SEATTLE OFFICE OF CITY AUDITOR

Date: April 10, 2017

To: City Councilmember Tim Burgess, Chair, Affordable Housing, Neighborhoods & Finance Committee
City Councilmember Lisa Herbold, Chair, Civil Rights, Utilities, Economic Development & Arts Committee
City Councilmember Kshama Sawant, Chair, Energy & Environment Committee
City Council President Bruce Harrell

From: David G. Jones, City Auditor
Michael Mattmiller, Chief Technology Officer

RE: Summary of Emerging and Best Practices in Public Sector IT Project Management

In 2016 Councilmember Tim Burgess asked the Office of City Auditor to conduct an audit of the New Customer Information System (NCIS), a customer information and billing system shared by Seattle City Light and Seattle Public Utilities. As part of this work, in cooperation with the Chief Technology Officer (CTO), the Office of City Auditor hired a consultant to produce a report on best practices in public sector information technology (IT) portfolio and project management. The purpose of this report is to help the City of Seattle improve IT project management and deliver projects on time and within budget.

What the Consultant Did
The Office of City Auditor, with the assistance of the CTO, selected Gartner, Inc. to write a best practices report based on their experience working with public agencies in managing their IT projects. The report's content and recommendations are the opinions of Gartner and may need to be tailored to fit the needs of the City.

What the Consultant Found
Gartner's report provides a high level overview of best practices for government portfolio and project management. Recommendations are organized by stages of the project life cycle, including initiation, planning, execution, and monitoring and control.

Chief Technology Officer Response
With the April 2016 consolidation of IT teams from across the City into the new Seattle IT department, the CTO is positioned to drive consistent project management practices across the City's technology projects, and provide regular and appropriate status reporting to the Mayor and City Council. The CTO has already taken steps to increase consistency and transparency across projects, and the CTO looks forward to ensuring the practices noted in this report are incorporated into Seattle IT's practices by 2017. The CTO encourages those departments not included in the IT consolidation (Seattle Municipal Court, the City Attorney's Office, the Legislative Department, and Seattle Public Library) to observe these practices as well.

Office of City Auditor Response

The Office of City Auditor used this report to inform its work on the NCIS audit.

Report for City of Seattle

Emerging and Best Practices in Public Sector IT Project Management

April 10, 2017

Engagement: 330037326

EXECUTIVE SUMMARY

On April 4, 2016, the Seattle City Council received a briefing on the status of the New Customer Information System (NCIS) project, a new billing system for Seattle City Light and Seattle Public Utilities. During the briefing, the Council learned that the project would be $34 million over the initial budget and delivered 12 months behind schedule. In response, the City Council asked the Office of City Auditor (OCA) to audit the project to understand reasons for the project's delay and budget increase and to develop a report on emerging and best practices in public sector information technology (IT) project management. The objective of this report is to provide a guide on emerging and best practices in public sector IT project management that can help the City of Seattle (City) avoid future project delays and deliver projects on time and within budget. The guidance in this report is based on Gartner research and client engagement experiences. The report is structured as follows:

- Chapter 1: Introduction
- Chapter 2: Portfolio Management
- Chapter 3: Project Life Cycle & Initiation
- Chapter 4: Project Planning
- Chapter 5: Project Execution
- Chapter 6: Project Monitoring & Control

In Chapter 2, the report discusses how portfolio management—overall management of all IT projects, services, and investments within an organization—can benefit from an established policy framework, including a decision-making matrix. It also describes the roles and responsibilities of various members of IT management teams, including Business Relationship Management, the Project and Portfolio Management Office (PPM), and Enterprise Architecture.

The Project Management Life Cycle Methodology, discussed in Chapter 3, serves as a guide to provide the City with project management capabilities based on a common language, a practical set of skills, and a robust methodology, with appropriate supporting tools for maximizing productivity and effectiveness in completing projects successfully, on time, and within budget. The chapter describes the typical Project Management Life Cycle of five phases: Initiation, Planning, Execution, Monitoring & Control, and Closing. A clear understanding of these phases can allow the City to maintain control of the project from its initial stage through completion. The chapter discusses the importance of developing policy frameworks and governance structures for successfully driving projects and facilitating discussions and capturing inputs from multiple stakeholders to make timely decisions. It also provides information on the roles and responsibilities of the project's Executive Steering Committee (ESC), key characteristics ESC members should possess, training that should be provided to them, and suggestions for structuring ESC meetings. Finally, it describes the emerging practices of bimodal project planning and implementation, the challenges to implementing these methods in the public sector, and some best practices for overcoming these barriers.

Chapter 4 discusses the importance of project planning for setting up expectations and establishing project goals early in the project. As more and more organizations are moving towards agile and

bimodal IT, proper project planning is growing in importance as a factor in achieving overall project success. The chapter discusses project staffing, methods and tools for developing scope, schedule, and budget, and creating a communication plan to help project teams effectively manage time, cost, quality, and risk to the delivery of the project. A key element in planning is assessing the capabilities and capacity of internal resources when making decisions regarding how the project will be staffed. Drivers for the use of independent quality assurance services are also discussed.

Chapter 5 focuses on successful execution of projects. For any IT department, managing projects across different agencies and departments can often be challenging and risky. In this chapter, Gartner identifies several best practices for executing high risk projects by outlining tools and methodologies for managing dependent projects, handling data migrations, managing testing, and ensuring sufficient training and knowledge transfer.

Finally, in Chapter 6, the report discusses various mechanisms for outlining decision authority, team member accountability, and communicating project performance. Project management metrics, including Earned Value Management (EVM), and key performance indicators for controlling and monitoring the project throughout the execution and implementation phases are also discussed in this chapter.

The report is a high level overview of project management best practices developed to provide guidance to the Seattle Information Technology Department for successfully managing and implementing large scale IT projects and to assist the Office of City Auditor (OCA) in their evaluations of IT projects. The methods and tools outlined in this report are presented in a general manner and will need to be modified or enhanced to meet the requirements of individual City projects.

CHAPTER 1: INTRODUCTION

BACKGROUND

On April 4, 2016, the Seattle City Council received a briefing on the status of the New Customer Information System (NCIS) project, a new billing system for the Seattle City Light and Seattle Public Utilities. During the briefing the Council learned that the project would be $34 million over the initial budget and delivered 12-months behind schedule. In response, the City Council asked the Office of City Auditor (OCA) to audit the project to understand reasons for the project's delay and budget increase, and improvements to be made in project oversight. The Council also asked OCA to develop a report on emerging and best practices in public sector information technology (IT) project management.

OBJECTIVES

The objective of this report is to provide a guide on emerging and best practices in public sector IT project management that can help the City of Seattle (City) avoid future project delays and deliver projects on time and budget. To guide development of this report, the City identified specific questions in the areas of project structure / approach, staffing, governance and control. This report addresses those areas.

The guidance in this report is based on Gartner research and client engagement experiences.

CHAPTER 2: PORTFOLIO MANAGEMENT

Often a confusing and misunderstood term, portfolio management refers to the centralized management of the organization's projects and ensuring that they achieve intended strategic objectives. Portfolio management is an organization's mechanism to bridge the gap between strategy and implementation.

Successful management of an organization's projects and priorities (i.e., its portfolio of IT projects) can benefit from a policy framework that establishes roles and guides decision making. Successful portfolio management also requires continuous support from IT management teams to ensure the goals of individual projects are aligned with the rest of the organization. This chapter provides a sample portfolio policy framework and describes the roles and responsibilities of IT management teams.

POLICY FRAMEWORK

As part of governance planning, organizations should develop policies and a decision authority matrix to facilitate discussions and capture inputs from multiple stakeholders to make timely decisions. Early in a project's initiation phase, executive sponsors and steering committee members should determine and publish policies that govern their actions, ways of working and other activities related to the approval and continued oversight of their projects.

The table below provides a sample framework for identifying and considering decision-making policies for your organization.

Table 1 Sample Policy Framework

Policy	Description and Elements
New IT Initiative Approval	• Required submission data • Prioritization method • Review process • Participants • Voting and approval
New IT Initiative Funding Model	• Agreed-upon initiative funding models • Funding review process • Return on Investment (ROI) calculations • Funding sources • Chief Financial Officer's (CFO) review for major initiatives
Authorization to Proceed with the New Initiative	• Executive sponsor selection and role • Program / project management selection • Staffing process • Role of the Project Management Office (PMO) • Tracking and reporting setup • Portfolio setup

Policy	Description and Elements
Portfolio Reviews for Existing Initiatives	• Ownership of reviews • Reviews by initiative type • Schedule of reviews by initiative type • Recommendation development and use • Reporting • How decisions are made
Phase or Stage Gate Review for Existing Initiatives	• Mandated reviews by initiative type • Steering committee planning • Steering committee participation • Schedule of reviews by initiative type • How decisions are made • Follow-up requirements
Reporting and Tracking for all Initiatives	• Metrics, contents, calculations and use • General reporting requirements • Standards for reports on timeliness and accuracy • Ownership of reporting • Recipients of the reports • Alerts, alarms and escalation

SUPPORT FROM IT MANAGEMENT TEAMS

A lot of attention is placed on the Project Team and Executive Steering Committee (ESC), and rightfully so as those are the groups central to overall project success, but there are other important teams that play different and essential roles. The Enterprise Architecture, Project Portfolio and Management Office (PPM), and Business Relationship Management teams are also pivotal to project success. These teams are typically housed within the IT department and may assist with multiple projects.

BUSINESS RELATIONSHIP MANAGEMENT

One of the leading practices in public sector organizations is the development and implementation of teams within IT focused on understanding and meeting the various needs of departments. The name of this team is most commonly referred to as the Business Relationship Management team. Personnel on this team will typically fulfill one of two roles:

- **Business Relationship Managers (BRMs).** These individuals will be assigned to manage relationships with one or more departments. BRMs act as IT consultants to their assigned departments, advising on how current or new technologies can help to solve business problems. The number of departments a BRM will be assigned will depend on its size and complexity. For example, the City may have one BRM assigned to Seattle City Light, while smaller departments such as Office of Arts and Culture, and Seattle Parks and Recreation may share a BRM since their organizations are less-dependent on IT. BRMs will also conduct periodic reviews (monthly or quarterly) with their business partners to discuss overall business-IT engagement.

- **BRM Team Leader.** This individual manages the team of BRMs and will provide guidance and coaching on how they can better manage relationships with the departments. This individual may also get involved in helping to craft solutions to complex business problems.

A key function of the Business Relationship Management Team is to identify and help to craft departments' requests for new IT projects. Often IT will learn of IT needs and initiatives from the department late in the planning and solution / vendor selection stages. Having a BRM helps IT to understand a department's business needs. The BRM team serves as the central point of project intake and should work closely with the PPM.

PROJECT & PORTFOLIO MANAGEMENT OFFICE

The Project & Portfolio Management Office (PPM) assigns project managers to projects, develops and maintains project management standards and methodologies, and manages the organization's project portfolio. Often a confusing and misunderstood term, portfolio management refers to the centralized management of the organization's projects and ensuring that they achieve intended strategic objectives. Portfolio management is an organization's mechanism to bridge the gap between strategy and implementation.

PPMs generally comprise the following positions:

- **PPM Leader.** This individual sets the direction of the PPM, including the establishment of standards and methodologies. The PPM Leader will manage and developing the team of project managers, and the other members of the PPM. In certain situations, the BRMs may also be a member of the PPM and fall under the leadership of the PPM Leader. The PPM Leader will typically have the final say on the initial assessment of project requests before they are communicated to a governing body for approval, such as an IT Steering Committee.

- **Project Managers.** These individuals lead the management and execution of projects that bring new or enhanced capabilities to the organization.

- **Performance Manager.** This individual, sometimes referred to as the Portfolio Manager, is responsible for obtaining data on project performance and overall reporting. This role is usually focused on benefits realization and prioritization of projects within the portfolio. The Performance Manager will also lead the establishment of key performance metrics across all the projects.

Besides managing project intake and the projects themselves, the PPM is also responsible for managing the stage gate process for each project. Sometimes the PPM will provide a quality assurance function that reviews and approves deliverables. The success of project management, as a competency and in delivering value, depends on a strong PPM and its resources.

ENTERPRISE ARCHITECTURE

When advising on potential solutions and evaluating requests for projects, BRMs and PPM personnel should understand the organization's technology standards and preferences. Establishing, providing education on, and communicating these standards and preferences are one of the main responsibilities of Enterprise Architecture (EA).

EA is a discipline and practice for conducting enterprise analysis, design, planning and implementation, for successful development and execution of business plans and strategies. The practice applies industry best-practice principles to guide organizations through process, information flow and technology alignment. In the context of Seattle City government, the primary objective of EA is to create a structure that enables departments' business needs to be met as well as those of the City's overall IT strategy.

There are many roles within EA. Below are some of the most common ones:

- **Senior Enterprise Architect.** This individual, typically the leader of the EA function, provides guidance, roadmaps, principles, standards and best practices. They must be focused on enabling business and IT leaders to make investment decisions that balance and prioritize current operational demands, minimize disruption, and create opportunities within the longer-term strategic vision of the organization. Being forward-looking is a key trait of successful individuals in this role. Each of the following roles could report to this individual.

- **Technology Architect.** Responsible for developing technology related insights that align with organizational strategies and long-term vision.

- **Business Architect.** Responsible for engaging business partners in analyzing, strategizing and prioritizing business processes, and for ensuring that projects realize their intended benefits. They identify customer business / process issues and translate them into business requirements. Business architects champion innovative changes and technology-enabled solutions.

- **Information/Data Architect.** Responsible for improving business performance or cost optimization through enterprise information solutions, such as master data management, metadata management, business intelligence, content management, data interoperability, analytics, data integration and related information infrastructure components. They are principally focused on the high-level information repositories and information flows that will meet the requirements of the business strategies and processes.

- **Applications Architect.** Responsible for identifying needed changes to the portfolio of applications across the organization. They develop and administer application-specific standard such as user interface design, globalization, Web services, portal application programming interfaces, XML, and content. They provide design recommendations based on long-term development organization strategy and develop enterprise level application and custom integration solutions including major enhancements and interfaces, functions and features. Individuals with these responsibilities may also be a part of the Applications team.

- **Security Architect.** Responsible for developing and implementing enterprise information security architectures and solutions. They serve as security experts in application development, database design and platform efforts, helping project teams comply with enterprise and IT security policies, industry regulations and best practices. Individuals with these responsibilities may also be a part of the Cybersecurity team.

The primary role of EA on large-scale IT projects is to provide the business and technical constraints that the project team must operate within. Often excluded from solution specification and vendor selection a member from the EA team should, at a minimum, be involved in these activities during the planning stages of projects, and be consulted on technical decisions during design and execution.

For an organization to become successful in executing its strategies and long term goals it is imperative that synergies not only exist between EA and PPM, but that EA properly manages relationships with the entire enterprise, including external participants. Other key relationships for successful EA include the Chief Technology Officer – who provides overall direction to EA, IT Executives, Business Executives and the BRMs.

DIFFERENCE BETWEEN ENTERPRISE ARCHITECTURE AND THE PPM

The line between EA and the PPM is often blurred and confusing. While both enable solutions that meet business needs, there are distinct differences in the role each will play within public sector organizations.

EA's role is to assist business leaders in developing the vision, mission, capability, goals and objectives to meet business requirements and describe future use of IT business systems. In fulfilling this role of business advisor, EA identifies goals and standards that must be accounted for by PPM in project management planning. EA does not tell the PPM what to do; instead it facilitates the discussion and provides a process between the PPM and the business leadership to create a structure to achieve the goals of the project. EA is a liaison between the business stakeholder and IT project management, similar to the function of BRMs. Working directly for business leaders, EA creates an architecture to capture the business needs such as purpose, vision, mission, capabilities, business goals, scope, process, functional needs, success factors (objectives) and other business technical requirements to complete the business architecture. On approval, the business stakeholder authorizes delivery of the business architecture to IT project management.

IT project management then uses the business architecture to plan an implementation strategy that includes developing proposals, contracting, coordinating resource needs, planning for execution and defining outsourcing strategies. During architecture collaboration sessions, IT project management participates to obtain a better understanding of architecture design considerations and other business requirements drawn. Project management participation in such sessions leads to the project manager being better informed about operational considerations that affect the project.

CHAPTER 3: PROJECT LIFE CYCLE & INITIATION

The project management life cycle describes the essential phases that every IT project must go through. This chapter describes the project management life cycle, including the key activities that should take place during each phase. These phases include initiation, planning, execution, monitoring and control, and close-out. The first phase, initiation, also discussed in this chapter, includes defining the project governance structure and determining which project methodology to use, such as bimodal project planning and rapid implementation. It also provides information on the roles and responsibilities of the project's Executive Steering Committee (ESC), key characteristics ESC members should possess, training that should be provided to them, and suggestions for structuring ESC meetings. The chapter includes an overview of one emerging IT best practice, bimodal planning, describes some of the challenges to implementing this practice in the public sector, and gives recommendations for addressing these barriers. Finally, the chapter provides information on rapid implementation tools that can be used to reduce project time and cost.

PROJECT MANAGEMENT LIFE CYCLE

Every project goes through different phases of development. The Project Management Life Cycle was developed as a key project management tool for successfully guiding projects through different developmental phases. The typical Project Management Life Cycle has five phases: Initiation, Planning, Execution, Monitoring and Closing as shown in the figure below. A clear understanding of these phases can allow organizations to maintain control of the project from its initial stage to completion. The Project Management Life Cycle can assist organizations in narrowing the project's scope, keeping project objectives in order and completing the project on time and budget. Using the Project Management Life Cycle methodology can maximize value for any organization and minimize the project risks.

Figure 1: Project Management Life Cycle

The following table describes the typical activities and goals for each phase of the project management life cycle.

Table 2 Project Management Life Cycle Activities and Goals

Life Cycle Stage	Activities	Goals
	▪ Develop a Business Case ▪ Undertake a Feasibility Study ▪ Establish a Project Charter ▪ Appoint the Project Team	▪ Initiate a new project by defining its objectives, scope, purpose and deliverables to be produced ▪ Appoint the right project team to run the project
	▪ Create a Project Plan ▪ Create a Resource Plan ▪ Create a Financial Plan ▪ Create a Quality Plan ▪ Create a Risk Plan ▪ Create a Communication Plan ▪ Create a Procurement Plan	▪ Create a set of plans to help guide the project team through the execution and closure ▪ To help the team manage time, cost, quality and risk to ensure on time delivery of projects
	▪ Execute project according to the agreed-on schedule ▪ Build Deliverables and conduct quality assurance	▪ Project stays on track despite changes to project needs or situation ▪ Build deliverables based on sound methods and that address organization needs
	▪ Perform Time Management ▪ Perform Cost Management ▪ Perform Quality Management ▪ Perform Change Management ▪ Perform Risk Management ▪ Perform Procurement Management ▪ Perform Communication Management	▪ Increase performance satisfaction through quick identification and resolution of required changes ▪ Decrease project risk through regular status reporting and forward-looking, analytical approach
	▪ Perform Project Closure ▪ Review Project Completion	▪ Ensure knowledge transfer that equips the City to be successful and self-sustainable in future efforts ▪ Discuss outcomes, accomplishments, lessons learned and next steps

PROJECT GOVERNANCE

Establishing a governance model that brings the right people and the right data together at the right time to make key decisions that may affect scope, schedule and budget is a critical first step when initiating any project.

Governance structures should comprise the following workgroups, at a minimum:

- **Executive Leadership Team** – This represents the highest level of leadership within the organization. These resources are closely involved with the planning and funding of the project. They are also responsible for setting expectations around project goals and objectives, and establishing high level milestones. Specific roles include:
    - Executive Steering Committee (ESC) – Responsible for providing guidance on overall strategic direction
    - Executive Sponsor – Responsible for the overall success of the project and serves as the chair of the ESC

- **Project Leadership Team** – This represents the individuals responsible for providing strategic leadership to the project. This team handles detailed planning, project control and execution. Key responsibilities also include reporting of status and escalation of critical risks and issues to the Executive Leadership. Specific roles include:
    - Project Director – Responsible for providing an executive leadership presence for the project team and is the chief liaison with Executive Leadership
    - Project Manager – Responsible for day to day project management, control and execution activities; this person is typically supported by a Deputy Project Manager

- **Project Team** – This represents the operational leadership responsible for project execution. These resources typically supervise work streams, conduct analysis, and design, develop, test and deploy the resulting technology solution. Specific roles include:
    - Technical Lead – Responsible for managing delivery of technical tasks (e.g., development, infrastructure, integration) and the associated staff
    - Functional Lead – Responsible for managing delivery of the functional tasks (e.g., business requirements, design, reporting)
    - Additional Leads – Depending on the project scope there may be leads for Organizational Change Management, Communications and Testing
    - Analysts and Subject Matters Experts (SMEs) – Responsible for development of technical and functional work products (e.g., design documentation, code, infrastructure configuration); SMEs should have intimate department/agency knowledge

The figure below provides an example of a typical governance structure for a large IT system implementation project.

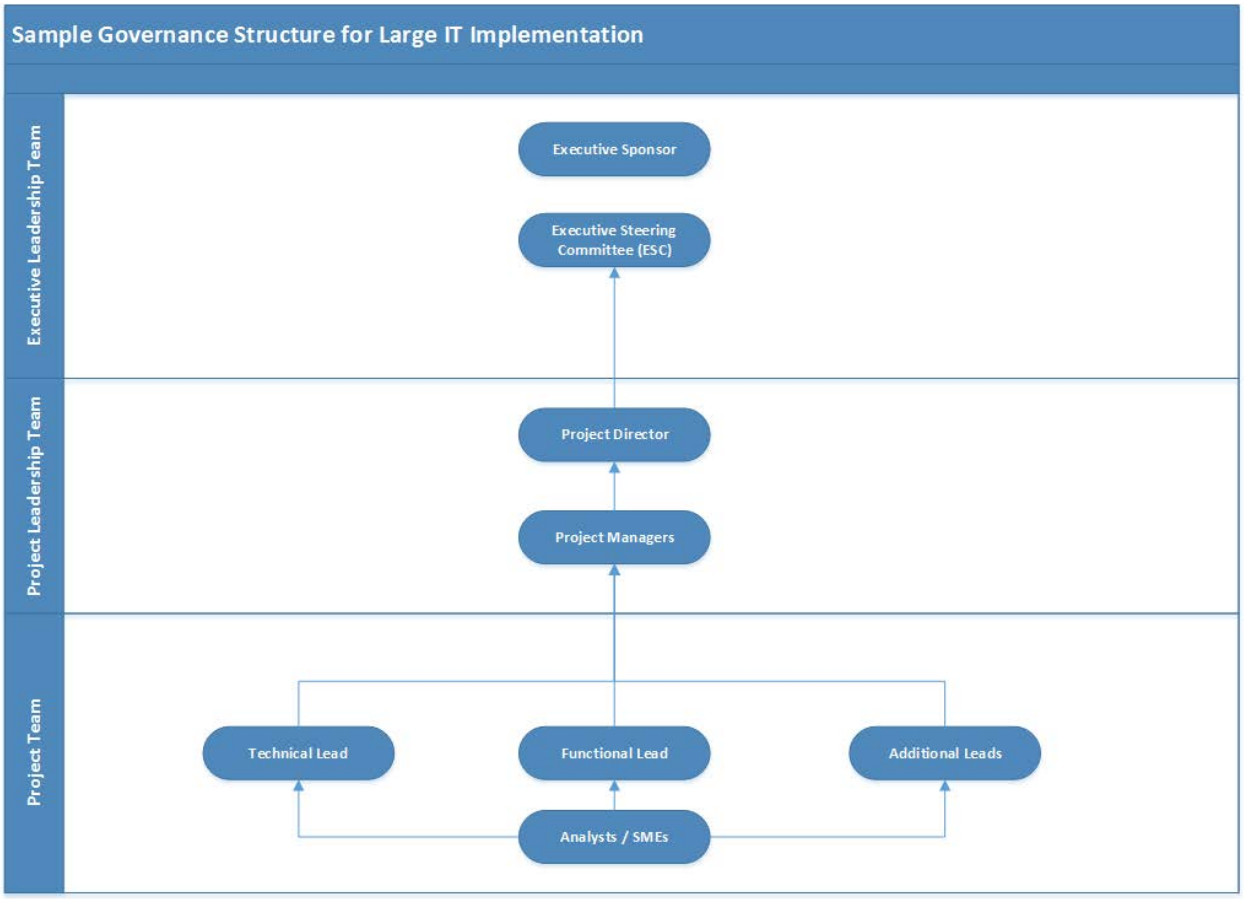


Figure 2: Sample Governance Structure

PROJECT CHARTER

One of the first and most critical deliverables for a project is the Project Charter. The Project Charter is a document that captures project objectives, scope, deliverables and the governance structure. High level deliverables, functional and business requirements, and key assumptions should also be captured with in the Project Charter. The Project Charter represents a contract between the executive sponsors and the leadership team that will manage the project. It is a living document that plays an important role in effective governance and communication.

It is important to **create the Project Charter during the initial project stages** because:

- The elements of a Project Charter help to identify the team and skills needed to plan, execute and manage the project
- It serves as a communication tool that helps drive project buy-in across the organization
- Developing the Project Charter forces the organization upfront to consider the project's risks, assumptions and constraints
- It grants authority to the project team to commence work with official, documented approval
- Allows senior management to set boundaries for the project scope

- Formalizes the partnership between the Executive Leadership, Project Leadership and Project Teams
- Serves as a project requirements reference guide

ELEMENTS OF A PROJECT CHARTER

The Project Charter should describe business needs and how the project intends to address them. A comprehensive charter includes:

- Alignment of the project to the enterprise's strategy, goals and priorities
- Expected project deliverables and how they meet business needs
- Success criteria (e.g., improved customer satisfaction, reduced dual data entry, business process efficiency gains)
- Funding sources and high level cost estimates
- Interval(s) for updated cost estimates
- Key assumptions (e.g., system performance, skills needed)
- Preliminary risks and mitigation strategies
- Guiding principles and methodologies
- High level stakeholder analysis and communication plan

Development of the Project Charter should be led by the Executive Sponsor. Often, it is not until the charter has been developed that a project manager, typically from the organization's Program Management Office (PMO), is assigned. Maintenance of the Project Charter then becomes a joint responsibility between the Executive Sponsor and the Project Manager. The core management team running the project, including key stakeholders from different department or agencies, should be given the authority to propose changes to the charter, which are ultimately considered and processed by the Executive Sponsor and Project Manager.

Given the 'living' nature of the Project Charter, it is important to track any changes. Project Charters should have a "Document Change Log" that captures the document version, date of the change, author(s) and a description of the changes. The Project Charter should be stored on a portal or file location (i.e., SharePoint) that is accessible by all members of the project team.

EXECUTIVE STEERING COMMITTEE

The key driver for effectiveness of the governance structure and success of the project is the Executive Steering Committee. This body resolves issues and risks associated with the project to ensure on time project delivery and achievement of the intended outcomes.

ESC RESPONSIBILITIES

An important part of composing the ESC is making sure you have the right people who can dedicate the time to fulfill its duties. ESC responsibilities should include:

- Ensuring project outputs meet the business requirements
- Balancing conflicting priorities and resources
- Providing guidance to the project team
- Clearing roadblocks that impede the project team's progress
- Fostering positive, yet realistic, communication out of the ESC regarding the project's progress and outcomes
- Enforcing adherence of project activities to organizational standards
- Reviewing project progress – in terms of both qualitative and quantitative measures – milestones

ESC MEMBERS

Public sector organizations typically struggle to identify the right size and mix of personnel to sit on the ESC. While there is no optimal number, deciding who should be on the ESC comes down to the organization's culture towards decision-making and collaboration and the scope of the project. For example, if the culture is trust-based then having a select few members on the ESC for making decisions would make sense. However, if the culture is more collaborative and every key stakeholder must be involved in the decision making, then having more ESC members is advised.

Composition of the ESC is determined by the Executive Sponsor. Members will include:

- **Executive Sponsor** who serves as the Chairperson; this is normally the key business stakeholder; the Executive Sponsor also serves as the final authority on decisions and should exercise this power when the ESC cannot come to a collective agreement
- **Key department or agency leaders** (e.g., Seattle IT Chief Technology Officer, Director of Transportation, Seattle City Light General Manager and CEO, Director of Finance and Administrative Services)
- **Representatives** with project management governance experience (e.g., Program Management Office Director)
- **Subject matter experts** from within the affected departments
- **Non-voting external, independent resources** (e.g., Oversight and quality assurance vendor)

Questions about "where in the organization" ESC members should come from is always a topic when on the quest to put together the right mix. The Seattle Police Department's Data Analytics Platform (DAP) project, an initiative to consolidate and centrally manage data for a variety of transactional systems related to police calls and incidents, citizen interactions, administrative processes, training and workforce management, provides a good example of organizational coverage and influence.

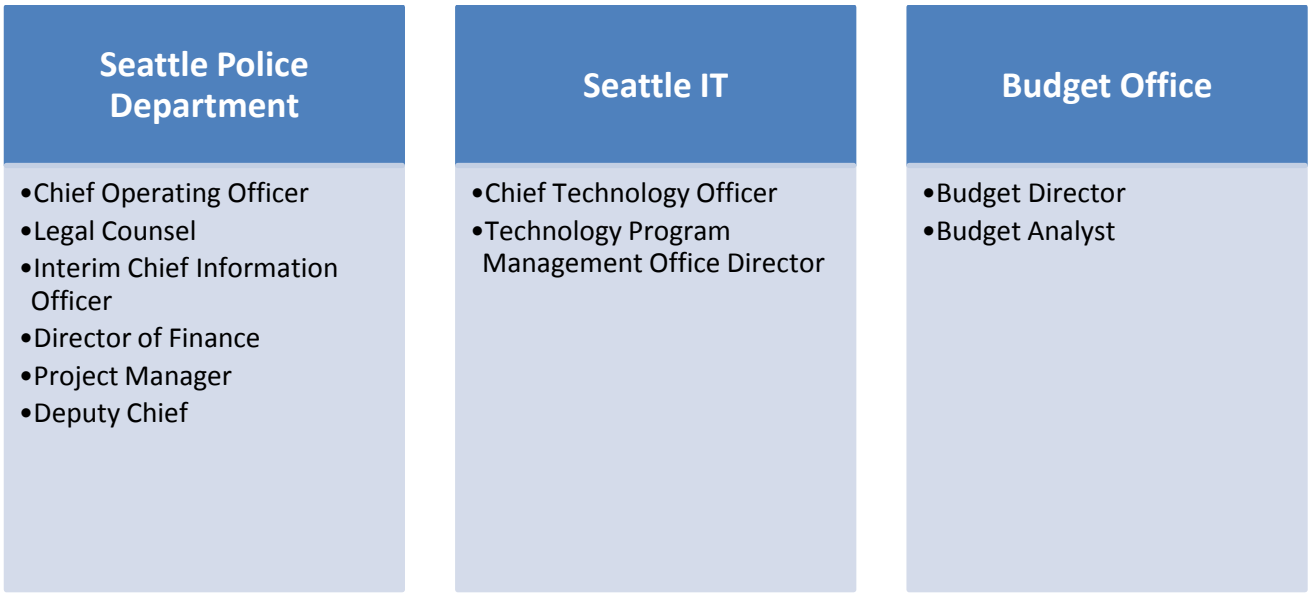


Figure 3: Seattle Police Department DAP ESC Members

ESC SKILLS AND TRAINING

The ideal public sector governance framework is not solely determined by organizational structure. The characteristics and interactions of those in leadership positions (ESC members), and their willingness and ability to engage in decision-making processes, are also important factors.

For effective governance, ESC members must have these traits:

- **Authority:** The organizational authority to make final decisions and ensure that they are executed.
- **Aptitude:** The aptitude to make decisions on complex IT or business-process-related issues. They need not have the expertise, but they must have the willingness to learn what they need to do and decide with confidence and conviction. They cannot be frozen by analysis paralysis.
- **Access:** Access and willingness to use information to make decisions. They must know what additional information to request. This information does not have to be comprehensive. It must allow the individual to make an informed decision.
- **Time:** Ability to take the time to make decisions, including the time to gather the information required to make informed decisions. Project Managers must be diligent in ensuring leaders have the right information and remind them of the importance of their time commitment.

ESC members must have a deep understanding of the project charter and comfort with the qualitative and quantitative measures of project performance; training should be provided on these topics during the ESC's formation and initiation. ESC members should also receive proper training in the areas of finance, change management, negotiation, contract management, issue management, project management, risk management and quality management so they can successfully execute their duties. If these skills have not already been developed then members should seek opportunities to do so at a level that will ensure their effectiveness.

More important than the individual competencies of the ESC members is the composition of the ESC itself. Level of empowerment and diverse representation are key. An ESC comprised of empowered leaders is able to make quick decisions and better positioned to influence allocation of resources for desired outcomes.

Large IT implementations generally touch multiple, if not all, areas of the organization. Wherever in the organization change is definite, anticipated or likely, there should be representation on the ESC from those parts of the organization that will experience the change. Representative, cross-functional composition is key toward mitigating the risk of unforeseen circumstances, helping to ensure that all critical requirements are communicated, and to identify the full impact of changes, risks and issues.

ESC MEETINGS

A typical ESC agenda will have:

- Meeting initiation items such as:
  - Introductions (particularly if there are new participants)
  - Review and confirmation of the upcoming agenda topics
  - Confirmation of receipt and approval of minutes from the last meeting
  - Review of outstanding action items from previous ESC meetings
- Review project status
  - Performance review
    - Scope
    - Schedule (including key milestones)
    - Budget
    - Previously identified risks
  - Accomplishments since the last meeting
  - Key upcoming activities for the next reporting period
  - Review new and outstanding issues
  - Review new and outstanding risks
  - Review any new project change orders
  - Additional agenda topics / presentations (e.g., briefing on vendor demonstrations, work stream[1] briefing, user acceptance testing update, go live readiness, independent verification & validation / quality assurance)
  - Outstanding decisions and project conflicts
  - Logistics and high level agenda for the next meeting

[1] The progressive completion of tasks completed by different groups within a company which are required to finish a single project. *Source: BusinessDictionary.com*

The ESC should meet every other week, at a minimum. For long term, less dynamic projects, monthly meetings may suffice. ESC meetings should be focused on overall project status, and critical issues and risks that the members can address. The Executive Sponsor should ensure that an agenda and all supporting documents are published before the meeting to promote preparation, participation and engagement from each of the ESC members.

The agenda for these meetings should be brief and succinct, to help the ESC members best prepare for making informed decisions.

BIMODAL PROJECT PLANNING AND IMPLEMENTATION

BIMODAL PLANNING

As its name implies, bimodal IT comprises two modes:

Mode 1

- Focuses on **predictability** and has a goal of **stability**. It is best used when requirements are well-understood.
- Large IT systems such as the City's Summit Re-Implementation (SRI) and New Customer Information System (NCIS) are examples of Mode 1 platforms and projects. These projects will typically follow the traditional, **linear approach to systems development**.
- Advantages include:
    - Developers and organizations agree on what will be delivered early in the development life cycle, making **planning and designing more straightforward**
    - **Progress can be more easily measured** as the full scope of the work is known in advance

Mode 2

- Focuses on **enabling innovation**. It is best used when the requirements are not well-understood in advance, and in areas where an organization cannot make an accurate, detailed, predefined plan because not enough is known. Mode 2 efforts do not presume to predict the future, but allow the future to reveal itself in small pieces. This work often begins with a hypothesis that is proven, disproven or evolves during a process typically involving short interactions (e.g., the Agile and Scrum software development framework). Project examples include the development of mobile applications.
- Mode 2 project development emphasizes the **rapid delivery of an application** in complete functional components. Instead of creating tasks and schedules, the **project is divided into phases** with a running list of deliverables, planned at the start of the phase. Deliverables are prioritized by business value.
- Advantages include:
    - Frequent and early opportunities to see the work being delivered and the **ability to make decisions and changes** throughout the development project

- Development is often **more user-focused** because the business is involved in every step; this requires a high degree of collaboration
- By breaking the project into manageable units, the project team can focus on **high-quality development, testing and collaboration**

The following table shows the difference in characteristics between the different modes.

Table 3 Bimodal Characteristics

Characteristic	Mode 1	Mode 2
Goal	Reliability	Agility
Value	Price for performance	Customer experience
Approach	Waterfall	Agile, iterative and incremental development
Governance	Plan-driven, approval-based	Empirical, continuous process-based
Sourcing	Enterprise suppliers, long-term deals	New vendors, short-term deals
Talent	Good at conventional process, projects	Good at new and uncertain projects
Culture	IT-centric, removed from the customer	Business-centric, close to the customer
Cycle Times	Long (months)	Short (weeks)

Agile development and bimodal IT are emerging as best practices in the IT industry. We recommend that the City consider adopting these practices and adapt their business practices to accommodate this change.

BARRIERS TO BIMODAL PLANNING

Each mode has specific requirements for people, resources, partners, structure, culture, methodologies, governance and metrics, and different attitudes toward value and risk. Mode 2 requires a more collaborative work environment and flexibility in resources. Gartner has seen public sector agencies' attempts to leverage Mode 2 for development of large IT systems provide limited results because:

- **Budget**. Government agencies typically require exhaustive business cases with a linkage to clear business benefits. Mode 2 projects rarely have these elements well-defined.
- **Planning constraints**. Successful Mode 2 projects rely on flexible funding, when financial support can be provided more frequently than biennially. Most government agencies cannot accommodate this.
- **Business and IT collaboration**. Regular, sometimes daily, checkpoints are key for the success of iterative development cycles. The resource constraints (i.e. lean staff, arduous process to alter roles and responsibilities) often found in the public sector are typically a deterrent.
- **Contracting processes**. Mode 2 projects may require flexibility in adding resources and acquiring new technical solutions. Government agencies' contracting processes generally require added flexibility to support the fluid Mode 2 requirements.

- **Decision-making**. The iterative nature of Mode 2 projects demands quick decisions, an area where public sector organizations struggle.

Because of the above constraints typically seen in the public sector, when developing and implementing large IT systems Gartner advises the City to **leverage the Mode 1 development path with elements of Mode 2** (e.g., rapid user feedback, use cases, short development cycles) incorporated into it as appropriate. As organizational, cultural and political roadblocks are removed, more elements of Mode 2 can be incorporated into large IT projects.

BEST PRACTICES FOR BIMODAL PLANNING

For public sector agencies that want to implement bimodal development practices, Gartner offers these recommendations:

- **Use a simple approach to determine which mode makes sense for a project.** For example, consider Mode 1 projects for systems of record[2] and Mode 2 projects for systems of differentiation[3] and systems of innovation.[4] Mode 1 projects tend to have both clear outcomes and clear approaches to achieving these outcomes. Typically, commercial-off-the-shelf (COTS) products fall into the Mode 1 category. Mode 2 projects will be more evolving in outcomes and their value resides in providing capabilities to gain competitive advantage.

- **Adopt a more outcome-centered approach to project management.** The measure of project success should be the intended business outcome. Having an outcome-centered approach will help organizations manage the different requirements of "slow" (Mode 1) and "fast" (Mode 2) IT most effectively. With a typical Mode 1 project, for example, the sales organization must submit a request and a business case for implementing a customer relationship management system with a stated benefit of ultimately delivering increased revenue. If the business case is approved, IT would work with the sales team to establish exactly what aspects of the vendor-provided system offers the core critical capabilities to ensure the system was configured correctly. Mode 2 projects, however, are explorative and may not have an obvious list of capabilities by which to define their success from the outset. For such projects identify a specific business outcome such as, "Improve staff productivity by x percent by implementing new ERP

[2] Established packaged applications or legacy homegrown systems that support core transaction processing and manage the organization's critical master data. The rate of change is low, because the processes are well-established and common to most organizations, and often are subject to regulatory requirements.
[3] Applications that enable unique company processes or industry-specific capabilities. They have a medium life cycle (one to three years), but need to be reconfigured frequently to accommodate changing business practices or customer requirements.
[4] New applications that are built on an ad hoc basis to address new business requirements or opportunities. These are typically short life cycle projects (zero to 12 months) using departmental or outside resources and consumer-grade technologies.

system" and build the business case specific to that outcome. The process works well across both modes because the outcomes define the correct project scope.

- **Clearly separate portfolio and project governance.** Organizations can make bimodal governance effective by combining efficient project leaders comfortable with innovation and investment portfolio leaders with sufficient levels of authority to make decisions across the entire IT portfolio.

RAPID IMPLEMENTATION METHODS

Organizations can consider using rapid implementation methods and tools to reduce project and implementation costs. Rapid implementation can include using agile methodologies or rapid application development methodologies and tools to reduce project time and costs.

RAPID APPLICATION DEVELOPMENT

Rapid application development (RAD) tools focus on quick, iterative development methods over traditional waterfall techniques. In general, RAD approaches to software development put less emphasis on planning and more emphasis on process. In contrast to the waterfall model, which calls for rigorously defined specifications to be established prior to entering the development phase, RAD approaches emphasize adaptability and the need for adjusting requirements in response to knowledge gained as the project progresses.

AGILE METHODOLOGIES

Agile methodologies require both training and continuous improvement to fit and adapt it to the larger organization and its established management processes. In selecting an agile method or methods, application development leaders should consider the availability of training and tools support. However, a basic level of Scrum training, which is almost universally available, would serve as a good starting point for any team embarking on agile development.

Examples of enterprise agile frameworks include:

- Disciplined Agile Delivery (DAD) – DAD is a process decision framework that enables simplified process decisions around incremental and iterative solution delivery. DAD builds on the many practices supported by agile software development, including Scrum, agile modeling and lean software development. The DAD process framework recognizes not only the importance of networks of cross-functional teams, it also explicitly offers support for scaling key practices across complex working environments using techniques that link software development efforts into robust software delivery contexts.

- Large-Scale Scrum (LeSS) - LeSS is an enterprise agile framework that applies scaling by extending Scrum with multiple (between one and eight) Scrum teams. The LeSS principles build on feature teams with customer-centric Lean IT.

- Scaled Agile Framework (SAFe) – SAFe is a four-level structured framework that builds on Scrum or the Kanban scheduling methodology and targets complex enterprise projects across the team, program, value stream and portfolio levels with detailed, control-oriented management heavily based on lean principles. SAFe is the best-known enterprise agile framework and also the most complex in its specification of processes, practices and organizational models.

CHAPTER 4: PROJECT PLANNING

During the project planning phase of the project management life cycle, the PMO creates a set of plans to help guide the team through the project's execution. Project staffing, developing scope schedule and budget, and creating a communication plan are all issues that must be addressed during this phase. Doing so can help the project team manage time, cost, quality, and risk to ensure on time delivery of the project. This chapter provides information on project staffing options, the importance of assessing internal competencies before making staffing decisions, and the roles of Managed Services and independent quality assurance. It also describes the early development of project scope, schedule, and budget, and the importance of establishing a communication plan.

PROJECT STAFFING

One essential element of planning an IT implementation project is identifying the correct mix of staffing. Below we describe the roles of full-time, term-limited temporary, consulting, and outsourced staff, and systems integrators, in a large IT implementation project.

FULL-TIME STAFF

It is critical to staff projects with people 100% dedicated to the project. Full-time staff can include a team of analysts, programmers, designers and project managers. Typical responsibilities include:

- Understanding the work to be completed
- Planning the assigned activities in more detail if needed
- Completing assigned work within the budget, timeline and quality expectations
- Informing the project manager of issues, scope changes, risks and quality concerns
- Proactively communicating project status and managing expectations
- Facilitating change management
- Receiving transfer of knowledge from vendors

It is a best practice is to have a team comprised of cross-functional staff to provide the expertise and capabilities needed to execute the project successfully.

TERM-LIMITED TEMPORARY (TLT)

Term-Limited Temporary (TLT) positions are great resources to have access to when needing to backfill for full-time employees dedicated to the project. TLT is largely used when specialized skills or short-term resources are needed, or to temporarily replace workers on leave. TLT are generally hired based on an organization's need to supplement its own head count because it: a) faces hiring restrictions, b) needs temporary or additional labor, or c) needs to access IT skills it does not have. This resourcing strategy is also used if an organization prefers the flexibility to add and release IT resources based on the dynamic needs of the enterprise.

CONSULTING

Consultants work in partnership with clients/organizations, advising them on complex IT projects to meet their business objectives or overcome problems. Consultants work to improve the structure and efficiency of IT systems in various organizations. Consultants can also provide guidance, and technical and organizational assistance during all phases of the project life cycle. Typical responsibilities on large IT implementations include:

- Meeting with clients to determine and validate requirements
- Working with clients to define the scope of a project
- Advising on independent cost estimates and project budgeting
- Clarifying a client's system specifications, work practices and nature of the business
- Liaising with staff at all levels of a client organization
- Analyzing IT requirements and providing independent and objective advise on technology evaluation and selection
- Advising throughout the procurement life cycle, from RFP development to vendor evaluation and selection process facilitation
- Helping clients with organizational change management and communications activities
- Designing, testing, installing and monitoring new systems
- Providing client-side program and project management to compliment the roles of the System Integrator

OUTSOURCED STAFF

Outsourcing involves a contract/relationship for the purchase of IT services from an external service provider that supplies not only the staff, but also the processes, tools and methodologies for managing, enhancing, maintaining and supporting the IT services to be performed. Outsourcing is typically structured as a long-term contract and has several pricing methodologies/models that can be used, such as fixed price, time and materials or outcome-based. When using outsourcing as a delivery model, a large percentage (if not all) of the risk for delivery is transferred to the provider and delivery obligations are formally delineated in a master service agreement that includes a variety of service level agreements. In an outsourcing model, the provider oversees all work efforts, quality and delivery timeliness utilizing the provider's productivity standards, processes and methodologies.

SYSTEM INTEGRATORS

System Integrators (SIs) design, build, synthesize and implement technological applications customized to meet organization needs. With professionals in the IT department, SIs test and authenticate software to determine its suitability before integration into the organization's main system. SIs evaluate and recommend integration solutions based on an organization's preferences. They regularly work with an organization's management, administrative and legal staff to ascertain that the recommended solution meets the business and functional requirements. SIs also provide organizations with post-implementation and integration support which involves troubleshooting, updating and maintaining the

system. Management of subcontractors and training of internal staff represent roles generally fulfilled by the SI. The role and scope of SI responsibilities are ultimately defined and agreed-to via its contract with the organization requiring its services.

ASSESSING INTERNAL COMPETENCIES

For large-scale IT implementation projects, organizations should **decide upfront** whether they need to procure and install the solution via internal staffing/sourcing or via the services of one or more external vendors. If the organization decides to internally source the solution that means the burden of hiring the right staff with the right skills 100% dedicated to the project falls on the leaders of the organization. If the organization decides to externally source the solution it is absolutely important to ensure that the ultimate decision authority lies within the organization and not with the vendor or external staff. It is also important to ensure that the vendor or external staff has no conflict of interest with the City and are objective and independent in their analysis.

For determining the right mix of internal and external staff for a project, the organization must **look at the capacity of internal resources** (e.g., utilization, competency), the availability and cost of contracted staff, and its long term approach toward technology evolution and adoption. Another key factor is the organization's culture of training and development. If the organization expects to constantly evolve at or close to the rate of technological change, leveraging a team mostly comprising contractors is preferred given the accessibility to modern skills and knowledge instead of constantly relying on internal staff to do this. Alternatively, if the organization has a tendency to modify platforms to accommodate specialized processes and is slow to adopt new technologies, then creating a project team heavy on internal resources is advised.

A key factor in making decisions around staffing strategies includes the skills and capabilities of the current FTE workforce. Public sector organizations often lack awareness of the inventory of skills they have in-house, thus they immediately default to engaging external parties.

An effective way to build that inventory of in-house skills and to determine if staff have the right skills for the project is to **conduct a skills assessment**. A skills assessment is like an employee survey that can gather information from employees on their areas of competency, levels of mastery and years of experience. After employees have completed these assessments, managers should be able to validate the results and suggest training and development opportunities to fill any gaps in skills.

Various tools are available in the market that can assist organizations with these types of assessments, and a multitude of approaches from independent consultants. An example is Gartner's skillpower™, which can assess the skills of various employees and report results in several ways that help to inform the organization of its competencies in selected areas.

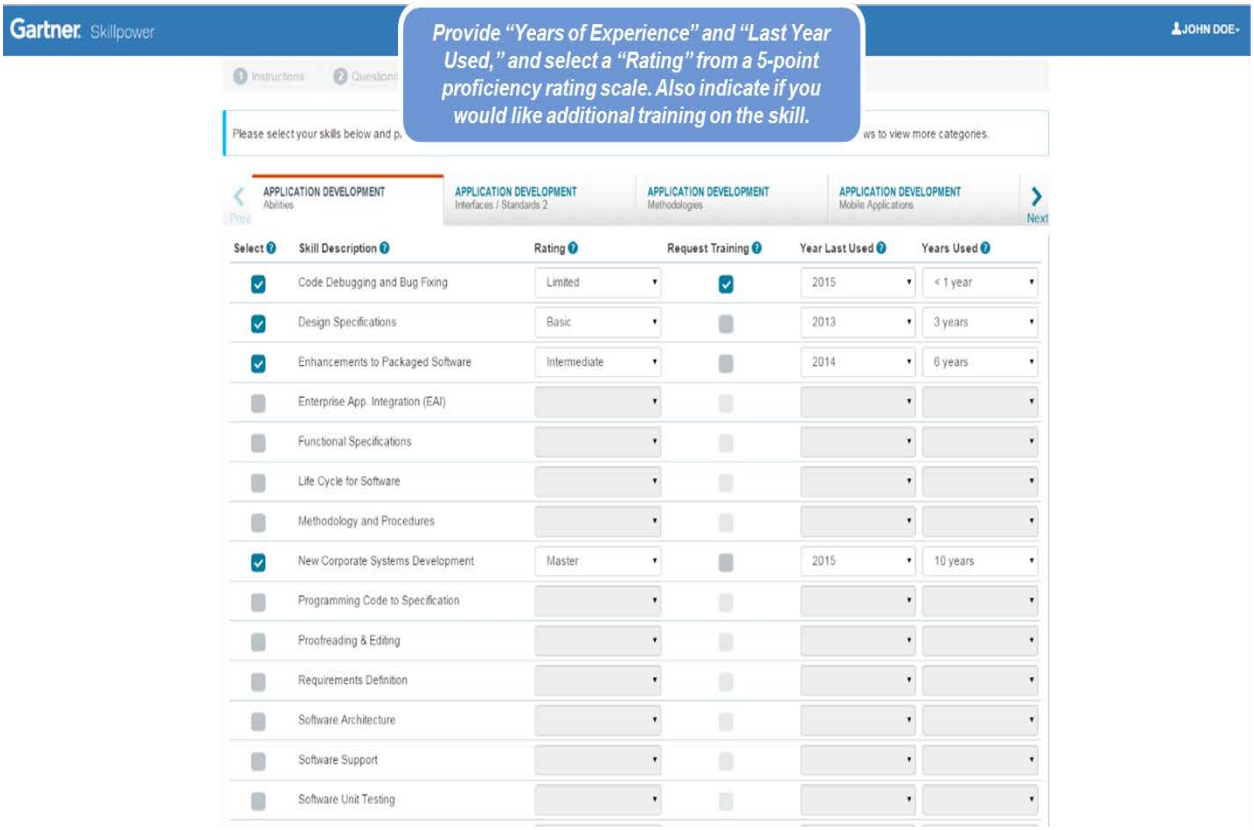


Figure 4: Gartner skillpower™

The results from these assessments can inform not only an organizational wide development program, but also can help to determine what type of training, if any, would be needed to accommodate the needs of a new project.

MANAGED SERVICES

Managed Services generally include the delivery of a specific IT service through the management of software, hardware, and IT infrastructure by an industry service provider. The relationship between an organization and a Managed Services provider is defined by a services contract that will contain several service level agreements (SLAs). These SLAs will represent a compromise between what is feasible for the provider and the needs of the customer organization. For organizations that do not have adequate IT resources to manage large scale IT projects, Managed Services can manage day-to-day redundant management tasks related to implementation while the internal staff can focus more on the strategic activities.

Managed Services offer several advantages, including:

- Reduced cost of ownership, including traditional service fees, hardware, IT operations and transport
- Increased levels of support and network availability with no additional staff
- Improved IT budget stability and predictability

- Easy access to leading-edge technology
- Simplified response to evolving requirements
- Allowing the IT group to focus on its core mission and objectives

When labor unions are involved, Managed Services arrangements should be entered with an understanding of how the contracted service relates to labor contracts, and ideally an understanding would be reached on how the arrangement provides value to represented employees and their bodies of work. Organizations must also understand the cost implications associated with Managed Services.

Whether to use Managed Services depends on organizational needs and capabilities. The organizations must **evaluate internal resources and skill levels** to decide if they want to have an in-house team manage large scale IT implementations or outsource the process to external service providers. As internal resources become more constrained and struggle to keep skills up-to-date with the dynamic technology landscape, public sector organizations are increasingly leveraging the offerings of Managed Services Providers in ongoing maintenance and operations. Many SIs for large IT systems also provide this service.

However, compared to the investment in training in-house staff, having a quality outsourced IT service organization with the resources to start new projects right away can save organizations time and money. Handling the same project in-house might involve weeks or months to hire the right people, train them, and provide the support they need. Also, organizations that try to do all IT services in-house themselves can have much higher research, development, and implementation costs that are ultimately passed on to customers. Managed Services can be less risky because providers assume and manage much of the risk for the organizations to whom they are providing the service, by using experts with specific industry knowledge, especially in security and compliance issues.

INDEPENDENT QUALITY ASSURANCE

For many of our clients with projects budgeted at $1M or more, there will be a mandate for independent quality assurance (QA) services. Organizations may also choose to mandate independent services if the project's assessed risk level is high enough, regardless of expected budget. The provider of independent QA services, an external vendor, will act as an advisor to the Executive Sponsor and ESC regarding areas where the project may need to improve to meet its goals and objectives. The value of the QA vendor is their **independence and objectivity** regarding the project itself and any of its team members, including other vendors.

While the scope of work a QA vendor has may vary, it will generally focus on **assessing the project's health** across several indicators, similar to what was displayed in Figure 6 ESC Project Dashboard. A key output of the QA assessment are risks and recommended mitigation strategies. These risks, if accepted by the project team, should be managed by the Project Manager via the project's Risk Register.

QA assessments are typically performed monthly or quarterly. The timing between assessments will be determined by the project's complexity and duration. QA vendors will complete their analysis and

develop an assessment report that is presented to key members of the project, including the Executive Sponsor, ESC members and the Project Manager, typically during ESC meetings.

DEVELOPING PROJECT SCOPE, SCHEDULE, AND BUDGET

Scope, schedule, and budget comprise the Project Management Triangle, each being interdependent. With agile and bimodal projects, this triangle can be challenging since the project needs and requirements evolve throughout the project. However, if project scope is not well defined and the budgets are not estimated adequately in the planning phase, the projects can be at risk of failing due to cost escalations related to changes in scope. This can also affect the project schedule and cause significant delays in the delivery of the project.

DEFINE SCOPE, SCHEDULE, AND BUDGET EARLY

Gartner recommends the following best practices for early scope, schedule, and budget definition:

- **Benchmarking the organization's IT spending** against similar-sized organizations to verify if the budget estimates are aligned with industry standards. The benchmarking would be effective for understanding what organizations of similar size and industry are paying for systems of similar scope and complexity.
- **Collaborating with agencies** that focus on identifying and grouping peer organizations experiencing similar challenges in the areas of project costs and implementations. For example, by regularly participating in peer group meetings organizations can learn and share similar experiences with other industry leaders and identify gaps and improve their planning and budgeting practices.
- **Using an independent research and advisory firm** can help with developing scope, budget and schedule for complex projects. These firms bring data, via a benchmarking database and prior customer interactions, from similar implementations and clients. This approach tends to provide a level of objectivity and credibility to the project scoping, budgeting and planning process required for political purposes.
- **Leveraging historical project costs** for projects similar in scope and size for future project planning and budgeting purposes.

USE A WORK BREAKDOWN STRUCTURE

Another approach for estimating elements of the Project Management Triangle is by using a Work Breakdown Structure (WBS). The WBS approach requires the project team to decompose the project (including development, technical solution, consulting) into units of work, also referred to as work packages. Each work package can then be applied attributes for estimated cost and duration. The summation of estimated costs results in an overall budget estimate.

Estimating the project schedule based on the WBS requires rigor. Work packages are designated as predecessor and successor activities. Combining this information with the project's estimated duration, the team can then develop a properly sequenced project schedule that accounts for dependent activities.

Leveraging the WBS approach requires a collaborative and time-intensive process that can yield high confidence in the estimated schedule and budget. Organizations rarely afford their teams enough time to conduct this exercise but when they do, it's a proven, effective method for estimating and setting expectations.

OBTAIN PHASED APPROVAL OF PROJECT BUDGETS

Budget management, the most scrutinized of the three elements of the Project Management Triangle, is important throughout the project for managing expectations from the City Council and getting the required approval. The Executive Sponsor educates the Council, up front, about the confidence levels in budgeting at different phases of the project life cycle. One proven way for communicating budget requirements to the Council is to **develop a Stage Gate review approach** at different phases of the project life cycle. The Stage Gate approach divides the budget review process into different stages based on the budgeting confidence levels.

Below is an example of what stage gates will look like for public sector organizations.

- **Stage 1. Conceptualization.** This initial stage, closely aligned with the Initiation lifecycle phase, is when high level concepts, plans and benefits are documented and presented. Formal approval is required for funding to develop a detailed business case and project plan.

- **Stage 2. Business Case.** This stage, closely aligned with the Initiation lifecycle phase, is when the solution approach, business and functional requirements to support the Request for Proposal (RFP), and a project plan that lays out scope, schedule, budget and resource needs (with an expected variance of no greater than 50% of the original business case) will be developed. Key project staff should also be identified at this stage.

- **Stage 3. Detailed Planning.** This stage, most closely aligned with the Planning lifecycle phase, is when vendor evaluation and selection, and detailed project planning (with an expected variance of no greater than 10% of the project plan developed for the RFP) are conducted. The Project Management Plan should also be developed during this stage.

- **Stage 4. Execution Phase.** This stage is when functionality is delivered and regular status reports are provided to the governing bodies (e.g., ESC, City Council). Transition planning, lessons-learned, close-out documentation, and operations and maintenance planning should also be finalized here.

COMMUNICATION PLAN

Even when they are equipped with the appropriate tools and processes, ESCs may still get stymied, thus delaying decisions and potentially affecting project schedule and budget. To mitigate this, it is imperative to have a robust communication plan that includes the different stakeholders, even within the ESC, and the preferences for frequency and mode of communication. An example communication plan is show below.

#	Stakeholder	Messaging / Method	Timing	Sender / Presenter
1	ASOs	**Fiscal meeting:** Provide overall project status update, share upcoming timeline and next steps for the Assessment Report, CAFR Consolidation Testing, and Draft Design Preview	April 28, 2015	Program Team, Project Team
2	CAFR Consolidation POC list	**CAFR Consolidation Testing:** Email the CAFR Consolidation POCs from to invite them to a CAFR Consolidation Testing session, providing an overview of what to expect, who should attend, and what they should bring/prepare	May 4, 2015	Finance Director
3	Reporting Unit POC list	**Assessment Report Review / Draft Design Assistance:** Email the POCs from Reporting Units with the following: • Request to prepare sample transactions to demonstrate how the crosswalk happens, example provided • Their Department's page(s) from the Assessment Report for review • Their Department's consolidation structure for review • Reminder of forthcoming invitation to the Draft Design Preview	May 8, 2015	Finance Director
4	Reporting Unit POC List	**Invitation to Draft Design Preview:** Email the POCs from the Reporting Units to invite them to Roadshow sessions between June 3 and June 5	May 18, 2015	Finance Director
5	ESC	**ESC meeting:** Provide overall project overview, share status to date, key findings, timeline of upcoming activities and executive summary of Department Assessment Report.	May (TBD)	Project Team
6	ASOs	**Fiscal BPA meeting:** Provide overall project status update; present design rationale for draft UCOA	June (TBD)	Program Team, Project eam

Planned | In Progress | Complete

Figure 5: Example Communication Plan

The communication plan should be developed by the team member responsible for communications, typically either the Communications or Organizational Change Management Lead. This plan should include communications to the ESC, which the Project Manager will execute, to keep them appraised of the project's status. Open communication is key. If required, Project Managers should have individual meetings with the ESC members to ensure that they have the right data to make decisions. Typically, when are issues are raised to the ESC, a recommendation from the project team endorsed by and presented from the Project Manager should accompany it. A consultant, in the role of independent Program Advisory / QA can also be called upon to advise the ESC on making challenging decisions. Ultimately, the Executive Sponsor, if empowered by the ESC, can make final decisions.

CHAPTER 5: PROJECT EXECUTION

Changes to projects are inevitable, but there are certain success factors for keeping a project on track despite these changes, which are discussed in this chapter. In this chapter we also identify several best practices for other high risk areas, including managing dependent projects, converting and migrating data, managing testing, using exit criteria, and allowing for sufficient training and knowledge transfer.

PROJECT SUCCESS FACTORS

Gartner Research spells out five essential factors for implementing and planning large scale Mode 1 IT projects in the public sector:

- Commitment from Executive Management
- Realistic Investment Expectations
- Strong Project Management and Project Team
- Minimize Modifications
- Adequate Change Management and Training

COMMITMENT FROM EXECUTIVE MANAGEMENT

In the age of agile and bimodal IT, oversight and active support from senior leadership are imperative. Government organizations should not lose sight that an enterprise system can fundamentally affect an organization's entire mode of operation. As a result, the IT team should not have sole responsibility for the project. Some of the ways organizations can overcome this challenge are:

- By ensuring that top management support and responsibility is present from the beginning of the project and that it is sustained and visible throughout the project life cycle. This can include addressing internal political issues, and external ones.
- Senior management involvement in project sponsorship, project steering committees, quality reviews, and issue and conflict resolution is vital. Involvement in these governance mechanisms can help sustain management support by keeping managers informed of the project's progress.

REALISTIC INVESTMENT EXPECTATIONS

One of the common practices for many government organizations is to reduce project costs to improve their return on investment (ROI). Typically they do this by negotiating with vendors to reduce software license fees and by cutting budget in the areas of implementation, change management, training and project management. Many organizations view these as expensive overhead, rather than as vital components of success. Inadequate understanding of the costs associated with implementation and modifications can lead to insufficient budgeting. Therefore organizations should **plan sufficient budget** for change management, training and/or project management. These are critical success factors for any project.

STRONG PROJECT MANAGEMENT AND PROJECT TEAM

Project management is key to helping to ensure that large scale IT implementation projects are completed on time and within the budget.

Some of the ways government organizations can ensure they have a strong project team is by:

- Appointing a strong, **experienced project manager** at the outset of the project.
- Providing **incentives** like retention or success bonuses for the project manager to stay for the life of the project.
- **Empowering implementation teams** to make the final decisions without needing to consult management regarding issues such as configuration and process change. If possible, place people on the team who have been through IT implementations before and are motivated, enthusiastic and good team players.
- Providing **post-implementation support**. Many projects fail as seconded staff return to their departments or as experienced contractors end their assignments. Use competency centers to help fill the critical support requirements once the project is live
- Maintaining rigorous control of the project by using **proven methodologies** or software-specific methodologies. For example, by using collaboration tools like project management dashboards for reporting the status of the project or using Project and Portfolio Management (PPM) software tools available in the market for tracking project schedule and milestones. PPM application tools address most core functions that are required for project management. Most of the PPM software tools will support activities like time management, resource management, risk management and cost management.

MINIMIZE MODIFICATIONS

Many organizations, especially in the public sector, make modifications to software to accommodate nuanced business requirements. These customizations can come in the form of changes to user interfaces, documents and forms, reports, interfaces, workflows, functional extensions or functionality modifications (these represent the most intrusive and costly type).

To avoid modifications all together, it has to be an organizational decision that is agreed-upon by the highest levels of leadership at the project's outset. As applications have matured and evolved to accommodate the complexities that previously justified customization, so has the practice of adopting solutions "As Is." The shift to cloud solutions, where vendors are seeking to limit customizations as to maximize the fit of their applications to multiple clients, has also contributed to changed behavior in the market.

If modifications are needed, it is important to diligently manage them for long-term business value. Management approaches include:

- **Select the Right Customizations to Build.** The only purposes of building and maintaining customizations should be to increase the business value of applications or ensure governance and compliance. However, building and maintaining customizations create additional costs. Avoid any customization that doesn't measurably increase the business value. Therefore, whoever requests that a customization be built needs to demonstrate and prove the resulting business value.

- **Budget for the Full Life Cycle Costs of Selected Customizations.** It's not enough to just budget for the initial development and implementation of customizations. As with business applications, most of their costs occur during the many years after going live. Customizations brings additional costs in ability to upgrade, and applications of enhancements and bug fixes. Customizations may also affect the ability to exploit opportunities in future versions.

- **Build the Customizations in the Least Intrusive Way Possible.** To avoid the inertia of impossible upgrades and unfeasible optimization of the application, build the customizations with as little intrusiveness as possible (as enabled by the application's architecture).

- **Put Source Code Management and Version Control in Place.** Having strong policies and powerful tools for managing source code, storing technical object descriptions and offering version control are especially important when multiple teams are working in parallel, and for activities that involve a handoff between the teams that originally built the customizations and the teams responsible for their long-term support.

- **Document All Aspects of Customizations for the Longest Possible Life Span.** Documentation of customizations should include the purpose, business value and how it was derived, circumstances that would void its need, how it was built, the technical environments used, and how it is to be tested and quality assured. The documentation must be done in such a way that it is usable for a minimum of five years.

ADEQUATE CHANGE MANAGEMENT AND TRAINING

Change management skills are paramount for any IT implementation project to succeed. A robust change management program should be instituted at the project's outset. Training is also a key deliverable of any change management program and is a critical success factor for large scale IT implementations.

Some of the effective ways government organizations can plan for effective change management and training are discussed below:

- **Create a Communication Strategy.** Communication plan and mechanisms (such as a website with regular updates, a monthly newsletter and road shows) can channel information to end users. Keeping the lines of communication open between the project teams and keeping the information flowing regularly can alleviate staff fears related to new IT system implementations and will make them more accepting to the change. Ensuring that key end-users are involved

through active communications regarding the project's progress and the changes to the business processes and organization, and through participation in the project's governance mechanisms are key for change management.

- **Educate and Prepare Users.** Conduct educational activities to assist the staff in grasping the importance of the project, its benefits and its effects on the organization. Prepare the user community for change from a project and a business perspective. Set realistic expectations by compiling a detailed business case that clearly states the process changes and functionalities involved in the project, tying them to specific benefits. The change management team should reset users' expectations, when necessary, based on the business case. A critical error cited by many organizations is the scarce attention paid to end users. Create a "power user" community, comprised of the most experienced users who would also be the first line of user contact for functional help and training.

- **Conduct a Change Readiness Assessment.** Hire an experienced third-party independent organization if needed to conduct a change readiness assessment prior to the implementation of large projects or significant change components to identify weakness and to determine the organization's ability to cope with change.

- **Provide Quality Training.** Education and training programs must embrace multiple methods and delivery vehicles, such as one-on-one training, classroom training and computer-based training to meet the needs of adult learners.

MANAGING DEPENDENT PROJECTS

The coordination of dependent projects (activities that relate or interact with the project in question) is the responsibility of the PMO.

This level of coordination and dependency tracking should be facilitated by:

- **PMO team status meetings.** These meetings should bring together all the Project Managers and the Portfolio Manager to discuss the overall status of individual projects and dependencies on current or pending projects.

- **ESC meetings.** Key projects and their dependencies should be presented and discussed at meetings with the ESC and other key business and technology executives (e.g., City Council, Mayor’s IT Cabinet) to help mitigate risk impact or likelihood of occurrence.

To successfully manage and deliver a project, a project manager must plan, coordinate, and manage all project dependencies across teams, departments and assets. Below we discuss five simple steps to successfully manage dependencies on a project.

1. **Document Dependencies:** Project dependencies should be documented and tracked by each Project Manager. Each dependency should be linked to the associated project and captured

within project milestones, stage gate criteria and the project schedule. These dependencies should also be captured as risks, or issues if the dependency is presenting a roadblock.

2. **Align and coordinate scope:** The project manager should define a clear scope for all the dependencies and ensure that the teams responsible for them agree with the scope. The project manager should also establish an ongoing relationship with each dependency team or organization to facilitate timely decision-making. For example, if a project needs a certain setup from your organization's infrastructure team, ensure that the project manager defines what he/she needs (e.g., number of servers, software, technical specifications) and confirm this setup can be delivered.

3. **Align and coordinate timelines:** Ensure that the project manager reaches a timeline consensus with the team that specifies exactly when the dependency is required and for how long. Finally, coordinate the timeline to secure the on-time delivery or on-time availability. For example, if the project manager asks the organization's infrastructure team to deliver the servers by 31st July, the project manager can use this setup during an August 1st – September 30th testing period.

4. **Monitor and control dependencies throughout the project:** Although it will be impossible to plan all project dependencies precisely and completely from the project start until project end, maintaining an up-to-date list of dependencies can be valuable. Throughout the project new dependencies might show up and others might become dispensable.

5. **Collect sign-offs:** Sign-offs can confirm the delivery or the fulfillment in the defined boundaries. For example, an end user outside your project team will sign-off the product change your project generated, confirming that this is conforming with his/her requirements or expectations.

DATA CONVERSION

Migration of data represents one of the biggest risks to the success of implementing any IT system; the risk is even more severe for large, complex ones. Risks and challenges in data migrations and conversions are generally the result of poor decision about scoping, timing and data quality.

To mitigate this risk and increase the positive impact of data migration, Gartner recommends the best practice concepts shown below.

RIGHT TIMING – FOCUS EARLY AND HEAVILY ON DATA QUALITY

- Identify the data most important for the new system to fulfill business needs and assess its quality. Data cleaning activities should be prioritized based on timing of implementation (in the event of a phased deployment) and importance of the data to business operations.

- Prevent ongoing data quality issues by understanding their root causes and addressing them within the current system and business processes.

- Establish a service-level agreement (SLA) for data quality metrics (e.g., number of records, data accuracy, data validity, etc.) that must assess the quality of source data and validate that the SLA has been met after migration has taken place. Data governance should be established and implemented to monitor and enforce data quality.

- When data volumes are extreme, sampling approaches can infer quality levels of migration sources. However, sampling approaches typically create the opportunity for certain data quality issues to be missed in the initial analysis. Setting expectations and establishing procedures for post-migration quality assessment and resolution will be critical to the ongoing success of the project.

RIGHT PEOPLE – ENGAGE BUSINESS SUBJECT MATTER EXPERTS

- Identify a team of business users that understand the data requirements of the applications and the business processes that the target data structures will support.

- During testing and post-migration, business users must be heavily involved in validating data from a data quality perspective, but also in the context of the applications and businesses processes that will consume or operate on the final software solution.

RIGHT SOURCES / DATA – LEVERAGE EXISTING KNOWLEDGE AND MIGRATE ONLY WHAT IS NEEDED

- Organizations must ensure that the initiative is limited to data sources that will be required or that add value to the target application or data structures. Just because data sources related to the target are available does not mean there is business value in migrating all of them. With many organizations experiencing budget constraints, optimizing the cost of data migration efforts via wise scoping is imperative.

- Existing project charters and ownership roles can be leveraged to gain approval and confirm the sources to be migrated. A project charter may point to applications that will be upgraded or replaced / decommissioned because of the new initiative, thus providing insight into the systems that house data to be migrated.

- In high-volume data scenarios, consider scoping the migration so a subset of large data sources will be addressed. Often, not all historical data must be migrated to the target. By archiving or disposing of older, non-value-added data, the level of effort and time frames can be minimized.

- Consider legal and regulatory imperatives. For example data that is no longer required to be retained because it is outside the required retention time frames can become a risk to the organization. By excluding it from the migration effort, the organization can simplify the project, while mitigating litigation.

RIGHT TOOL – APPLY THE RIGHT TOOLS

- Avoid custom-coded or desktop-tool-based approaches (such as coding of macros in Excel spreadsheets to transform and cleanse data). These approaches can create quality challenges, and are limited in their ability to be reused and extended. In addition, they provide no capabilities for discovery and capture of metadata.

- Readily available packaged data integration tools and data quality tools can provide greater productivity, higher-quality results and more opportunities for reuse than custom-coded approaches. Depending on the data quality issues existing in the data sources, either the built-in transformation functionality of packaged data integration tools or specialized data quality tools can provide substantial value.

- Leverage existing investments in data integration and data quality tools that may have already been deployed to support a data warehousing initiative or other use case. Rather than initiating new selection and deployment projects, reusing existing licenses and skills where possible can provide an immediate positive impact on the migration effort, while optimizing costs.

TESTING

Organizations should **develop a robust and comprehensive test plan** as part of the project planning exercise that states the frequency of testing events and when they will occur. The test plan should encompass the unit, integration, system and user acceptance testing activities. Given probable patching, upgrades and post-implementation enhancements, regression testing should also be incorporated into the testing plan.

Identifying and engaging the testing resources, both from the business and IT, early in the project will help to ensure that testing occurs in a timely manner. It is important to incorporate this stakeholder group into the communications plan and execute it accordingly. Remaining in contact with the testing resource throughout the project and between cycles will increase the likelihood of their availability to perform testing and improve the overall quality of testing. This level of advanced planning and ongoing communication will also allow the early identification of alternate testers if a change to the team needs to be made.

Opportunities to expedite testing and increase quality includes the use of **automated testing tools**. Leveraging these tools bring organizations several benefits:

- Shortened test cycle times
- Improved use case or unit test coverage during regression testing
- Freeing up resources usually reserved for repetitive testing tasks for other activities that add more value
- Improved resource utilization (as tests can be run at any time)
- A consistent testing process, especially when test automation efforts are connected to continuous integration efforts

Another approach growing in popularity is the use of an independent, **third party vendor to lead and execute testing**. Similar to the role of a QA vendor, this party should be objective with the sole purpose of executing the test plan, and capturing and providing results. Having a vendor separate from the rest of the implementation team brings a level of focus, rigor and quality that may not be present with a team also managing design, development and overall project management activities.

Leveraging automation and independent testing bring objectivity to the testing process and reduces reliance on end users and other project team members, who can then focus on the value-added activities of preparing the test plan and scenarios, and accommodating their normal job duties.

EXIT CRITERIA

As with any decision on the project, the level of risk associated with loosening entry criteria into subsequent phases should be carefully evaluated and mitigated. Risks identified at this stage do not differ from other risks on the project; they should be identified, mitigated and tracked via the project's risk register. Stage Gate entry and exit criteria are best practices developed and implemented to mitigate traditional project risks. The table below shows typical risks encountered when exit criteria are compromised.

Table 4 Risks and Exit Criteria

Stage Gate	Risks of Loosening Exit Criteria
1. Conceptualization	• Incomplete and/or inaccurate business case that results in insufficient funding • Invalid project concept that ultimately is not representative of true business needs
2. Business Case	• Incomplete capture of business requirements resulting in unmet business needs, insufficient funding and limited buy-in • Inadequate staffing needs assessment resulting in a suboptimal project team
3. Detailed Planning	• Inadequate project management plan that results in disorganized project control and limited standardization in the management of risks, issues and deliverable quality • Rushed vendor selection process that ends up focused on cost instead of other key factors such as past experience and personnel; this could negatively affect all areas of the project going forward • Compromises in planning for organizational change that result in strong change resistance and limited adoption
4. Execution	• Inadequate testing that results in a defect-ridden solution at implementation, requiring additional cost for support and challenges with driving user adoption • Insufficient training that could cause a steeper than expected learning curve upon deployment, thus driving up support costs and delaying business benefits • Lack of understanding of go-live readiness could cause lower user adoption and additional costs for change management activities

Stage Gate	Risks of Loosening Exit Criteria
5. Closure	• Limited accessible project documentation that can be used for post-deployment audits and serve as input to lessons learned to be leveraged by other project teams

There will always be political and environmental factors will force the entry and exit criteria to be compromised, or even ignored, in certain situations. If a project must be moved forward before it is ready, Gartner advises to do this later in the project as opposed to during the early stages. The impact of compromise in developing the business case, concept, requirements and solution design phases could be costlier than making exceptions during implementation.

TRAINING AND KNOWLEDGE TRANSFER

When organizations **leverage internal resources** for maintenance of large IT systems, it is critical that they are properly developed during and after the implementation. Education and training methods must embrace multiple methods and delivery vehicles, such as one-on-one training, classroom training and computer-based training to meet the needs of adult learners.

Training and development must be an ongoing organizational investment after "go live," catering to new hires, staff shifts, and organizational and process changes for the life of the system. **Continued training efforts after implementation** will also ensure the advancement of skills for current staff and help them become more efficient.

When weighing the decision between outsourcing and leveraging internal staff, the training costs associated with the internal staff is a key factor. Training costs vary depending on the project requirements but generally represent a significant allotment of the project budget. It is not uncommon to see end user training and transition services (typically the transfer of knowledge from the vendor to internal staff for maintenance and operations) comprise up to 20% of the project budget for large IT projects.

Knowledge transfer on large IT projects is best conducted throughout the project. For each functional lead provided by the system integrator, the organization should assign an internal resource, not only to ensure the organization's interests are met, but to also shadow them and learn what it will take to configure and operate the system once the vendor is gone.

Making **Transition Services** part of work for a vendor is a way to apply structure around the transfer of technical knowledge. Internal developers, database administrators and architects from the organization should shadow the peer vendor resources and gradually take on more of their responsibilities as the project progresses.

If both functional and technical knowledge transfer occurs, the activities should be defined in a **Transition Plan**. Robust plans generally include:

- Number of planned internal resource that vendor responsibilities will be transitioned to
- Listing of roles and responsibilities the vendor will transition, and to whom

- Training classes that internal staff must attend
- Certification criteria and competencies to demonstrate internal resources are ready and qualified to assume the roles and responsibilities from the vendor
- A month-by-month plan of the roles and responsibilities to be transitioned

Avoiding the cost of developing and maintaining internal staff is one of the key drivers behind the movement towards **cloud solutions and Managed Services** but there are still scenarios where maintaining the solution in-house makes the most business sense from a cost and quality perspective. The trade-offs between these two options must be identified and understood. The final decision should not be determined solely by cost, but should also account for organizational culture and the preference toward customization or standardization. Organizations that tend to customize and leverage technology solutions for long periods of time (over seven years) will have a strong case for leveraging internal staff and resources.

CHAPTER 6: PROJECT MONITORING & CONTROL

The right level of project monitoring is essential to increase stakeholders' satisfaction with a project and to decrease the risk of project failure. Using a decision authority matrix or a RACI matrix helps to determine decision making roles on a project. Successful projects also need sufficient executive and legislative oversight, a pre-determined reporting frequency, and thresholds to consistently communicate project health. ESCs need their own reporting mechanism, such as the earned value management approach, and PMO tracking and reporting on the project should also be completed regularly.

DECISION AUTHORITY MATRIX

A decision authority matrix is an effective tool for making timely decisions and resolving any disagreements or bottlenecks within departments. The table below outlines the components for a decision matrix.

Table 5 Example Decision Authority Matrix

Major Decision Area	Decision and Subject	Decision Owner	Qualifier Examples
Ways of working	Content of meeting agenda	Executive Sponsor	Agenda items are sought from all ESC members
Organization composition	Major changes to the ESC's composition and responsibilities	ESC	This requires the approval of a majority of the ESC
Project prioritization	Ranking of proposed projects	ESC	This requires the approval of a majority of the ESC
Current project actions	Decisions to continue, change, hold or discontinue projects	ESC	This requires the approval of a majority of the ESC
New project approval	Acceptance of proposed projects	ESC	Individual projects with estimated total costs expected to equal or exceed $100,000 require the approval of a major of the ESC
Contract change approval	Acceptance of contract change requests	ESC	Individual projects with estimated total changes in cost expected to meet or exceed $100,000 or 20% of budget requires approval of the majority of the ESC

Major Decision Area	Decision and Subject	Decision Owner	Qualifier Examples
Support of new projects and goals	Qualification and quantification of specific projects' contributions to goals	Program Manager	Goal contributions must be reviewed / accepted by the ESC
Risk identification and quantification	Identification and qualification of risk exposure for projects	Executive Sponsor	Risk exposure must be reviewed / accepted by the ESC

RACI MATRIX

Another tool that helps to clarify roles and responsibilities is a RACI matrix. RACI can assist Executive and Legislative bodies in making decisions. The acronym is defined as:

- **Responsible (R)**. A single clear function or role (or several) responsible for carrying out the work. For large IT projects this will often be the Project Manager, Work stream Leads and Core Team Members.
- **Accountable (A)**. A function or role that owns overall accountability for the work. For large IT projects this will often be the Executive Sponsor, ESC Members, Project Manager and Work stream Leads.
- **Consult (C)**. Functions / roles asked about the formation and performance of the work. For large IT projects this will often be the Executive Sponsor, ESC, Project Manager, Work stream Leads and Core Team Members, including SMEs.
- **Inform (I)**. Functions / roles informed about the status of the work. For large IT program, this often been Business Stakeholders, IT staff, City Council and Core Team Members.

Table 6 Example RACI Matrix

Decision Area	City Council	CTO	PPM
Review and approval of Citywide IT policies and procedures (not including technical standards)	I	A	C
Development of the IT strategy and management of changes	I	A	C
Defining or modifying enterprise architecture principles and standards	N/A	A	N/A
Evaluation, approval and prioritization of IT investments	I	A	R
Defining services to include in the IT services portfolio	N/A	A	N/A

EXECUTIVE AND LEGISLATIVE OVERSIGHT

When considering how to communicate to executive audiences, it is important to take into account their perspective. With large IT projects in public sector organizations, this audience typically comprises elected officials and their staff (e.g., City Council, Mayor, Governor, legislative committee, etc.).

The executive audience is interested in a few key components (as opposed to the additional detail required at the management and staff levels):

- Is the project aligned with the organization's strategic needs? (i.e., is it satisfying business requirements)
- Will the project require more money?
- Will the project require more time?

If the response to any of these questions represents a deviation from what the executives have supported, funded, and possibly communicated to constituents, an explanation and plan of resolution will be required. That content comprises the general extent of what needs to be communicated at the executive level.

REPORTING FREQUENCY

The frequency of reporting to executives is often a question that organizations and teams struggle to agree upon. A communication plan, based on a stakeholder analysis that includes the executive audience as a stakeholder group, should define this. Absent that, the following table provides general guidance on reporting frequency based on the project's duration and assessed risk level.

Table 7 Frequency of Reporting, Based on Risk and Size (Effort)

Project Type (duration)	Low Risk	Moderate Risk	High Risk
Smaller projects (fewer than 20 months)	Quarterly	Quarterly	Monthly
Midsize projects (20 – 100 months)	Monthly	Biweekly	Biweekly
Large projects (over 100 months)	Monthly	Biweekly	Biweekly

The communication method need not be as formal as an in-person meeting but a status report of some agreed-to form should be provided. Ultimately, the preferences of the executive audience should take precedence.

PROJECT THRESHOLDS

From a content and presentation perspective, dashboards have proven to be one of the more effective tools for communicating project status to an executive audience. The key is simplicity: less is more and consistency is essential. Establishing unambiguous criteria for thresholds of key project elements – scope, budget, schedule, risks and issues – is an effective method for striking the balance between simplicity and executive audience member knowledge of various topical areas.

An example of project thresholds for both cost and schedule are listed below:

Table 8 Example Project Thresholds

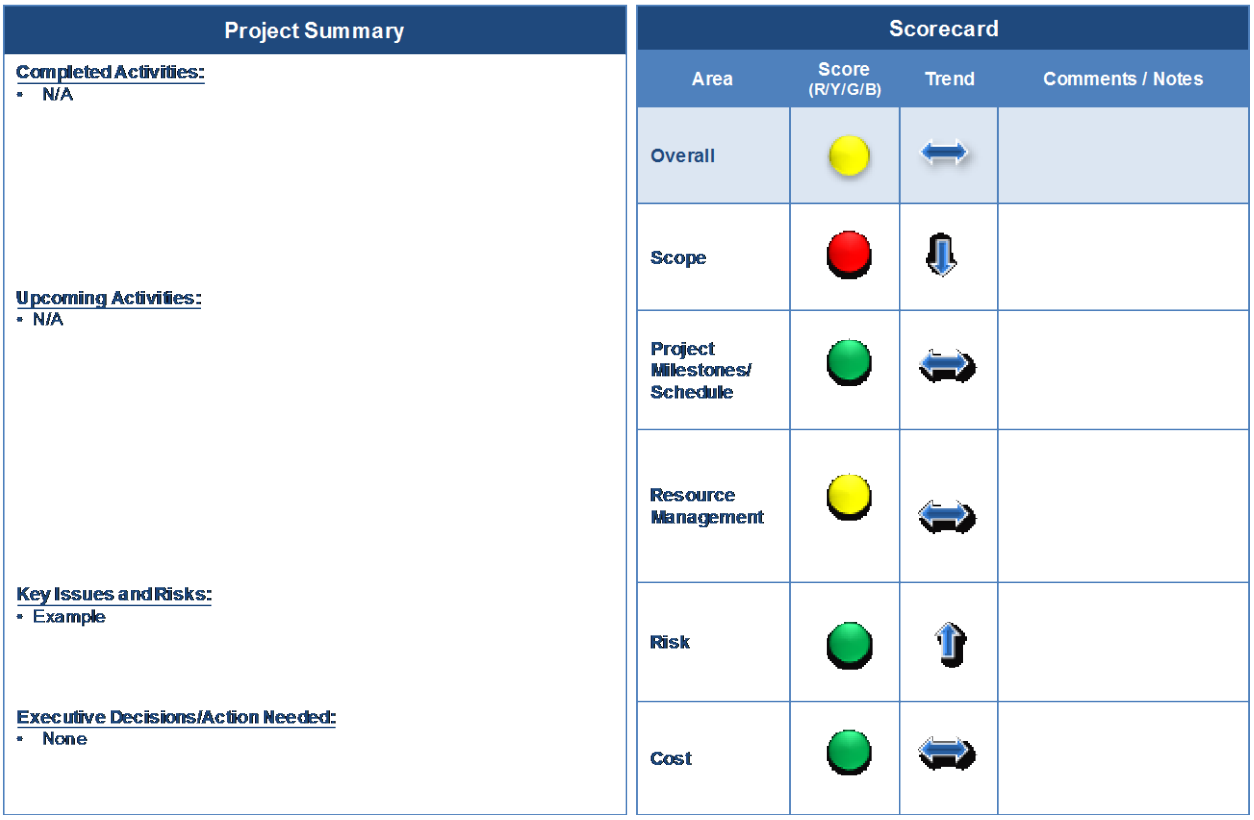
Overall level of Project Health			% variance to baseline
	**Blue**	A BLUE overall score represents a healthy project (no issues). All key indicators are blue or green.	0% variance
	**Green**	A GREEN overall score represents health project (no issues). If one of the indicators if temporarily yellow, the project may retain the green overall score. If one of the key indicators is red, the overall score cannot be green.	1% - 5% variance
	**Yellow**	A YELLOW overall score represents a project experiencing issues with one or more key indicators. When a project has one or more yellow key indicators, the Project Manager should develop and monitor a plan to bring the project back to green status.	6% - 10% variance
	**Red**	A RED overall score represents a project experiencing significant issues with one or more of the key indicators. When a project has one or more red indicators, the Executive Sponsor, PMO and Project Manager must develop and monitor an immediate action plan to bring the project back to green status.	11%+ variance

This approach enables executive team members with different areas of expertise to ask probing, relevant questions about root causes, risks and issues, and implications of potential mitigation strategies.

ESC REPORTING MECHANISMS

DASHBOARDS

Using project dashboards to indicate project health is an effective way to communicate project status during project team and ESC meetings. Below is an example from one of our consulting engagements where the client was deploying a statewide ERP system.



Project Summary

Completed Activities:
- N/A

Upcoming Activities:
- N/A

Key Issues and Risks:
- Example

Executive Decisions/Action Needed:
- None

Scorecard

Area	Score (R/Y/G/B)	Trend	Comments / Notes
Overall			
Scope			
Project Milestones/ Schedule			
Resource Management			
Risk			
Cost			

Figure 6: ESC Project Dashboard

The above dashboard allows the ESC to quickly see how the project is performing. Two components make this model particularly effective:

- Project Summary > Executive Decisions / Action Needed. Often ESC members are unsure of where their assistance is needed. This section provides an opportunity to clearly answer that question.
- Scorecard > Comments / Notes. Also ESC members frequently ask for an explanation of why elements within the project are shifting. This section allows the project team to succinctly and clearly communicate the rationale behind either improvements or declines for the project indicators.

EARNED VALUE MANAGEMENT

Organizations often struggle to understand effective and attainable quantitative measures to monitor project progress. Gartner often observes a lack of maturity in this area, and it is advised that the City look toward the commonly adopted approach within the public sector: earned value management. Earned value management (EVM) is a project management technique for measuring project performance and progress. EVM provides a set of metrics that provide current and projected performance on project scope, budget and time. EVM operates on a set initial metrics that enable more intermediate and advanced analysis:

- Budget at Completion (BAC) – The overall project budget, i.e., the total amount project managers originally planned to spend
- Planned Value (PV) – The budgeted value of the work completed by a specific date (e.g., if by the end of week two of a project, managers planned to have spent $2,000, the PV is $2,000)
- Earned Value (EV) – The actual value of the work completed by a specific date (e.g., if at the end of week two only one work package was completed, the EV is $1,000)
- Actual Cost (AC) – The total expenditure for the work so far at a specific date; also referred to as the actual project expenditures (e.g., if at the end of week two $2,000 of the project budget was spent, the AC is $2,000)

With PV, EV and AC monitored and tracked, organizations can then deploy intermediate measures that provide a current state of the project:

Table 9 Intermediate EVM Metrics

KPI	Description	Formula	Interpretation
Schedule Variance (SV)	Difference between PV and EV, to determine whether the project work is ahead of, on or behind schedule	SV = EV – PV	▪ SV < 0, behind schedule ▪ SV = 0, on schedule ▪ SV > 0, ahead of schedule
Scheduled Performance Index (SPI)	Schedule performance expressed in a ratio	SPI = EV / PV	▪ SPI < 1, behind schedule ▪ SPI = 1, on schedule ▪ SPI >1, ahead of schedule
Cost Variance (CV)	Difference between EV and AC, to determine whether the project work is under, on or over budget	CV = EV – AC	▪ CV < 0, over budget ▪ CV = 0, on budget ▪ CV > 0, under budget
Cost Performance Index (CPI)	Budget performance expressed in a ratio	CPI = EV / AC	▪ CPI < 1, over budget ▪ CPI = 1, on budget ▪ CPI > 1, under budget

Once the City is familiar and comfortable with capturing and evaluating current state performance on the basic and intermediate EVM metrics, it should incorporate the use of advanced, predictive ones.

Table 10 Advanced EVM Metrics

KPI	Description	Formula	Alternatives / Interpretation
Estimate at Completion (EAC)	A way to estimate the planned cost at project finish; basic formula assumes project	EAC = BAC / CPI	▪ EAC = AC + (BAC / EV); assumes future spending occurs as originally forecast

KPI	Description	Formula	Alternatives / Interpretation
	spending rate remains unchanged (incl. delays)		▪ EAC = AC + New Estimate; assumes original estimates and assumptions are wrong
Estimate to Completion (ETC)	Remaining cost to complete the project	ETC = EAC – AC	▪ No alternative formula exists
Variance at Completion (VAC)	Difference between the new EAC and original PV	VAC = BAC - EAC	▪ VAC < 0, project will be over budget ▪ VAC = 0, on budget ▪ VAC > 0, under budget
To Complete Performance Index (TCPI)	Performance required to finish project on budget, expressed as a ratio	TCPI = (BAC-EV) / (BAC – AC)	▪ TCPI < 1, under budget ▪ TCPI = 1, on budget ▪ TCPI > 1, over budget

To adopt EVM, the City must have robust project control and estimation capabilities (via a work breakdown structure), and discipline. Once these capabilities are in place, EVM can applied to new projects by preparing for its use during project planning. As with any metrics, the extent to which EVM is applied should be balanced with project risk and value for the required level of effort. Other considerations include accounting rules for determination of value. The Project Manager handles collection and data to inform the adopted key performance indicators (KPIs) and is also responsible for their presentation at project team and ESC meetings. Presentation of these metrics outside of the ESC should be done by the Executive Sponsor.

PMO TRACKING AND REPORTING

Status reports are the most common and effective way to communicate project performance. These reports are often produced weekly, although when reporting to higher level governance bodies, such as the ESC, reporting may occur less frequently (e.g., monthly, quarterly).

Status reports for large IT projects typically contain:

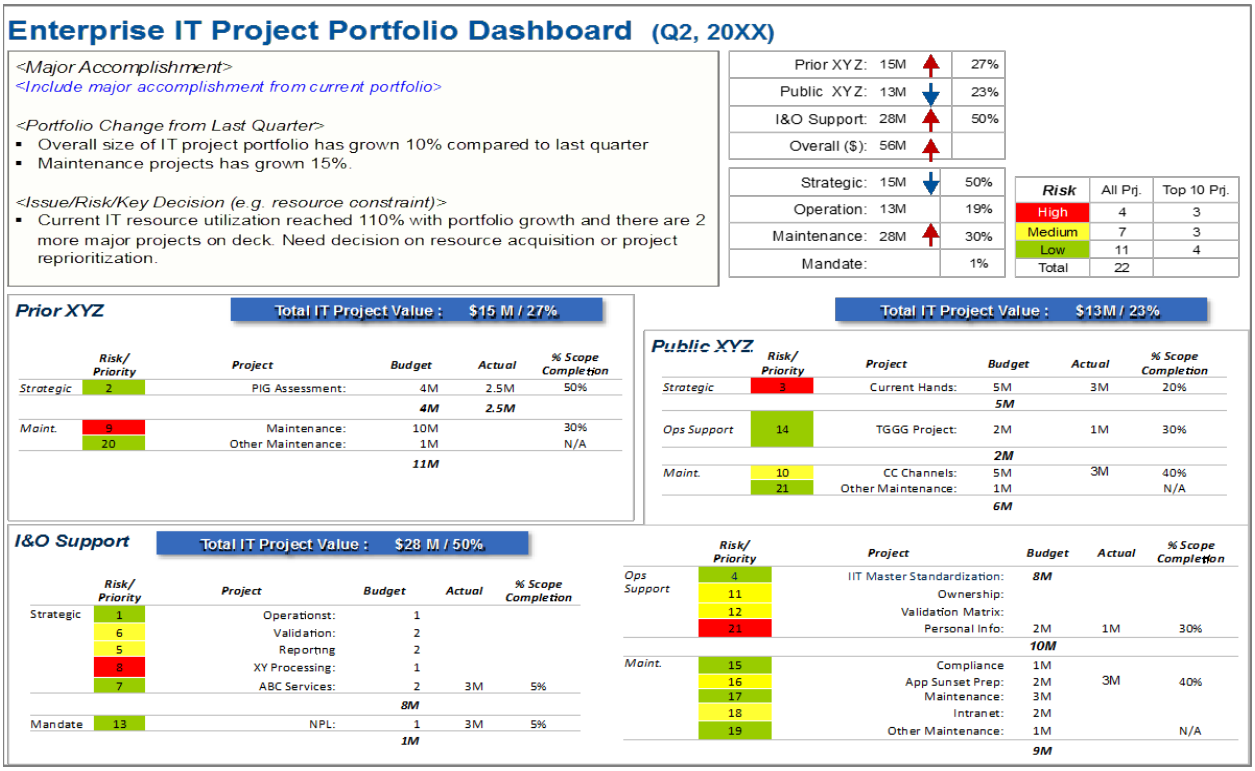
- A dashboard that shows the status of scope, budget and schedule, along with any changes and rationale
- Tasks and activities completed during the reporting period, and those planned for the next
- Completed and upcoming milestones
- Key issues and risks
- Needed decisions and outstanding actions

Regardless of frequency, status reports are important to ensure that key parties are communicating with each other, and that Project Managers are analyzing the team's performance and effectively controlling

the project. Status reports are also ways to provide the PMO and ESC with early warning of issues and risks so they can assist with necessary remedies or mitigations.

PORTFOLIO DASHBOARD

The PPM analyzes data from all projects in the portfolio and providing a portfolio-level view of overall performance. Portfolio dashboards are an effective tool for PPMs to leverage for this type of tracking and communication. Below is an example of portfolio dashboard.



Enterprise IT Project Portfolio Dashboard (Q2, 20XX)

<Major Accomplishment>
<Include major accomplishment from current portfolio>

<Portfolio Change from Last Quarter>
- Overall size of IT project portfolio has grown 10% compared to last quarter
- Maintenance projects has grown 15%.

<Issue/Risk/Key Decision (e.g. resource constraint)>
- Current IT resource utilization reached 110% with portfolio growth and there are 2 more major projects on deck. Need decision on resource acquisition or project reprioritization.

Prior XYZ:	15M	↑	27%
Public XYZ:	13M	↓	23%
I&O Support:	28M	↑	50%
Overall ($):	56M	↑	

Strategic:	15M	↓	50%
Operation:	13M		19%
Maintenance:	28M	↑	30%
Mandate:			1%

Risk	All Prj.	Top 10 Prj.
High	4	3
Medium	7	3
Low	11	4
Total	22	

Prior XYZ — Total IT Project Value : $15 M / 27%

	Risk/ Priority	Project	Budget	Actual	% Scope Completion
Strategic	2	PIG Assessment:	4M	2.5M	50%
			4M	2.5M	
Maint.	9	Maintenance:	10M		30%
	20	Other Maintenance:	1M		N/A
			11M		

Public XYZ — Total IT Project Value : $13M / 23%

	Risk/ Priority	Project	Budget	Actual	% Scope Completion
Strategic	3	Current Hands:	5M	3M	20%
			5M		
Ops Support	14	TGGG Project:	2M	1M	30%
			2M		
Maint.	10	CC Channels:	5M	3M	40%
	21	Other Maintenance:	1M		N/A
			6M		

I&O Support — Total IT Project Value : $28 M / 50%

	Risk/ Priority	Project	Budget	Actual	% Scope Completion
Strategic	1	Operationst:	1		
	6	Validation:	2		
	5	Reporting	2		
	8	XY Processing:	1		
	7	ABC Services:	2	3M	5%
			8M		
Mandate	13	NPL:	1	3M	5%
			1M		

	Risk/ Priority	Project	Budget	Actual	% Scope Completion
Ops Support	4	IIT Master Standardization:	8M		
	11	Ownership:			
	12	Validation Matrix:			
	21	Personal Info:	2M	1M	30%
			10M		
Maint.	15	Compliance	1M		
	16	App Sunset Prep:	2M	3M	40%
	17	Maintenance:	3M		
	18	Intranet:	2M		
	19	Other Maintenance:	1M		N/A
			9M		

Figure 7: Portfolio Dashboard

APPENDIX A

GARTNER RESEARCH REFERENCES

The following Gartner Research was referenced and leveraged during the development of this document. The links on the right column require a Gartner Research Subscription and may not be available to the reader.

Table 11 Gartner Research Referenced

Title	Link
How to Ensure Your Governance Framework Works	http://www.gartner.com/document/code/279155
Program & Project Management; CIO Desk Reference Chapter 20	http://www.gartner.com/document/code/171865
Kick-Start Bimodal IT by Launching Mode 2	http://www.gartner.com/document/code/273955
Get Ready for ERP Project Changes Driven by Bimodal IT	http://www.gartner.com/document/code/274182
Effective Governance of Bimodal IT Projects Requires Adopting a More Outcome-Centered Approach	http://www.gartner.com/document/code/274509
Successful IT Performance Management for IT Shared Services: Relevant Key Performance Indicators	http://www.gartner.com/document/code/229663
Dealing with Major Projects; CIO Desk Reference Chapter 29, Updated Q2 2013	http://www.gartner.com/document/code/255609
Effective Communications: How to Develop a Communications Plan	http://www.gartner.com/document/code/170368
Best Practices Mitigate Data Migration Risks and Challenges	http://www.gartner.com/document/code/267841
IT Key Metrics Data 2016: Key Industry Measures: Government — State and Local Analysis: Multiyear	http://www.gartner.com/document/code/291356
How to Scope a Postmodern ERP Project	http://www.gartner.com/document/code/281839
Use a Communications Cascade to Align Program Execution With Strategy	http://www.gartner.com/document/code/278149
Three Ways to Maximize Financial Value of Mode 2 Operations	http://www.gartner.com/document/code/279813
Manage ERP Customizations, Don't Avoid Them	http://www.gartner.com/document/code/289634

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"Understanding Roles between Enterprise Architecture and the Project Management Office," by Rob Byrd.

"408.0 Project Roles and Responsibilities," by TenStep Inc.

"Waterfall vs. Agile: Which is the Right Development Methodology for Your Project?" by Mary Lotz.

"Job Responsibilities for a Systems Integrator and Systems Administrator," by Louisa Torrez.

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