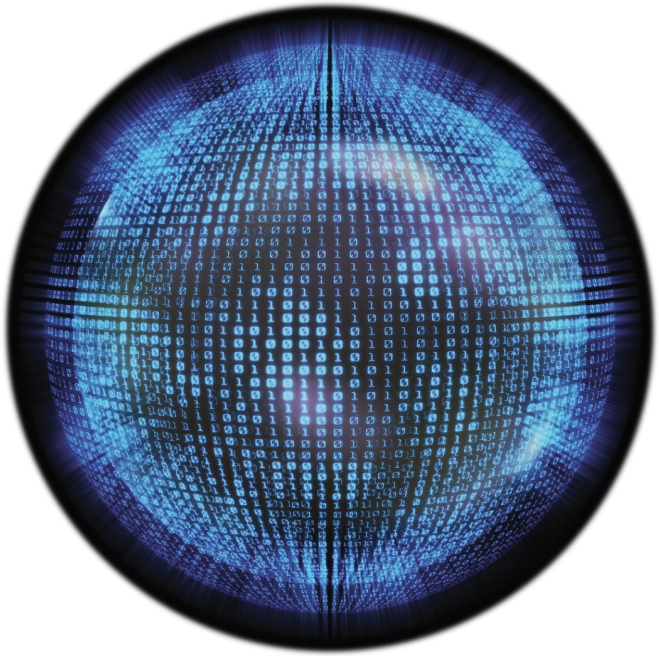
Deloitte.



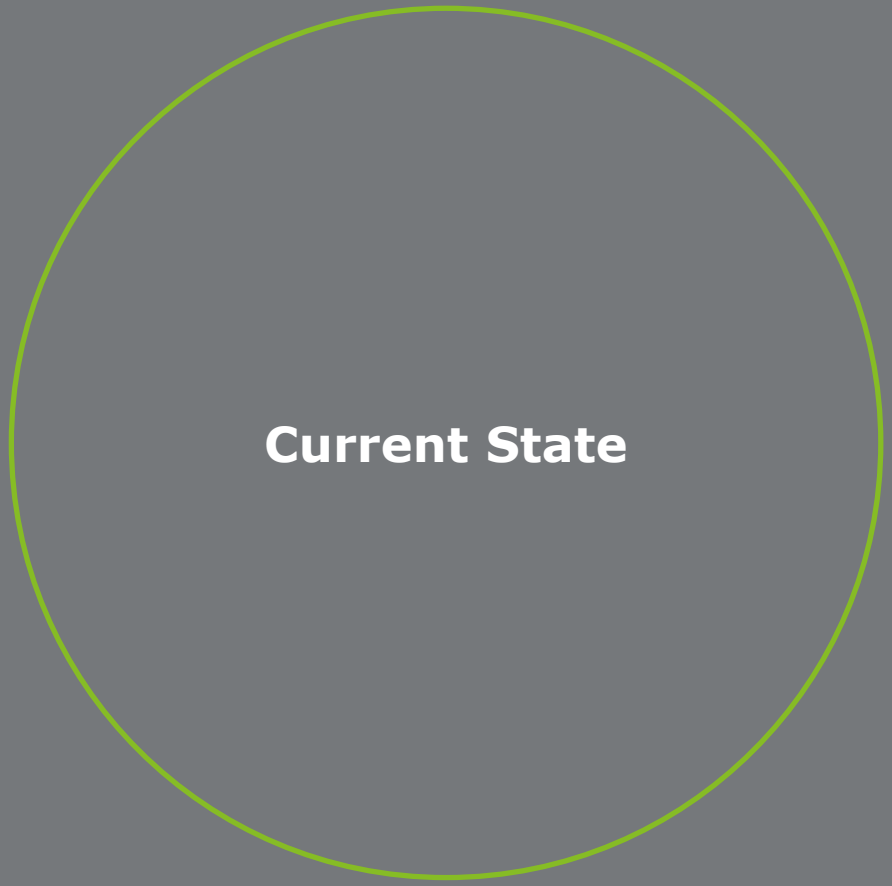
University of Pittsburgh
Information Technology Assessment

Future State: Recommendations Report - Final

February 14, 2019

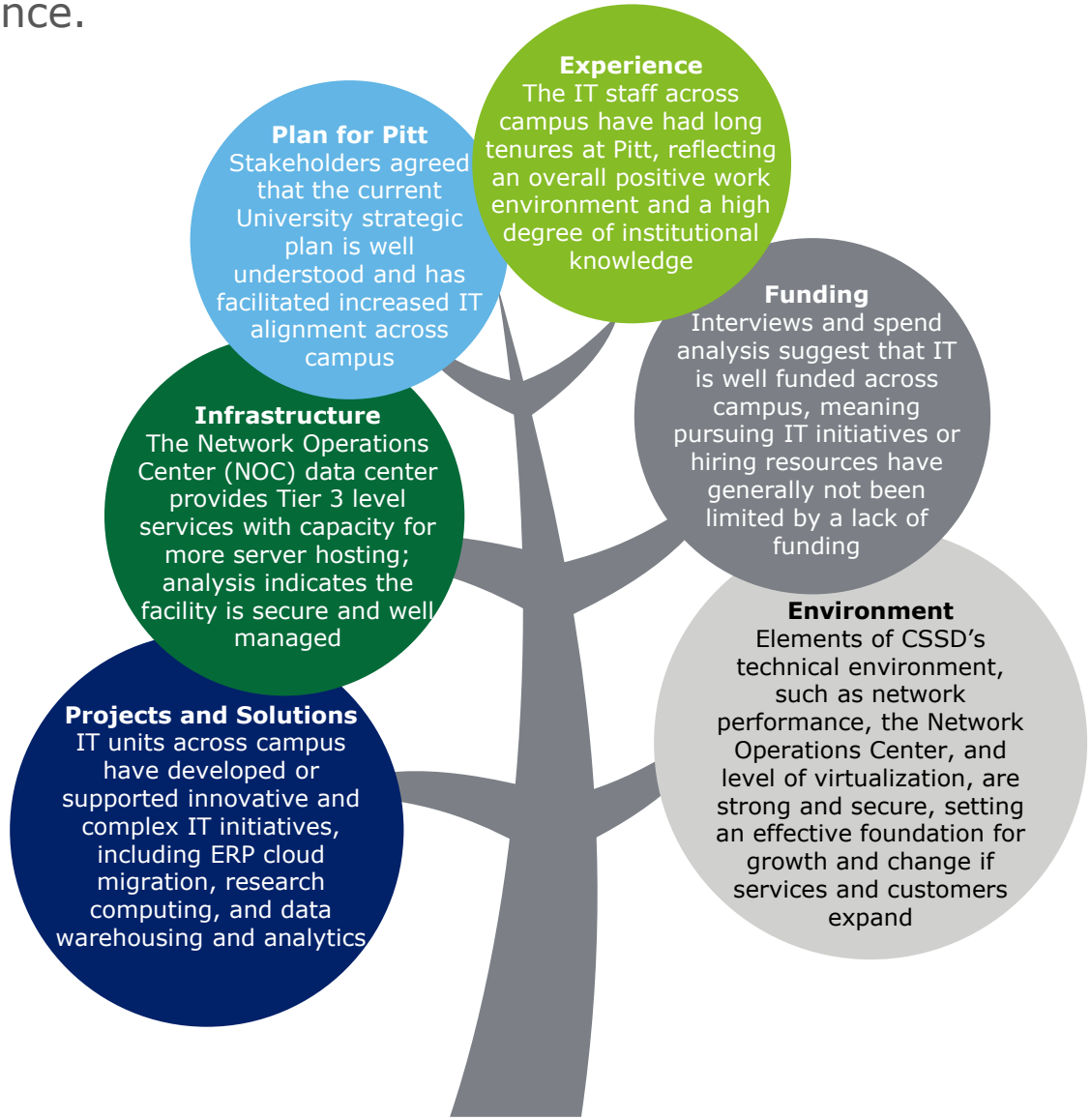
Contents

Executive Summary


Current State

A Chance to Grow, an Opportunity to Build on Strengths

Over the last decade, Pitt has made tremendous strides in improving technology efficiency, effectiveness, and information security to improve the student, faculty, and staff experience.



IT At-a-Glance

Pitt maintains a wide and diverse IT footprint across its campuses, reflecting the strategic importance that IT holds in fulfilling the University's mission.

Pitt spends over $132M on IT

- 46% on salaries and benefits
- 54% on goods and services
- 41% of total IT spend charged to CSSD's budget; 59% charged to non-CSSD budgets
- 94% of IT spend is managed as follows:
  - 48% of commonly used IT hardware and software purchases was through university-wide contracted suppliers or other enterprise agreements
  - 46% was special-purpose hardware, software, or consulting services for a specific responsibility center
  - 80% of IT spend was with 3% of IT suppliers

621 IT staff FTEs across Pitt

- 37% in CSSD; 63% across non-CSSD units
- IT staff in 97 schools and departments

IT At-a-Glance

While many core IT services are centralized at CSSD, there are a significant amount of IT services decentralized across campus impacting efficiency, effectiveness, and risk management.

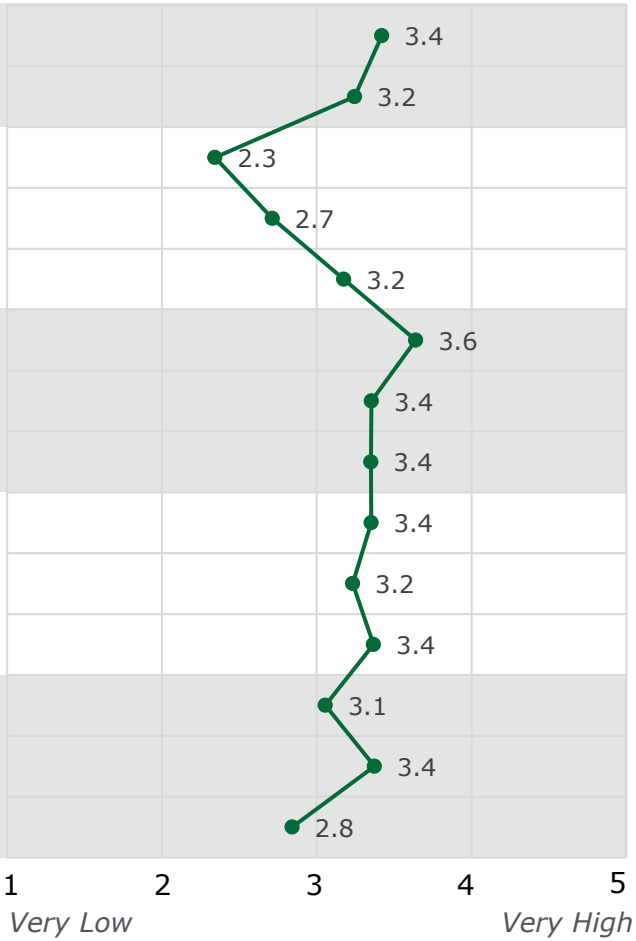
Some examples of decentralization include:

- FIS runs and operates PRISM HR and Financials from hardware to applications, resulting in duplicate services, solution selection, and data sharing capabilities
- Pitt has over 19 help desks on campus using at least 16 different ticketing systems
- About 1/3 of all physical servers reside outside the CSSD data center
- At least 4 other data centers across Pitt campuses

Perceptions of IT at Pitt

Deloitte interviewed over 100 individuals from 60 IT stakeholder groups across the University to gather perceptions of the current state of IT effectiveness on a number of dimensions.

IT Effectiveness Assessment Questions		Average Stakeholder Perception
Business IT Alignment	Level of understanding of Pitt's strategic priorities?	3.4
	Quality of relationship with academic/administrative units?	3.2
IT Governance	Clarity of IT governance groups?	2.3
	Effectiveness of IT governance at Pitt?	2.7
	Ability to successfully deliver projects on time and budget?	3.2
IT Optimization	Quality of infrastructure services?	3.6
	Quality of application services?	3.4
	Effectiveness of enterprise architecture and standards at Pitt?	3.4
IT Service Management	Level of customer satisfaction with services?	3.4
	Clarity of services offered?	3.2
	Value of services offered?	3.4
IT Organization Model	Perception of sufficiency of personnel?	3.1
	Perception of quality of personnel?	3.4
	Effectiveness of organizational structure?	2.8



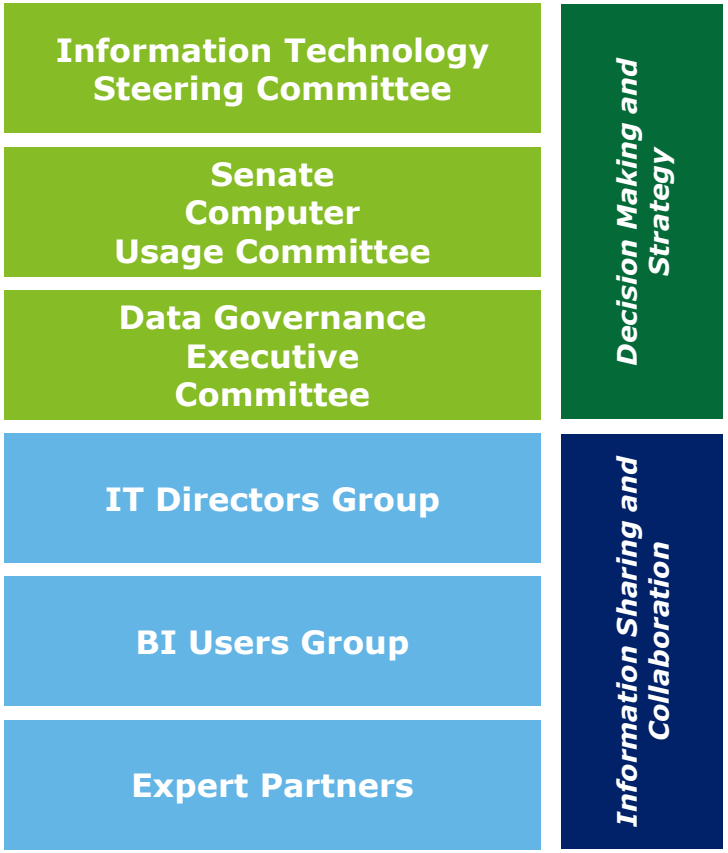
Note: Ratings of stakeholder perceptions were assessed based on the interview responses for each question and topic. Ratings were not assigned if the topic did not arise.

IT Governance Findings

Key Findings

- Lack of effective or transparent way to facilitate/enforce enterprise decision-making
- IT strategic planning not tied to budgeting process
- Duplicate IT infrastructure and security services between CSSD and FIS, and data services between CSSD and Office of the Provost
- Siloed IT divisions mean different people ultimately responsible for risk

Current Governance Groups

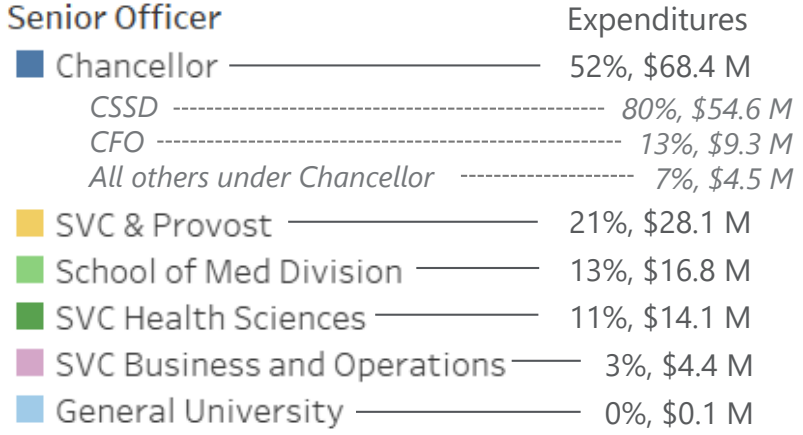


IT Finance Findings

Key Findings

- Pitt spends over $132M on IT: $61M on IT staff, $72M on IT purchases*
- 41% of IT spend is charged to CSSD's budget, 59% is charged to non-CSSD budgets
- CSSD is funded primarily through general operating funds (54%), cost recovery (22%), the student computing fee (18%), and network access fee (5%)
- 48% of IT spend through university-wide contracted suppliers; 80% of IT spend is with less than 3% of IT suppliers, compared to the ISM benchmark of 5%
- Enhanced governance processes to manage and monitor IT spend can improve overall efficiency and effectiveness

IT Spend Distribution



*Figures rounded for summary purposes

IT Talent Findings

Key Findings

- 621 IT FTEs across Pitt: 37% in CSSD, 63% across non-CSSD units
- CSSD has the lowest turnover rate across schools and departments with >10 IT staff
- 95 distinct IT titles in CSSD, 223 outside of CSSD
- Current salary perceived to be significant barrier to hiring/retention
- Lack of standards and requirements around IT training inhibits pace of skills change
- Pitt does not have a strong, shared IT culture resulting in siloed teams

IT Staff Distribution (Top 6 RCs)

RC	Count	Percent of Total
CSSD	229	37%
School of Medicine	82	13%
Graduate School of Public Health	43	7%
Office of CFO	35	6%
School of Medicine Division Administration	31	5%
Office of the Provost	24	4%

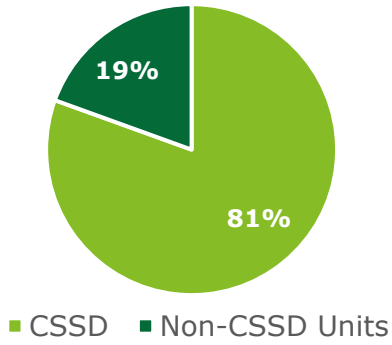
11 Note: IT staff counts based on Office of Human Resources data wherein the Systems/Programmer job family is primarily used as a means of designating IT staff across Pitt. Actual FIS IT staff count is 46.

Technology: Infrastructure Findings

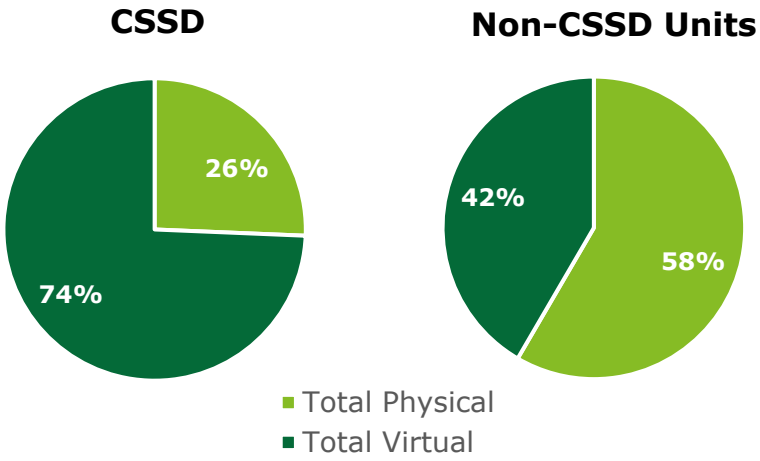
Key Findings

- About 1/3 of reported physical servers reside outside the RIDC data center, posing an increased risk to business and security
- Network uptime of 99%+ is on par with industry leading standards
- Network connectivity at UPMC is limited compared to PittNet resulting in lost staff productivity and a higher risk profile
- No university-wide Configuration Management Database (CMDB) or standard asset management process and tool in place resulting in duplication of assets and security exposures

Server Distribution



Server Virtualization

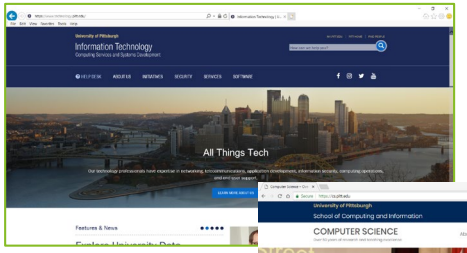


Technology: Applications Findings

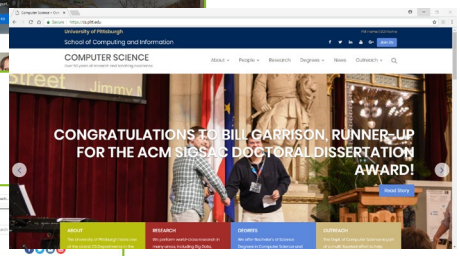
Key Findings

- 680+ application instances; about 2.9M licenses identified across 23 categories*. While almost half of these purchases were using university-wide agreements, the majority of interviewees cited opportunities to better coordinate purchases based on improved visibility of under-utilized assets across units
- 95% of reported licensed applications owned by CSSD
- Pitt lacks a common look and feel for its web presence resulting in a fragmented brand being presented to the public

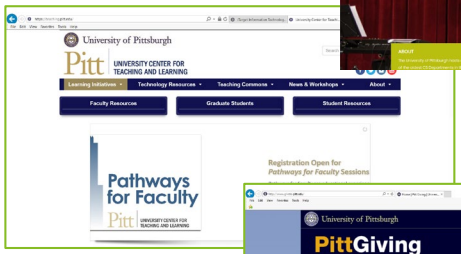
Illustrative Websites



CSSD Homepage



Department of Computer Science



Center for Teaching and Learning

Office of Institutional Advancement

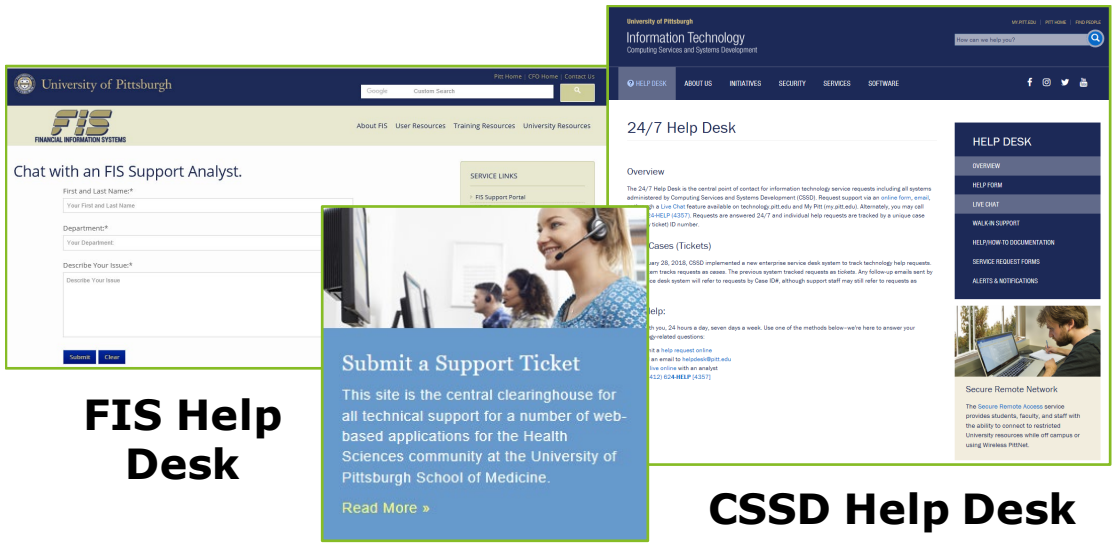
*Actual application count most likely higher due to lack of reporting from multiple units

Technology: Service Management Findings

Key Findings

- At least 19 schools and departments are providing help desk support, using at least 16 different call tracking applications
- Siloed help desks prevent knowledge sharing

Pitt Helpdesk Portals



FIS Help Desk

CSSD Help Desk

iTarget Help Desk

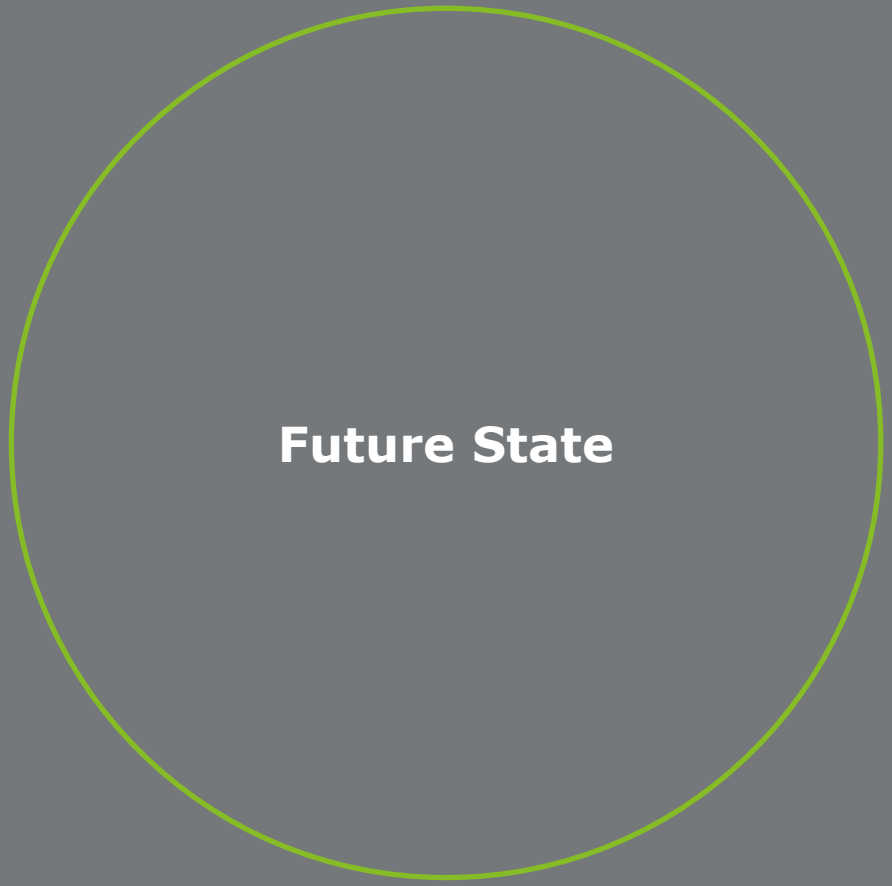
Technology: Data and Research Computing Findings

Key Findings: Data

- Limited data policies and standards (e.g., data use or sharing)
- Efforts to establish data governance are underway
- Distributed IT has led to several data warehouse platforms and reporting tools
- Roles and responsibilities for Business Analytics are unclear, resulting in siloed operations and inability for campus to make strategic decisions using data that is dispersed across campus

Key Findings: Research Computing

- VP of Research position has been recently established and has consolidated several siloed research functions
- Coordination between CSSD and CRC cited as improving by numerous stakeholders
- Foundational infrastructure for Research Computing is strong
- A strategic Research Computing roadmap that includes governance, process, technology (e.g., cloud), security, and organizational design needs to be developed to guide any further investments


Future State

The Imperative for Change

Based on the current strengths and opportunities, there is an imperative to focus on three key areas that can move the University of Pittsburgh to a more effective future state IT Operating Model.

1 Strengthen the Core

Maintain the delivery of reliable, cost-effective core infrastructure and services through CSSD while also defining a shared vision of IT

2 Increase Collaboration

Increase alignment between CSSD and schools and departments to operate collaboratively and consistently through a clear governance model

3 Foster Innovation and Efficiency

Focus on enhancing the end-user experience by efficient, timely, and innovative delivery of IT services (e.g., Artificial Intelligence, Machine Learning, Robotic Process Automation, and other Smart Campus platforms)

Strategic Priorities for IT at Pitt and Recommended Considerations

The strategic priorities outlined in *The IT Plan for Pitt* serve as guiding principles to frame the recommendations and expected benefits.

Reliable – Information technology resources need to be available when students, faculty, and staff need them.

Secure – The University's data and technology resources must be protected, and the privacy of individuals and the integrity of data must be preserved.

Integrated – Information technology systems must work together so that individuals can accomplish their goals efficiently and without needing to understand the complexities of individual systems.

Transparent – Information technology decision-making, future directions, initiatives, and operations must be visible to the University community.

Collaborative – All areas of the University need to work together to gain efficiencies and ensure that information technology is in alignment with the goals of the University.

Innovative* – Information technology must include state-of-the-art technologies and practices to preserve service excellence while also meeting the future needs of students, faculty, and staff.

Efficient* – Information technology investments and processes must be made to optimize the University's resources by saving time and money.

*Additional priorities to consider based on current state assessment findings

Summary of Recommendations

Recommendations are aligned to current state assessment finding areas, taking into consideration *The IT Plan for Pitt* and ongoing Pitt initiatives impacting IT.

Recommendation	Summary	Benefits
1. Governance		
1.1 Implement IT Governance	Define and stand up a coordinated governance structure to facilitate effective IT decision-making and establish roles and responsibilities over enterprise applications and services.	Builds a model that allows the right people to make business, IT, and financial decisions around IT projects, standards, and priorities.
2. Finance		
2.1 Develop an Integrated IT Budget University-wide	Build mechanisms to enable university-wide coordination on IT budget formulation and strategic investment planning.	Budgets for IT initiatives in an integrated, collaborative manner that works for each school and department and increases transparency and efficiency, allowing for resource pooling for shared needs.
2.2 Strengthen IT Purchases Across the University	Enhance IT spend management by enhancing governance and purchasing policies across units and establishing purchasing controls for duplicate spend across units.	Strengthens the governance approach towards IT spend to reduce duplicate purchasing within units and increase ability to leverage existing or under-utilized assets across campus units.
3. Talent		
3.1 Develop Career Paths for IT Staff (in coordination with existing OHR initiative)	Develop and standardize IT career paths to improve talent development and facilitate effective IT staff deployment.	Creates clarity on career progression from new hire to retirement, increasing the ability to share staffing needs. Increases effectiveness of IT service provisioning, and lowers attrition.
3.2 Build a Unified IT Training Program	Develop a comprehensive, function-oriented training program to provide IT staff with the skills necessary for their position and the changing tech environment.	Builds a consistent skill and knowledge base that standardizes training, facilitates flexibility of staff deployment, and grows a workforce that keeps pace with innovation and emerging technologies.
3.3 Create a Culture of One IT	Introduce activities to shape university-wide IT culture to foster collaboration, enable effectiveness of IT service delivery, and promote partnership for innovation at Pitt.	Provides staff with a university-wide IT identity that shapes behaviors, facilitates collective commitment, and improves retention, communication, collaboration, and trust.

Summary of Recommendations

Recommendations are aligned to current state assessment finding areas, taking into consideration *The IT Plan for Pitt* and ongoing Pitt initiatives impacting IT.

Recommendation		Summary	Benefits
4. Technology			
4.1	**Establish Long-Term Cloud and Data Center Strategy**	Enable best-in-class service by establishing a cloud-focused strategy and consolidating remaining data centers.	Enables best-in-class cloud computing IT services and cloud offerings that align with Pitt's overall strategy. Reduces risk, increases accuracy in refresh cycles and capacity, and enhances accuracy in reporting.
4.2	**Implement Enterprise IT Asset Management**	Reduce risk, increase visibility, and enable capacity planning by tracking IT assets across Pitt.	Reduces risk of failure, increases accuracy in planned renewal cycles and capacity, and enhances reporting capabilities.
4.3	**Collaborate with UPMC to Improve PittNet Access**	Strengthen collaboration, introduce governance, and establish policies and procedures that facilitate secure, fast, and reliable access to Pitt resources from UPMC	Reduces risk, improves network performance, and enables a better user experience through greater collaboration
4.4	**Consolidate Help Desk Tools**	Adopt a single system for tracking and reporting IT support activity across the University to deliver consistent technology service.	A single help desk system eliminates redundant help desk products, gives support teams better technology to diagnose issues and system changes, and allows for mobile-based tools.
4.5	**Deploy a Common Brand for all Pitt Websites**	Develop a strategy and common toolset for creators and contributors to create a more common web brand	A common Pitt web brand increases consistency and improves user experience for customers.

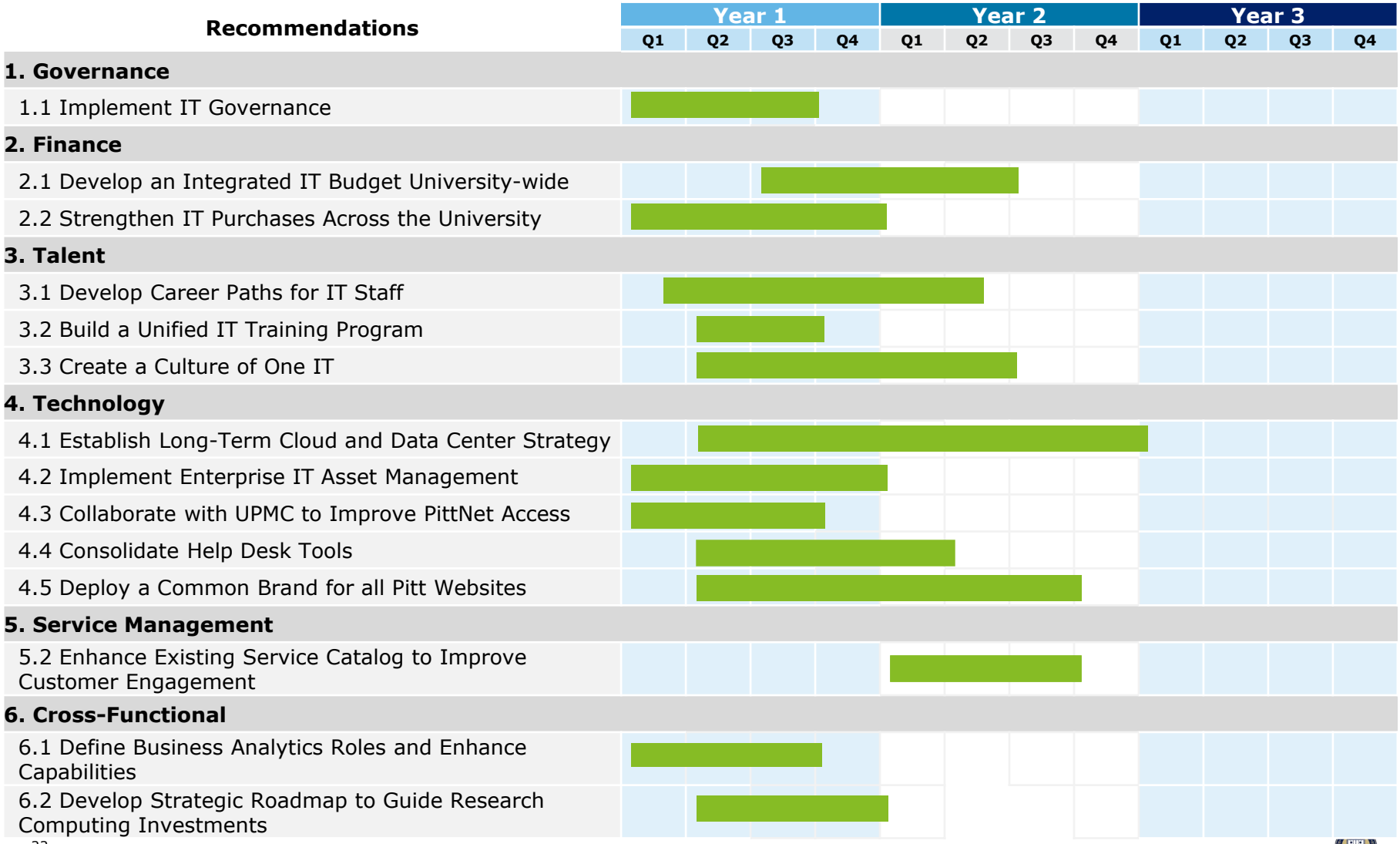
Summary of Recommendations

Recommendations are aligned to current state assessment finding areas, taking into consideration *The IT Plan for Pitt* and ongoing Pitt initiatives impacting IT.

Recommendation	Summary	Benefits
5. Service Management		
5.1 Enhance Existing Service Catalog to Improve Customer Engagement	Re-design the current CSSD service catalog to include non-CSSD services available to Pitt end users which provides a single point of entry for searching, ordering, and purchasing IT services.	A single source for requesting services reduces processing time and delays, reduces the risk of unauthorized products or suppliers, and helps CSSD understand needs, expectations, and challenges of customers more effectively.
6. Cross-Functional		
6.1 Define Business Analytics Roles and Enhance Capabilities	Build an approach for managing, sharing, and leveraging data at Pitt which clearly defines ownership and promotes collaboration.	Enables a university-wide understanding of data access and privileges, standards, tools, capabilities, and resources, streamlining decision-making on data issues, improving collaboration, and enabling more advanced capabilities that can drive insights for University leadership and other stakeholders.
6.2 Develop Strategic Roadmap to Guide Research Computing Investments	Build upon existing foundation of research computing capabilities and define a strategy that includes governance, process, technology (e.g., cloud), security, and organizational design to guide any further investments.	Moves Pitt towards creating a seamless, standardized experience for researchers and facilitates more strategic investments, making research computing capabilities more accessible and known.

High Level Roadmap of Recommendations

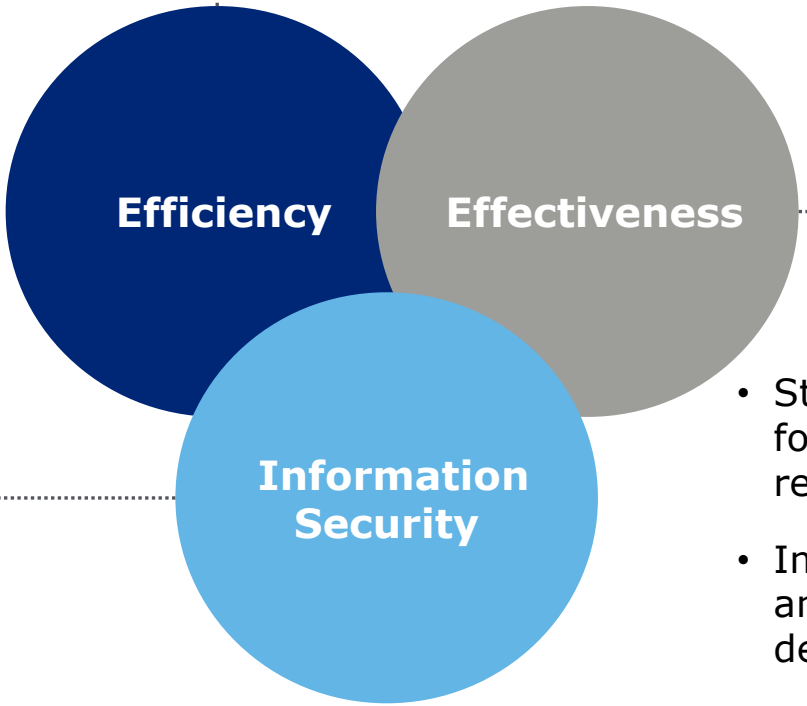
A 3-year roadmap balances the urgency to execute transformation projects immediately against the reasonable time required to implement each project successfully.



IT Transformation Benefits

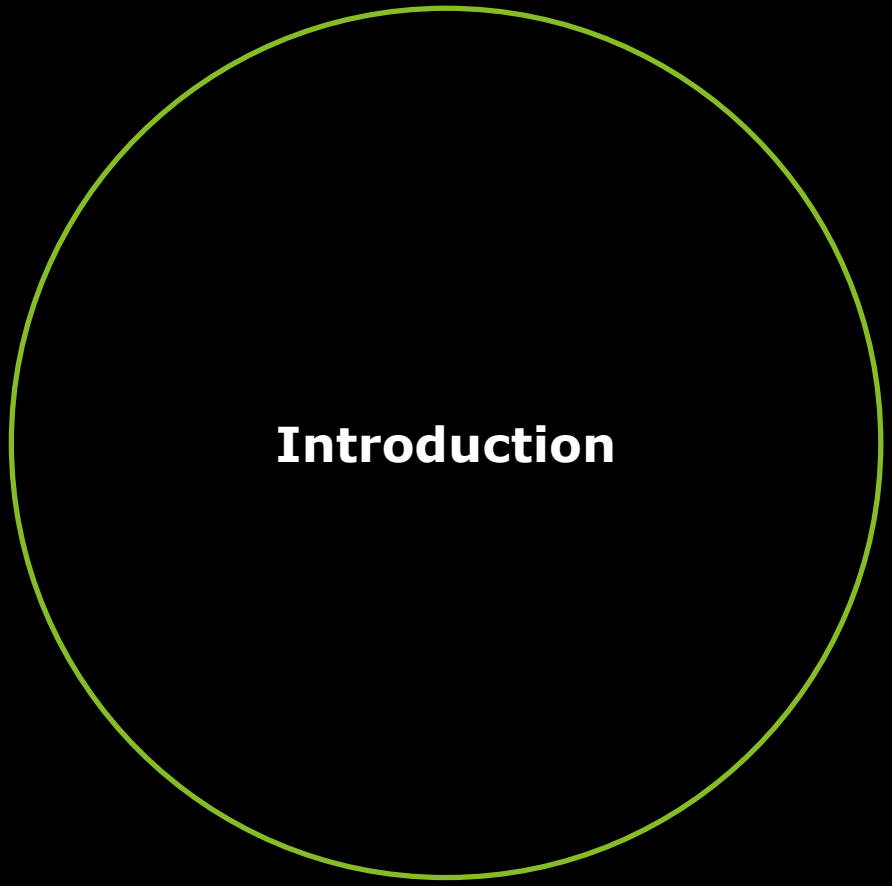
By taking the steps necessary to transform its IT operating model, Pitt can expect to achieve the following benefits relative to its current strategic priorities.

- CSSD as the "go-to" provider for core IT services at Pitt
- Investments and processes that save Pitt time and money



- State of the art service for faculty to advance research and teaching
- Improved collaboration and transparency in decision-making

- Stronger data protection
- Improved monitoring, detection, alerting, and response capabilities


Introduction

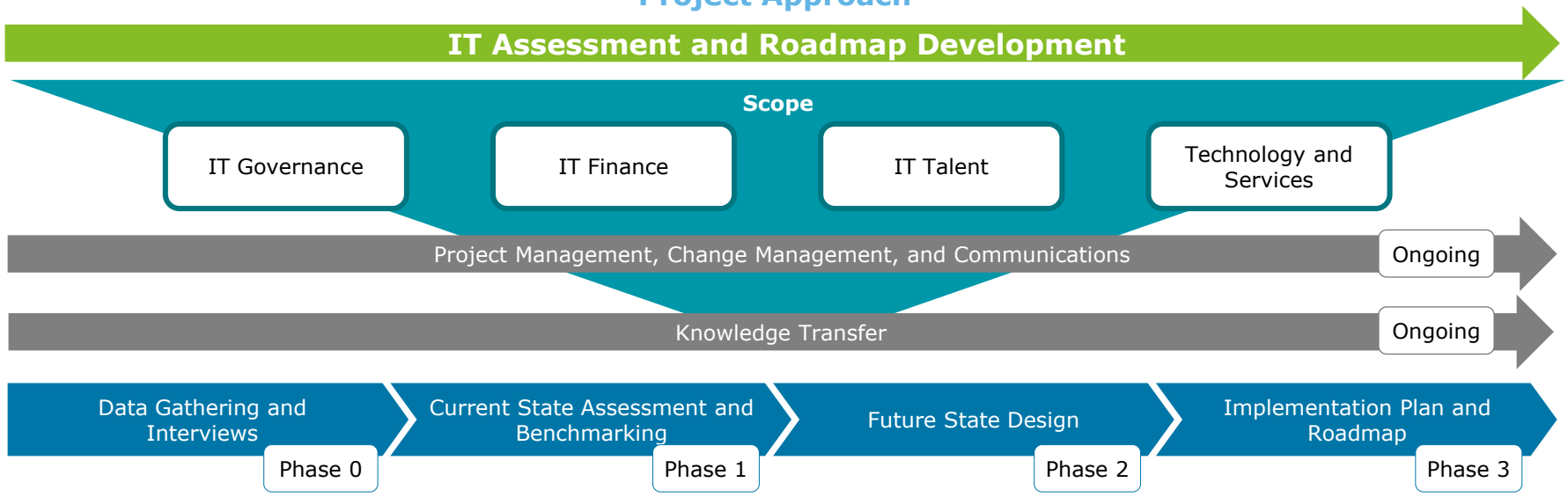
Information Technology (IT) Assessment Objectives and Activities

This project seeks to understand the extent to which the University of Pittsburgh (Pitt) is maximizing its IT resources and is positioned to meet its current and future needs.

IT Assessment Objectives

- Assess the current state of technology, the degree of IT and business alignment, and the effective use of technology across Pitt, inclusive of Computing Service and Systems Development (CSSD) and other University IT
- Meet with focus groups comprised of representatives from key IT stakeholder areas including academic, administrative, and business units and the four regional campuses
- Benchmark performance against peer organizations
- Make recommendations to improve the efficiency and effectiveness of IT at Pitt according to four primary areas: IT Governance, IT Finance, IT Talent, and Technology and Services
- Define a plan and considerations for prioritizing and implementing recommendations

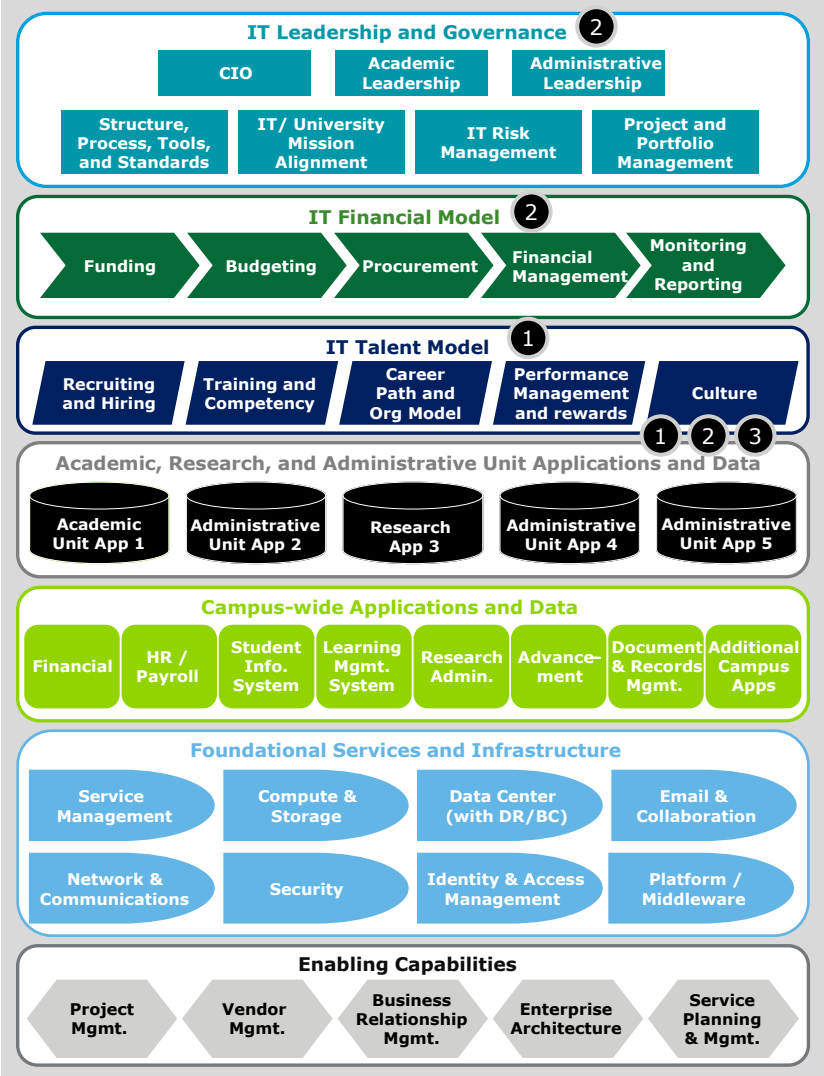
Project Approach



Source: RFP No. 1-RFPCSSD_CBD-11-8-17, Responses to RFP Questions, and SOW

Application of the IT Transformation Framework

For this assessment, Deloitte references an IT operating model framework to systematically evaluate IT operations across the University.



- **IT Governance:** A structure that supports effective IT oversight, strategic direction, collaboration, and coordinated budgeting across the entire organization
- **IT Finance:** Functions that establish effective financial planning, cost-recovery, increased oversight of suppliers, and tighter controls for IT spending across the organization
- **IT Talent:** An organization orientated towards strategies for talent growth, retention, and attraction
- **Technology and Services:** The technology and processes that enable modernization and increased cyber security, with a strong focus on applications, infrastructure, and IT Service Management (ITSM) processes

Scope Requested by Pitt maps to our Transformation Framework

1. University IT Organization
2. University IT Efficacy
3. Strategic Recommendations (Enterprise)

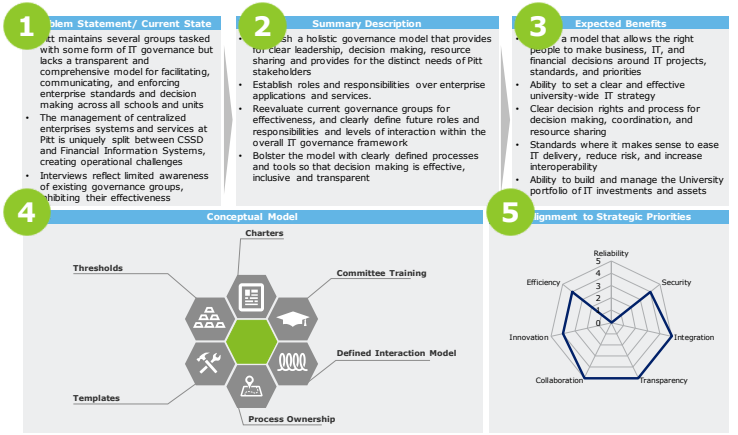
How to Read the Recommendation Slides

Each recommendation follows a common template with key elements.

Recommendation Summary

1. Problem statement/current state finding to be addressed
2. Summary description of recommendation activities
3. Anticipated benefits of implementing recommendation
4. Framework outlining how to conceptualize the recommendation or elements of the recommendation
5. Chart mapping alignment to Pitt's strategic priorities relative to each other

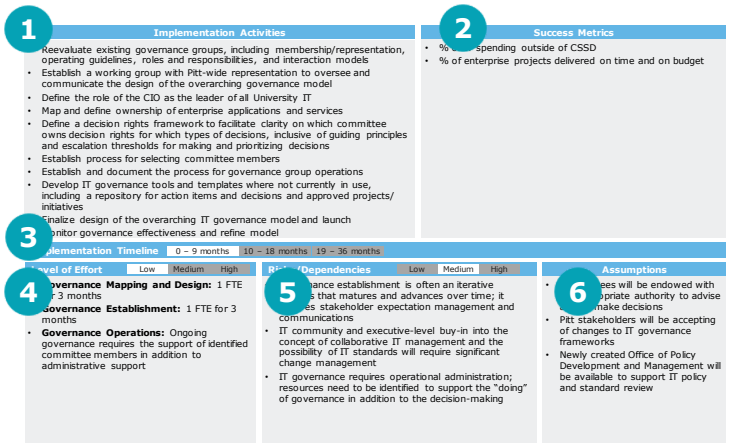
Summary



Recommendation Detail

1. Detailed activities required to implement the recommendation
2. Metrics Pitt can use to measure the benefits of implementing the recommendation
3. Estimated duration of implementation based on current state understanding and similar projects implemented at other organizations
4. Level of effort outlining staff and time allocations for conducting implementation activities – staff counts are not necessarily cumulative
5. Risks and dependencies to be considered, anticipated, mitigated, and/or planned for
6. Any assumptions that drive elements of the recommended approach

Detail



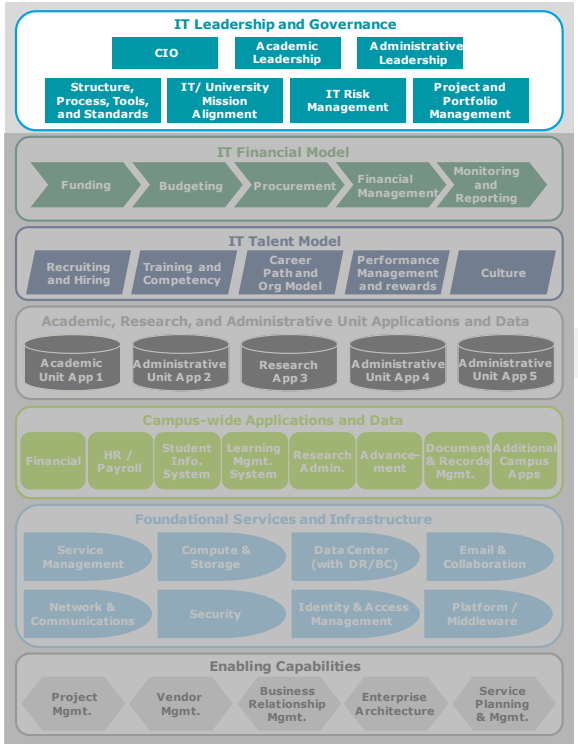
Following the recommendation summary and detail slides for each opportunity, additional information is provided to aid Pitt in conceptualizing and operationalizing the opportunity

Future State Recommendations


IT Governance

IT Governance Opportunities

A more comprehensive governance model supports effective oversight, strategic direction, and coordinated IT initiatives across the University.



1.1 Implement IT Governance

- Builds a coordinated model that allows the right people to make business, IT, and financial decisions around IT projects, standards, and priorities.

1.1 Implement IT Governance

Define and stand up a coordinated governance structure to facilitate effective IT decision making.

Problem Statement/ Current State

- Pitt maintains several groups tasked with some form of IT governance but lacks a transparent and comprehensive model for facilitating, communicating, and enforcing enterprise standards and decision making across all schools and units
- FIS runs and operates PRISM HR and Financials from hardware to applications, resulting in overlap of services, solution selection, and data sharing capabilities
- Interviews reflect limited awareness of existing governance groups, inhibiting their effectiveness

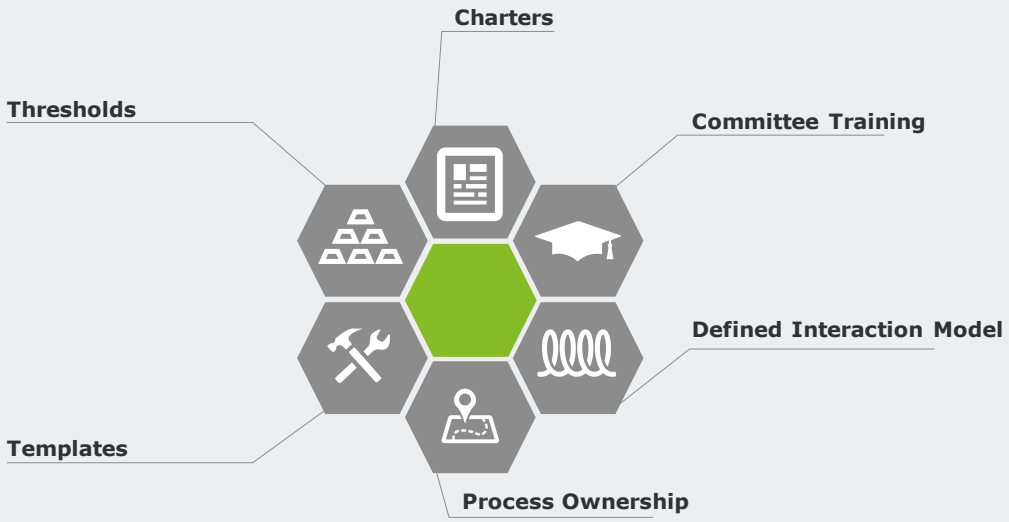
Summary Description

- Establish a holistic governance model that provides for clear leadership, decision making, resource sharing and provides for the distinct needs of Pitt stakeholders
- Establish roles and responsibilities over enterprise applications and services.
- Reevaluate current governance groups for effectiveness, and clearly define future roles and responsibilities and levels of interaction within the overall IT governance framework
- Bolster the model with clearly defined processes and tools so that decision making is effective, inclusive and transparent

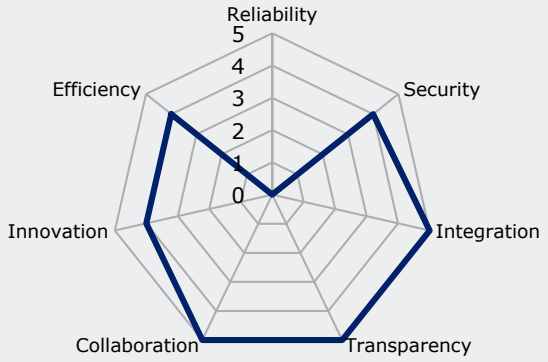
Expected Benefits

- Builds a model that allows the right people to make business, IT, and financial decisions around IT projects, standards, and priorities
- Ability to set a clear and effective university-wide IT strategy
- Clear decision rights and process for decision making, coordination, and resource sharing
- Standards where it makes sense to ease IT delivery, reduce risk, and increase interoperability
- Ability to build and manage the University portfolio of IT investments and assets

Conceptual Model



Alignment to Strategic Priorities



1.1 Implement IT Governance

Define and stand up a coordinated governance structure to facilitate effective IT decision making.

Implementation Activities

- Reevaluate existing governance groups, including membership/representation, operating guidelines, roles and responsibilities, and interaction models
- Establish a working group with Pitt-wide representation to oversee and communicate the design of the overarching governance model
- Define the role of the Chief Information Officer (CIO) as the leader of all University IT
- Map and define ownership of enterprise applications and services
- Define a decision rights framework to facilitate clarity on which committee owns decision rights for which types of decisions, inclusive of guiding principles and escalation thresholds for making and prioritizing decisions
- Establish process for selecting committee members
- Establish and document the process for governance group operations
- Develop IT governance tools and templates where not currently in use, including a repository for action items and decisions and approved projects/ initiatives
- Finalize design of the overarching IT governance model and launch
- Monitor governance effectiveness and refine model

Success Metrics

- % of IT spending outside of CSSD
- % of enterprise projects delivered on time and on budget

Implementation Timeline | 0 – 9 months | 10 – 18 months | 19 – 36 months

Level of Effort

Low | Medium | High

- **Governance Mapping and Design:** 1 FTE (full time equivalent) for 3 months
- **Governance Establishment:** 1 FTE for 3 months
- **Governance Operations:** Ongoing governance requires the support of identified committee members in addition to administrative support

Risks/Dependencies

Low | Medium | High

- Governance establishment is often an iterative process that matures and advances over time; it requires stakeholder expectation management and communications
- IT community and executive-level buy-in into the concept of collaborative IT management and the possibility of IT standards will require significant change management
- IT governance requires operational administration; resources need to be identified to support the "doing" of governance in addition to the decision-making

Assumptions

- Committees will be endowed with the appropriate authority to advise and/or make decisions
- Pitt stakeholders will be accepting of changes to IT governance frameworks
- Newly created Office of Policy Development and Management will be available to support IT policy and standard review

1.1 Implement IT Governance

Effective IT governance is determined as much by the supporting tools and processes as it is the membership and designated groups.

Charters

A charter template defines the key elements of each group including: responsibilities, membership, decision rights, inputs and outputs, and reporting requirements. This helps clarify each group's purpose.

Thresholds

To help bring the right decisions to the right group/level, a set of thresholds should be defined to differentiate between project types. Thresholds can be based on estimated hours to complete, estimated cost, strategic impacts etc. Once defined, the interaction model can use this information to determine who should have visibility into which types of requests.

Committee Training

As part of the initial launch of a committee and as membership changes, members are trained on committee charter elements, supporting processes and the overall governance model. This helps members understand committee operations within their specific board and how they fit into the big picture.

Defined Interaction Model

As part of the governance design, Pitt needs a model for governance interactions, how do the individual groups interact with the business units represented, how do committees interact with one another, how and to whom decisions are escalated.

Templates

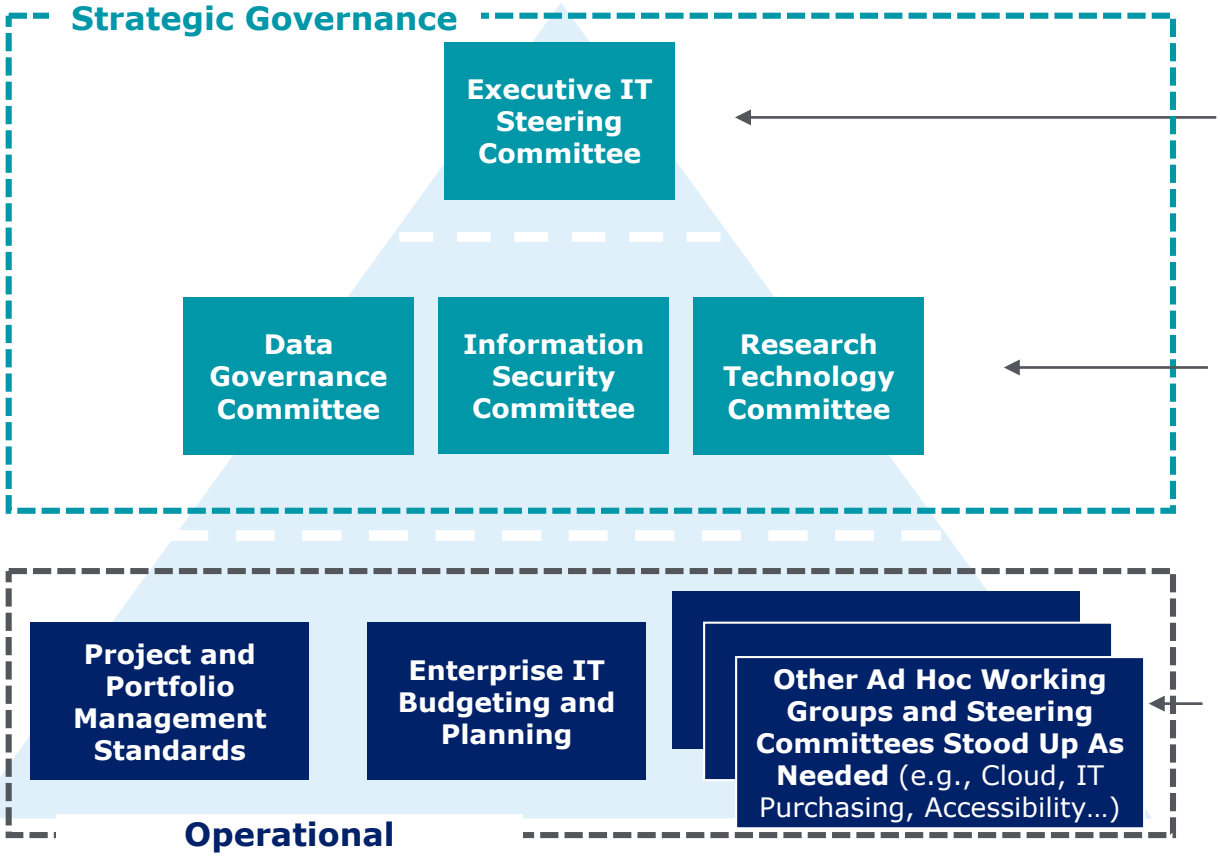
A set of templates should support all activities. Templates should include: a project request form, a business case template, a project health check form, a technical standard template, a post mortem or lessons learned template. Pitt should leverage existing templates where available.

Process Ownership

To be effective, committees need a person or group of people to support the actual operations. This includes activities such as developing materials for meetings, taking meeting minutes, moving decisions from one committee to another.

1.1 Implement IT Governance

The model below represents a potential design based on effective approaches used by other universities and the priorities and needs of Pitt.



The **IT Executive Committee** oversees and makes decisions on enterprise-wide IT strategy. Enables executive level sponsorship of IT decisions and holistic oversight of IT investments and their impact.

Subcommittees are cross-functional, decision-making groups that provide oversight, coordination, and collaboration on specific domain and mission focused IT areas. Allows for broad stakeholder involvement in IT decision making and direction setting.

Working Groups and Steering Committees are operational and provide recommendations to support the development of a common approach to specific domains and missions of IT at Pitt. Working groups may be standing or ad hoc and convened to drive standards or process around specific initiatives and projects (e.g., Enterprise IT Budgeting and Planning – See recommendation 2.1 or IT Purchasing – See recommendation 2.2)

The model enables sponsorship and partnership across diverse IT constituencies to drive mutually beneficial strategies, standards, and solutions

Note: Governance recommendations based on benchmarking of 16 Higher Ed public/private R1 institutions

1.1 Implement IT Governance

The new model should define interactions between new and existing groups.

	Current Groups	Transition
Decision Making and Strategy	**Information Technology Steering Committee**	*Reconvened as the Executive IT Steering Committee*
	Senate Computer Usage Committee	*Continues as an advisory body to the Executive IT Steering Committee that identifies and escalates issues and opportunities, advises on pending decisions, and champions University IT initiatives*
	Data Governance Executive Committee	*Repositioned as the Data Governance Committee, a decision making subcommittee in the proposed new model*
Information Sharing and Collaboration	**IT Directors Group**	*Continues as forum for information sharing and collaboration between IT Directors and CSSD that also provides members with an opportunity to advise and escalate issues to the operational groups*
	BI Users Group	*Continues as a forum to collaborate and share information in support of data and analytics on campus; can serve as a user-level channel for information sharing and initiative execution for Data Governance Committee*
	Expert Partners	*Continues as forum for information sharing and collaboration between CSSD and school and department IT staff, that also provides members with an opportunity to provide input on pending initiatives at CSSD*

1.1 Implement IT Governance

A key element of any governance structure is promoting diverse membership with both IT and non-IT staff to facilitate IT/University business alignment.

Committee	Scope	Proposed Membership*
Executive IT Steering Committee	• Facilitates alignment of IT strategy with University priorities and mission • Oversees the return on Pitt's IT investments • Improves transparency of University IT decision-making • Implements a priority-setting process and accountability mechanisms • Encourages knowledge- and information-sharing across campus	• CIO • Chief Financial Officer (CFO) • Provost • Sr. Vice Chancellor (VC) for Research • Sr. VC for Health Sciences • Total: 3-5
Data Governance Committee	• Reviews and approves data management strategy, standards and policy • Promotes/ facilitates intra and inter-unit, cluster and institution data sets and sharing opportunities • Advocates for stakeholder data needs and concerns	• CIO • Provost • Chief Information Security Officer (CISO) • Select IT Service Leaders/Providers • Area representatives • Faculty representatives • Total: 5-7
Information Security Committee	• Align IT security practices with Pitt's tolerance for risk • Establish accountability, authority, and responsibility for information protection • Identify, prioritize, and develop IT security standards and enforcement mechanisms to be implemented across Pitt • Communicate new IT security processes, practices, and standards across Pitt	• CISO • Financial Information Systems (FIS) Security Officer • Provost or designee • Area representatives • Internal Audit • Total: 7-9
Research Technology Committee	• Focuses on advanced information technology to support research across campus • Establishes priorities, identify initiatives, and allocate seed money to innovative technology projects that support the advanced information technology needs of research at the University	• Sr. VC for Research • VC for Research Computing • CIO or designee • Area representatives • Faculty representatives from research intensive disciplines • Total: 7-9

* Representative model only; actual participants should be finalized and appointed by Pitt leadership

1.1 Implement IT Governance

Beyond identifying and approving enterprise projects, governance functions to set standards and policies across campus.

What are policies and standards?

- A policy is a governing principle that provides the basis for standards and carries the highest authority in the organization.
- Standards identify a set of common technologies that should be used for a particular function, or a common process to carry out an activity.

Benefits of policies and standards

- In order to optimize Pitt's IT investments, technologies and resources must be leveraged across campus. Using a consistent set of standards can support this effort by addressing:
  - When colleges and administrative units adopt a unique technology it limits their ability to share resources with other units.
  - When colleges and administrative units cannot aggregate contracts for similar categories of products and services, keeping unit costs high.
  - When colleges and administrative units use different standards and processes that result in a siloed and fragmented IT environment.

- Addressing these issues through the establishment of policies and standards allows for:
  - Opportunities to share hardware, software and resources
  - Greater volumes of similar items to aggregate spend
  - Increased unification and integration of campus IT environment
  - Increased adoption of common processes to decrease risk
  - Increased ability to ensure compliance with policies
  - Reduce overall IT costs
  - Reduce maintenance and support costs
  - Reduce development costs
  - Reduce training costs and even staff skills
  - Increase IT staff productivity
  - Increase integration between colleges and administrative units
  - Reduce risk due to unsupported or outdated assets
  - Promote accessibility for all users

1.1 Implement IT Governance

Policies and standards should contain certain elements to enable them to be found and easily followed.

Policies

- Policies are high-level statements regarding principles and requirements that set the tone and temperament of management's risk tolerance.
- A policy is a governing principle that provides the basis for standards and carries the highest authority in the organization.
- Some policy requirements overlap with Standards, policies should also:
- Identify the authority under which it is issued
- Identify relationship to other policies and standards
- Specify the consequences of non compliance
- Consider Taxonomy and Scope
- Policy regarding Data Privacy should be able to address requirements of a broad array of colleges and administrative units

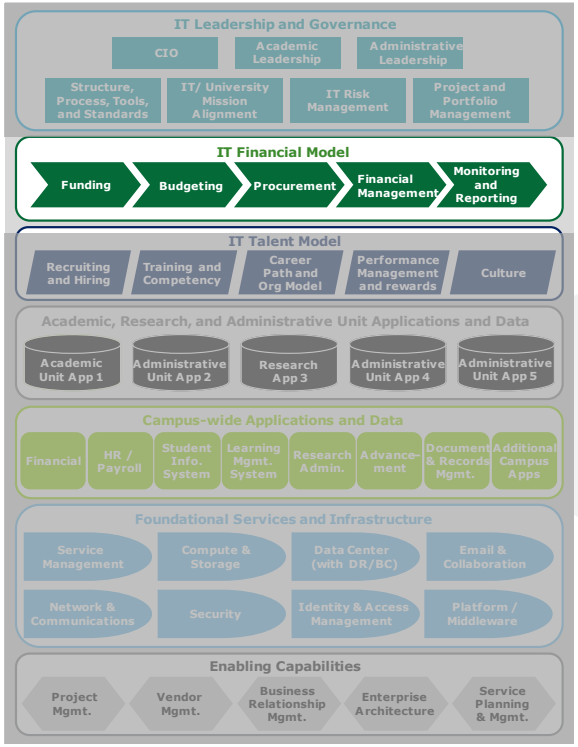
Standards

- Standards provide detailed mandatory criteria to ensure conformity with Pitt policies. Standards define an acceptable level of control and associated measurable compliance criteria.
- Identification of the pertinent domain
- Discussion of how it was developed (Procurement, Current State Evaluation, Best Practice)
- Identification of necessary particulars
    - Product Vendor
    - Product Version
    - Lifecycle Categorization
    - Design features and elements
    - Process steps
- Approach to implementing/adopting the standard, effective date and anticipated duration
- Relationship to other standards, if any


IT Finance

IT Finance Opportunities

More collaborative financial processes for IT can drive visibility and coordination on IT initiatives and improve management and reporting.



2.1 Develop an Integrated IT Budget University-wide

- Introduces mechanisms to increase collaboration, transparency and efficiency, allowing for resource pooling for shared needs.

2.2 Strengthen IT Purchases across the University

- Strengthens the governance approach towards IT spend to reduce duplicate purchasing within units and increase ability to leverage existing or under-utilized assets across campus units

2.1 Develop an Integrated IT Budget University-wide

Create an integrated IT budgeting process across the University to enhance budget formulation centered around shared needs and strategic priorities.

Problem Statement/ Current State

- There is a lack of budgeting for IT at the responsibility center (RC) level or university-wide, limiting the ability to identify shared needs and assess the return on investment (ROI) of IT investments
- While CSSD maintains *The IT Plan for Pitt*, there is not an effective annual cadence to identify enterprise IT needs and budget for those needs strategically
- There is limited transparency of what IT initiatives are being budgeted for either to CSSD or to the University community.
- Lack of an integrated IT budget leads to duplication and inefficient efforts not aligned to a broader IT strategy.

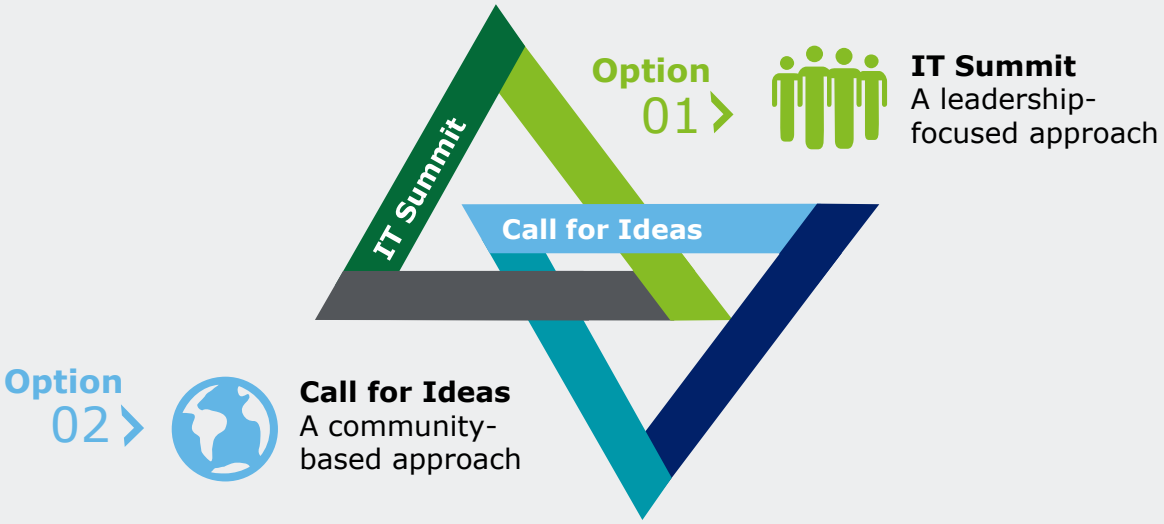
Summary Description

- Define a university-wide IT budgeting process and enhance alignment of the budget with strategic priorities
- Enable university-wide engagement in IT strategic planning with a call for ideas or an annual IT summit
- Build standardized tools or templates for budgeting to enhance collaboration
- Develop an integrated IT budget for all IT spend university-wide to identify shared needs for IT investments or shared resources for IT initiatives
- Define and communicate a budget formulation methodology for IT at Pitt

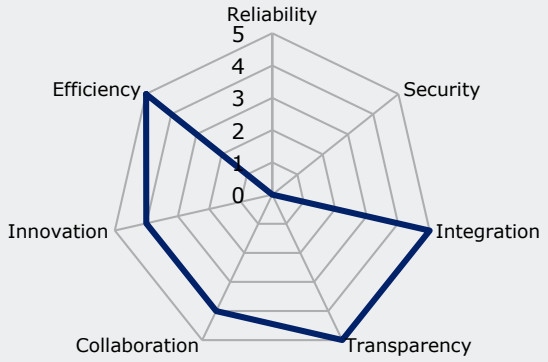
Expected Benefits

- An integrated, collaborative approach to budgeting for IT that works for each school and department increases transparency and efficiency, allowing for resource pooling for shared needs.
- Standardized tools and templates for budget formulation allows comparison of IT initiatives across units to identify efficiencies and reduces overlap by identifying shared needs
- An integrated IT budget facilitates continuous improvement in budget formulation

Conceptual Model



Alignment to Strategic Priorities



2.1 Develop an Integrated IT Budget University-wide

Create an integrated IT budgeting process across the University to enhance budget formulation centered around shared needs and strategic priorities.

Implementation Activities

- Use a proposed operational governance working group (Enterprise IT Budgeting and Planning, see Recommendation 1.1) to assess IT budgeting processes and IT strategic planning maturity at the University
- Working group to develop standard IT budget exhibits and standardized reports or visualizations to facilitate identification of shared needs
- Working group to develop standard IT strategic planning process
    - Approach may include an annual governance coordination cycle through an annual IT summit or call for ideas. It should be integrated with IT governance groups, have a linkage with the budget, and link to *The IT Plan for Pitt*
- With integrated and standardized IT budget documents, reevaluate budget formulation methodologies to move toward more strategic budgeting practices where appropriate
- With greater visibility over common IT needs, explore a bundled-services chargeback model whereby services are packaged together for varying customer types (e.g., staff, student, researcher) and tied to a set price, so that RC directors have a better understanding of what they are paying for
- Define an implementation, communication, and training plan

Success Metrics

- % of IT budget in integrated university-wide IT budget
- # of schools and departments that participate in university-wide IT strategic planning activities

Implementation Timeline 0 – 9 months | **10 – 18 months** | 19 – 36 months

Level of Effort

Low | **Medium** | High

- **Document current state:** 1 FTE for 2-3 months to assess IT budgeting and strategic planning processes university-wide
- **Standardize tools and templates:** 1-2 FTEs for 3-6 months to develop standardized workbooks, reports, and visualizations
- **Reevaluate budget formulation methodologies:** 1 FTE for 6-9 months to evaluate budget formulation and explore a bundled-services chargeback model
- **Deploy change management plan:** 1 FTE for 2-3 months to design communication and training plans, and deliver trainings and workshops

Risks/Dependencies

Low | **Medium** | High

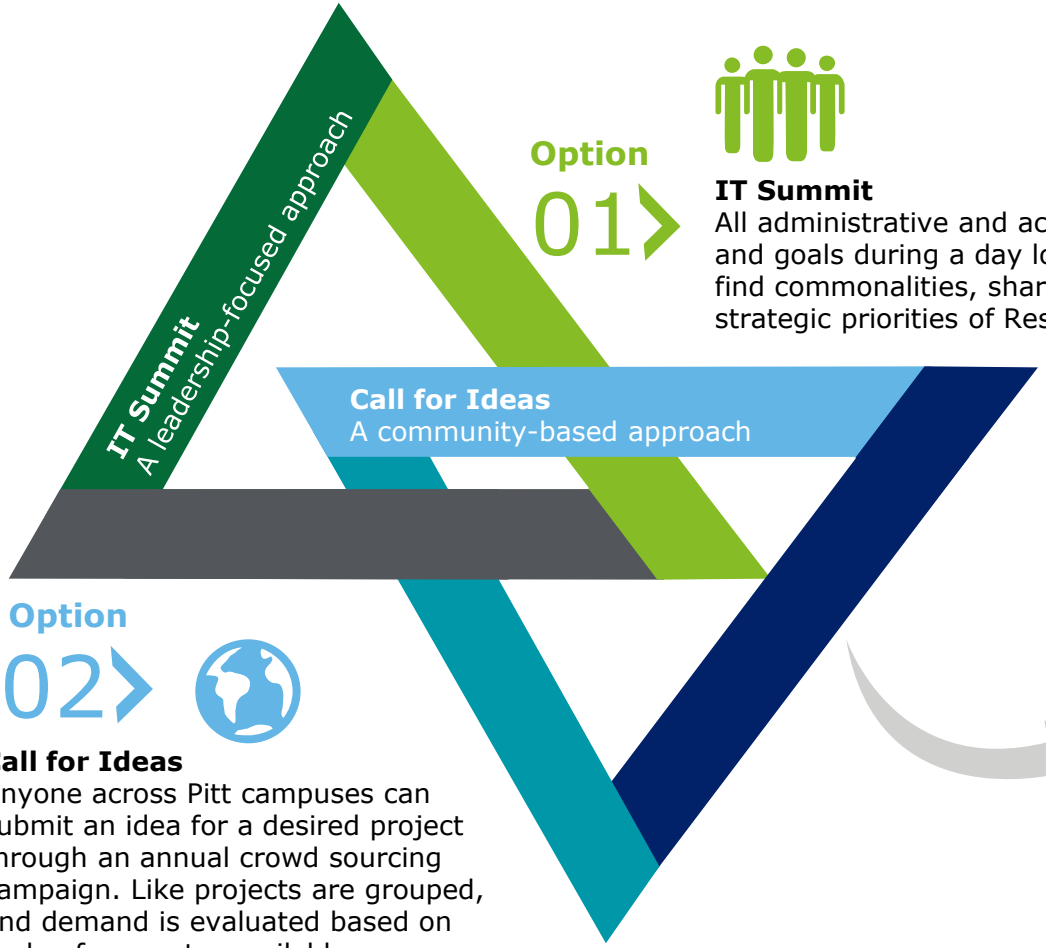
- Involves an enhanced IT governance structure to provide unified oversight of IT and lead initiatives (see Recommendation 1.1)
- Involves building a collaborative culture for IT initiatives, where school and department IT staff work together to identify shared needs and pool resources for efficiencies (facilitated by Recommendations 3.1 - 3.2)
- Change management may be required to rollout new processes to budget formulation staff, IT directors, and IT customers

Assumptions

- IT directors at schools and departments will disclose IT budgets, activities, and initiatives
- This effort will not require a University referendum to complete

2.1 Develop an Integrated IT Budget University-wide

Either an IT Summit or Call for Ideas could serve as a mechanism to proactively identify shared needs across the University, allowing schools and departments to budget more collaboratively and toward defined strategic priorities.



Option 01

IT Summit
All administrative and academic units discuss strategies, funding, needs, and goals during a day long IT Summit. This provides an opportunity to find commonalities, share resources, or define gaps in achieving the IT strategic priorities of Responsibility Centers or of the University

Option 02

Call for Ideas
Anyone across Pitt campuses can submit an idea for a desired project through an annual crowd sourcing campaign. Like projects are grouped, and demand is evaluated based on scale of requests, available resources, and alignment with strategy

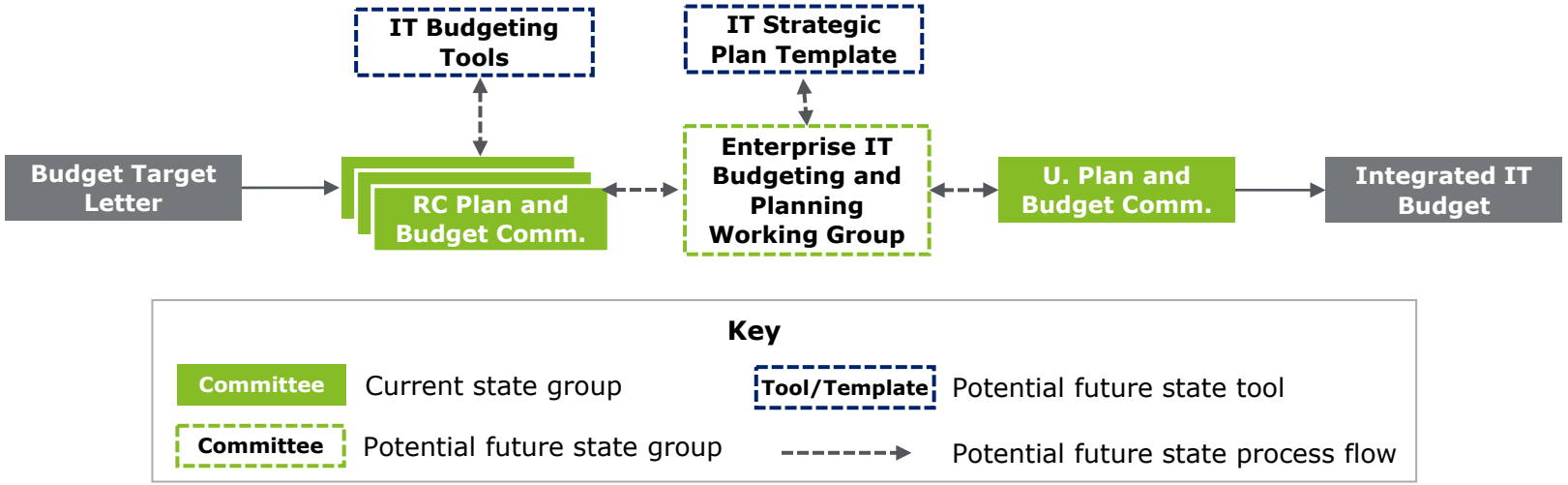
Transparency and Communication

For either option, outcomes should be communicated and transparent for annual and ongoing IT budgeting and governance activities

- Outputs from either operation provide the information necessary to inform how departments may budget for shared projects
- In alignment with the annual cycle of activities, IT governance committees have an opportunity to both reach out to the community and report back on activities and decisions that can build excitement and connection to the process
- With a more process-oriented, ongoing approach, communications about outcomes can be more schedule driven and predictable

2.1 Develop an Integrated IT Budget University-wide

A potential future state budgeting process could use an operational governance working group to oversee and assist in budget formulation university-wide, aligning with and enhancing existing budgeting processes



Potential Timeframe	Group	Potential Activities
Aug. – Nov.	Target letter	Budget targets released to Responsibility Centers (RCs)
Nov. – Mar.	RC Planning and Budgeting Committees	Evaluate previous year performance and develop proposed budget
Nov. – May	Enterprise IT Budgeting and Planning Working Group*	Evaluate IT-specific budgets from each RC to have one university-wide view of IT budgeting. Assist RCs in IT budget formulation, and work with UPBC and RCs to reconcile IT budget consistencies and reduce overlaps
Jan. – May	University Planning and Budgeting Committee (UPBC)	Develop budget parameters and metrics for the year. Evaluate plans for internal consistency
May – June	UPBC	UPBC recommends consolidated University budget to Chancellor

 *Note: Working group proposed as part of governance Recommendation 1.1

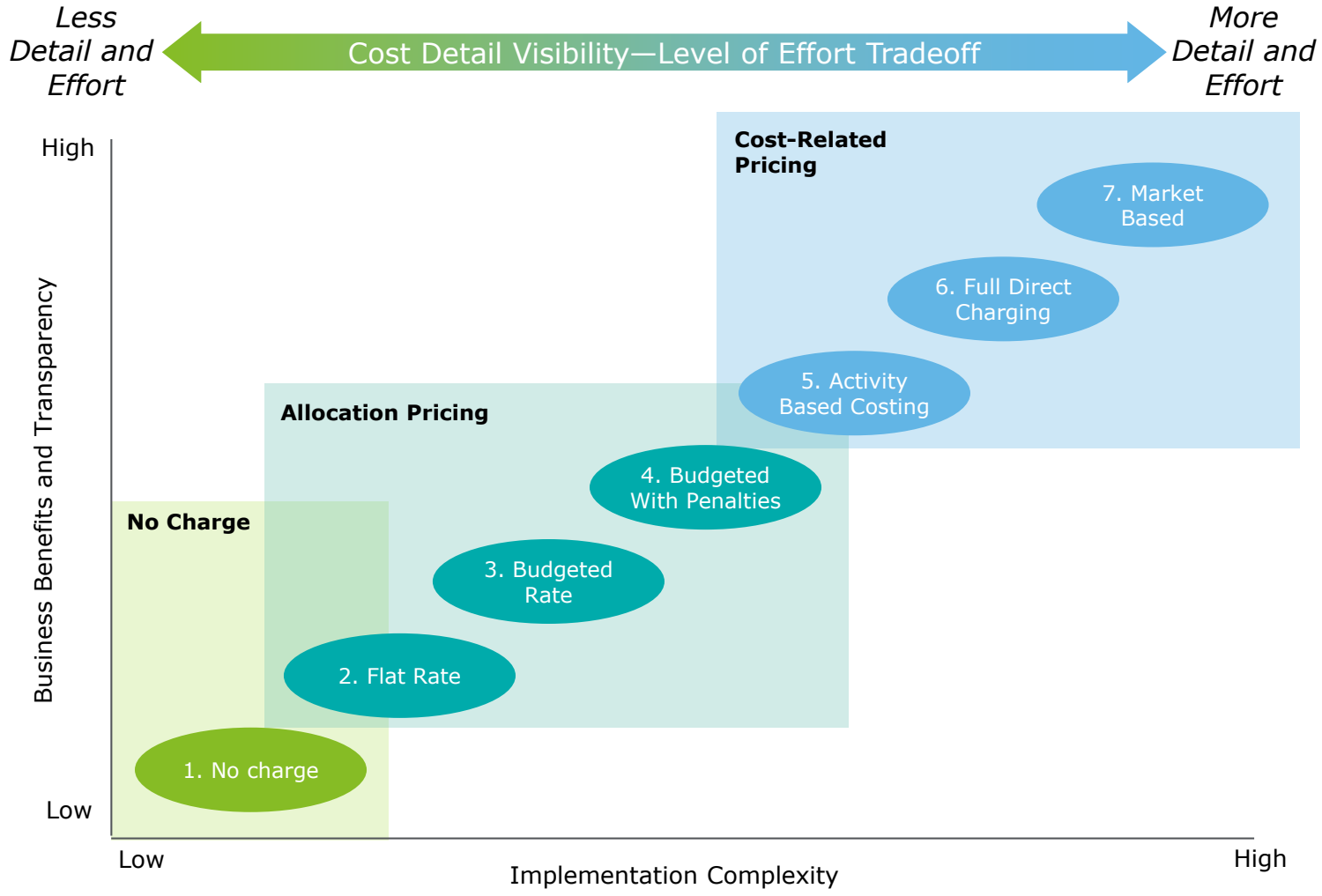
2.1 Develop an Integrated IT Budget University-wide

Of four common budget methodologies, incremental budgeting is most prevalent in universities. A shift toward more strategic budgeting can enhance the link between budget and strategy.

Incremental	Formula	Performance	Incentive
• Centrally driven • Current budget acts as "base" • Each year's budget adjustments are increments (or decrements) to the base (typically the previous year's budget) • Focus is typically placed on expenses	• Unit-based model focused on providing equitable funding • Unit rates are input-based and commonly agreed upon • Annual fluctuations are driven primarily by quantity and not from changes to rates	• Unit-based model focused on rewarding mission delivery • Unit rates are output-based • Annual fluctuations are driven primarily by changing production and not from changes to rates	• Focus on academic units • Incorporates a devolution of revenue ownership to local units, as generated • Allocates costs to revenue generating units • Uses a centrally managed "subvention pool" to address strategic priorities

2.1 Develop an Integrated IT Budget University-wide

With greater visibility over common IT needs, Pitt can revaluate the packaging and pricing of services available across the University, perhaps developing a bundled-services approach whereby services are packaged by role and tied to a set price. Selecting the right chargeback method is a tradeoff between detail and effort.



2.2 Strengthen IT Purchases across the University

Enhance IT procurement by critically evaluating the demand of IT goods and services of schools and departments and avoiding duplication

Problem Statement/ Current State

- 48% of purchases are through university-wide contracted suppliers
- 94% of IT spend is considered spend under management (transactions of less than $10,000 AND not through a university-wide contract)
- Feedback from majority of ~100+ interviewees reported difficulty in ascertaining which products exist on campus and what service contracts might already be available and their rates

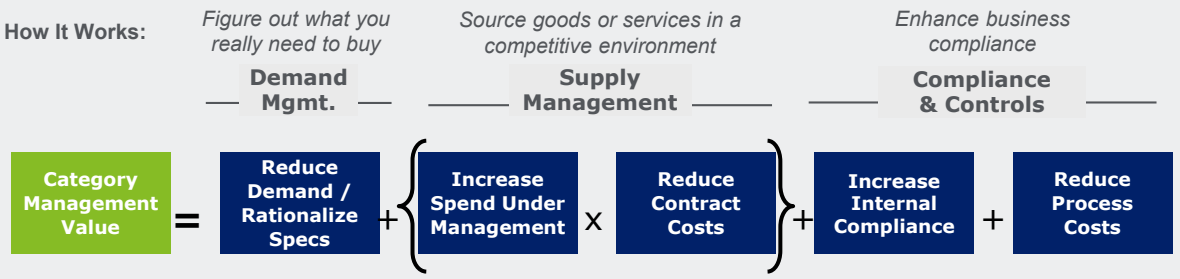
Summary Description

- Develop a more defined sourcing strategy with CSSD oversight of university-wide IT purchases to increase collaboration and standardization in IT purchasing, leading to more efficient, secure, and reliable IT services.
- Evaluate current IT purchases to identify both ad hoc purchases and shared needs

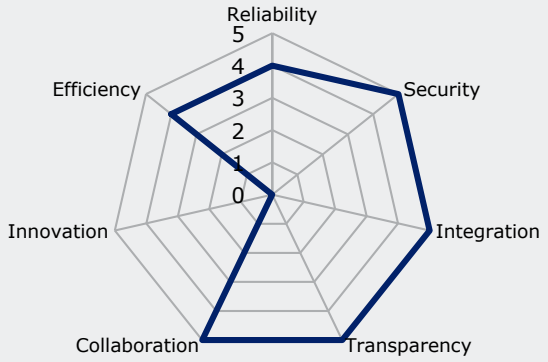
Expected Benefits

- Increased reliability and security will result when more IT purchases are adhering to security and other standards
- Increased transparency in the full scope of IT purchases occurring across Pitt
- Increased collaboration between schools and departments and CSSD in order to reduce spend and better utilize existing enterprise contracts and solutions
- University-wide IT efficiency gained in reduced overlap of IT purchases

Conceptual Model



Alignment to Strategic Priorities



2.2 Strengthen IT Purchases across the University

Enhance IT procurement by critically evaluating the demand of IT goods and services of schools and departments and avoiding duplication

Implementation Activities

- Develop a defined sourcing strategy for IT including a documentation of current sourcing processes, improvement opportunities, University IT goals, and steps for consolidating IT purchases
  - Utilize existing IT Purchasing working group (see Recommendation 1.1) to define enhanced governance and purchasing controls approach; working group may include representation from Purchasing Services, Strategic Sourcing, CSSD Vendor Relations, and relevant IT directors (may evolve any current working groups if they exist)
  - Sourcing strategy may include budget targets for key purchasing categories or targets for number of suppliers for each purchasing category, and should include roles, responsibilities, and delegation authority for IT purchasers
  - Define enhanced processes for flagging and routing IT purchases through Purchasing Services and CSSD where gaps are identified
- Assess additional opportunities for consolidating, modifying, or reducing current systems and software purchases
- Increase initial support for future state vendor relations to ease transition

Success Metrics

- % of IT purchasing under or reviewed by CSSD
- % of IT purchasing through university-wide contracted suppliers

Implementation Timeline

0 – 9 months | **10 – 18 months** | 19 – 36 months

Level of Effort

Low | **Medium** | High

- **Comprehensive current systems cost and software purchase review:** 1 FTE for 3-6 months to work with each school and department to understand current state IT systems in place, documenting demand, supply, and controls
- **Sourcing strategy and system or software purchase right-sizing:** 1 FTE for 3-6 months to develop consolidation, modification, or reduction plans and negotiate future state systems
- **Initial Vendor Relations:** 0.5 or 1 FTE for 3 months for surge support to facilitate transition of future state

Risks/Dependencies

Low | **Medium** | High

- Involves strong IT governance and standing up a working group to develop and drive IT purchasing strategy, rules, and standards (see Recommendation 1.1)
- Involves continued monitoring, either automatic or ad hoc, of IT expenses using data from the CFO's office, to flag, control, or highlight IT purchases that are not in accordance with standards
- IT purchasing data can be used to enhance integrated budgeting process and identify shared department needs (see Recommendation 2.1)

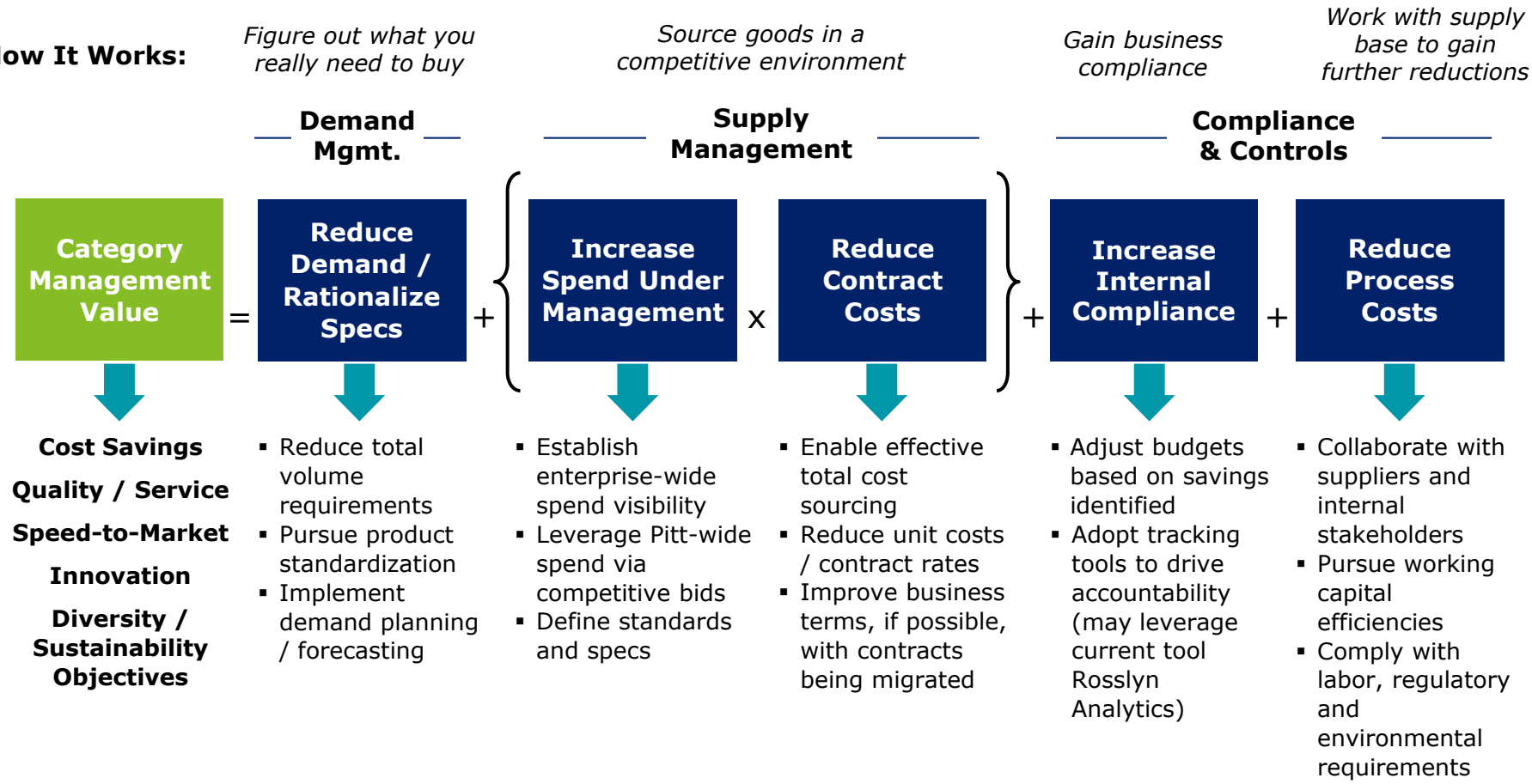
Assumptions

- End user training and change management will be provided to all authorized IT purchasers
- CIO will be given appropriate controls to enforce process
- Finance system can create flags and alerts for IT object codes

2.2 Strengthen IT Purchases across the University

Pitt can manage spend more effectively through demand and supply management of varying purchasing categories, and corresponding compliance and controls.

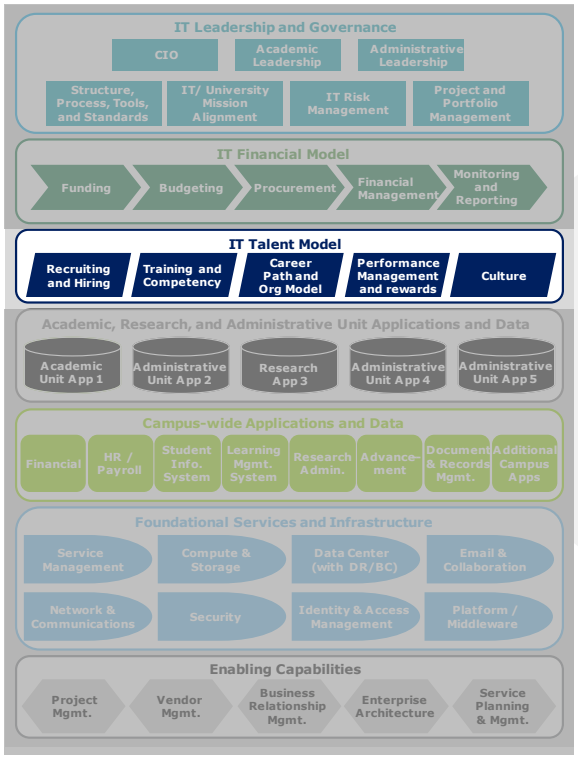
How It Works:




IT Talent

IT Talent Opportunities

A fresh, unified approach to IT talent management will help prepare and retain the right talent pipeline to realize the goals of *The Plan for Pitt.*



3.1 Develop Career Paths for IT Staff (in coordination with existing OHR initiative)

- Delivers clarity on career progression from new hire to retirement, increasing the ability to retain top talent and share staffing needs

3.2 Build a Unified IT Training Program

- Builds a consistent skill and knowledge base and grows a workforce that keeps pace with innovation and emerging technologies

3.3 Create a Culture of One IT

- Shapes behaviors to improve retention, communication, collaboration, and trust.

3.1 Develop Career Paths for IT Staff (in coordination with existing OHR initiative)

Develop and standardize IT career paths to improve talent development and facilitate effective IT staff deployment.

Problem Statement/ Current State

- No formal career pathing currently exists for IT staff within CSSD or across the University, which constrains career growth
- IT staff career paths are dependent on unique managers
- While IT staff turnover is lower than the Pitt staff average, variability across departments illustrates an opportunity to standardize the approach to improving retention
- Pitt cannot easily deploy IT staff across schools and departments due to silos and job titles that do not provide information about the work IT staff are performing

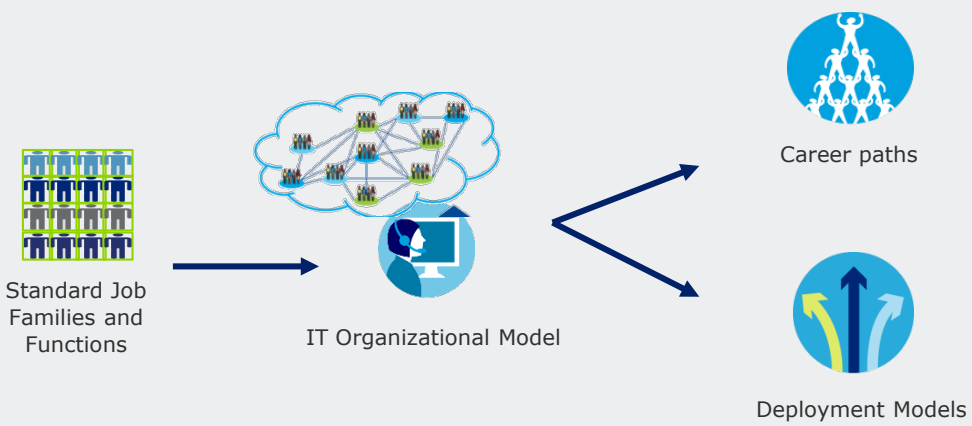
Summary Description

- Align updated job families and functions developed by the Office of Human Resources (OHR) with the organizational model to enable mobility and clear lines of progression
- Define career paths, ladders, and lattices using standardized pay scales developed by OHR
- Develop new models for deploying staff and new ways of working to better allocate IT talent

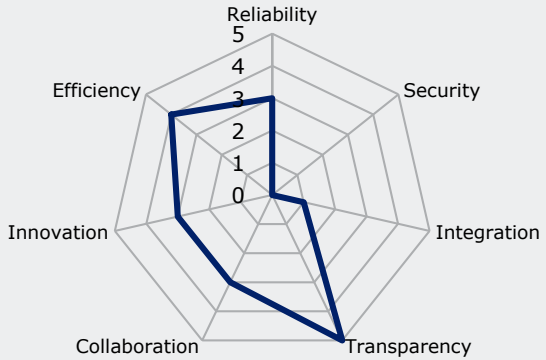
Expected Benefits

- Clarity on a standard career progression from new hire to retirement
- Increased effectiveness in IT service provision
- Low attrition rates for the most desirable staff; encourages top performers
- Ability to more easily share staff or plan for needs/gaps
- Prepares and guides the right pipeline of talent to meet future state requirements

Conceptual Model



Key Benefit Metrics



3.1 Develop Career Paths for IT Staff (in coordination with existing OHR initiative)

Develop and standardize IT career paths to improve talent development and facilitate effective IT staff deployment.

Implementation Activities

- Develop a timeline to design IT career paths in alignment with the Office of Human Resources (OHR) study and the debut of new job families and functions across the University
- Define career paths, ladders, and lattices in alignment with standardized pay scales developed by OHR
- Develop linkages between functions, expectations, training requirements, and development opportunities
- Evaluate flexible deployment models to allocate IT talent according to university-wide IT strategic priorities

Success Metrics

- # of career paths deployed in CSSD
- # of career paths deployed for IT staff across the University
- % of career paths shared by CSSD and IT staff distributed across schools and departments

Implementation Timeline 0 – 9 months | **10 – 18 months** | 19 – 36 months

Level of Effort

Low | **Medium** | High

- **CSSD Career Paths:** 1 FTE for 2 months to design career paths
- **Pitt IT Career Paths:** 1 FTE for 4 months to design standard career paths for schools and departments

Risks/Dependencies

Low | Medium | **High**

- The Office of Human Resource study and reclassification is a prerequisite to developing career paths
- Staff activity analysis is a prerequisite to understanding the scope of IT staff activities
- Engagement with the school deans and department leaders from the start will be essential to being able to execute the designed strategy
- Deep change management will be required to support the transition
- Departments that are cohesive today may resist consolidation into a larger University resource pool or deployment process

Assumptions

- Standardization would allow staff to be effectively shared across IT units as part of an enhanced deployment strategy in the future

3.1 Develop Career Paths for IT Staff

The approach below provides a model by which promotion readiness is determined according to defined career paths.

Step 1
Define High Level Skill Sets Required Across Roles

Step 2
Identify Core Competency Requirements for a Specific Role

Step 3
Determine Different Levels of Proficiency Related to Competencies

Sample Evaluation Criteria to Determine Readiness for Promotion

Technical Knowledge and Skills
- Core Technical Skills
- Technical Proficiency & Throughput
- Proven Results & Value

Interpersonal Skills
- Effective Communication
- Stakeholder Management
- Cultivating Relationships & Networks

Managerial Skills
- Planning & Management
- Motivating & Leading Others
- Developing Self & Others

Personal Skills
- Alignment with Culture
- Creativity, Empathy, etc.
- Innovation Mindset

Sample IT Career Path

Developer I → Developer II → Developer III *or* Senior Developer

Sample CSSD Career Path

Help Desk Analyst → NOC Monitor → Consultant

3.2 Build a Unified IT Training Program

Develop a comprehensive, function-oriented training program to provide IT staff with the skills necessary for their position and the changing tech environment.

Problem Statement/ Current State

- While CSSD invests heavily in conferences and memberships, there is a lack of standards and requirements around IT training university-wide, leading to inconsistent IT staff development across schools and departments
- Aside from a one-day HR orientation, onboarding of newly hired IT staff is inconsistent and dependent on the individual school, department, and team for structure
- Interviews revealed that IT has significant skills/capabilities gaps that are not being developed
- Without a clear training program strategically designed and based on Pitt and CSSD priorities, there is no clear understanding of university-wide skills gaps or needs
- No formal career pathing currently exists for IT staff within CSSD or across the University, which constrains career growth

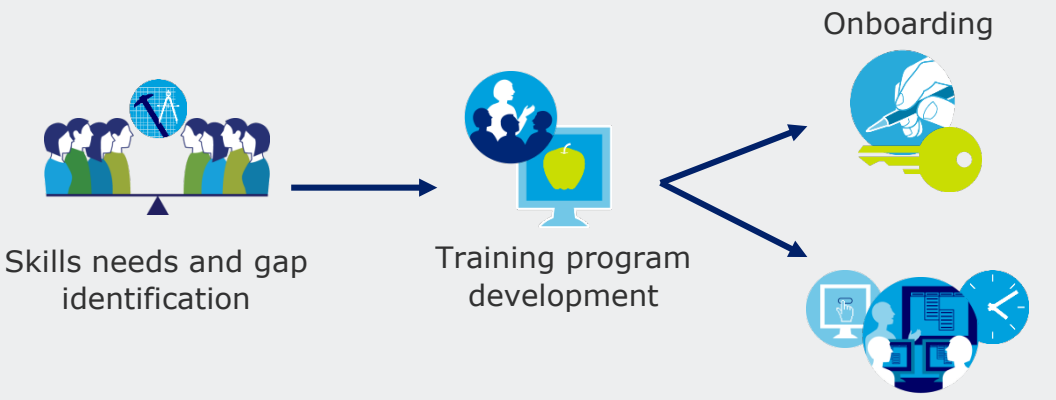
Summary Description

- Develop a consolidated, Pitt-wide IT training strategy
- Identify skills needs and gaps by building on the current study conducted by the Office of Human Resources
- Develop and standardize onboarding activities and resources by leveraging existing CSSD materials and expertise
- Develop a training program to address skills gaps that require remediation in order to achieve the goals outlined in *The Plan for Pitt* and *The IT Plan for Pitt*
- Define career paths, ladders, and lattices

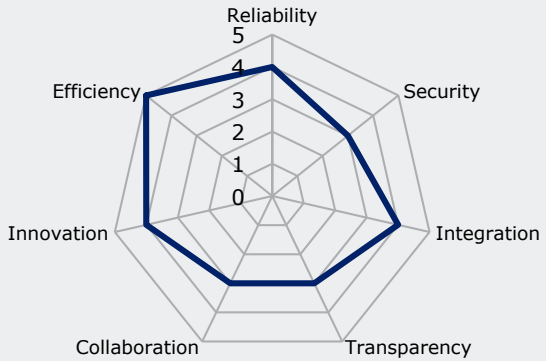
Expected Benefits

- Builds consistent skills and knowledge base
- Gains economies of scale through consolidation and standardization of training
- Facilitates flexibility in deployment of IT staff across the University
- Grows a workforce that keeps pace with innovation and emerging technologies
- Clarity on a standard career progression, and increased effectiveness in IT service provision

Conceptual Model



Alignment to Strategic Priorities



3.2 Build a Unified IT Training Program

Develop a comprehensive, function-oriented training program to provide IT staff with the skills necessary for their position and the changing tech environment.

Implementation Activities

- Build on the current study being conducted by the Office of Human Resources (OHR) to define core competencies and job functions that are supportive of University IT strategic priorities
- Create and distribute a skills assessment to analyze common skills gaps and identify development needs for all IT staff
- Validate skills and target development areas, and overall approach to university-wide training with a diverse range of IT stakeholders across schools and departments
- Develop guidelines and standards for IT training, including training minimums and courses for different levels and functions
- Leverage training available at the Faculty Staff Development Program (FSDP), other online courses, and the vendor community to build curricula at a low cost
- Build and maintain transcripts to gather and track data on staff professional development
- Align IT performance management expectations with training requirements
- Examine the feasibility of creating a unified IT training budget for the University
- Leverage standardization in training requirements and skills across levels as a foundation to define career paths, ladders, and lattices
- Develop new models for deploying staff with the same skills and training and new ways of working to better allocate a more consistent pool of IT talent

Success Metrics

- # of IT training guidelines and standards created
- % of IT staff who receive training under the new program

Implementation Timeline 0 – 9 months | 10 – 18 months | 19 – 36 months

Level of Effort

Low | **Medium** | High

- **Staff assessment:** 1 FTE for 2 months
- **Training program design:** 1 FTE for 3 months

Risks/Dependencies

Low | **Medium** | High

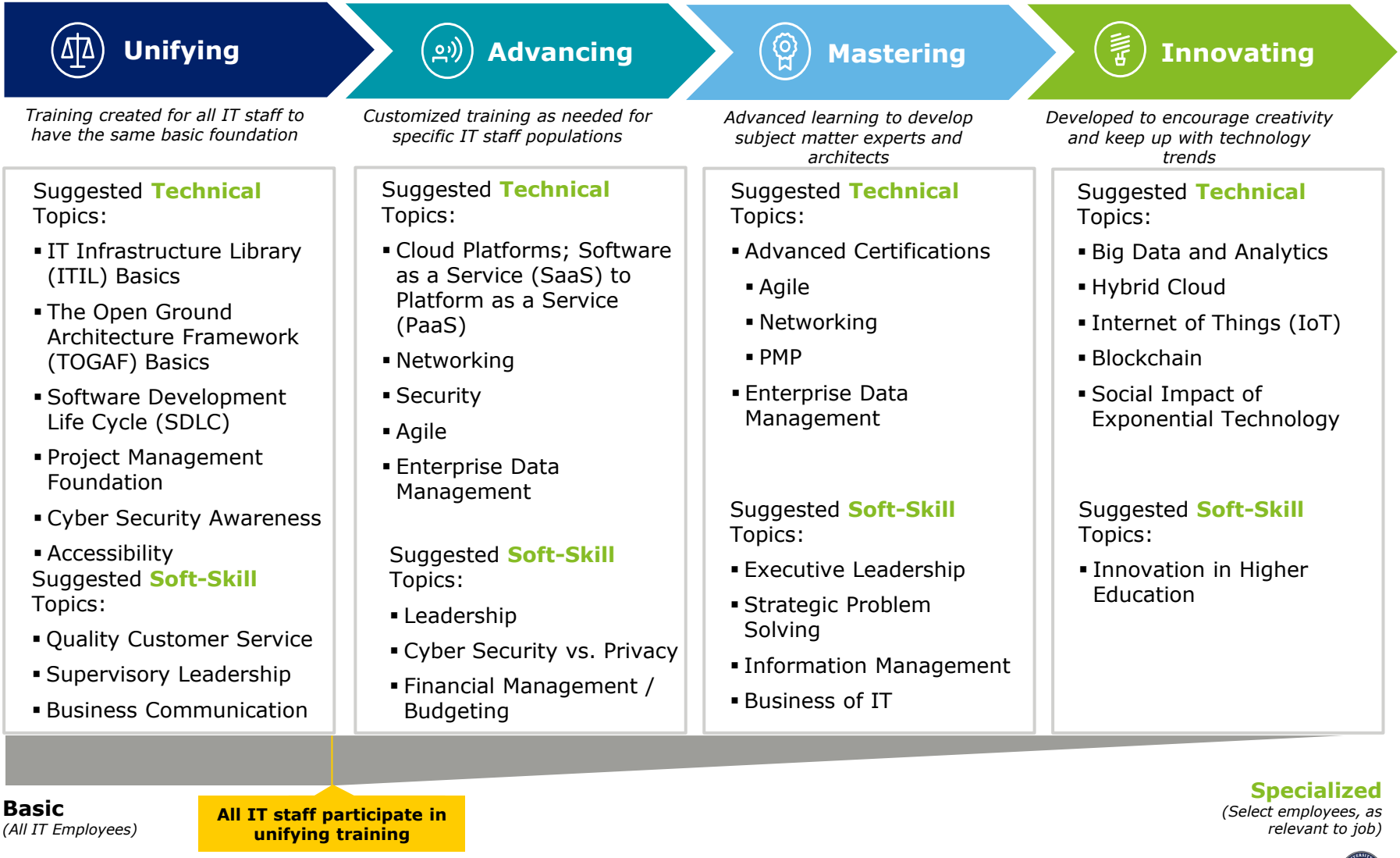
- Define university-wide IT guiding principles and budget to better align with Pitt's mission (see Recommendation 2.1)
- Skill and training expectations for each role must be integrated within the performance management framework
- Greater standardization of training will require consistent communications and change management planning to be successful
- The OHR study and reclassification is a prerequisite to developing career paths

Assumptions

- Overall IT training strategy and execution will fit within future state IT budget
- CSSD will shape the development of core competencies in alignment with *The IT Plan for Pitt*
- IT Governance Committees will play an active role in creating and approving training plans, and in driving adoption across campuses

3.2 Build a Unified IT Training Program

The sample approach below provides a framework by which a training curriculum could be organized.



3.3 Create a Culture of One IT

Shaping a cohesive IT culture will determine the success and effectiveness of IT service delivery, and fuel innovation across the University.

Problem Statement/ Current State

- The lack of a strong, shared IT culture across the University allows fiefdoms to operate in isolation and inhibits transparency, accountability, and collaboration
- Dispersed IT staff across campuses and siloed operating structures inhibit the establishment of a unified IT culture
- Many stakeholder interviewees described a culture of risk aversion and cited innovation as an improvement opportunity for both CSSD and the University
- While IT staff turnover is lower than the Pitt staff average, significant variability across departments illustrates an opportunity to standardize the approach to improving retention

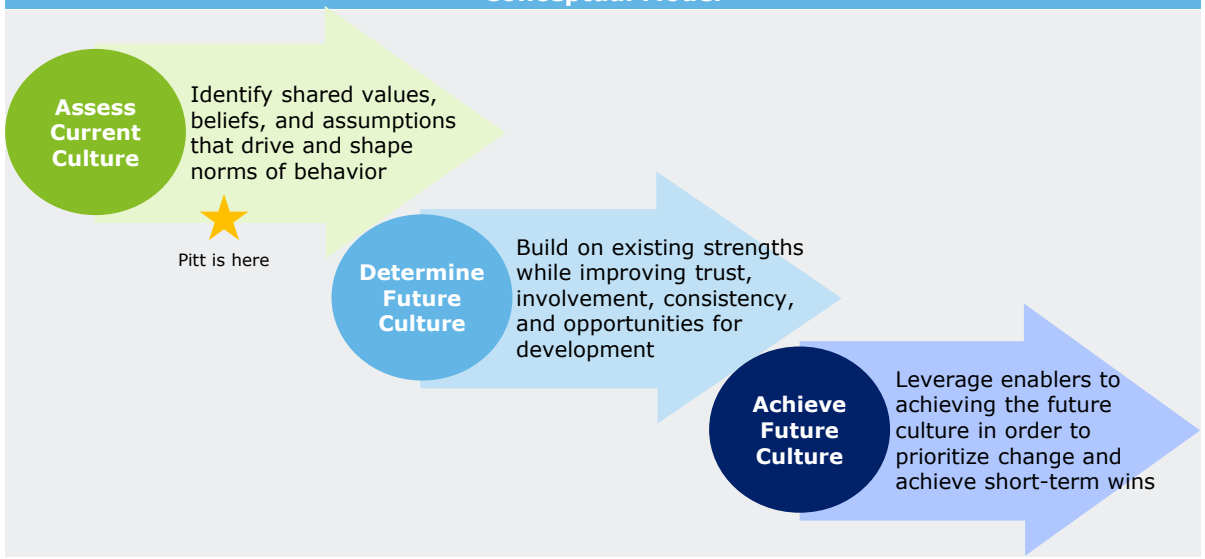
Summary Description

- Position CSSD and University IT stakeholders to drive the creation of a unified IT culture to shape and transform the IT footprint across Pitt
- Create a collaborative IT culture built on existing strengths and improvements in areas where a strong and unified IT culture is lacking
- Focus on developing a mutually beneficial relationship between CSSD and non-central IT departments, and schools and departments
- Encourage communication between CSSD and non-central IT departments, and schools and departments

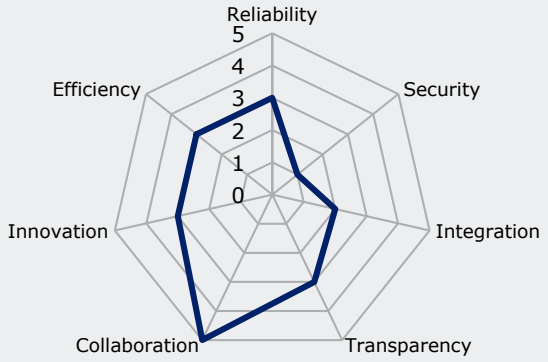
Expected Benefits

- Provides staff with a university-wide IT identity that shapes behaviors
- Facilitates collective commitment
- Improves retention among IT staff across the University
- Increases communication between CSSD and IT units embedded in schools and departments
- Improves trust and increases collaboration between non-central IT departments and CSSD

Conceptual Model



Alignment to Strategic Priorities



3.3 Create a Culture of One IT

Shaping a cohesive IT culture will determine the success and effectiveness of IT service delivery, and fuel innovation across the University.

Implementation Activities

- Building on interviews and current state findings of this assessment, define a future state IT culture that will bring together Pitt's IT workforce
- Develop a strategy for improving culture in alignment with the future state vision
- Build trust and authenticity first, then communicate desired need for change
- Leverage culture events and resources within CSSD to model success across the University (e.g., pancake breakfasts for the United Way, social committee)
- Build new mechanisms for culture to develop from the bottom up by empowering IT staff to own organizational outcomes (e.g., inter-departmental community events, newsletters, user groups, call for ideas)
- Reward IT staff who are championing and adopting future state culture
- Monitor employee satisfaction with various aspects of IT culture at Pitt (e.g., pulse surveys) and model continuous improvement by seeking opportunities to innovate

Success Metrics

- # of IT culture building events held/resources created
- % of IT staff participating in culture building events/accessing resources

Implementation Timeline

0 – 9 months | **10 – 18 months** | 19 – 36 months

Level of Effort

Low | **Medium** | High

- **Definition, Strategy, and Process:** 0.5 FTE for 3 months to develop future state culture and strategy, and facilitate culture-building activities
- **Monitor:** 0.25 FTE to monitor effectiveness of cultural transition

Risks/Dependencies

Low | **Medium** | High

- Developing a shared culture can be anchored by a defined, transparent, and effective governance model with representation across the University (see Recommendation 1.1)
- Changing culture is the hardest element IT transformation work; engaging stakeholders, demonstrating an understanding of the current culture, articulating the benefits of the future vision, and communicating short-term wins along the way will enable Pitt to achieve its strategic goals
- Implementing a unified IT training program and developing career paths (see Recommendation 3.1) will help facilitate a strong and sustainable IT culture across Pitt

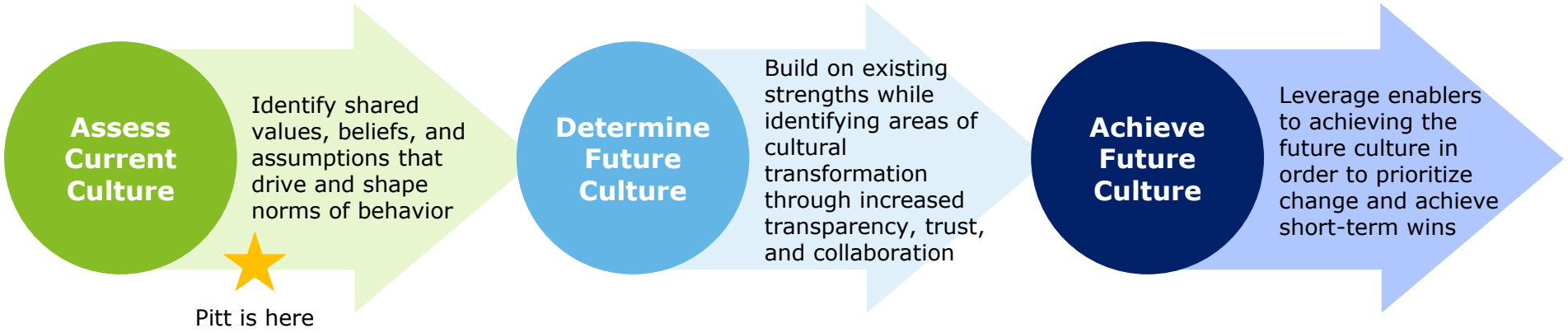
Assumptions

- New approach to culture will be introduced with ample communication and change management
- Current staff will be open and willing to improve University IT culture
- IT Governance Committees will play an active role in shaping and transforming IT culture across campuses

3.3 Create a Culture of One IT

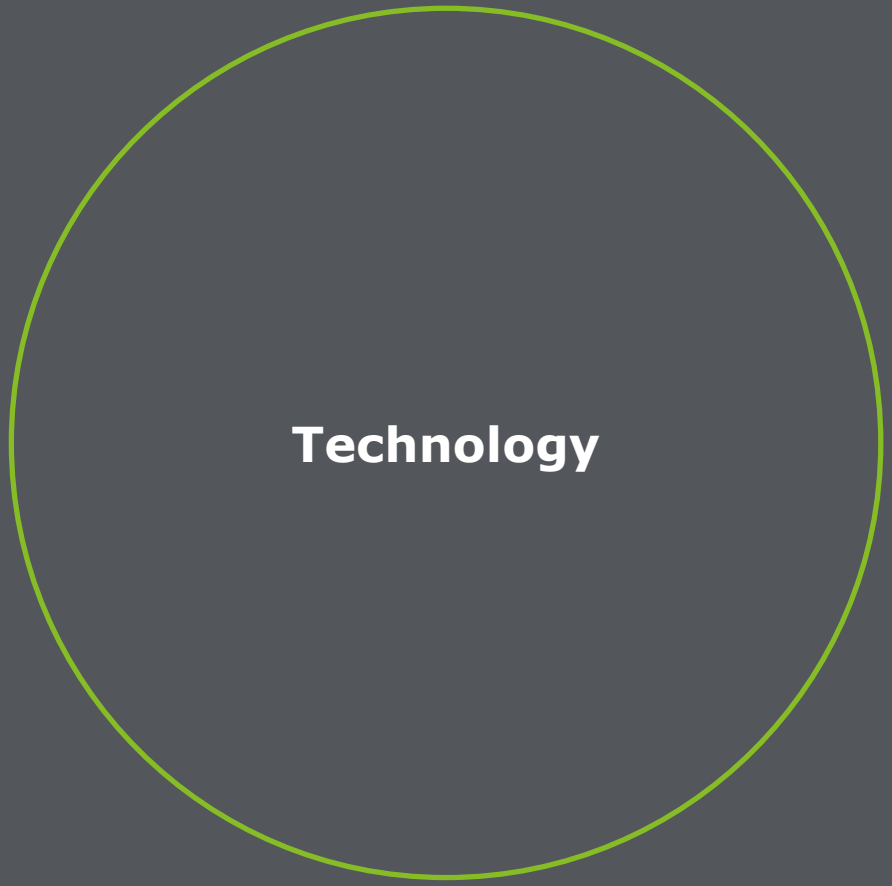
Creating a cohesive IT culture requires an approach that includes understanding the future state, defining a shared vision, and executing a plan that maps risks and challenges.

Culture Strategy



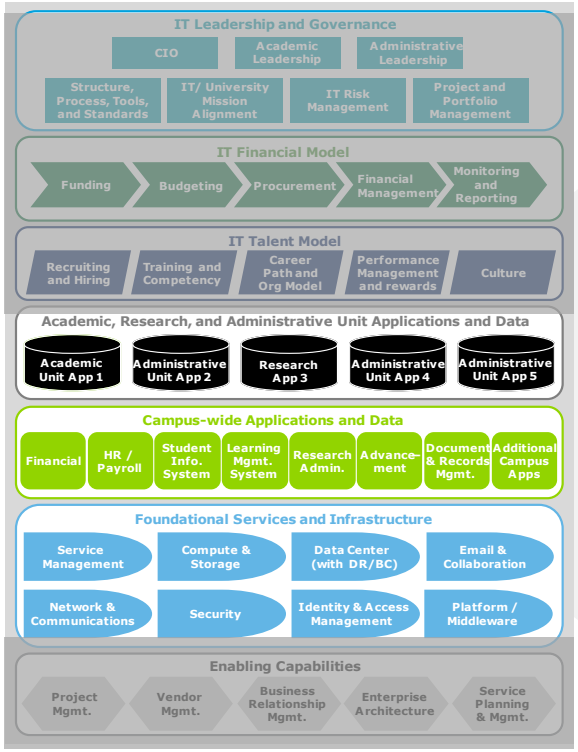
Key Considerations

- The **enablers** and **barriers** for **cultural change** identified by this assessment provide a baseline understanding of the values, beliefs, and assumptions at Pitt – a foundation upon which the future state IT culture can be shaped
- The perspective of all stakeholder groups – from leadership to entry-level staff, from existing to prospective students – is essential in bringing along **all levels** of the University and addressing **IT culture change holistically**
- Realizing the clear **vision** outlined in *The Plan for Pitt* and *The IT Plan for Pitt* will require academic and administrative stakeholders to align on the ways in which technology can enable Pitt's mission
- **Changing culture** is the **hardest element** of IT transformation work; engaging stakeholders, demonstrating an understanding of the current culture, articulating the benefits of the future vision, and communicating short-term wins along the way will enable Pitt to successfully shape an IT culture of excellence


Technology

Technology Opportunities

These opportunities allow Pitt to modernize its technology services through key network enhancements, a forward-thinking infrastructure strategy, and a holistic approach to web.



4.1 Establish Long-Term Cloud and Data Center Strategy

- Enables best-in-class services by consolidating data centers and developing a cloud-focused strategy.

4.2 Implement Enterprise IT Asset Management

- Reduces risk of failure, increases accuracy in planned renewal cycles and capacity, and enhances reporting capabilities.

4.3 Collaborate with UPMC to Improve PittNet Access

- Improves the experience and data security of dually-appointed faculty.

4.4 Consolidate Help Desk Tools

- Eliminates redundant help desk products and improves ability to diagnose issues.

4.5 Deploy a Common Brand for All Pitt Websites

- Develop a strategy and common toolset for creators and contributors to create a more common web brand.

4.1 Establish Long-Term Cloud and Data Center Strategy

Consolidated data centers and a cloud-focused strategy enable best-in-class services.

Problem Statement/ Current State

- The data center at Regional Industrial Development Corporation (RIDC), also known as the Network Operations Center (NOC), provides Tier 3 level data center services with room for growth, yet some schools and departments choose to maintain their own data center or server room facilities, requiring additional resources to maintain, support, and secure equipment
- Increased storage and computing needs are a driving factor for cloud utilization
- Without a unified cloud strategy, schools and departments are exploring cloud services ad hoc

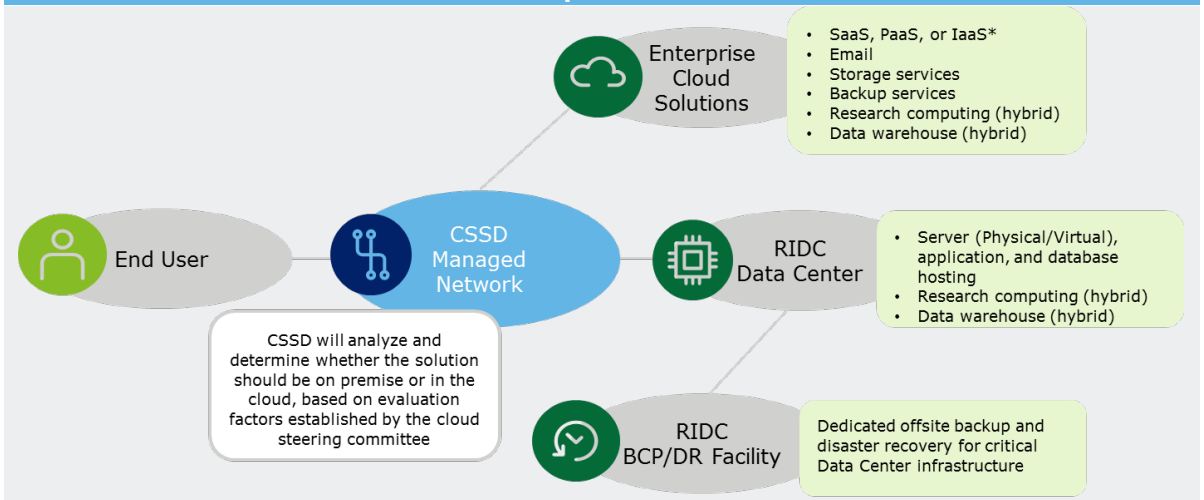
Summary Description

- Complete strategy for moving or decommissioning Pitt server and storage equipment from existing data centers and server rooms to the NOC and consolidate these facilities into network hubs
- Provide a university-wide central cloud migration plan and enterprise procurement vehicle for third-party cloud services (e.g., Amazon Web Services, Microsoft Azure)
- Establish a cloud security framework to determine a standardized approach to risk management prior to migrating IT assets and workloads to the cloud

Expected Benefits

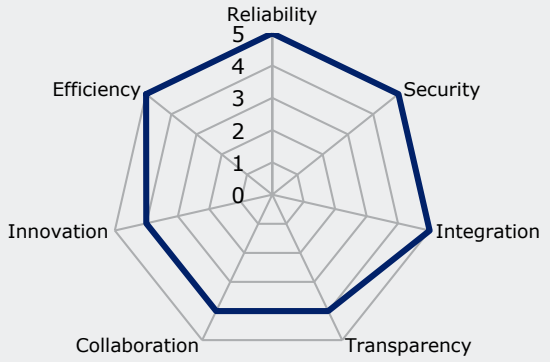
- Reduces risk, increases accuracy in refresh cycles and capacity, and enhances accuracy in reporting
- Reduces school and department IT server administration efforts
- Best-in-class IT services enabled through cloud computing
- Standardized cloud architecture that is commonly agreed upon and adhered to throughout Pitt
- Cloud offerings align with business strategy, business process, and overall IT strategy

Conceptual Model



* Refers to cloud solutions: Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS)

Alignment to Strategic Priorities



4.1 Establish Long-Term Cloud and Data Center Strategy

Consolidated data centers and a cloud-focused strategy enable best-in-class services.

Implementation Activities

- Leverage current steering committee as a working group in developing cloud strategy
- Map and define ownership of enterprise applications and services
- Consolidate the nearly 1/3rd of physical servers and storage hardware remaining into the NOC and re-purpose remaining hardware for business continuity planning (BCP) and disaster recovery (DR) purposes where appropriate
- Define overarching objectives and business drivers for cloud within context of current IT strategy; validate business and IT requirements
- Establish standardized cloud architecture to support the organized migration of applications and systems to the cloud
- Align cloud reference model with architecture standards along each of the architecture domains (server, storage, database, cyber security, and network)
- Create a cyber security framework to enhance risk management around workload types that can be migrated to the cloud
- Evaluate applications and infrastructure to determine suitability for cloud platform options

Success Metrics

- # of data centers across Pitt
- % of applications and storage using cloud/SaaS services

Implementation Timeline 0 – 9 months | 10 – 18 months | 19 – 36 months

Level of Effort

Low | Medium | High

- **Data Center Consolidation Planning:** 1 FTEs for 4-6 months
- **Data Center Consolidation and Reclassification:** 3 FTEs, with additional part-time data center resources to help conduct transition of equipment (18-24 months)
- **Cloud Architecture and Security Framework:** 1-2 FTEs to establish standards, create framework, and develop policies (6 months)

Risks/Dependencies

Low | **Medium** | High

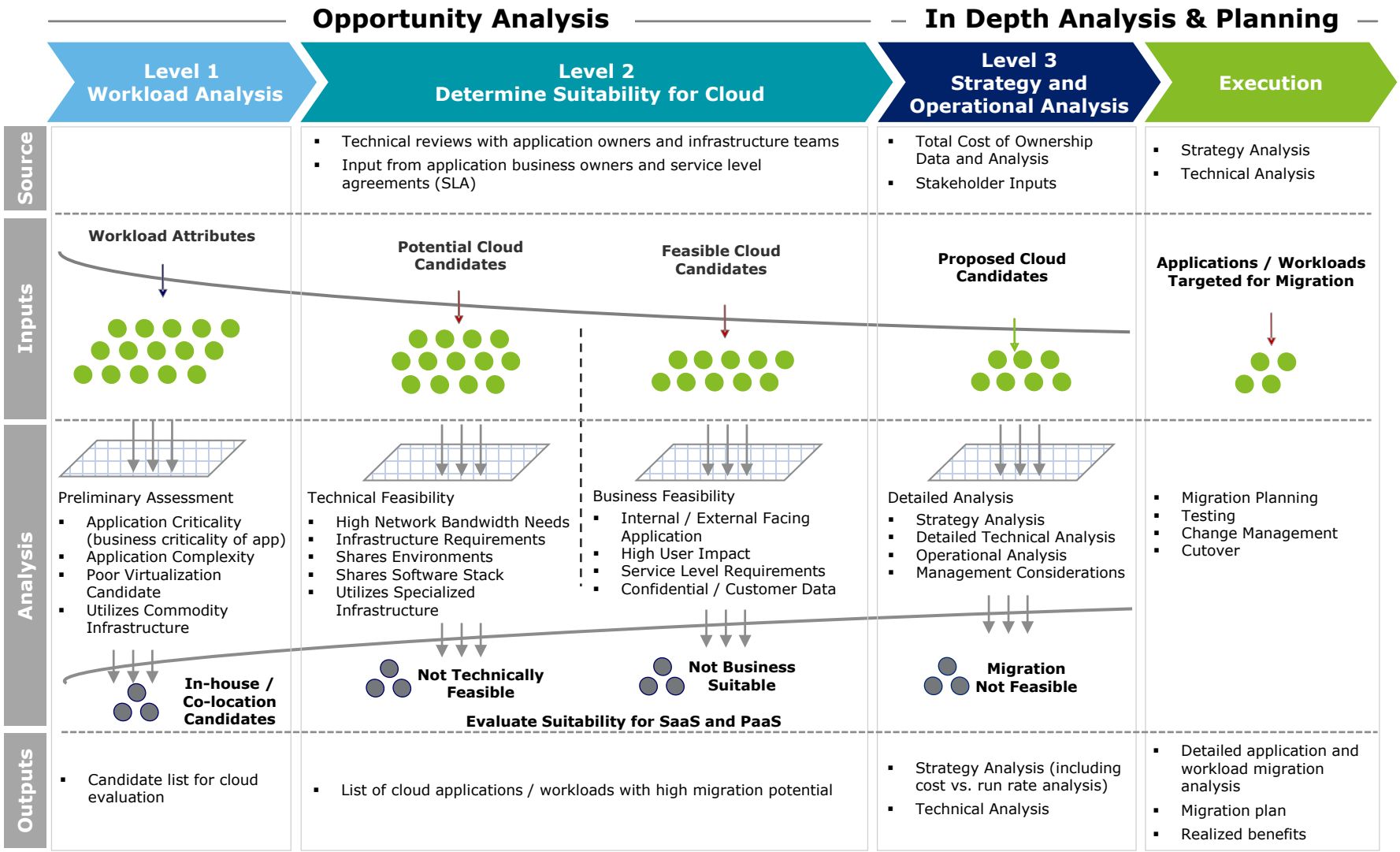
- Implementation of IT governance will help facilitate campus-wide decision making around consolidation (see Recommendation 1.1)
- Leadership by business and academic executives will be required to institute a new funding model and cost structure that will enhance participation by schools and departments (see Recommendation 2.1)
- Participation and buy-in from individual schools and departments around strategy development and implementation (see Recommendation 2.1)
- Cloud platform-specific training to enable users and support staff (see Recommendation 3.1)

Assumptions

- Remaining server equipment in on-campus data centers can feasibly be relocated to the NOC
- NOC data center equipment requirements will meet the needs of school and department IT groups
- Public cloud options will be identified to meet the cyber security requirements of Pitt
- Legacy systems will be modernized in order to be migrated to the cloud

4.1 Establish Long-Term Cloud and Data Center Strategy

Evaluate applications and infrastructure to determine suitability for cloud platform options.



4.2 Implement Enterprise IT Asset Management

Proper tracking of Pitt's IT assets reduces risk, increases visibility, and enables capacity planning.

Problem Statement/ Current State

- Insite System tracks and capitalizes hardware and software above $5K and used for financial reporting purposes
- Lack of visibility between CSSD and departments that manage their own assets creates potential for missed hardware and software optimization opportunities

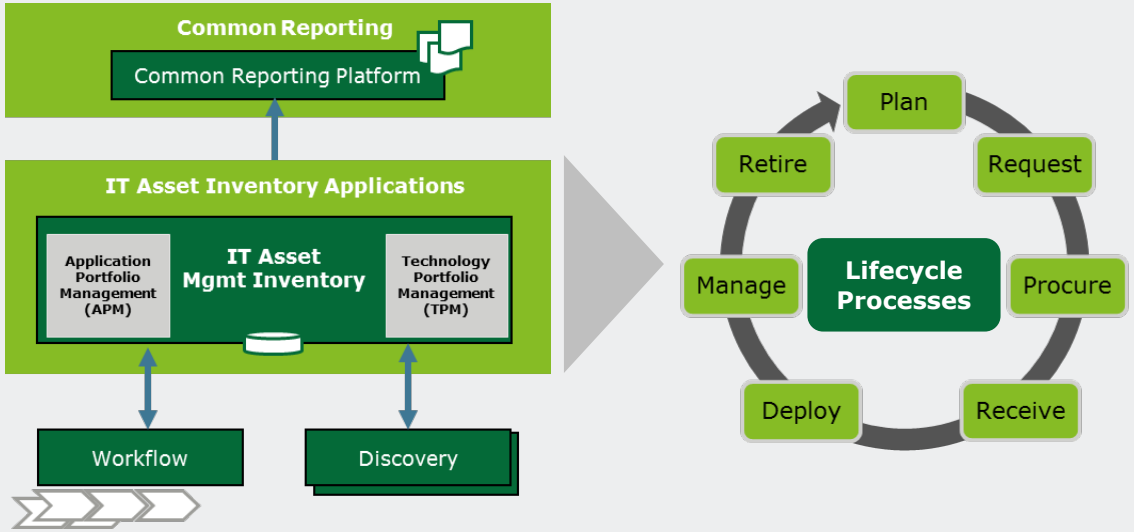
Summary Description

- Define a strategy to manage all new, retiring or changed assets, including what traits to track, when to update or review the list, and what reports to generate based on the relevant information
- Inventory can be mined for information about redundant technologies and licenses, unsupported or outdated versions, and the size and scale of the technology portfolio

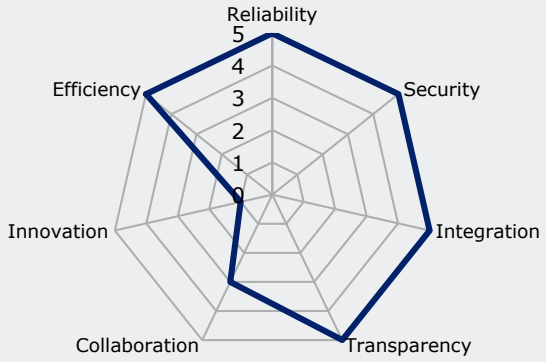
Expected Benefits

- Reduces risk of failure
- Increases accuracy in data to plan renewal and replacement investments
- Increases efficiency by streamlining Asset Lifecycle Management strategy and tracking all Pitt IT assets from start to end
- Improves effectiveness by increasing visibility into assets and opportunities to track and predict capacity
- Enhances reporting capabilities to increase transparency and make management decisions

Conceptual Model



Alignment to Strategic Priorities



4.2 Implement Enterprise IT Asset Management

Proper tracking of Pitt's IT assets reduces risk, increases visibility, and enables capacity planning.

Implementation Activities

- CSSD and schools and departments to work together to establish standard asset management and discovery process
- Define standards, taxonomy, and lifecycle for each asset
- Map assets to lifecycle
- Evaluate current asset management tool functionality to determine enterprise capability
- Explore and evaluate new tools designed specifically for asset management, including discovery tools
- Select and implement the appropriate asset management tool that will support all Pitt assets across the University, and will integrate with the enterprise help desk tool
- Develop and train staff on new systems and processes
- Develop policies and procedures on system usage and monitoring
- Conduct comprehensive training for IT staff on new system and processes to facilitate change management

Success Metrics

- % of hardware assets with correct platform/build data
- % of purchased software licenses in use

Implementation Timeline

0 – 9 months | **10 – 18 months** | 19 – 36 months

Level of Effort

Low | Medium | **High**

- **Data Gathering:** 1 FTE to work with each of the IT units for 1-2 months
- **Develop Lifecycle Standards and Taxonomy:** 1-2 FTE for 2-3 months
- **Determine Tool or Technology Support for Asset Management:** 1 FTE for 2 months
- **Process and procedures:** 1 FTE for 1-2 months
- **Strategy Implementation:** 1 FTE for 6-8 months
- **Staff training:** 1 FTE for 1 month

Risks/Dependencies

Low | **Medium** | High

- Having IT governance, architecture, and a technology roadmap established can help drive standards to which system objectives can be aligned (see Recommendation 1.1)
- Internal buy-in to the planned strategy and approach is required to drive adoption
- Asset lifecycle is diligently tracked beyond the initial implementation to achieve maximum effectiveness
- Critical attributes such as purchase date and end of life date are tracked in the asset management lifecycle

Assumptions

- End user training and change management will be provided to all possible managers and IT staff
- CSSD will own the asset process for all Pitt IT assets
- There exists resources dedicated to asset management (partial or full time) to enable this initiative

4.2 Implement Enterprise IT Asset Management

IT asset management future state vision incorporates all of Pitt's IT assets into one common system

Common, consistent and fit-for-purpose data model

Common underlying logical taxonomy across the reporting layer; consistent use of the model across the different IT Streams

Common Reporting Platform

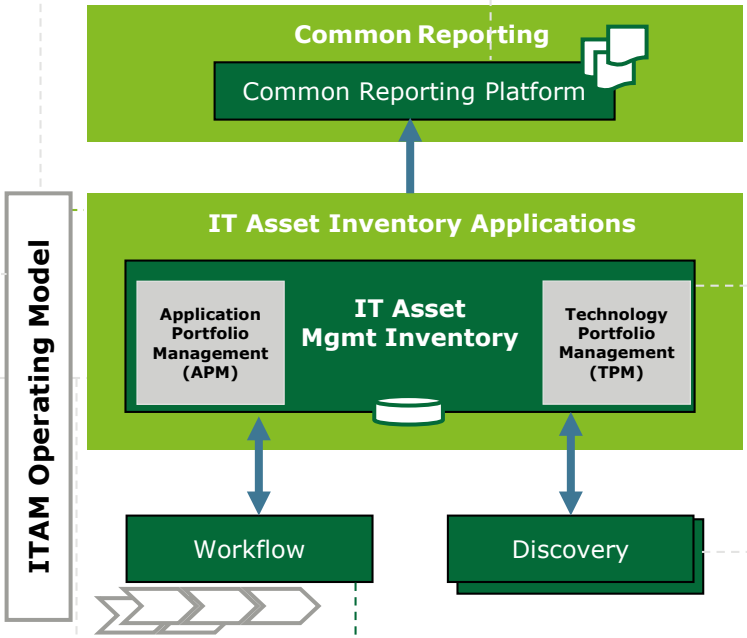
End-to-end analytical and key performance indicator (KPI) reporting across inventory boundaries

Common Operating Model

Common standard operating model in place; roles and responsibilities consistently defined and adopted across IT Streams; data ownership established

Application Portfolio Management (APM)

Complete management and proactive planning of the Application portfolio to reduce costs, manage risk and improve business alignment



Asset Management

Complete inventory of Pitt's IT Environment; common source of data for all service request and service delivery processes

Automated Discovery

Automated update of IT asset data based on defined discovery mechanisms

Technology Portfolio Mgmt. (TPM)

Complete management and introduction of new technology portfolio to reduce costs, manage risk and improve business alignment; facilitates the use of available engineered standard technology stacks, manages the lifecycle of assets, and the incorporation of additional technology into Pitt

Common Workflow

Registration of IT Assets and IT Asset related information (e.g., IT Asset related risk profiles) through implemented workflows

Legend
Data flow

4.3 Collaborate with UPMC to Improve PittNet Access

Greater collaboration between CSSD and UPMC IT enables secure, fast, and reliable access to Pitt resources.

Problem Statement/ Current State

- The UPMC network is a "one size fits all" network for clinical services that lacks the special configurations required to meet the needs of research faculty and staff housed in UPMC buildings and is a not a multi-vendor network
- Collaboration between UPMC IT and CSSD is limited and mainly focused at the Helpdesk and Networks level
- Access to Pitt resources when on the UPMC network is challenging due to IT security and configuration differences between UPMC and Pitt

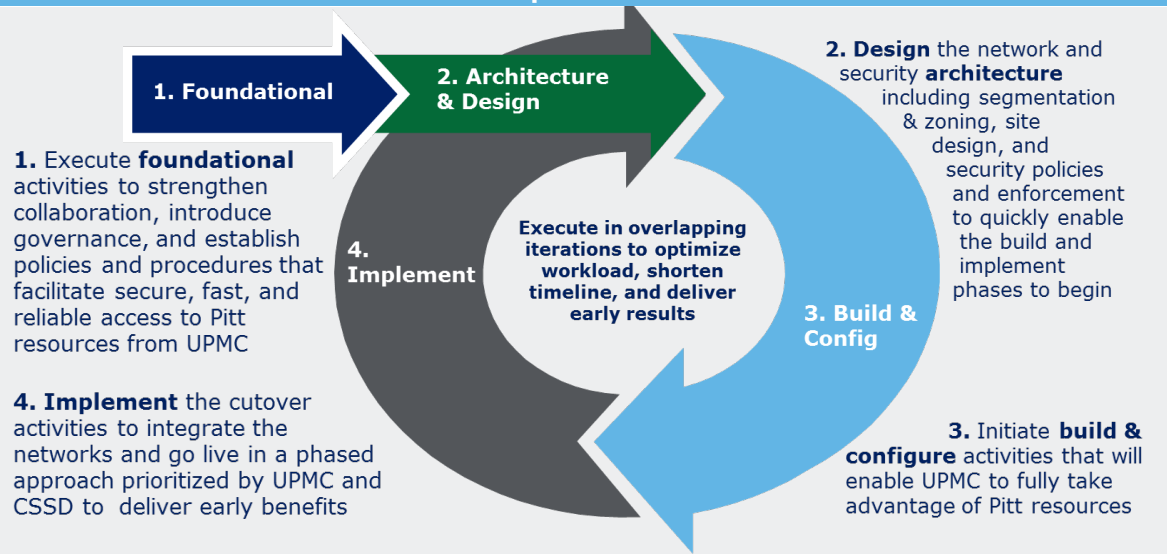
Summary Description

- Establish formal cadence for executive-level meetings between IT at UPMC and Pitt, to include CIOs from Pitt and UPMC and the Vice Chancellor of Research
- Establish formal recurring meetings between CSSD and UPMC IT leadership to discuss challenges and solutions
- CSSD and UPMC to develop and/or update rules around IT security, hardware, software, and network connectivity to address current network integrations issues identified in the Current State Assessment
- CSSD to work with UPMC to update network components that enable seamless access to Pitt resources

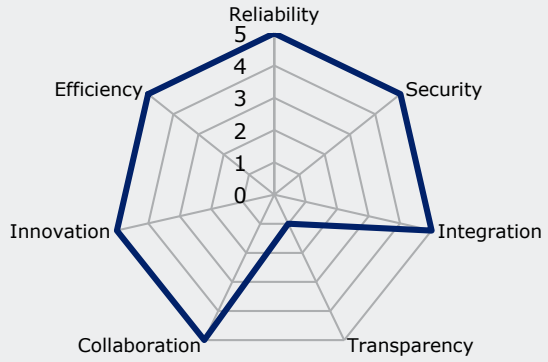
Expected Benefits

- Reduces risk, improves network performance, and enables a better user experience through greater collaboration
- Researchers will be able to take full advantage of high performance computing (HPC) because of upgraded network components
- Greater access for University research faculty and staff using computers for academic/research purposes on the UPMC network to take advantage of academic benefits, such as software licensing costs

Conceptual Model



Key Benefit Metrics



4.3 Collaborate with UPMC to Improve PittNet Access

Greater collaboration between CSSD and UPMC IT enables secure, fast, and reliable access to Pitt resources.

Implementation Activities

- Establish a working group between Pitt and UPMC that aligns with current or future Pitt or UPMC IT governance
- CSSD and UPMC IT to establish formal recurring leadership meetings to focus on technology, data, and research issues and solutions
- CSSD to work with UPMC IT to establish new policies and procedures for IT security, data, research, hardware, software, and network connectivity to Pitt resources
- Develop a joint implementation plan between UPMC IT and CSSD to update network components necessary to facilitate seamless access to Pitt resources
- Identify dedicated funding from Pitt and UPMC to support the project implementation as well as ongoing support for Pitt infrastructure at UPMC

Success Metrics

- # of help desk tickets for network connectivity
- # of help desk tickets reporting Pitt resources (SharePoint, Email, etc.) issues

Implementation Timeline

0 – 9 months | 10 – 18 months | 19 – 36 months

Level of Effort

Low | Medium | High

- **Planning:** 5-6 FTEs, network SMEs as needed, and UPMC and CSSD enterprise architects (6 months)
- **Implementation:** 7-8 FTEs, and network SMEs as needed (12-18 months)

Risks/Dependencies

Low | Medium | High

- IT governance will need to be in place to help manage key decisions around implementation and future operations (see Recommendation 1.1)
- To be effective, the model must be funded to support joint implementation and operations (see Recommendation 2.1)
- Successful project execution and ongoing operations hinge on CSSD and UPMC working together in a joint partnership

Assumptions

- Executive leadership at both Pitt and UPMC will be supportive of the initiative
- UPMC facilities will have the room to house Pitt network infrastructure
- Ongoing oversight and monitoring to be handled by CSSD at the NOC

4.4 Consolidate Help Desk Tools

Adoption of a single system for tracking and reporting IT support activity across the University is the foundation for delivering consistent technology service.

Problem Statement/ Current State

- There are currently over 16 different help desk ticketing tools in use between CSSD and various school and department IT groups at Pitt
- With many isolated support tools, it is difficult to refer tickets among CSSD and the various schools and departments, with no clarity around the status of work
- Siloed help desks and disparate tools prevent knowledge sharing
- Increased cost and resources are required to support and maintain multiple help desk tools

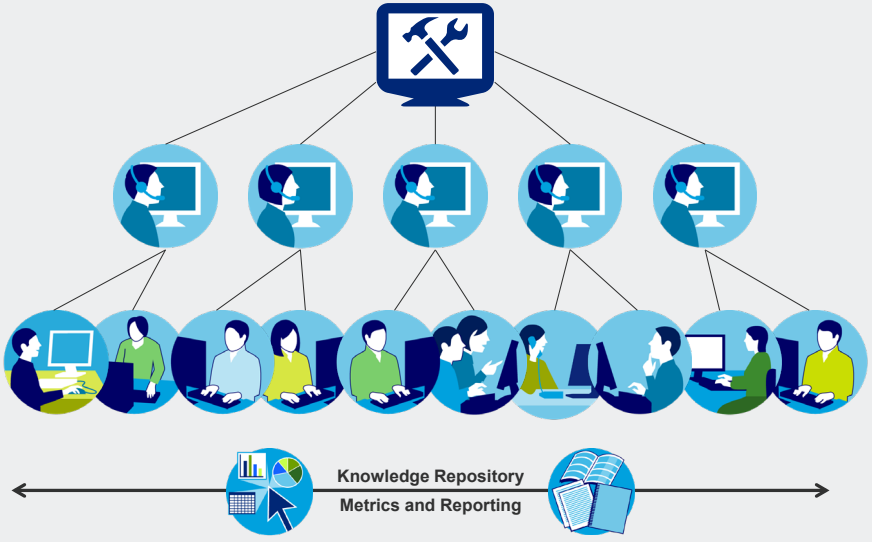
Summary Description

- Evaluate current help desk tools to determine capabilities and if necessary, explore new tools with focus on functionality, scalability, cloud-based, and cost
- CSSD and department IT groups collaborate on a shared process design along with common service reports
- Develop common Incident, Problem, Change, Request and Configuration Management processes
- Share information across boundaries to help create a unified "virtual support team"

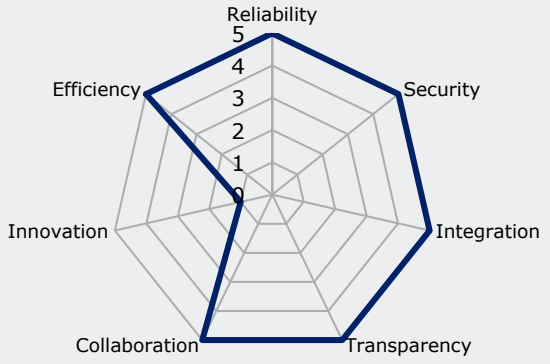
Expected Benefits

- Improves IT effectiveness by giving support teams better technology to diagnose issues, automate and manage work
- Eliminates redundant help desk products and any recurring costs for non-CSSD units with help desks
- A single IT infrastructure database with proper analysis and handling of system changes and incidents reduces risk to faculty and staff using help desk services
- Provides self-service and mobile-based tools to enhance end-user and classroom support in the long term

Conceptual Model



Alignment to Strategic Priorities



4.4 Consolidate Help Desk Tools

Adoption of a single system for tracking and reporting IT support activity across the University is the foundation for delivering consistent technology service.

Implementation Activities

- Complete critical process designs with input from CSSD and school and department IT SMEs
- Identify enterprise help desk tool
- Establish prototyping environment to perform testing
- Prototype process designs in selected product
- Develop operational and customer reports
- Develop training modules
- Perform acceptance testing with early adopters
- Deploy to early adopter units
- Perform acceptance testing with distributed help desks and school and department IT representatives
- Deploy to academic groups in waves
- Decommission and archive legacy help desk tools after converting relevant legacy data into knowledge base

Success Metrics

- % of IT departments using the help desk tool
- $ saved by eliminating redundant help desk applications

Implementation Timeline

0 – 9 months | **10 – 18 months** | 19 – 36 months

Level of Effort

Low | **Medium** | High

- **System design:** 1.5 FTEs, plus 4-8 part-time departmental participants
- **Process prototyping, report development and training prep:** 3 FTEs, plus departmental prototype reviewers (3-4 months development)
- **Acceptance testing and deployment:** 1.5 FTEs, plus unit participation during their migrations (4-6 months total duration)
- **Operations and support:** 1.5 FTEs, plus process oversight

Risks/Dependencies

Low | **Medium** | High

- Schools and departments must participate in process design, configuration, and testing of core system functions to achieve the necessary consistency and understanding of the tool
- The scope of business requirements must be managed to deliver results in a reasonable timeframe
- If school and department IT teams continue to use legacy systems instead of the standardized application, it will increase cost and complicate the delivery of technology services to users

Assumptions

- The IT funding model will treat the system as a common good (i.e., individual schools and departments will not be charged by CSSD to use the core help desk system)
- A service management advisory committee will provide ongoing input for enhancing and extending the system in response to school and department IT needs
- The system will comply with any applicable Payment Card Industry (PCI) Security Standard, Family Educational Rights and Privacy Act (FERPA), Health Insurance Portability and Accountability Act (HIPAA), or other statutory constraints

4.5 Deploy a Common Brand for All Pitt Websites

A common Pitt web brand increases consistency and improves user experience for customers.

Problem Statement/ Current State

- Although CSSD manages the enterprise web infrastructure, schools and departments are responsible for content
- The Office of University Communications establishes a style guide for websites and provides web development and design services at no cost, however there is no mechanism to enforce design standards
- As a result, Pitt lacks a common look and feel for its web presence resulting in a fragmented brand being presented to the public.

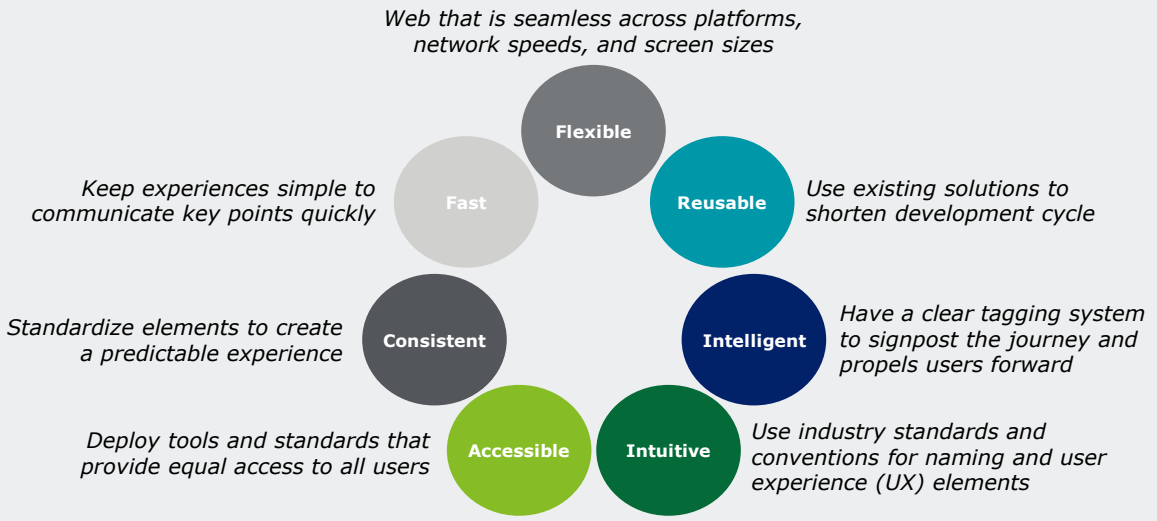
Summary Description

- Assess and catalog the University's existing web services, domains, and websites
- Establish a working group to create a standard set of brand templates, including style guide, security resources, and common toolset for developers and content contributors
- Develop a policy to mandate compliance with established standards across the University
- Define a timeline for migration to standardized templates
- Distribute migration mandate and resources across Pitt

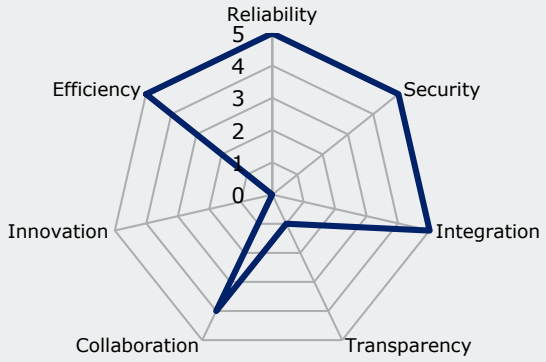
Expected Benefits

- Increases consistency and cohesion of the Pitt brand
- Improves user experience with Pitt's websites
- Reduces resource needs through the creation of standardized templates
- Reduces IT security risk by enforcing compliance

Conceptual Model



Alignment to Strategic Priorities



4.5 Deploy a Common Brand for All Pitt Websites

A common Pitt web brand increases consistency and improves user experience for customers.

Implementation Activities

- Assess and catalog the University's existing web services, domains, and websites
- Establish a working group to create a standard set of brand templates, including style guide, accessibility standards, and security resources
- Develop a policy to mandate compliance with established standards across the University
- Define a timeline for migration to standardized templates
- Distribute migration mandate and resources across Pitt
- Review websites to confirm compliance, leveraging the catalog to facilitate comprehensive review and audit
- Conduct routine reviews to monitor compliance

Success Metrics

- # of standardized templates created
- % of websites in compliance with mandate

Implementation Timeline

0 – 9 months | **10 – 18 months** | 19 – 36 months

Level of Effort

Low | **Medium** | High

- **Planning:** 2-3 FTEs for 3-4 months to assess and catalog current state websites, develop standard templates, and define migration timeline
- **Migration:** 2-3 FTEs for 3-4 months to support migration, 0.5 FTE ongoing to enforce compliance

Risks/Dependencies

Low | **Medium** | High

- School and department IT groups will need to be brought on board to support a more unified brand
- Architect web strategy so all customers, including students, faculty, and staff have a seamless experience
- Effective IT governance can help drive decisions around a new model (See Recommendation 1.1)

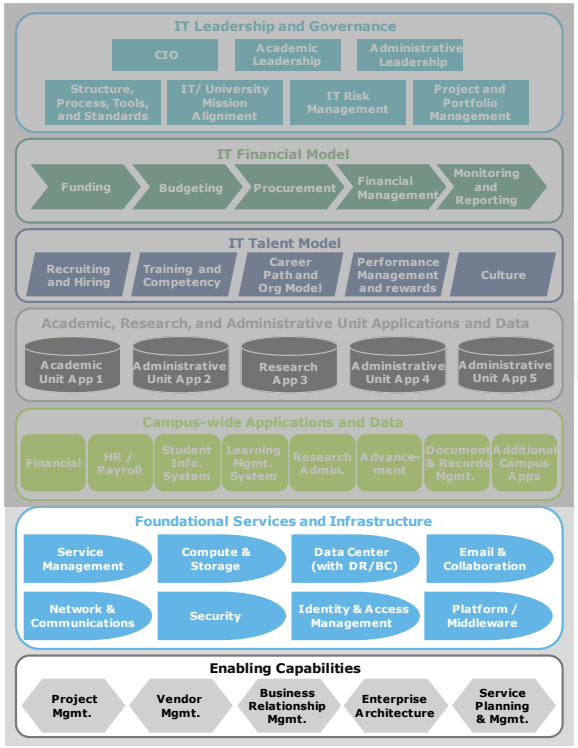
Assumptions

- Leadership will develop policies to enforce compliance across the University
- New approach to website branding will be introduced with ample communication and change management


Service Management

Service Management Opportunities

CSSD and decentralized IT teams will collaborate to support their University customers' needs using consistent, transparent processes and tools.



5.1 Enhance Existing Service Catalog to Improve Customer Engagement

- Reduces processing time and improves customer satisfaction.

5.1 Enhance Existing Service Catalog to Improve Customer Engagement

Re-design of the current service catalog to present unified IT services available to Pitt end users supports improved customer engagement.

Problem Statement/ Current State

- The existing CSSD service catalog offers information about the services that CSSD provides, but does not include an option to order the service, nor the cost associated with it
- Feedback from interviews identified a perceived gap in general communication around service request status, projects, initiatives, strategic priorities, etc. from CSSD
- Although multiple avenues of communication exist, respondents stated they provided awareness rather than collaboration

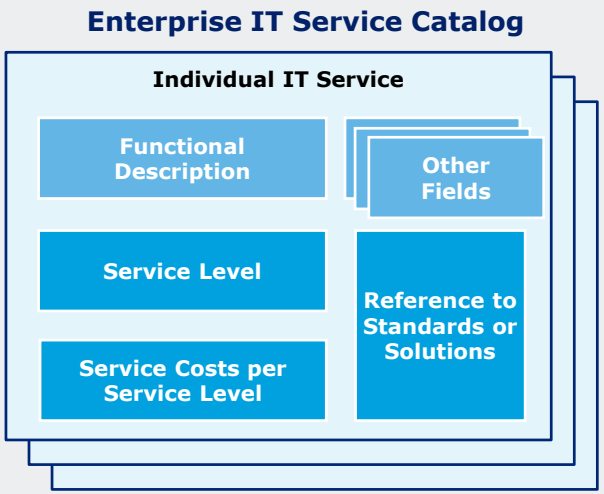
Summary Description

- Develop a unified catalog of IT services and present it in a central self-service portal that integrates with the enterprise help desk tool
  - Services listed should provide value to the customer and include IT services from other schools and departments
  - Automated ordering, approver routing and fulfillment workflows to the appropriate groups
- CSSD should establish a customer engagement strategy that builds on the groundwork laid by the establishment of service owners and takes into account the needs of customers while facilitating connection

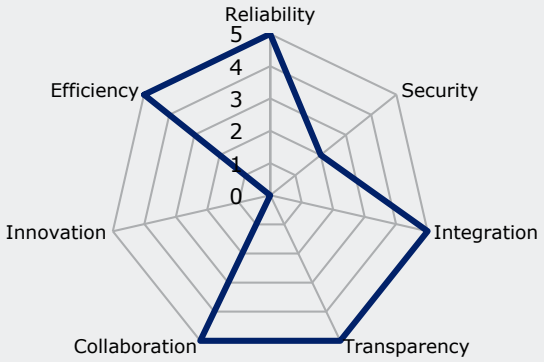
Expected Benefits

- Improves user efficiency by providing a single source for requesting services; reduces manual request processing and time delays, while providing transparency into status of requests
- Unified catalog reduces risk of using unauthorized products or suppliers
- Facilitates increased utilization of CSSD services and proactive engagement at the onset of new initiatives
- Helps CSSD understand needs, expectations, and challenges of customers more effectively

Conceptual Model



Alignment to Strategic Priorities



5.1 Enhance Existing Service Catalog to Improve Customer Engagement

Re-design of the current service catalog to present unified IT services available to Pitt end users supports improved customer engagement.

Implementation Activities

- Engage with schools and departments that are not currently using CSSD services to determine which services CSSD can provide
- Incorporate a business relationship management (BRM) function within CSSD Service Owners and develop formal customer engagement processes and organizational structures to promote effective relationship management
- Plan overall catalog structure in relation to evolving IT Service Portfolio and IT delivery model
- Define functions, layout, and maintenance process for service catalog portal
- Collect and coalesce catalog listings from all participating IT teams
- Design workflows for review, approval, and fulfillment with service owners
- Develop uniform specifications, service level agreements (SLA), pricing, ordering rules, data elements for each offering
- Expand catalog contents, availability, and fulfillment processes in phases
- Manage ongoing catalog maintenance, support, and improvement

Success Metrics

- % of service requests via portal instead of phone/email
- % reduction in service fulfillment time; error ratio

Implementation Timeline

0 – 9 months | 10 – 18 months | 19 – 36 months

Level of Effort

Low | **Medium** | High

- **Catalog and process design:** 1 FTE, plus 2-4 part-time unit IT participants for 2 months
- **Catalog and portal development:** 2.5 FTEs, plus departmental prototype reviewers
- **Pilot testing and deployment:** 0.5 FTE PM, IT service owners, 3 fulfillment teams, customer testers (3-week pilot, 3 month rollout)
- **Maintenance and support:** 1 FTE, plus IT service owner oversight

Risks/Dependencies

Low | **Medium** | High

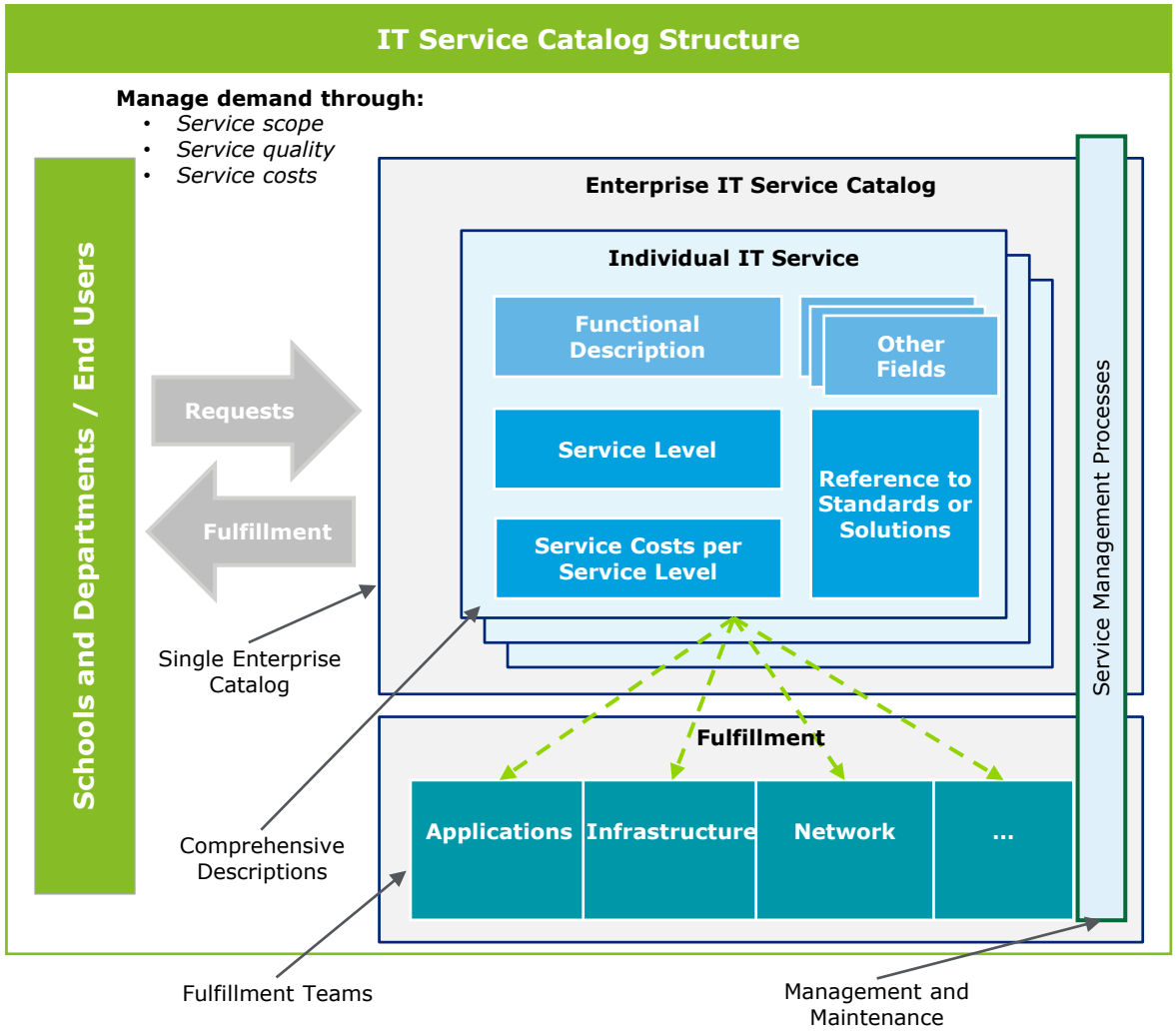
- Governance process must establish accountable service owners and policies to plan and maintain the IT service portfolio, including introduction and retirement of services (see Recommendation 1.1)
- The automated workflows for request fulfillment depend on alignment of all IT teams on a single service management system
  - Dependencies: Consolidate Help Desk Tools (see Recommendation 4.4)
- Developing appropriate frequency of communications will be a critical success factor

Assumptions

- Service Catalog and portal licenses are included in the enterprise help desk product agreement
- School and departmental IT websites will replace their service listings with access to the CSSD portal
- The definition of services and SLAs can proceed concurrently with the redesign of the service catalog
- BRM function can be incorporated into existing service owners and CSSD consultants

5.1 Enhance Existing Service Catalog to Improve Customer Engagement

The service catalog model is used to drive consistency through a set of standard interactions throughout the service delivery process.



Single Enterprise Catalog

- A single point of entry provides end users with a simple and consistent method submitting requests. Typically this would be available through a web interface

Comprehensive Descriptions

- Detailed descriptions provide users with the information they need to make informed decisions about services

Fulfillment Teams

- The model is built based on the concept of fulfillment teams for standard services
- The teams allow for standardized fulfillment processes to be performed in an efficient and predictable manner, leaving more complex tasks to be handled by separate hourly type services

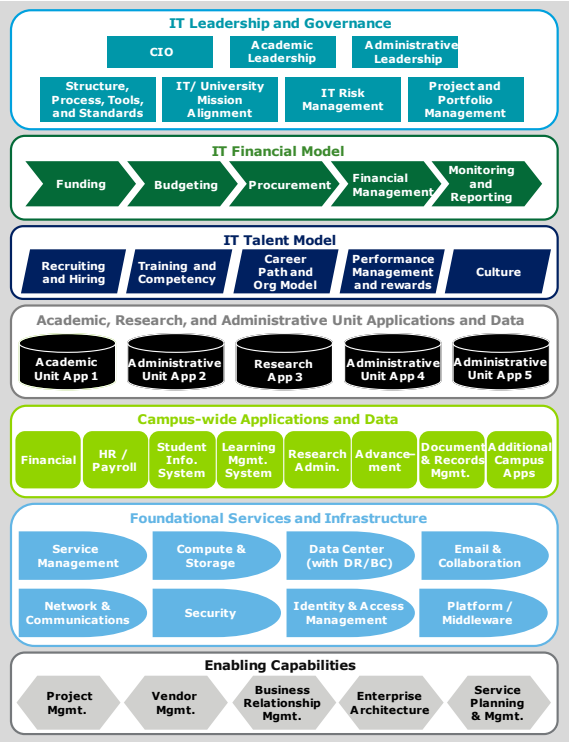
Management and Maintenance:

- Standard processes, roles, etc. are in place to manage the ongoing activities surrounding the catalog


Cross-Functional

Cross-Functional Opportunities

Pitt's IT resources can be strategically improved to enable mission-driven innovations across the University.



6.1 Define Business Analytics Roles and Enhance Capabilities

- Defines data access and privileges, standards, and capabilities, streamlining decision-making on data issues and fostering improved analytics capabilities.

6.2 Develop Strategic Roadmap to Guide Research Computing Investments

- Moves Pitt towards creating a seamless, standardized experience for researchers and facilitates more strategic investments.

6.1 Define Business Analytics Roles and Enhance Capabilities

Build an approach for managing, sharing, and leveraging data at Pitt which clearly defines ownership and promotes collaboration.

Problem Statement/ Current State

- Roles and responsibilities for business intelligence (BI) are not clear – BI groups exist within CSSD, FIS, Institutional Advancement, and Student Affairs
- Distributed IT and lack of data governance enabled the existence of several data warehouse architectures currently at Pitt
- Reporting tools are high quality and industry standard but not consistent across the University
- Pitt is now undertaking an effort to establish data governance, however interviews reflect limited awareness of the initiative

Summary Description

- Create a Center of Excellence (CoE) for BI that incorporates institutional analysis and business knowledge with current data warehousing capabilities
- Build a common understanding of Pitt's master data elements, supporting infrastructure, and tools to allow for greater collaboration
- Establish clear roles on which group is responsible for what layer of the BI platform (see graphic below)

Expected Benefits

- Enables a university-wide understanding of data access and privileges, standards, tools, capabilities, and resources
- Promotes streamlined decision-making on data issues, improving collaboration, and enabling more advanced capabilities that can drive insights for University leadership and other stakeholders.
- Provides predictive analytics to help all schools and departments gain an edge in research, administration, recruiting, and retention

Conceptual Model

DATA OWNERSHIP

The **University** owns all institutional data. Units may be stewards or custodians of certain data, subject to shared use agreements.

DATA TOOLS

CSSD will own the data warehouse, and manage hardware and software tools, and IT security for Pitt.

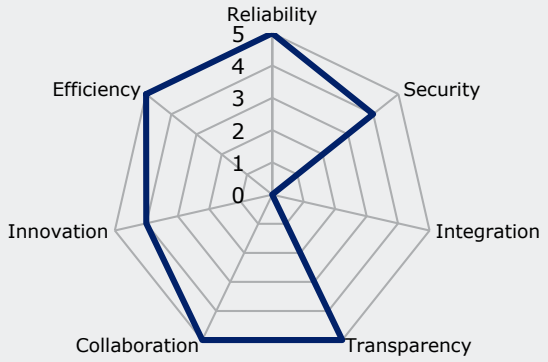
DATA ANALYSIS

Functional Offices will own and manage conducting the data analysis.

DATA GOVERNANCE

IT Governance Committees will coordinate, and drive the evolution of capability maturity across the University.

Alignment to Strategic Priorities



6.1 Define Business Analytics Roles and Enhance Capabilities

Build an approach for managing, sharing, and leveraging data at Pitt which clearly defines ownership and promotes collaboration.

Implementation Activities

- Establish the new data governance model with clarity in roles and responsibilities
- Approve CoE model with key BI stakeholders, including CFO, OHR, Provost's Office, Student Affairs and other key stakeholders; define reporting relationships
- Inventory the departmental shadow systems in use and document the requirements and reasons that these systems exist
- Identify a single definitive data warehouse architecture to be the master for all data which can limit end users' ability to negatively manipulate data structures
- Establish a standard process and tool used to request access to data
- Align CoE staff to various schools and departments
- Develop a self-service portal for users to access key reports
- Create entries for BI CoE offerings in CSSD service catalog (see Recommendation 5.1)
- Promote unified BI capabilities to foster greater collaboration

Success Metrics

- # of data warehouse and reporting tools implemented across the University
- # of reports using standardized definitions and available to multiple units and # of users/views of those standardized reports

Implementation Timeline

0 – 9 months | 10 – 18 months | 19 – 36 months

Level of Effort

Low | **Medium** | High

- **Development:** 2 FTEs with additional input from non-CSSD IT units for 2 months to develop organizational structure and governance model
- **Implementation:** 3-4 FTEs with both technical and business expertise for 3-4 months to bring organizational structure and new data management into place
- **Operations:** 8-10 FTEs to operationalize CoE, 1-2 months to work through implementation challenges

Risks/Dependencies

Low | **Medium** | High

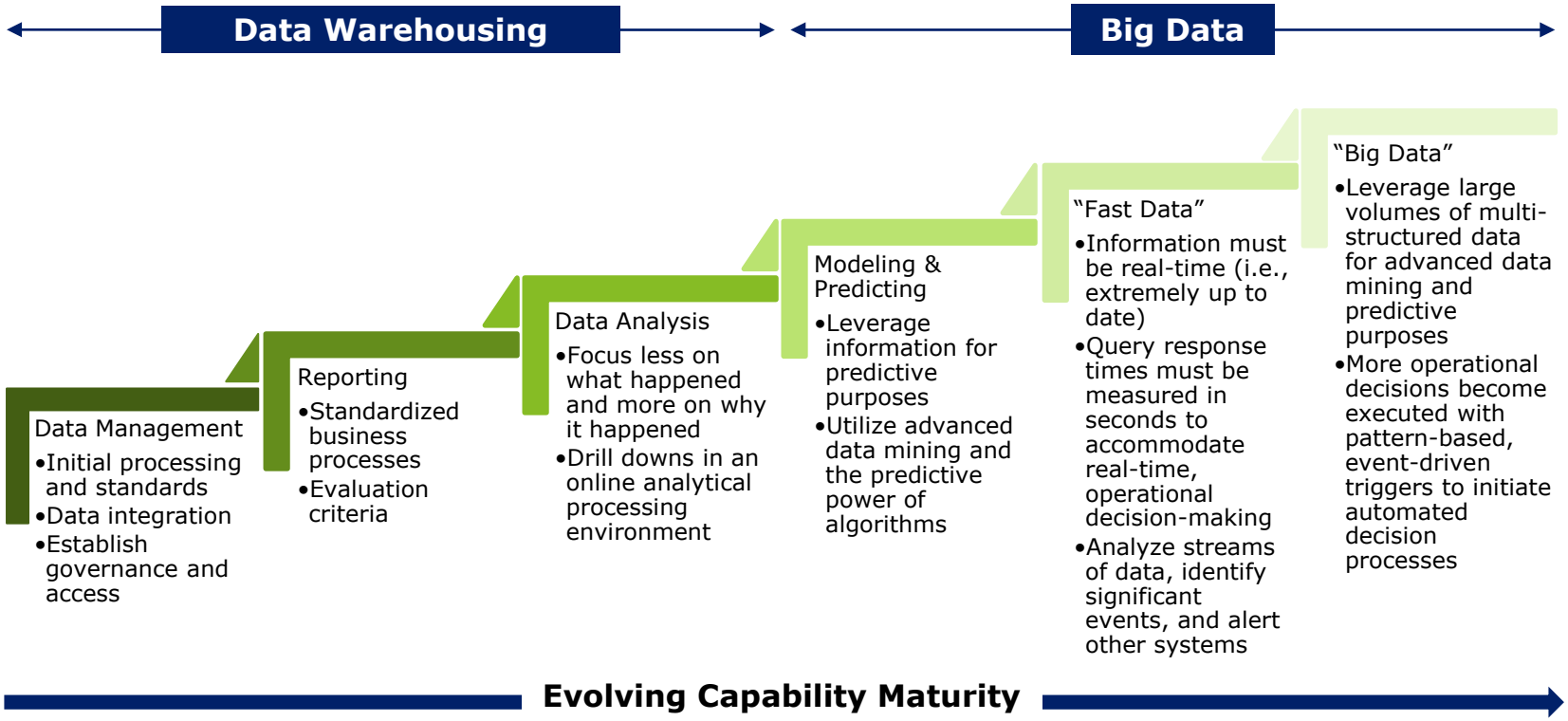
- Governance processes need to be in place to facilitate business ownership of the organizational model and outcomes, and put standards in place to reduce duplication of data to facilitate accuracy of reporting from the business team (see Recommendation 1.1)
- The prevalence of shadow systems across campuses presents a risk for alignment of data management processes
- Implementation should reflect principles currently being codified in University policy, specifically that it is the University that owns all institutional data, not individual units. Units may be stewards or custodians of data, but the University is the owner. This principle is necessary in order to breakdown silos in the cases where a unit incorrectly sees themselves as the sole decision maker on who should have access and for what purposes

Assumptions

- Data SME's will be available during the strategy and design sessions
- Physical data models are available for the critical enterprise systems
- Ability to identify and distinguish systems of record and entry exist

6.1 Define Business Analytics Roles and Enhance Capabilities

The analytics journey is a progression of developing capabilities across the organization.



- Maturity often occurs at differing paces across higher education institutions
- A key challenge is to orchestrate the journey in a way that optimizes foundational investments
- Nearly all universities are at different stages of this progression in different areas of their institution

6.1 Define Business Analytics Roles and Enhance Capabilities

The RACI chart (Responsible, Accountable, Consulted, Informed) is a useful tool for documenting who has authority for making various data governance decisions. A sample for reference is provide below.

Decision	Data Governance Chair	Data Governance Committee Members	Pitt Academic Units	Functional Offices (e.g. Advancement)	CSSD
Identify and establish data governance standards, policies, and procedures	A	R	C	I	--
Enforce data governance processes and standards	C	C	R/A	R/A	R
Implement data governance processes and standards	I	C	A	R	R
Maintain issue logs and support remediation	I	I	C	C	R/A
Communicate and escalate data issues as needed	C	C	R/A	R/A	A
Identify and report data quality issues	I	I	R/A	C/I	C/I
Manage data warehouse	C/I	C/I	C/I	C/I	R/A
Identify and managing tools and software	C/I	C/I	C/I	C/I	R/A
Review and render recommendations on data requirements for Pitt IT projects	R/A	R/A	C/I	C/I	C
Conduct data analysis	C	C	R/A	R/A	C

R – Responsible for performing the task
A – Accountable for making the business decision or delegating specific tasks to other teams
C – Consulted for inputs and feedback; however, agreement or action on input is not required
I – Informed of the final result, task completion, and/or deliverable distribution

6.2 Develop Strategic Roadmap to Guide Research Computing Investments

Pitt can build upon its strong foundation for research computing capabilities by defining a strategy to guide further investments.

Problem Statement/ Current State

- Interviews reflect that there is an opportunity to improve coordination and awareness of research computing services
- Interviews found that some Pitt researchers are not using the Center for Research Computing (CRC), but instead building in-house capabilities or using contractors for research computing capabilities
- There is a strong appetite for leveraging research computing as a teaching resource, but no clarity around pricing models or standards for accessing computing capabilities exist

Summary Description

- Build upon existing foundation of research computing capabilities and define a strategy that includes governance, process, technology (e.g., cloud), security, and organizational design to guide any further investments

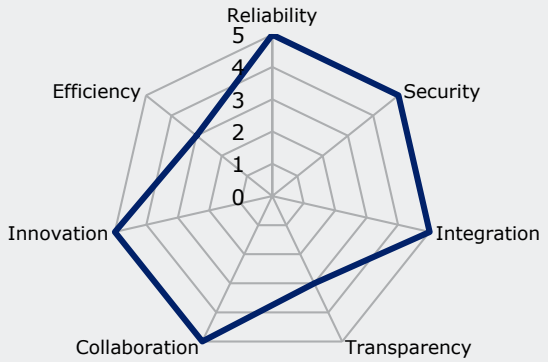
Expected Benefits

- Moves Pitt toward creating a more seamless, standardized experience for researchers and facilitates more strategic investments
- Improves the return on investment of research funds
- Makes research computing capabilities more accessible and known
- Positions the CRC as the preferred destination for enabling research needs
- Makes university-wide computing capabilities more accessible, and facilitates innovation in research and teaching and learning

Conceptual Model

Governance	Process	Technology	Security	Organization Design
Shared platform that unifies research computing expertise and capabilities	Long-term strategy and funding model for shared research	Standardized architecture that includes cloud computing and high performance computing capabilities	Secure infrastructure that enables modernization and focuses on applications and increased cyber security	Collaborative partnership between Sr. VC for Research, the CRC, and CSSD

Alignment to Strategic Priorities



6.2 Develop Strategic Roadmap to Guide Research Computing Investments

Pitt can build upon its strong foundation for research computing capabilities by defining a strategy to guide further investments.

Implementation Activities

- Create a working group that includes key research computing stakeholders across campuses (may be aligned to proposed Research Technology Committee identified as part of a new governance structure - see Recommendation 1.1)
- Establish priorities, identify initiatives, and develop funding model to support technology needs of research at the University
- Define governance model over research computing on campus (may be aligned to proposed Research Technology Committee identified as part of a new governance structure - see Recommendation 1.1)
- Define processes for coordination between CSSD, CRC, and research stakeholders that provides researchers with a more streamlined process for purchasing equipment and determining storage solutions
- Incorporate CRC workshops into university-wide IT staff training program (see Recommendation 3.1)
- Communicate roadmap across campuses to facilitate buy-in

Success Metrics

- % of research computing capabilities centralized across Pitt
- # of consultations conducted by CRC staff

Implementation Timeline 0 – 9 months | 10 – 18 months | 19 – 36 months

Level of Effort

Low | Medium | High

- **Strategic Planning and Communication:** 0.5 FTE to support working group in development of roadmap and communication of outputs

Risks/Dependencies

Low | Medium | High

- Implementation of IT governance will help facilitate decision making around university-wide shared research computing (see Recommendation 1.1)
- Successfully leveraging research computing capabilities for academic purposes may require the subject matter expertise of the Center for Teaching and Learning
- Improving network integration and management will better support high performance computing for researchers at UPMC (see Recommendation 4.3)

Assumptions

- CSSD is a critical enabler in the development of a shared research computing environment and will collaborate with the Sr. VC of Research
- Pitt will continue to make CRC resources available for academic purposes in addition to upholding its research mission

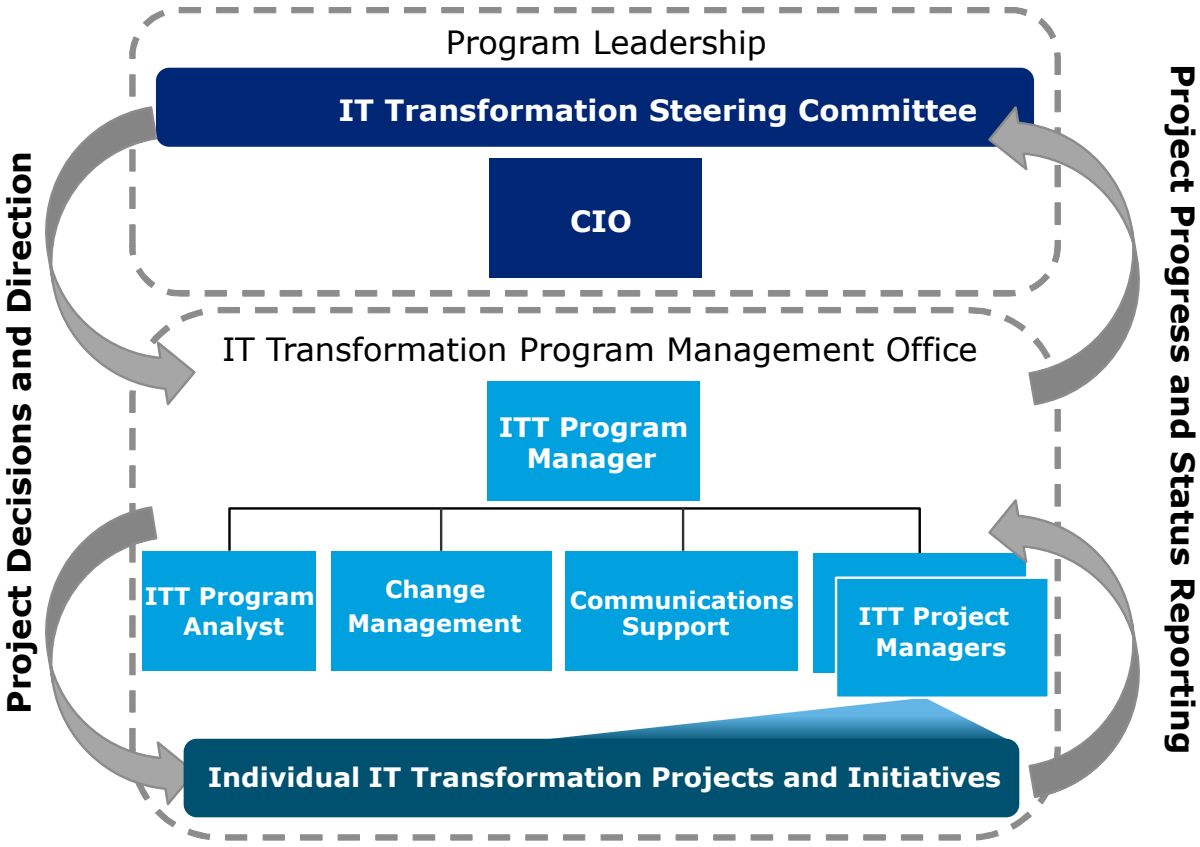

IT Transformation
Enabling Activities

IT Transformation Program Management

Define the IT Transformation Program Management Approach

Prior to kicking off the IT Transformation Program, Pitt should establish its approach to implementing IT Transformation. A proposed model implemented at similar institutions is outlined below.

Structure of IT Transformation (ITT) Program Management Office (PMO)



Staffed by full-time resources to support continuity of project management methodologies and skills, the ITT PMO will coordinate with the existing CSSD PMO infrastructure

Key Responsibilities

- IT Transformation cannot be completed ancillary to other duties; to get results and garner stakeholder support it should be implemented programmatically with effective organizational supports
- A first step is to set up the operating environment for the program:
  - Set up entails finalizing project management templates and documentation requirements
  - Roles and responsibilities and reporting lines of the ITT PMO
  - Processes related to project initiation, delivery and closeout/knowledge transfer
- A formal kick-off of processes and activities should then be conducted

PMO Roles and Responsibilities

Within the IT Transformation PMO, resources should fulfill the following roles and responsibilities throughout the life of the Program.

IT Transformation Steering Committee	• Provide guidance and strategic direction to IT Transformation Program • Provide context for individual school and department needs where necessary • Meet regularly to review initiative details, progress and to make decisions • Serve as program advocates and facilitate change management within each member's respective community
IT Transformation Program Manager	• Meet with the CSSD CIO and IT Transformation Executive or Oversight Committee on a regular basis to discuss program status, progress against the IT Transformation Roadmap, upcoming needs and activities, and any escalated issues or risks • Oversee, review, and approve IT Transformation activities, work products, and metrics reporting • Assist in meeting Pitt needs as needs arise throughout the IT Transformation effort
IT Transformation Program Analyst	• Build and maintain project management and reporting templates, tools, and documentation • Track status and progress across all IT Transformation efforts against the IT Transformation Master Plan on a regular basis and compile findings into portfolio-level reports according to the established process, including consolidated measurement of the IT Transformation Program against established metrics • Provide day-to-day Office of Transformation support, conducting tasks and activities as required by the IT Transformation effort
IT Transformation Change Management	• Develop and implement strategies related to change management and culture throughout the life of the Transformation • More detail on the contents/approaches to each of these strategies is contained in the "Change Management, Communications" section that follows
IT Transformation Communications Support	• Conduct ongoing communications, outreach, and stakeholder engagement activities • More detail on the contents/approaches to each of these strategies is contained in the "Change Management, Communications" section that follows
IT Transformation Project Managers	• Assigned to each individual IT Transformation initiative on a full-time basis • Report on status and metrics in accordance with the PMO standards and templates • Work with IT Transformation initiative project teams to identify risks and issues, escalating as appropriate • Identify and report on quick wins, milestone achievements, and other points of interest to the Pitt community for communication

Change Management and Communications

Key Change Management Considerations

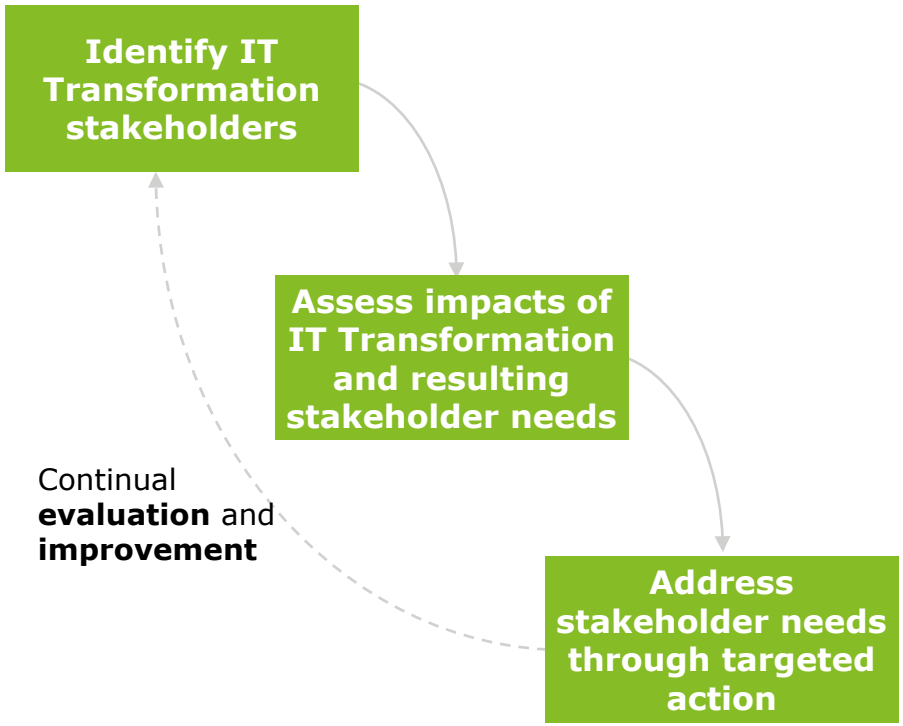
Transforming the IT operating model at an organization the size of Pitt requires careful attention to all dimensions of Change Management.

Dimension	Element	Key Considerations
Change Leadership	Culture	• Moving from a siloed environment to a more unified, customer-oriented organization will require significant culture change, which must be addressed during implementation
	Stakeholder Engagement	• Internal and external stakeholder support are essential throughout the transformation process, making assessment and engagement of stakeholders critical
	Change Readiness	• It will be important to know how ready the organization is for change, helping leaders preempt challenges and address concerns before challenges become problems
Organization / Human Resources (HR)	Organization Structure	• Balancing new capabilities with current strengths can help with both effectiveness and change readiness
	Workforce Transition	• The new model is only as strong as the workforce. Effective workforce transition requires effort but can speed up stabilization and reduce risk
	Supporting HR Programs / Processes	• The new IT organization will require a unified HR program to continue to align programs to strategies
	Talent Management Programs / Processes	• The new IT organization will require a comprehensive talent management program and associated human capital management processes
Capabilities	Training and Learning	• An effective change management approach includes a strategy for training and learning that addresses both short-term needs and long-term employee development
	Capability Transfer Plan / Processes	• If staff move into new roles within the IT organization, an effective change management plan will support capability transfer to limit knowledge gaps

Develop Change Management Strategy

Developing a comprehensive Change Management Strategy, comprised of individual plans and processes by dimension, will enable a successful IT Transformation Program at Pitt.

Change Management Strategy



Expected Benefits

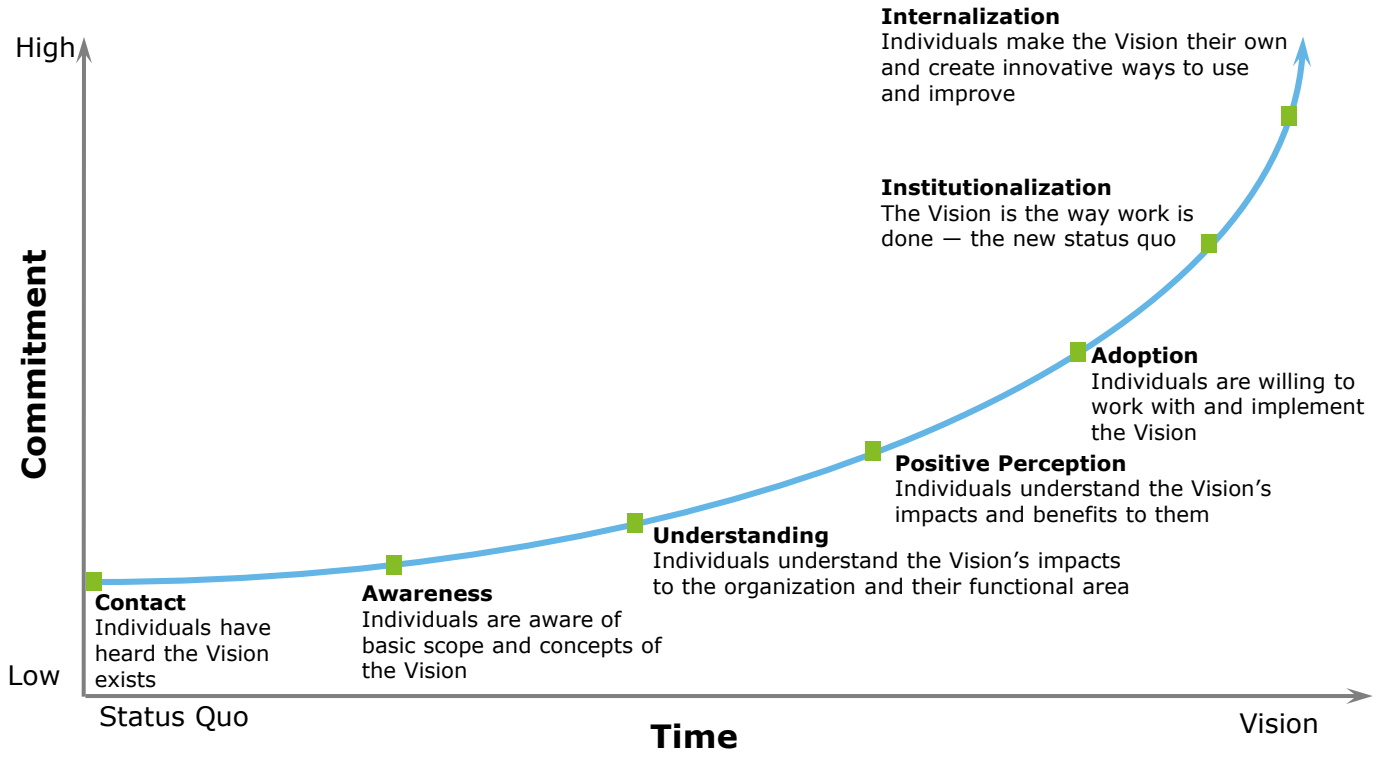
- Reduces the productivity gap that will occur as a result of changing how people do their jobs and leads to a less disruptive change window
- Reduces the risk of the IT Transformation failing and requiring significant additional costs to "fix it" after the fact
- Reduces the risk of employee turnover due to stress/anxiety around the change
- Increases employee commitment to the change, resulting in increased engagement through making the initiative a success
- Increases organizational effectiveness
- Reduces the likelihood of a disruption to the customer experience or bad press

Focus on Stakeholder Engagement

Pitt will need to identify, assess, and engage a range of stakeholders to move from uncertainty to commitment, all of whom will be impacted by the transition in different ways.

ITT Stakeholders

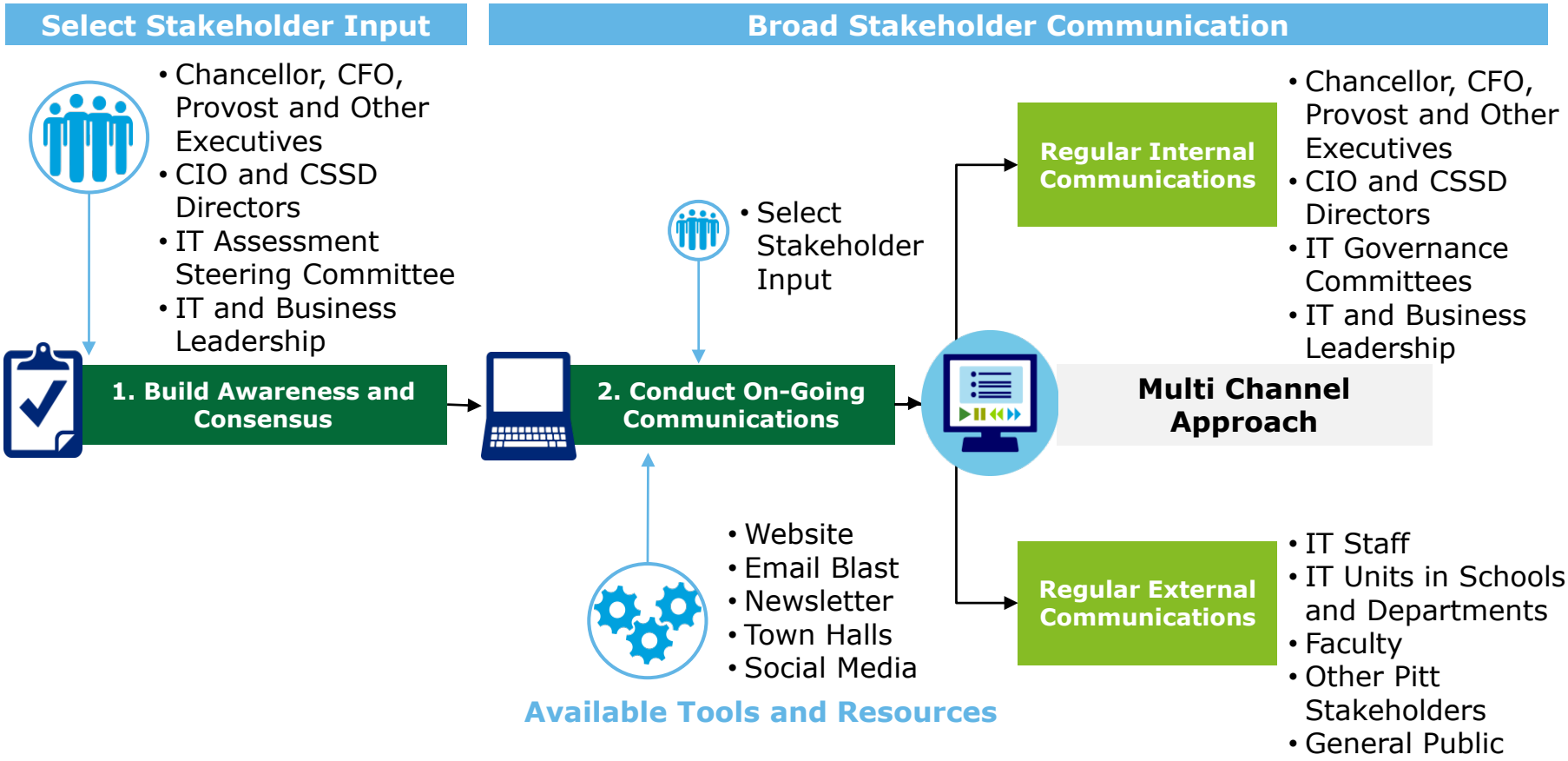
- Executive Leaders (Chancellor, Provost, CIO, Sr. VCs, etc.)
- Academic Leaders (School Deans, Department Chairs, etc.)
- Administrative Leaders (Directors, Unit IT managers, etc.)
- Faculty
- Researchers
- Existing Students
- Prospective Students
- Vendors and Suppliers
- The Pitt Community



Communicating a clear change imperative and providing visible and consistent leadership involvement will help guide stakeholders through the process

Communication Approach

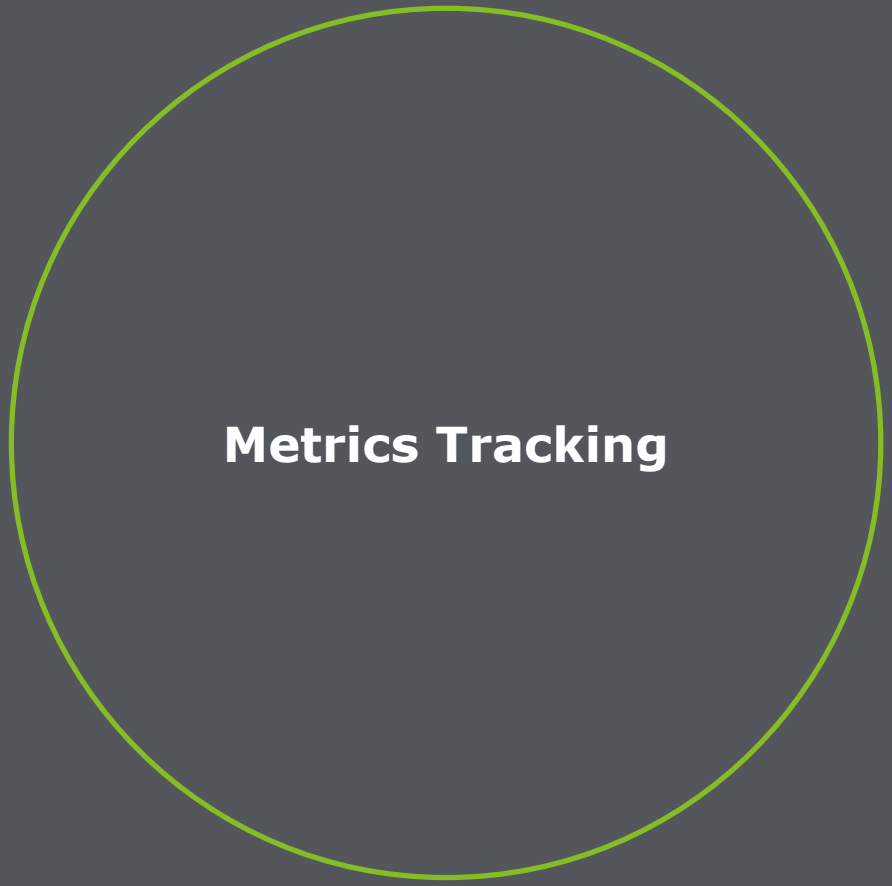
A two-phased communication approach is recommended; some communication has already begun in terms of the stakeholders engaged and awareness built throughout the IT Assessment project.



Communication Plan Output Details

Based on the approach described, the following communication details are provided by phase.

	1. Build Awareness and Consensus	2. Conduct On-Going Communication
Who	• Chancellor, CFO, Provost, and Other Executives • CIO and CSSD Directors • IT Assessment Steering Committee • IT and Business Leadership	• IT Assessment Stakeholder Groups • IT Staff • School and Department units • Faculty • Other Pitt Stakeholders/General Public
What	• Achieve support and feedback for IT Transformation guiding principles and recommendations, while laying the foundation for Pitt's strategic IT vision	• Obtain support of and participation in the IT Transformation Program • Communicate IT Transformation Program objectives, activities, lessons learned and opportunities
When	• Immediately and through IT Transformation Program set-up	• Throughout the life of the IT Transformation Program
Where	• In-person individual meetings • Group working meetings • Project briefings and reports • Website	• Existing University community meetings • Social Media • Town halls • Newsletter • Email blast
Why	• To build consensus around Assessment deliverables and Transformation Roadmap • To update other key stakeholders on impacts and changes as they occur • To build executive buy-in and ownership • To provide consistent public information	• To build support and engagement with initiatives and results from implementation onward • To create a culture of transparency and collaboration • To highlight efficiencies and leading practices in order to build campus and public support
How	• Tight coordination with CSSD, the Chancellor, CFO, and executive leaders, and school and department leaders to understand the needs of various stakeholders	• A robust, formal, and centrally managed communication program


Metrics Tracking

Benefits Tracking…Why do it?

Implementing a benefits tracking program is an important element to IT Transformation, as it allows program leaders to track and demonstrate results.

Objectives

- **To create a benefits tracking process** that will help collect, measure, monitor, and communicate outcomes of IT Transformation
- **To incorporate continuous improvement** mechanisms for initial stages of the program and beyond

Guiding Principles

- Focus on **outcomes that matter** (both measurable and anecdotal)
- Establish **accountability within each project**
- Keep it **straightforward and 'implementable'**
- Apply a **phased approach** (Pilot, then small and manageable rollout Year 1, then build upon in future years)

Lessons Learned

This is Hard Work

- Benefits tracking is complicated
- The current process is manually intensive because of a lack of data available and automated tools for generating metrics

Avoid Comparing Apples to Oranges

- Differences in sophistication in schools and departments make gathering consistent data a challenge
- Creating a consistent understanding among participants is essential

Metrics Summary

Pitt can measure implementation progress against expected benefits by using a set of Key Performance Indicators.*

Key Governance Metrics			
1.1	**Implement IT Governance**	• % of IT spending outside of CSSD	• % of projects delivered on time and on budget
Key Finance Metrics			
2.1	**Develop an Integrated IT Budget University-wide**	• % of IT budget in integrated university-wide IT budget	• # of schools and departments that participate in university-wide IT strategic planning activities
2.2	**Strengthen IT Purchases Across the University**	• % of IT purchasing under or reviewed by CSSD	• % of IT purchasing through university-wide contracted suppliers
Key Talent Metrics			
3.1	**Develop Career Paths for IT Staff (in coordination with existing OHR initiative)**	• # of career paths deployed for IT staff across the University	• % of career paths shared by CSSD and IT staff distributed across schools and departments
3.2	**Build a Unified IT Training Program**	• # of IT training guidelines and standards created	• % of IT staff who receive training under the new program
3.3	**Create a Culture of One IT**	• # of IT culture building events held/resources created	• % of IT staff participating in culture building events/accessing resources
Key Technology Metrics			
4.1	**Establish Long-Term Cloud and Data Center Strategy**	• # of data centers across Pitt	• % of applications and storage using cloud/SaaS services
4.2	**Implement Enterprise IT Asset Management**	• % of hardware assets with correct platform/build data	• % of purchased software licenses in use

*Sample metrics only; actual metrics should be finalized by Pitt leadership

Metrics Summary (continued)

Pitt can measure implementation progress against expected benefits by using a set of Key Performance Indicators.*

Key Technology Metrics (continued)			
4.3	Collaborate with UPMC to Improve PittNet Access	• # of help desk tickets for network connectivity	• # of help desk tickets reporting email access issues
4.4	Consolidate Help Desk Tools	• % of IT departments using the help desk tool	• $ saved by eliminating redundant help desk applications
4.5	Deploy a Common Brand for all Pitt Websites	• # of standardized templates created	• % of websites in compliance with mandate

Key Service Management Metrics			
5.1	Enhance Existing Service Catalog to Improve Customer Engagement	• % of service requests via portal instead of phone/email	• % reduction in service fulfillment time; error ratio

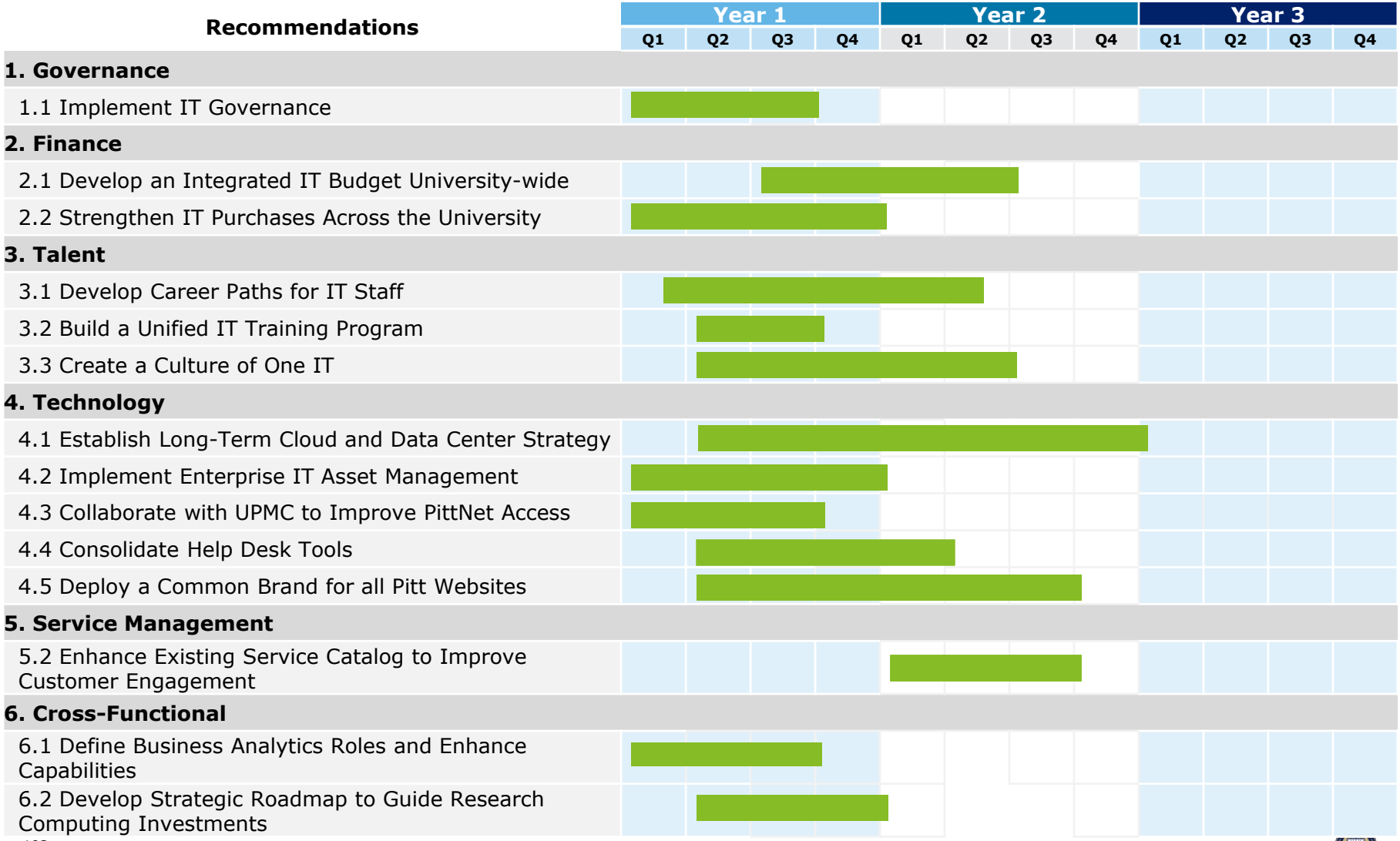
Key Cross-Functional Metrics			
6.1	Define Business Analytics Roles and Enhance Capabilities	• # of data warehouse and reporting tools implemented across the University	• # of reports using standardized definitions and available to multiple units and # of users/views of those standardized reports
6.2	Develop Strategic Roadmap to Guide Research Computing Investments	• % of research computing capabilities centralized across Pitt	• # of consultations conducted by CRC staff

*Sample metrics only; actual metrics should be finalized by Pitt leadership


Next Steps

High Level Roadmap of Recommendations

A 3-year roadmap balances the urgency to execute transformation projects immediately against the reasonable time required to implement each project successfully.



Where to begin…?

Thirteen projects are a significant undertaking and invites the questions: What do we do now that we have these recommendations? Where do we start?

Short Term

- Regroup on areas requiring further discussion
- Review opportunities and prioritize
- Identify high-level budget

Program Initiation

- Define:
  - Program and project management
  - Change management where necessary
  - Owners and resources for selected projects
- Initiate detailed design and implementation planning