones (Students, 3rd party, Faculty & Staff etc.).

DISTRIBUTION

The Distribution has been extended into 7 buildings with 2 – 4500X's Cisco switch pairs providing full redundancy on a 20 Gig backbone. Distribution aggregates Access switches and provides uplinks to the Core of the network. VSS Virtual Switching System enables 2 switches to appear on the network as one – providing redundancy and higher port density. Routing via OSPF and VRF is deployed here as well.

EDGE

The Edge uses stacks of Cisco 3850 switches with redundant power supplies, a new UPS in 80 telecom closets with routing at the edge and 1Gbs connections for end points. Network policies and features are applied here. Layer 3 routed access is in use as well as limited Layer 2 switched access until older technology (systems) can be upgraded.

WIRELESS

700 new Cisco 3702i Access Points have been installed along with new Wireless Controllers creating a new wireless network that fully saturates the campus and is 802.11AC compliant – providing data rates up to 1.3 Gbps, roughly triple the speed of current 802.11n access points. Two new systems that assist with managing and securing the network include:

ISE – CISCO IDENTITY SERVICES ENGINE

An identity-based network access control and policy enforcement system. ISE allows a network administrator to centrally control access policies for wired and wireless endpoints based on information gathered via RADIUS messages passed between the de-

vice and the ISE node, also known as profiling. The major features that ISE solution supports include:

- Microsoft AD Integrated 802.1x Authentication Security on the Wired
- Dynamic Endpoint Profiling and Access Privilege Assignment to IP Phones, AP's and Printers
- Manually import Appliances, Cameras and devices that do not support 802.1x - via Mac addresses

The mechanism by which ISE enforces network access is to assign access privileges, in form of dACL (downloadable Access Control List), to network connection attempts based on the results of identity check, such as interactive user authentication, endpoint type and hardware addresses.

PRIME – CISCO PRIME INFRASTRUCTURE

A portfolio of management applications including Cisco Prime Network Control System (NCS) and Cisco Prime LAN Management Solution (LMS) which simplify and automate network management tasks from a single pane of glass. This new converged solution delivers all of the existing wireless capabilities for RF management, user access visibility, reporting, and troubleshooting along with wired lifecycle functions such as discovery, inventory, configuration and image management, automated deployment, compliance reporting, integrated best practices, and lifecycle management.

OSP

Inventory of existing fiber infrastructure for all buildings, Inventory of existing Outside Plant (Fiber) to/from all buildings, Manhole survey for inventory of existing fiber

and density, inventory of existing electrical in all telecom closets and list of needed circuits for UPS deployment, plus documentation of all.

IP PHONES

Deployment of the new IP Phones includes Cisco UC (Unified Communications) Business Edition 7000 – unlimited capacity, optimized for 1,000 to 5,000 users and 3,000 devices. Equipment includes 19 Virtual servers (VMWare), 12 Analog voice gateways, and 8800 Series IP phones. Core applications include Call processing (Redundant Servers), Voicemail (Unity Connection) Redundant Servers – 2250 Mailboxes, IM & Presence (Jabber) – On-premise instant messaging, presence and soft phone, Expressway – VPN-less connectivity from Jabber to above applications, WebEx Conferencing, Personal Multiparty (up to 4 in a video conference), Cisco Prime Collaboration, Unified Contact Center Express, Conferencing (Ad hoc & Meet Me), 911 Cisco CER Emergency Responder included for 3500 stations, Informacast Paging - Broadcasting – Announcement service directly to PC desktops 3000 endpoints, Music On Hold, Attendant Console.

UPS

Deployment of 76 Liebert rack mounted UPS's to provide emergency power for the new IP phones in case of a power outage.

Planned Projects

FISCAL YEAR 2017 PROJECT PLANS

- Consolidation/move of Data Center from Jennings Hall to Buley 4th floor Room 430.
- Installation of MCR fully contained network cabinets in Morrill Hall MDF and Earl Hall MDF.
- Classroom training for all network / telecom staff on all new network servers, applications.
- Upgrade to exterior of Help Desk – Buley 4th floor & redesign of interior space.
- Move 2 Staff into Buley 435 and empty Buley Room 430 for Data Center move.
- Remove old Admin network & sell.
- Remove dorm wireless network & sell.
- Move Lyman MDF into new cabinet in hallway.

FIGURE 7.1 Logical Network Overview

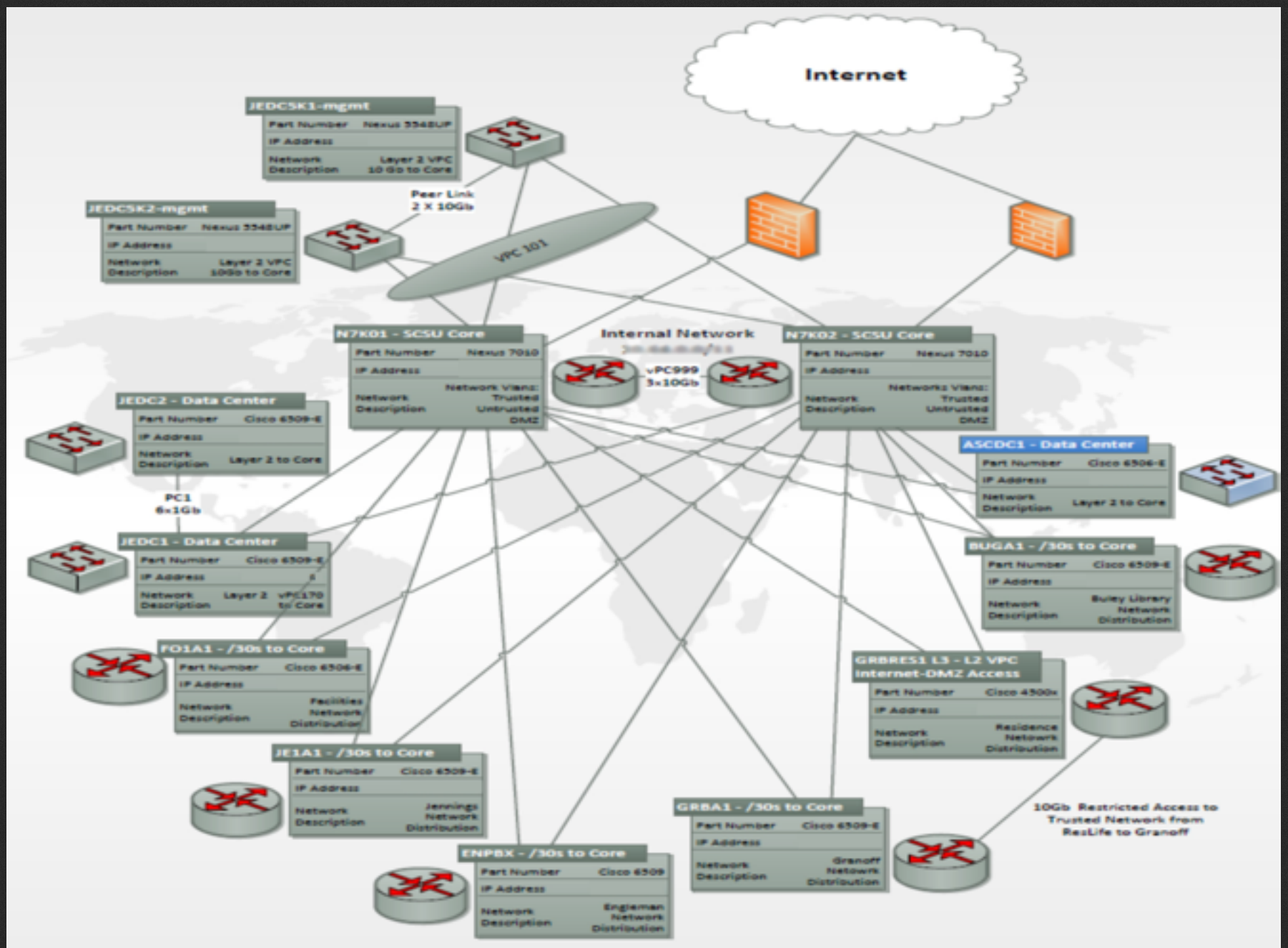


FIGURE 7.2 Physical Network Overview

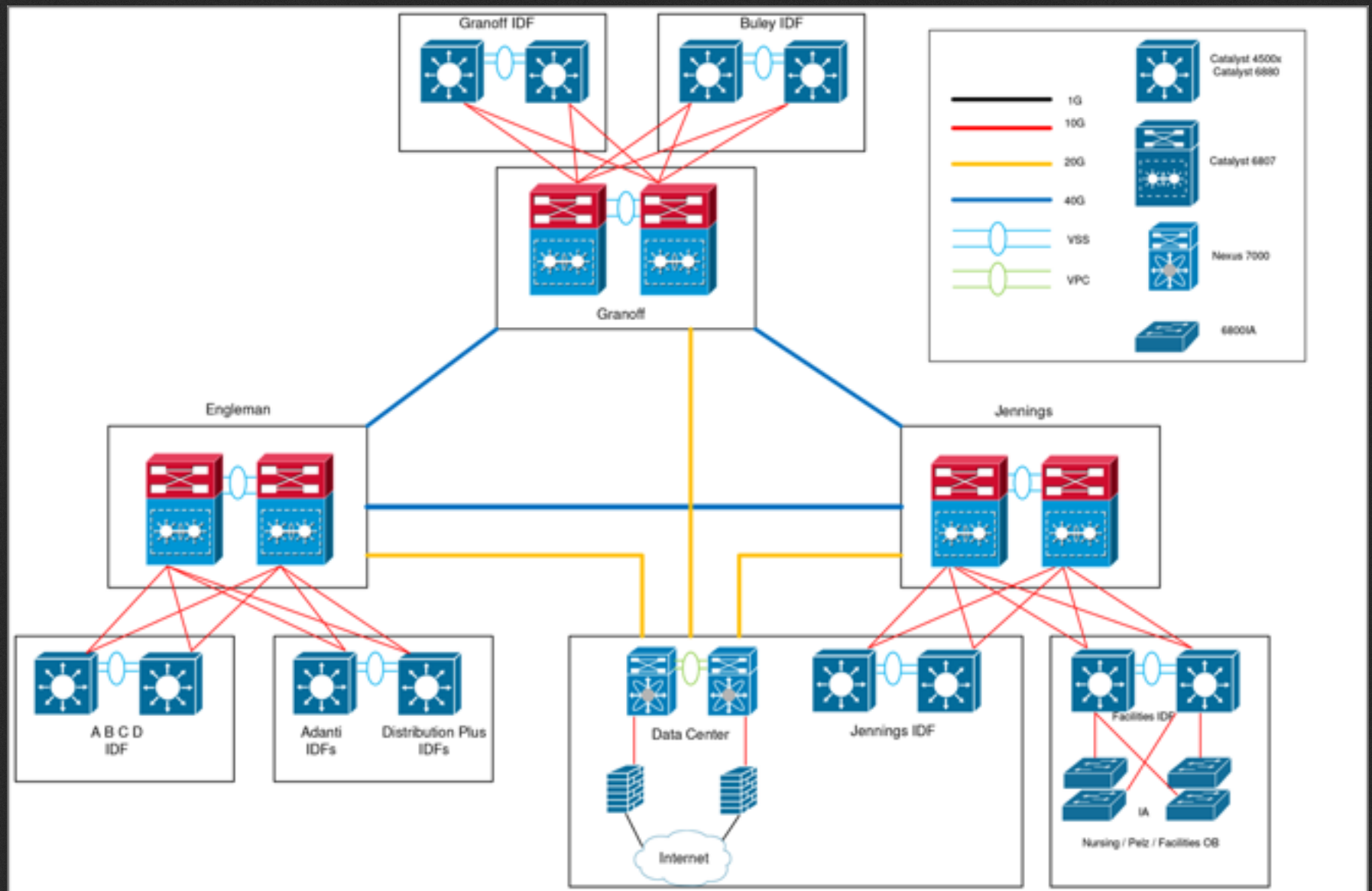


FIGURE 7.3

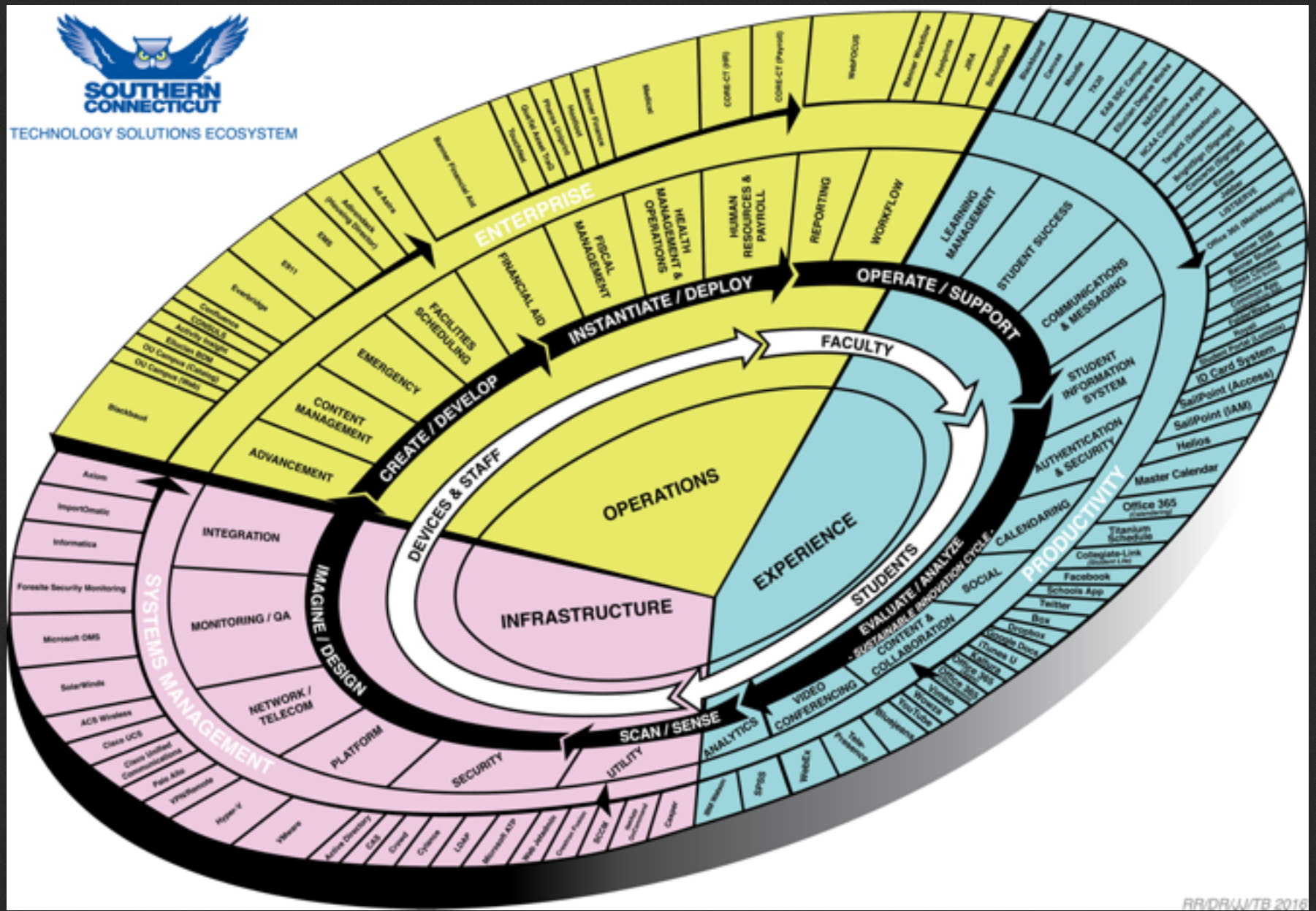


FIGURE 7.4

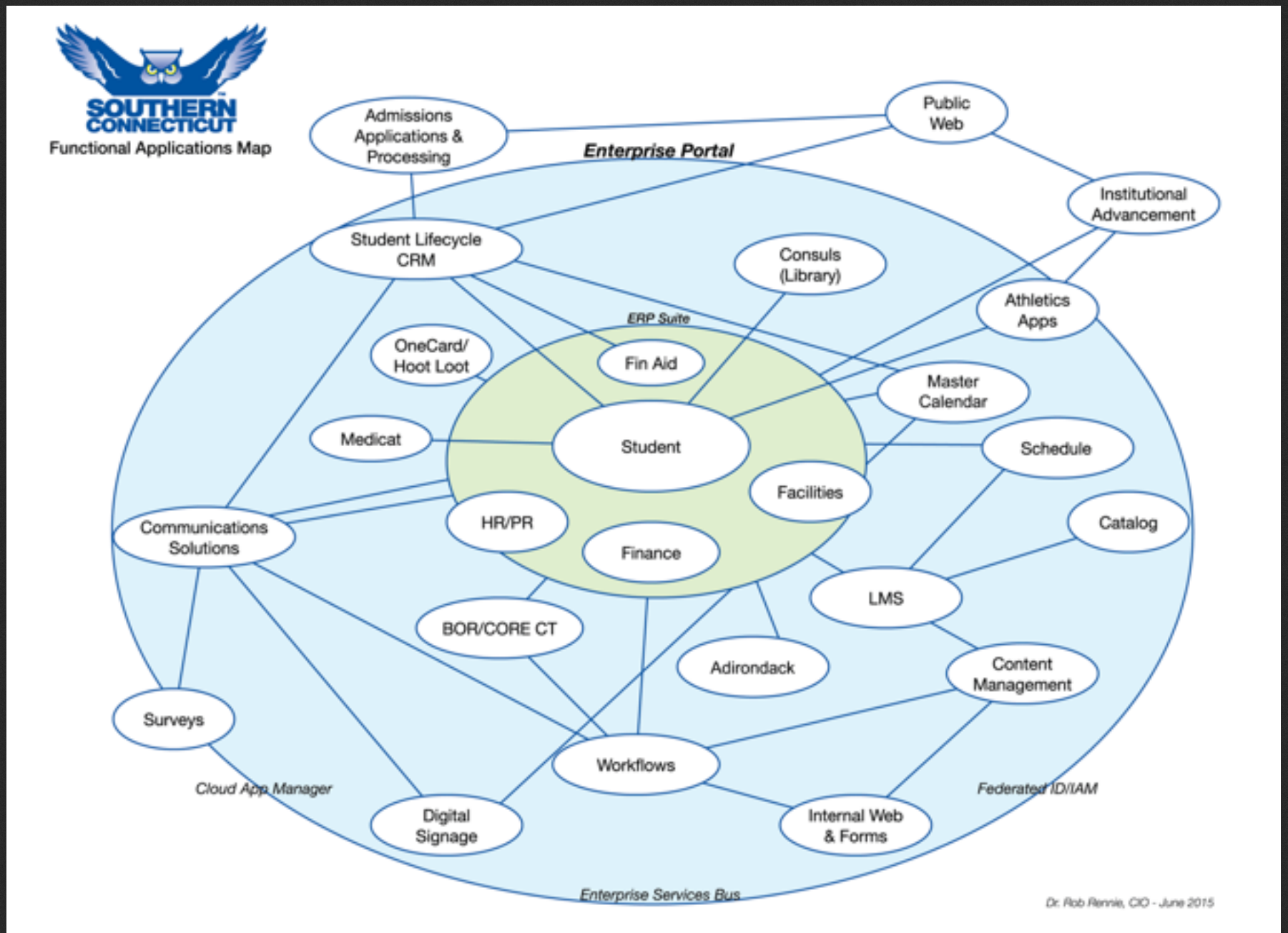
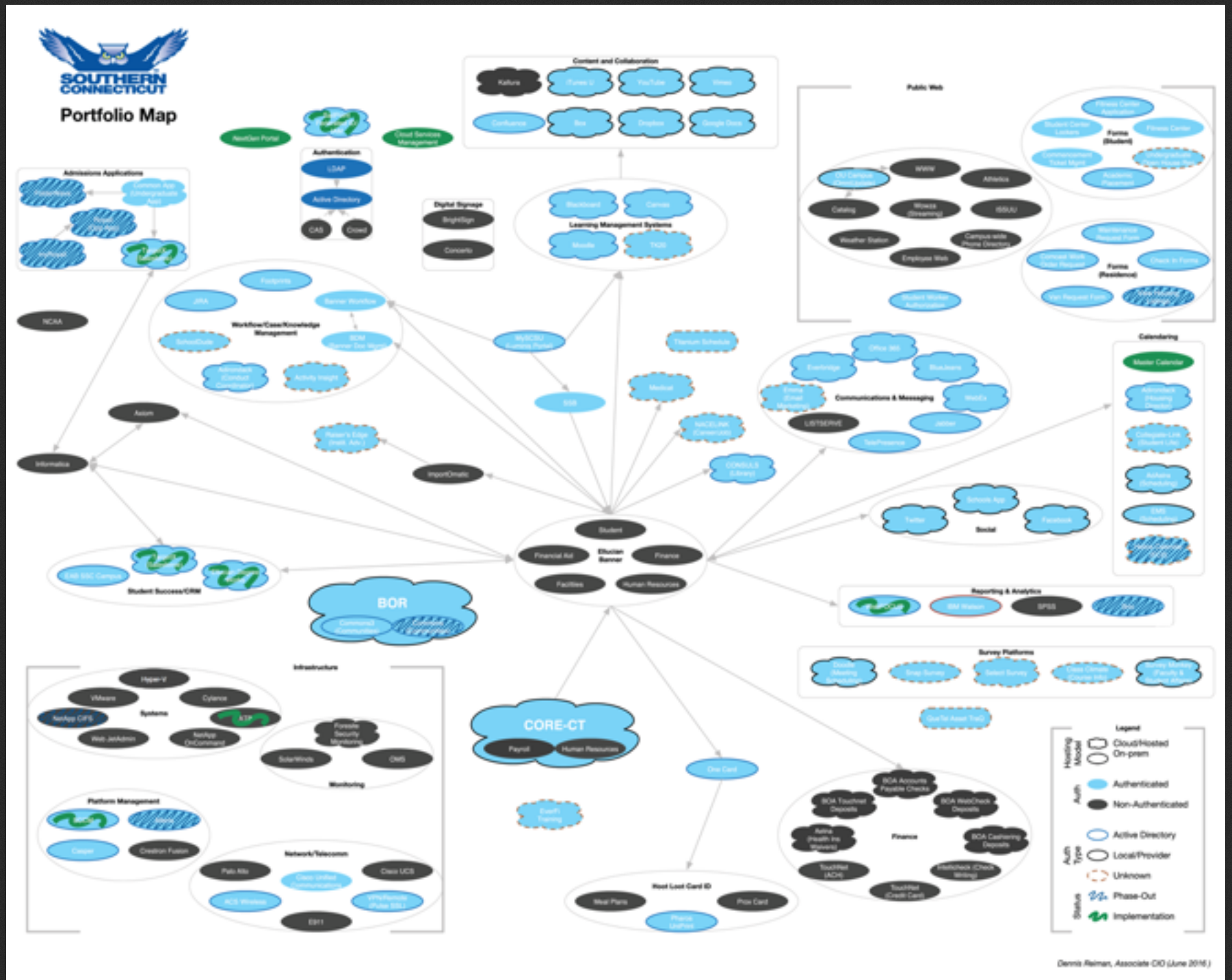


FIGURE 7.5



Appendix 1 - Technology Standards

“How much pain have cost us the evils that never happened?” –Thomas Jefferson



[Faculty Standards](#)

[Lab Standards](#)

[Classroom Standards](#)

Faculty Standards

	APPLE MACBOOK PRO RETINA (MAC)	HP FOLIO 1040 G3 (PC)
DISPLAY	13.3" diagonal LED-backlit display with IPS technology Resolution: 2560 x 1600	14" diagonal QHD UWVA LED-backlit display (touch screen) Resolution: 2560 x 1440
PROCESSOR	Intel Core i7 up to 3.4GHz with 4MB cache	Intel Core i7 up to 3.4GHz with 4MB cache
VIDEO CARD	Intel Iris Graphics 6100	Intel HD Graphics 520
STORAGE	512GB Solid State Drive	512GB Solid State Drive
MEMORY	16GB 1866MHz LPDDR3	16GB DDR4-2133 SDRAM
NETWORKING	Wireless 802.11a/b/g/n/ac Bluetooth® 4.0 Combo	Wireless 802.11a/b/g/n/ac Bluetooth® 4.2 Combo
CAMERA	High Definition camera (720p) with audio	High Definition camera (720p) with audio
PORTS	MagSafe 2 power port Thunderbolt 2 (2) USB 3 (2) HDMI (1) 3.5 mm headphone jack (1) SDXC card slot (1)	AC power (1) USB Type-C (1) USB 3 (2) HDMI (1) 3.5mm headphone jack 1 docking connector
DIMENSIONS	Height: 0.71 inch Width: 12.35 inches (31.4 cm) Depth: 8.62 inches (21.9 cm)	Height: 0.65 inch Width: 13.27 inch Depth: 9.23 inch
WEIGHT	3.48 lbs	3.15 lbs

Lab Standards

	APPLE IMAC (MAC)	HP ELITEONE (PC)
DISPLAY	21.5 inch Display	23 inch Display
PROCESSOR	Intel Core i5 up to 3.3GHz	Intel Core i5 up to 3.2GHz
VIDEO CARD	Intel Iris Pro Graphics 6200	AMD Radeon R9 360
STORAGE	1TB	500 GB
MEMORY	8GB	8GB
NETWORKING	Gigabit Physical Network Connection Wireless 802.11a/b/g/n/ac Bluetooth®	Gigabit Physical Network Connection Wireless 802.11a/b/g/n/ac Bluetooth®
CAMERA	High Definition camera with audio	High Definition camera with audio

Classroom Standards

	APPLE MAC MINI (MAC)	HP ELITEDESK (PC)
DISPLAY	*Screen size dependent on classroom configuration	*Screen size dependent on classroom configuration
PROCESSOR	Intel® Core™ i5 up to 3.2GHz	Intel® Core™ i5 up to 3.2GHz
VIDEO CARD	Intel Iris Graphics	Intel HD Graphics 530
STORAGE	512GB SSD	500GB SSD
MEMORY	8GB	8GB
NETWORKING	Gigabit Physical Network Connection Wireless 802.11a/b/g/n/ac Bluetooth®	Gigabit Physical Network Connection Wireless 802.11a/b/g/n/ac Bluetooth®

Appendix 2 - Proposed Acquisitions

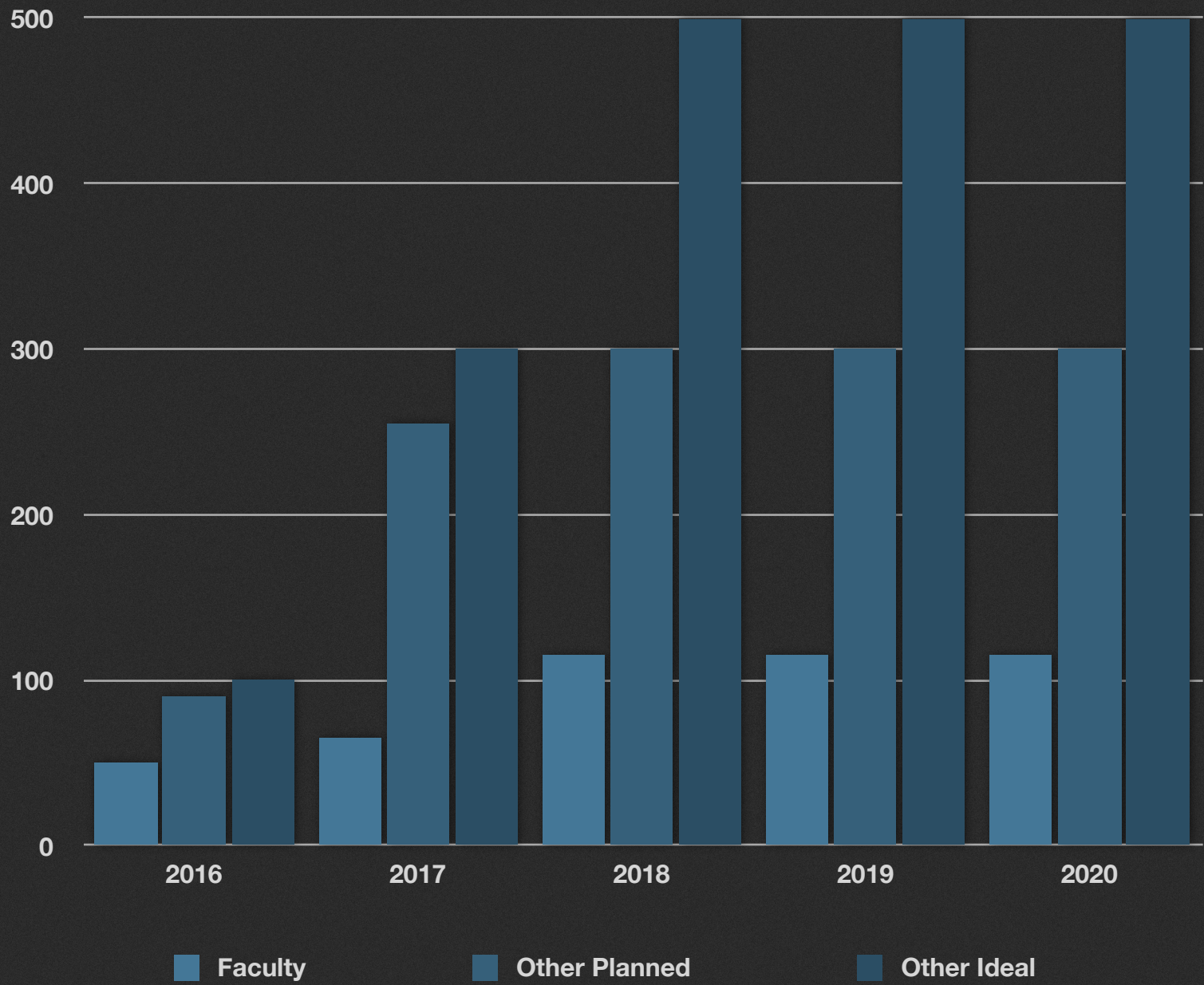
“Success is never final.” –Winston Churchill



Computer Acquisition Plan

Predictable funding is important for capital investments. This is particularly true for computers. A plan was put together based upon the current situation regarding equipment and funding sources. As technology evolves and needs change, the proposed plan will need to change with it. IT is committed to making the technology experience beneficial and productive for the entire SCSU community. The plan below extends to 2020 which is as far as funding is reasonably projected. However, as shown in [Figure 9.1](#), the planned non-faculty acquisitions are far short of ideal.

FIGURE 9.1 Computer Acquisition Plan



Citations

“Never express yourself more clearly than you are able to think.” –Neils Bohr



1. Phillip Goldstein, ‘The Future of Higher Education: A View from CHEMA’, *The Council of Higher Education Management Associations* [web document] (2006).
2. Thornton A. May, ‘Designing the Future you Want’, (Jacksonville, FL: ITLA 2006).
3. Moshe F. Rubenstein and Iris Firstenburg, *The Minding Organization* (New York: John Wiley & Sons, 1999), p. 133.

4. L. Johnson, R. Smith, H. Willis, A. Levine, and K. Haywood, 'The 2011 Horizon Report' [web document], (2011) The 2011 Horizon Report. <<http://net.educause.edu/ir/library/pdf/HR2011.pdf>>, accessed 2014, p.6.
5. L. Johnson, R. Smith, H. Willis, A. Levine, and K. Haywood, 'The 2011 Horizon Report' [web document], (2011) The 2011 Horizon Report. <<http://net.educause.edu/ir/library/pdf/HR2011.pdf>>, accessed 2014, p.7.
6. K. Woolsey, et al, 'The 2007 Horizon Report' [web document], (2007) The 2007 Horizon Report. <http://www.nmc.org/pdf/2007_Horizon_Report.pdf>, accessed 2014, p.21.
7. Eric Hoffer, *The True Believer: Thoughts on the Nature of Mass Movements* (Harper & Row, 1951).
8. R. Glaser and Thornton A. May, 'CIO Leadership Institute notes', (Berkeley, CA: UC 2006).
9. K. Woolsey, et al, 'The 2007 Horizon Report' [web document], (2007) The 2007 Horizon Report. <http://www.nmc.org/pdf/2007_Horizon_Report.pdf>, accessed 2014, p.18.
10. K. Woolsey, et al, 'The 2007 Horizon Report' [web document], (2007) The 2007 Horizon Report. <http://www.nmc.org/pdf/2007_Horizon_Report.pdf>, accessed 2014, p.25.

11. Bruce Buena de Mesquita, *The Predictioneer's Game: Using the Logic of Brazen Self-interest to See & Shape the Future* (New York: Random House Trade Paperbacks, 2010), p. 1
12. Bruce Buena de Mesquita, *The Predictioneer's Game: Using the Logic of Brazen Self-interest to See & Shape the Future* (New York: Random House Trade Paperbacks, 2010), p. 1
13. Bruce Buena de Mesquita, *The Predictioneer's Game: Using the Logic of Brazen Self-interest to See & Shape the Future* (New York: Random House Trade Paperbacks, 2010), p. 1
14. Charles Babcock, *Management Strategies for the Cloud Revolution* (US: McGraw-Hill, 2010), p. 222
15. Charles Babcock, *Management Strategies for the Cloud Revolution* (US: McGraw-Hill, 2010), p. 26
16. Hunter Muller, *The Transformational CIO: Leadership and Innovation Strategies for IT Executives in a Rapidly Changing World* (Hoboken, NJ: John Wiley & Sons, 2011), p. 175
17. K. Woolsey, et al, 'The 2007 Horizon Report' [web document], (2007) The 2007 Horizon Report. <http://www.nmc.org/pdf/2007_Horizon_Report.pdf>, accessed 2014, p.12.

18. Facebook, 'Statistics', *Newsroom – Company Info Fact Sheet* [web page] (2012)
<<http://newsroom.fb.com/content/default.aspx?NewsAreaID=22>>.
19. Chris Taylor, 'Social Networking "utopia" isn't coming', *CNN Tech* [web page], (2011)
<<http://www.cnn.com/2011/TECH/social.media/06/27/limits.social.networking.taylor/>>
20. Joseph B. Pine II and James H. Gilmore, *The Experience Economy: Work is Theatre & Every Business a Stage* (Boston: Harvard Business School Press, 1999).
21. Robert J. (Rob) Rennie, *Strategic Technology Plan 2012* (Jacksonville, FL: Florida State College, 2002).
22. D. Burrus and J.D. Man, *Flash Foresight: How to See the Invisible and Do the Impossible* (New York: Harper Collins, 2011), p. 190.
23. Zolli, A., 'Marketing and Branding in the Experience Economy', (Palm Desert, CA: Computerworld Premier 100 Conference 2004).
24. R. Schank, R. Lyras, and E. Soloway, *The Future of Decision Making*, (New York: Palgrave MacMillan, 2010), p. 187.
25. Kim Nash, '2011 State of the CIO: IT Departments are Fueling Company Growth Through Strategic Technology Investments', *CIO Magazine* [web page], (2011)

[http://www.cio.com/article/646750/2011 State of the CIO IT Departments Are Fueling Company Growth Through Strategic Technology Investments](http://www.cio.com/article/646750/2011_State_of_the_CIO_IT_Departments_Are_Fueling_Company_Growth_Through_Strategic_Technology_Investments)

26. Sherman, *Harvesting Intangible Assets: Uncover Hidden Revenue in Your Company's Intellectual Property*, (New York: AMACOM, 2012), p. 12.
27. R. Schank, R. Lyras, and E. Soloway, *The Future of Decision Making*, (New York: Palgrave MacMillan, 2010), p. 27.
28. R. Schank, R. Lyras, and E. Soloway, *The Future of Decision Making*, (New York: Palgrave MacMillan, 2010), p. 33.
29. Phillip Goldstein, 'The Future of Higher Education: A View from CHEMA', *The Council of Higher Education Management Associations* [web document] (2006), http://www.ala.org/APPA39a_ScreenOpt.pdf
30. Gostick and C. Elton, *The Orange revolution: How One Great Team Can Transform and Entire Organization*, (New York: Free Press, 2010), p. 7.
31. Gostick and C. Elton, *The Orange revolution: How One Great Team Can Transform and Entire Organization*, (New York: Free Press, 2010), p. 88.
32. Gostick and C. Elton, *The Orange revolution: How One Great Team Can Transform and Entire Organization*, (New York: Free Press, 2010), p. 88.

33. Gostick and C. Elton, *The Orange revolution: How One Great Team Can Transform and Entire Organization*, (New York: Free Press, 2010), p. 234.
34. Michael Gargano, Jr., 'Connecticut: Is Performance Based Funding for Public Higher Education Worth Exploring?'. *Office of the Provost Connecticut State College and University System* [web document] (2015),
<<http://media.trb.com/media/acrobat/2015-02/23951102966140-25084407.pdf>>
35. 'An Act Establishing a Task Force Concerning Outcomes-Based Financing'. *Connecticut. House of Representatives*. HB-6919, Special Act No. 15-20 [web document] (2015)
<<https://www.cga.ct.gov/2015/act/sa/2015SA-00020-R00HB-06919-SA.htm>>
36. 'Performance-Based Funding for Higher Education'. National Conference of State Legislatures [web article] (2015)
<<http://www.ncsl.org/research/education/performance-funding.aspx>>
37. Stephen Ferruci, 'State Spending on Higher Education in CT'. *National Council of Teachers of English* [web document] (2016),
<<http://www.ncte.org/policy-analysis-initiative?reportid=403>>

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