Project Management: Strategies and Resources for the State HIE Program

Department of Health & Human Services (HHS) Office of the National Coordinator for Health Information Technology (ONC)

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Project Management Basics

Project Management Basics

The State Health Information Exchange (HIE) environment is complex and fast-changing, with significant challenges including resource constraints. Nevertheless, each State/State Designated Entity (SDE) is charged with the task of engaging many stakeholders to meet the requirements of the State HIE Cooperative Agreement Program, particularly those found in the Program Information Notice # ONC-HIE-PIN-001, dated July 6, 2010. Consequentially, many effective leaders have leveraged proven project management practices to better align their engagements and to accomplish the goals of the State HIE Cooperate Agreement Program.

Project management applies knowledge, skills, tools, and techniques to project activities for the purpose of meeting stakeholder needs and client expectations. In mature project management organizations, project management exists in a broader context governed by program management and portfolio management. Many awardees may already have mature project management methodologies and procedures already in place.

Figure 1: Project Management Core Competencies

However, the purpose of this module is to introduce the basic concepts of project management to jumpstart awardees' thinking around how to undertake such a complex project with multiple requirements, stakeholders, and deadlines. Each of the nine project management core competencies will be explained:

1. **Integration Management**: identifying, defining, combining, unifying and coordinating the various process and project management activities
2. **Scope Management:** ensuring that the project includes all the work required, and only the work required to complete the project successfully
3. **Time Management:** managing timely completion of the project

Project Management Basics

4. **Cost Management:** estimating, budgeting and controlling costs to complete the project within the approved budget
5. **Human Resources Management:** organizing, managing, and leading the project team
6. **Communication Management:** ensuring timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposition of project information
7. **Risk Management:** conducting risk management planning, identification, analysis, response planning, and monitoring and control on a project
8. **Procurement Management:** purchasing or acquiring necessary products, services or results needed from outside the project team
9. **Quality Management:** determining and implementing quality policies, objectives, and responsibilities to satisfy the needs for which the project was undertaken

Throughout the module, the nine competences will be discussed in the context of five key processes that comprise the lifecycle of a project:

1. **Start Up:** defining and authorizing a project or project phase
2. **Planning:** identifying, refining and planning the course of action to meet objectives and scope requirements that the project was undertaken to address
3. **Executing:** integrating people and other resources to implement the project management plan for the project
4. **Monitoring and Controlling:** regularly measuring and monitoring progress to identify changes from the project management plan and taking corrective action when necessary to meet project objectives
5. **Closing:** formally accepting the product, service or results and bringing the project or phase to an orderly end

In addition, templates and resources for completing successful project management activities will be provided.

Finally, specific documents that provide important guidance throughout the project management process as a part of the project management plan will be called out with a green sidebar, as illustrated on the left hand side.

Integration Management

Success in planning and implementing a project relies heavily on the ability to integrate and coordinate effectively the various activities required. This involves documenting progress and decisions points, while also defining future actions and responsibilities. Collectively referred to as **Integration Management,** the processes and templates below are commonly seen as essential steps for effective management of projects.

Startup	• Develop Project Charter
Planning	• Develop Project Management Plan
Executing	• Direct and Manage Project Execution
Monitoring & Controlling	• Monitor and Control Project Work • Perform Integrated Change Control
Closing	• Close Project or Phase

Figure 2: Integration Management Cycle

Develop Project Charter

Ideally, each project should begin with a clear description of the needs and expectations for stakeholders, as well as an agreement to commit resources and proceed with the project. A **Project Charter** formally describes and authorizes the project, establishing a common understanding and commitment among participants in the project. Much of this information may be taken, or at least informed, by the state's strategic and operational HIE plans.

Project charters typically include the following:

- Project purpose or justification
- High-level project description
- High-level requirements

- Measurable project objectives and related success criteria
- Project team, including Project Manager and other assigned roles

Integration Management

- Summary schedule of project milestones
- High-level risks
- Summary budget

- Authorizing entity (including individual point of contact)
- Approval requirements, including authority levels of responsible individual

When developing a Project Charter, teams often create (or re-use) content that is aligned with strategic plans, operational plans, contracts and statements of work, environmental scans and other documents developed over the course of the project. Consistency throughout multiple documents aids in assuring effective Integration Management.

A template for a Project Charter can be found in the PM Templates zip file as: 01.Project_Charter_Template.doc

Develop Project Management Plan

Considered to be one of the most basic tools for any project, the **Project Management Plan (PMP)** is used to document the life cycle of the project, including the details of how the work will be executed. The PMP includes many subsidiary documents, organized so that project team members can each monitor specific areas of responsibility while also understanding how tasks fit into the broader context of the project. This helps to assure Integration Management by supporting the coordination of work through a team approach.

The subsidiary elements of a PMP will each be described in more detail in this document; however, PMPs commonly include the following:

1. **Project Charter:** describes and authorizes a project, serving as a foundation for the project
2. **Scope Management Plan:** ensures that the project includes all the work required, and only the work required to complete the project successfully
3. **Time Management Plan:** provides processes to manage timely completion of the project
4. **Cost Management Plan:** estimates, budgets and controls costs to ensure that the project is completed within the approved budget
5. **Human Resources Management Plan:** defines the project team organization, management and leadership
6. **Communication Management Plan:** describes communication techniques to ensure timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposition of project information

Integration Management

7. **Risk Management Plan:** facilitates risk management planning, identification, analysis, response planning, and monitoring and control on a project
8. **Procurement Management Plan:** identifies processes for purchasing or acquiring necessary products, services or results needed from outside the project team
9. **Quality Management Plan:** determines quality policies, objectives, and responsibilities to ensure that the project satisfies the needs for which it was undertaken

There are several software applications and tools that support development, monitoring and sharing of project management plans, which could be useful to state leaders charged with management responsibilities for monitoring and enabling health information exchange activities within and among states. Scheduling software, such as Microsoft Project, document repositories, information distribution systems, and wikis are common examples of such tools and software.

Direct and Manage Project Execution

For effective Integration Management, it is important that a qualified individual be designated and authorized to serve as **Project Manage**r. This team member is charged with overseeing and documenting progress in completing project milestones and deliverables, the allocation of resources and submission of required reports, as outlined in the PMP.

In many cases, the HIT Coordinator for the state holds this responsibility; however, several states have elected to engage other personnel (in-house or sub-contracted) possessing certification as a Project Management Professional to support the work performed under the State HIE Cooperative Agreement Program.

An example of a Project Manager Position Description can be found in the PM Templates zip file as: 02.Project_Manager_Position_Description_Example.doc

Monitor and Control Project Work

To identify and address any problems that might arise during the planning and implementation of the project, project teams should compare actual performance against the projections detailed in the PMP. This requires the ability to monitor (collect, measure and distribute information so that members of the project team can identify key areas of concern) and control (determine preventive and corrective actions, and adjust work plan accordingly). One proven method to organize monitoring and controlling activities is to develop performance reports that detail the following:

- Current status of the project
- Key accomplishments and issues

Integration Management

- A forecast of future actions

Perform Integrated Change Control

As a project progresses and evolves, it is likely that changes to the initial PMP may be needed. Changes might occur as a result of changes to the scope of a project, barriers in implementation, availability of resources, and new policies or standards.

Once identified, a proposed change should be documented as a **change request,** and then evaluated by the relevant members of a project team, who will consider the impact on other aspects of the project and recommend whether or not to proceed with the recommended change. If recommended, changes to the PMP and submitted for approval to the appropriate authority, and then documented in a **change log**.

Below is a diagram depicting the sequence of a change control process:

| Project Manager: Identify Scope Change | → | Assess Level of Impact | → | Complete Change Request | → | Update PMP Scope / Scope Change Register | → | Present Change to Sponsor / Steering Committee | → | Decision: Implement and Monitor / Reject |

- Time Impact
- Budget Impact
- Resources Impact
- Benefit Impact
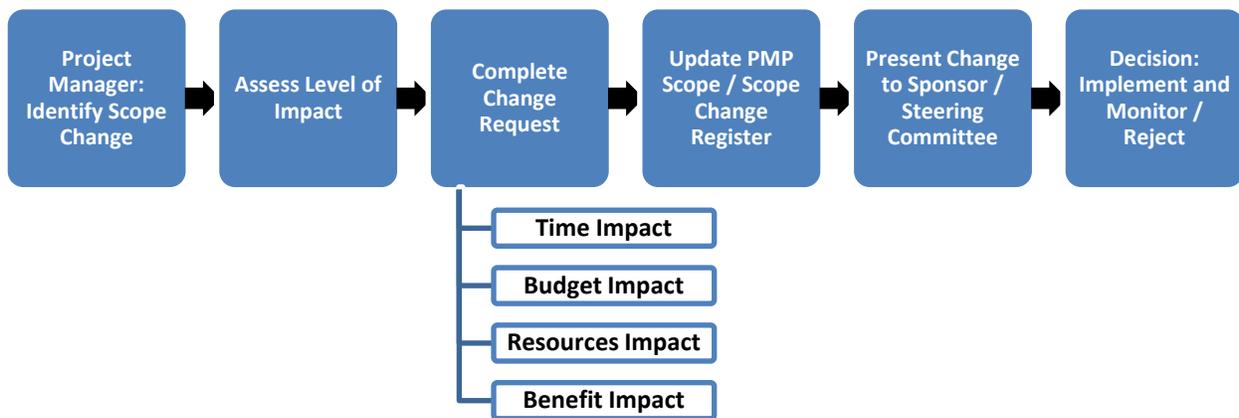
Figure 3: Integrated Change Control Process

It is common to establish a Change Control Review Committee, whose members typically include the Project Manager, leaders for tasks, and contracting officer. Personnel—including vendor representatives—with relevant expertise (legal, technical, and / or clinical) may be included on an ad hoc basis to contribute perspectives on changes in their specific area of responsibility.

A template for a Change Log can be found in the PM Templates zip file as:
03.*Change_Log_Template.xls*

Integration Management

Control, Close or Transition Project

As a project comes to the end of a phase or is completed, it is important that the project team defines and documents the details for closure, whether through termination of the project or transition to another project plan and / or project team.   Closure activities include:

- Document project successes and / or failures
- Document and share lessons learned, areas for improvement
- Collect and archive project documents for future use
- Designate steward for access to information as needed

Scope Management

No matter the size or timeframe for a project, it is important to determine the boundaries which define the scope of the work. Doing so will assure success both in meeting project goals and in managing project resources effectively. Particularly in complex, multi-stakeholder projects such as the State HIE Cooperative Agreement Program, there is a tendency for individuals or groups to push the boundaries in some directions that are easier or more aligned with their interests, while neglecting work on other areas that are critical to the project's success but which may not be perceived as high value for their particular agendas. Thus, defining the scope of the project at its inception is a critical activity; documenting both the process and outcomes for Scope Management through use of a **Scope Management Plan** can ensure that all project team members and stakeholders focus on priorities and maintain reasonable expectations throughout the project.

There are many benefits that results from effective management of scope for strategic projects:

- Improved decision-making through a formalized process for assessing, approving and communicating priorities to stakeholders
- Improved team leadership and synergy through clear expectations and a consistent focus on results-oriented implementation
- Reduced negative impact of changes on program cost, schedule, risk and quality
- Consistency with the scope outlined in the state HIE plans approved by the Office of the National Coordinator for Health Information Technology

A template for a Scope Management Plan can be found in the PM Templates zip file as: 04.Scope_Management_Plan_Template.doc

There are several steps in the process for developing and implementing a Scope Management Plan, which are described in more detail below:

Scope Management

Planning	• Collect Requirements • Define Scope • Create WBS
Monitoring & Controlling	• Verify Scope • Control Scope

Figure 4: Scope Management Cycle

Collect Requirements

In determining the scope of a project, it is first necessary to define and document the needs of stakeholders as thoroughly and accurately as possible. Typically, there are two types of requirements to consider:

- **Project Requirements:** the processes and tools necessary to carry out the project
- **Product Requirements**: the tangible or measurable outcomes that result from the work of the project team

For example, the State HIE Cooperative Agreements include the following requirements (among others):

Table 1: Example Requirements for State HIE Cooperative Agreements

Project Requirements	Product Requirements
Appointment of HIT coordinator for the state	Stakeholder engagement in governance
Compliance with legal reporting requirements (ARRA reporting, financial audit)	Mechanisms to assure public transparency
Environmental scan to determine baseline use of health IT and participation in electronic HIE in 2010	At least one option for every provider in the state to participate in electronic exchange of health information in 2011
Analysis of gaps in ability to perform e-prescribing, electronic lab ordering and lab results delivery, send / receive care summary document	Measurable increase in adoption rates for e-prescribing and electronic health information systems by providers and consumers of services
Fiscal management and reporting	Budget and sustainability plan
Public transparency	Communications strategy

There are many ways to gather information from stakeholders about requirements:

1. **Surveys (conducted on-line, by phone or in writing):** request responses to defined questions, each with a limited number of options for responses

Scope Management

2. **Interviews**: ask questions (one-on-one) from experienced end users, stakeholders and subject matter experts
3. **Focus Groups:** a moderator guides and records discussion among a small group of pre-selected participants sharing similar perspectives
4. **Facilitated Workshop:** larger group session for cross-functional stakeholders to discuss requirements from different perspectives

Often, a combination of these techniques is used to gather requirements, and outcomes are shared with participants, leading to consensus and shared understanding of the priorities for the project.

Define Scope

After stakeholders have helped to define requirements and priorities, the scope of a project can be defined by breaking down the longer-term requirements into shorter-term tasks, each leading to one or more tangible results (often referred to as "deliverables"). When the scope of a project has been properly defined, all work and deliverables are subdivided into discrete, manageable units.

Many project teams use a tool called the **Work Breakdown Structure (WBS)** to document the scope of work for their project. The diagram below depicts the process for creating a Work Breakdown Structure (WBS) for a project:

Identify major project deliverables

Decompose into smaller elements

Continue decomposition until elements are at their most basic and clear responsibility is established

Review the WBS for consistency, correctness, clarity, and completeness

Create the WBS dictionary
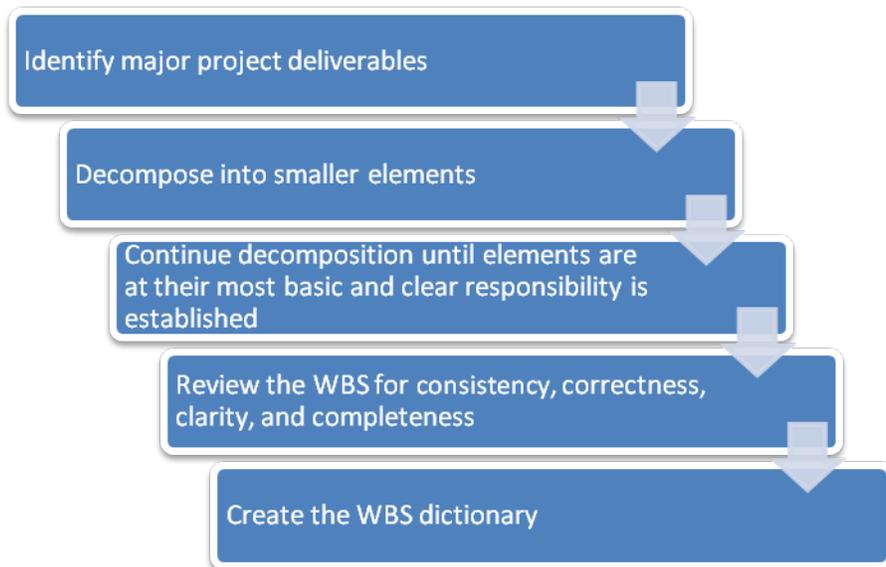
Figure 5: WBS Development Process

Below is an example WBS for setting up a medical center on a HIE Portal:

Scope Management
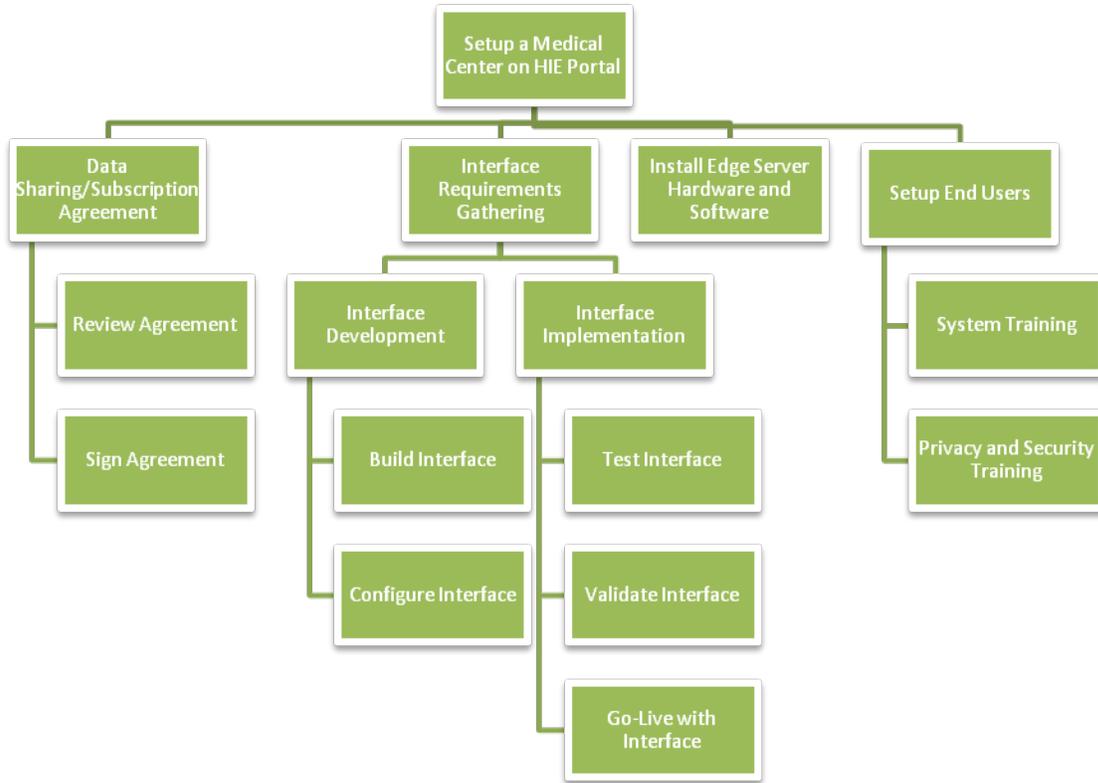
Figure 6: WBS for Setting up a Medical Center on HIE Portal

To explain the WBS to team members and stakeholders, it is often useful to compile a WBS dictionary, which could include descriptions of the following:

- Identifier
- Description
- Organization
- Milestones
- Associated Activities
- Resources

- Cost Estimates
- Quality Requirements
- Acceptance Criteria
- References
- Contract

A template of a WBS Dictionary can be found in the PM Templates zip file as: 05.WBS_Dictonary_Template.doc

Verify Scope

After the scope of the project has been defined and documented, project team members can work together to align the timeline and resources for key deliverables across the project, providing that information to the team sponsor and customer for review and validation. This

Scope Management

step formally **verifies the scope** of work, thereby assuring clear expectations and finalizes authorization for the project to proceed.

Control Scope

Throughout the life of the project, the project team must compare the project management plan's tasks and deliverables to the **Scope Management Plan**, to ensure that tasks and deliverables remain aligned with the defined scope of work. When work that has been proposed or undertaken is outside the agreed-upon scope of work initially defined, the project team should consider whether to review as part of the **Change Control Process** (as described in the Integration Management section).

When managing scope for a project, it is important to be aware of—and to mitigate—"scope creep". This term refers to the tendency of a project to add or implement tasks more broadly than originally defined and authorized, leading to higher than planned project costs and / or delays in meeting deadlines for deliverables. Scope creep frequently occurs when vendors, stakeholders, or project team members make small changes or modifications to project tasks or timelines, not realizing the ramification for the overall project timeline, resources or deliverables.

The Project Manager's role is to limit scope creep and to make sure that any changes to scope are reviewed and approved through the change control process. The project team and stakeholders can address scope creep by revisiting the Project Charter, as a reminder of the internal and external requirements, priorities, resources available, and process for change, if warranted.

Time Management

Time Management is an essential component of project management, and should be documented in a **Project Schedule**. The project schedule serves as a timeline for project startup, completion of tasks and project closure. If the schedule is not closely monitored and managed, there can be significant impact on project costs, quality and stakeholder satisfaction.

There are several steps to help define a project schedule and assure effective Time Management.
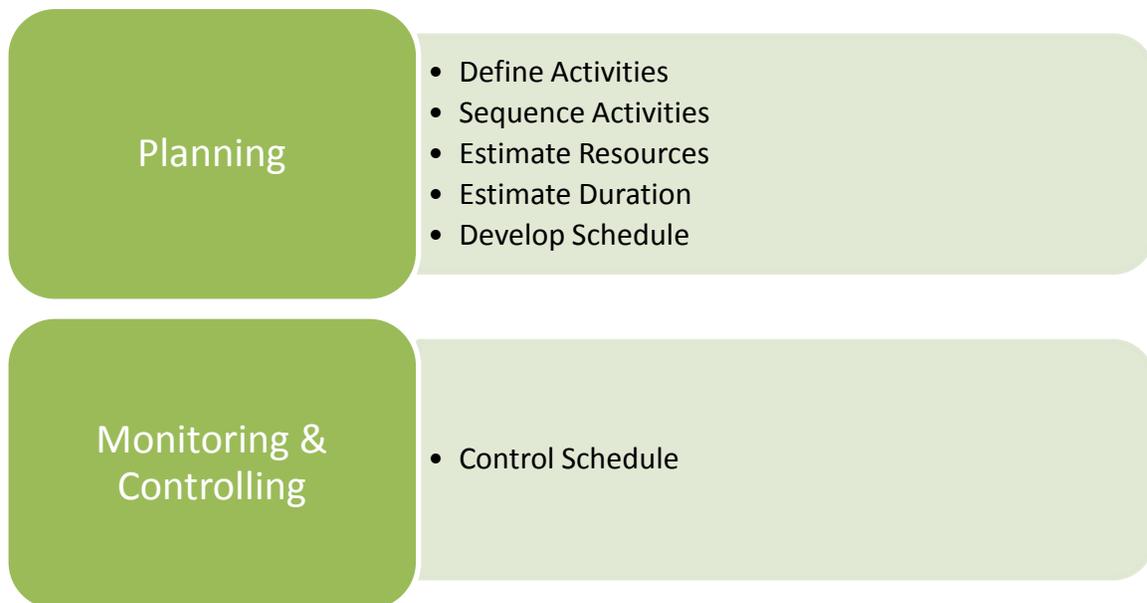

Planning

- Define Activities
- Sequence Activities
- Estimate Resources
- Estimate Duration
- Develop Schedule

Monitoring & Controlling

- Control Schedule

Figure 7: Time Management Cycle

Time Management

Figure 8 describes each of these steps in greater detail.

Define Activities
- Identify specific actions to be performed at the lowest level possible
- Create a comprehensive list of all project activities and milestones
- Identify all attributes of each activity

Sequence Activities
- Identify and document activities' relationships
- Decide the order in which activities should occur and if any can occur in parallel
- Every activity, except the first and last, should be attached to at least one predecessor and successor

Estimate Resources
- Estimate the people, material, equipment, and supplies for each activity

Estimate Duration
- Activity duration is dependent on the amount of work required to complete an activity and resources to be applied
- The person most familiar with the work should determine the duration of the task

Develop Schedule
- Calculate activity start and finish dates considering duration, relationships and constraints
- Develop the schedule by analyzing resource requirements, activity durations and schedule constraints

Control Schedule
- Monitor the project status and manage changes as they occur
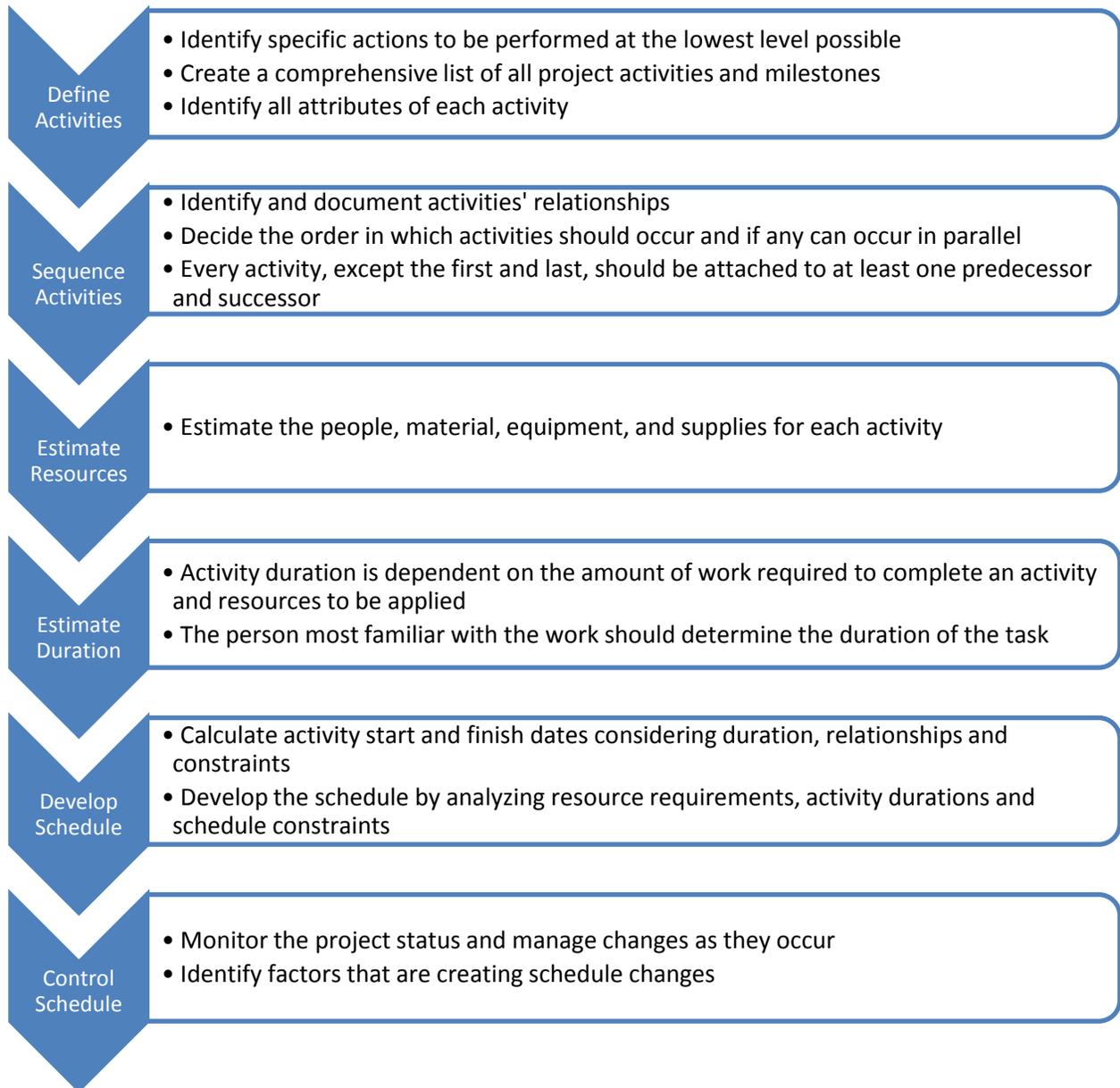- Identify factors that are creating schedule changes

Figure 8: Time Management Tasks and Activities

For large-scale projects such as the State HIE Cooperative Agreement Program, each of the steps may be separate and distinct. On smaller projects or sub-tasks, these steps are usually inter-connected and may be completed simultaneously.

Sample Project Schedules can be found in the PM Templates zip file as: 6.Sample_Project Schedule.pdf and 7.Sample_Project_Plan.xls

Cost Management

One of the most important measures of success for any project is whether it is completed within the budget allocated. **Cost Management** is described as the process for determining the project costs for the project from start to finish, then managing resources to assure that the costs do not exceed the project budget established. The process for Cost Management is detailed below:
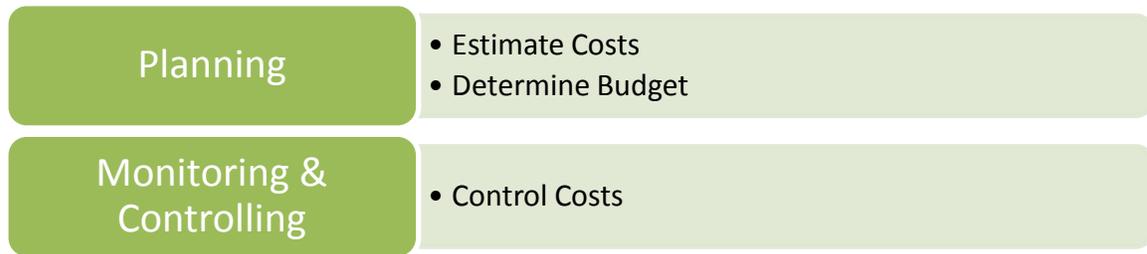

Figure 9: Cost Management Cycle

An effective **Cost Management Plan** helps establishes and documents:

- Process descriptions
- Organizational procedures
- Rules of performance measurement
- Units of measure
- Reporting format
- Control threshold
- Level of accuracy

A template for a Cost Management Plan can be found in the PM Templates zip file as: 8.Cost_Management_Plan_Template.doc

Estimate Costs

To be effective in managing project costs, one must first estimate the expenses that will be occurred during the life cycle of the project. Difficult as this may be in a fast-changing market, cost estimates should be based on the best information available at the time, combined with periodic review of projected costs as more information becomes available. Other components of the PMP must align with the cost estimate, including the baselines in the **Scope Management Plan** and the **WBS**, as well as the **Human Resources Plan**.

In estimating costs, a project team commonly considers the following: labor, materials, equipment, services, facilities, allowances for inflation and contingencies. For example, a

Cost Management

budget for State HIE activities could include staffing, infrastructure (facilities and technology), legal, communications and insurance (data loss protection).

Many project teams use one or more of the following tools while preparing a cost estimate:

1. **Vendor Bid Analysis:** compares bids from qualified vendors
2. **Analogous Estimating:** reviews costs for previous similar projects
3. **Parametric Estimating:** considers statistical relationship between historical data and other variables
4. **Three-Point Estimates:** uses a formula based on three different estimates (most optimistic outcome = a, most pessimistic outcome = b and most likely outcome = c), to calculate an expected activity (c_e) cost that factors uncertainty and risk; $c_e = (a+b+4c)/6$
5. **Reserve Analysis:** commonly used to estimate contingency costs, calculates a fixed percentage or number of other project costs

Regardless of the method used for estimating project cost, the process and resulting estimates should be well-documented and shared to assure a common understanding and clear expectations among project team members and stakeholders.

Determine Budget

After estimating cost, the next step is to determine the **Project Budget.** Using the cost estimate, the project budget should document the total funding needs, as well as the allocation of funding over the **Project Schedule**. This enables the creation of an authorized, time-phased budget known as a **Cost Performance Baseline**, which can be used to measure, monitor and control the project cost (as depicted in the graphic below).
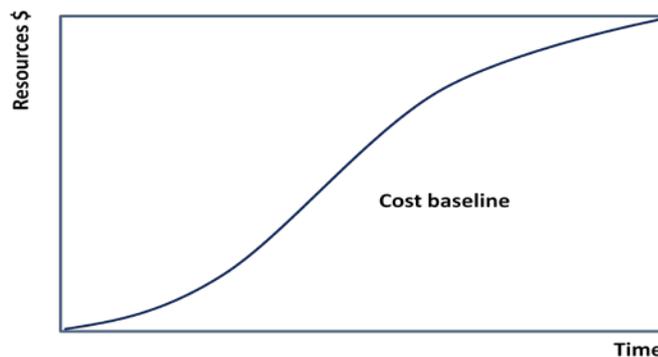

Figure 10: Cost Performance Baseline

In the case of the State HIE Cooperative Agreement Program, awardees budgets will include total resources from both federal and state sources, as well as any other funding or in-kind commitments for the project.

Cost Management

Control Costs

Once the Project Budget has been defined and authorized, the project team can then begin monitoring revenue and expenses for the project.   Project teams with effective processes for cost control often engage in the following activities:

- Providing accurate and detailed scope
- Monitoring cost variances
- Ensuring that cost overruns are within the approved limits
- Addressing incorrect, inappropriate or unapproved changes to the cost baseline

- Assuring that changes are implemented in a timely manner
- Recording changes to the cost baseline
- Informing stakeholders of changes
- Managing changes as they occur
- Considering influencing factors that cause change to the baseline

There are several tools and techniques that can be used to control costs as detailed in Figure 11. For more information on Earned Value Management, please see Appendix A.
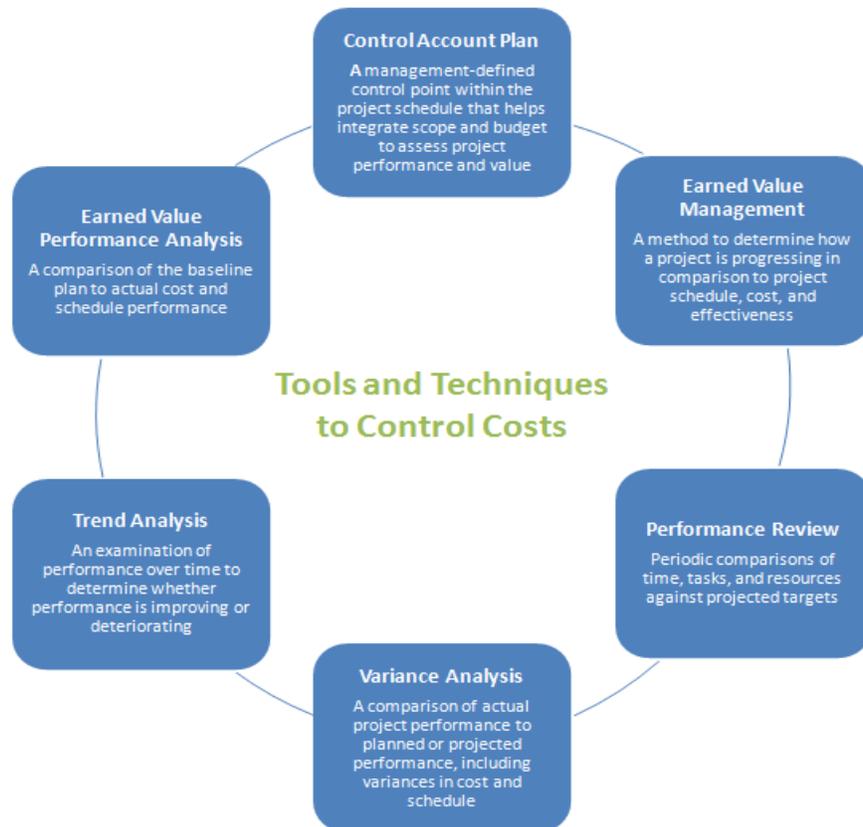
Figure 11: Tools and Techniques to Control Costs

Cost Management

Project teams may choose to use one or more of these tools for monitoring and reporting purposes, but all share the common elements of comparing planned tasks, costs, and timing to actual results in each of these categories.

Cost controls lay the foundation for three important project outputs:

1. **Work Performance Measurements** such as schedule and cost indices and variances help the project team to quickly assess the actual performance compared to original projections
2. A **Forecasted Budget** allows key stakeholders to make informed decisions and adjustments to the project by providing insight into the revenue and expenses as the project progresses
3. **Change Requests** may be recommended and integrated into the PMP as a result of analysis of project performance

Human Resources Management

The dynamics and interactions among project team members can make or break a project plan, as can the availability of capable personnel with relevant skills and expertise. Therefore, effective management of human resources is a critical component of any project. Whether personnel are employed, contracted or volunteer, a positive and constructive environment with clearly articulated roles and responsibilities can assure a motivated and productive project team, while a negative atmosphere has the opposite effect. Project leaders must know how to achieve results by planning for, engaging and directing a project team, using the processes and tools described below:
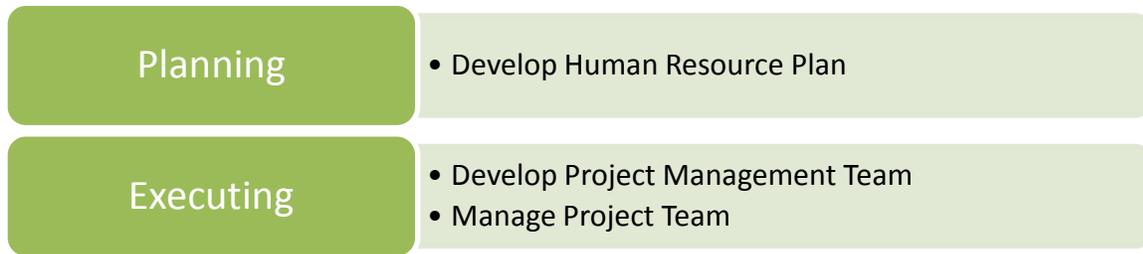

Planning
- Develop Human Resource Plan

Executing
- Develop Project Management Team
- Manage Project Team

Figure 9: Human Resources Management Cycle

Develop Human Resources Plan

An effective Human Resources Plan defines and documents the roles and responsibilities for project team members, as well as required skill, reporting relationships, and staffing plan describing allocation of time for team members. To assure productivity of the project team and limit risks affecting the overall project schedule, cost and quality, an effective **Human Resources Management Plan** should include the following:

Table 2: Components of Human Resources Management Plan

Roles and Responsibilities	Project Organization Chart	Staffing Plan

• **Role:** the part of the project for which the team member is responsible
• **Responsibility:** the work the team member is expected to perform
• **Competency:** the skills required by the team member to complete the work
	• A **graphic representation** of the project team members and their reporting relationships	• Details how and when **resource requirements** will be met, including:
		  • Staff acquisition
		  • Resource calendar
		  • Training needs
		  • Rewards and recognition

Human Resources Management

Templates of Roles and Responsibilities and a Project Organization Chart can be found in the PM Templates zip file as: 9.Roles_and_Responsiblities_Chart_Template.doc, 10.Project_Organization_Chart_Template.doc

There are several different methods for constructing an organization chart:

- A traditional **Project Organization Chart** starts at the top of the graphic and shows relationships flowing from the project lead (director or manager) downwards
- A **Resource Breakdown Structure** is arranged by types of resources, even if they are assigned to different tasks in the WBS; this structure is most useful in tracking costs for human resources
- An **Organizational Breakdown Structure** is arranged according to units or teams, with project activities assigned to each unit

Templates for the Resource Breakdown Structure and Organizational Breakdown Structure can be found in the PM Templates zip file as: 11.Resource_Breakdown_Struture_Template.doc and 12.Organizational_Breakdown_Structure_Template.doc

In addition, Project Managers can use a **Responsibility Assignment Matrix** to demonstrate the relationship between the work to be accomplished by project team members. A common method of assigning responsibility is through the use of a **RACI Chart**. This matrix documents the team member responsible, accountable, consulted and/or informed for each particular project activity.

Table 3: Responsibilities Outlined in RACI Chart

Responsible	Individual responsible for completing the task or deliverable
Accountable	Individual accountable for the completeness of task or deliverable
Consult	Individual whose opinions is sought
Inform	Individual who is kept up-to-date on progress and completion

A template for a RACI Chart can be found in the PM Templates zip file as: 13.RACI_Model_Template.doc

Develop and Engage Project Team

Development of an effective project team requires both planning and skill. In addition to identifying and recruiting the individuals who will serve on the project team, sufficient orientation and ongoing development of skills and knowledge must be provided to support the project requirements.

Human Resources Management

For the State HIE Cooperative Agreement Program, the project team members must collectively possess knowledge of legal, technical, and healthcare-related subject matter, and must also be effective in collaborative problem-solving, leading and managing projects and people, and communicating with stakeholders. Team members may enter and leave the project at different times, due to transition in employment or project status.   Team members may also have widely differing levels of experience with health information technology, publicly-funded contractual requirements, and accountability to multiple stakeholders. It is certain that State HIE project teams will experience the same stages of development typically seen among teams working on other complex issues:

- **Forming:** team members meet; behavior is typically formal and reserved
- **Storming:** team members vie for position and control; behavior can be confrontational
- **Norming:** team members adjust to one another and focus on project outcomes; behavior is cooperative, and conflict is avoided
- **Performing:** team members work effectively and productively; behavior is trusting and achievement-focused, accepting both exploration of and challenges to ideas and processes

Project team leaders can support the evolution of team members along this continuum, by using techniques which have proven successful for developing and maintaining a cohesive and productive project team. State HIE project team leaders may choose among these techniques:
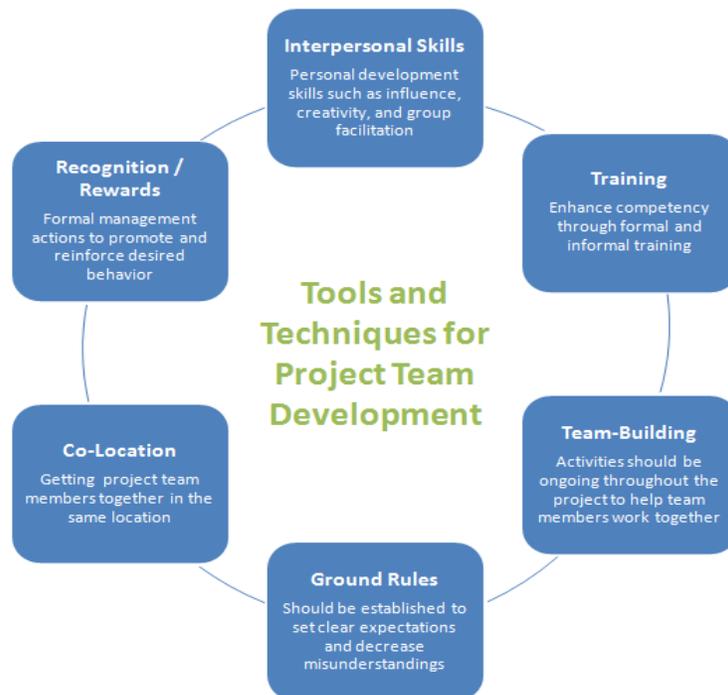

Figure 13: Tools and Techniques for Project Team Development

Human Resources Management

Manage Project Team

Once the project team has been formed, members engaged and activated, project leaders should monitor progress towards the overall project goals using project-specific performance objectives for each team member, while also identifying and addressing issues as they arise.

It is important to establish a positive and open environment for team members to discuss issues. This is particularly critical in situations where team members have responsibilities for other projects that may compete for their time and attention, and where the authority for the project may be indirect or spread among multiple entities (such as the leaders for the State Designated Entity and the HIT Coordinator for the State).

Conflict often occurs, and may even be necessary to avoid "group think" where team members avoid challenging assumptions or approaches that might offer better options. Moreover, conflict does not have to be negative if team members recognize conflicts as they arise and use techniques to resolve issues effectively. Common techniques for resolving conflicts are described below:

Table 4: Conflict Resolution Techniques

	Impact	Outcome
Withdrawing/Avoiding	Lose-lose	Retreat from the conflict
Smoothing/Accommodating	Lose-lose	Emphasizes agreement instead of differences
Compromising	All lose something	Each party gets some degree of satisfaction
Forcing	Win-lose	One party exercises power over the other
Collaborating	All win something	Multiple viewpoints, consensus, commitment
Confronting/Problem Solving	Win-win	Analysis of facts leading to the best solution

Human Resources Management

Other tools and techniques used by effective project team leaders are described below:

Observation and Conversation
Provide informal feedback to project team members during day to day encounters and be available for discussion

Project Performance Appraisals
Clarify roles and responsibilities, provide feedback, discover unknown issues, and establish goals for the future

Conflict Management
Conflict is inevitable and should be resolved, ideally at the peer to peer level, but the project manager should help resolve escalated conflicts; conflicts should be resolved early and in private

Issue Log
Allows project team members to raise any concerns they have about the project in a formal way so they are documented and reviewed

Interpersonal Skills
Utilize managerial skills such as motivation, communication, and cultural awareness for continued team building

Tools and Techniques For Project Team Management

Figure 14: Tools and Techniques for Project Team Management

Communication Management

Effective processes and mechanisms to support communication are important to assure timely and accurate dissemination of key points of information to the appropriate audiences. Communications should be presented in a manner which is easily accessed and understood, in order to inform decision-making and to engage stakeholders in the desired actions.

The process for Communications Management is detailed below:

Planning
- Identify Stakeholders
- Plan communications

Executing
- Distribute Information

Monitoring & Controlling
- Manage Stakeholder Expectations
- Develop Schedule
- Report on Performance

Figure 15: Communications Management Cycle

Communications Management

Plan Communications

Communications Management Plans typically document the process and outcomes for the following:

Identify Stakeholders	• Identify people and organizations whose interests are impacted by the project • Document their interest, involvements and impact
Plan Communications	• Determine stakeholder information needs and define a communication approach • Organize this information in a communications plan
Distribute Information	• Make relevant information available to stakeholders in a timely manner throughout the project lifecycle • Implement the communication plan
Manage Stakeholder Expectations	• Communicate and work with the stakeholders to increase project acceptance and address concerns before they become issues
Develop Schedule	• Collect and disseminate performance information through performance reports (status reports, dashboards, etc.)

Figure 16: Communications Management Tasks and Activities

Distribute Information

Skilled communicators develop and use a variety of messages, distributed through multiple means and repeated periodically, to assure two-way communication. It is helpful to identify and target communications along a continuum, including the following:

- **External** (public audience) / **Internal** (project team members)
- **Formal** (notification, report) / **Informal** (message)

Communications Management

- **Vertica**l (executive to implementer) / **Horizontal** (colleague to colleague)
- **Official** (guidance, regulation) / **Unofficial** (recommendation)
- **Written** (letter) /**Oral** (phone call, presentation)
- **Verbal** (document) / **Non-Verbal** (graph, picture)

Manage Stakeholder Expectations and Report on Performance

The following tools can be used to ensure effective management of communications in order to manage stakeholder expectations and report on performance:
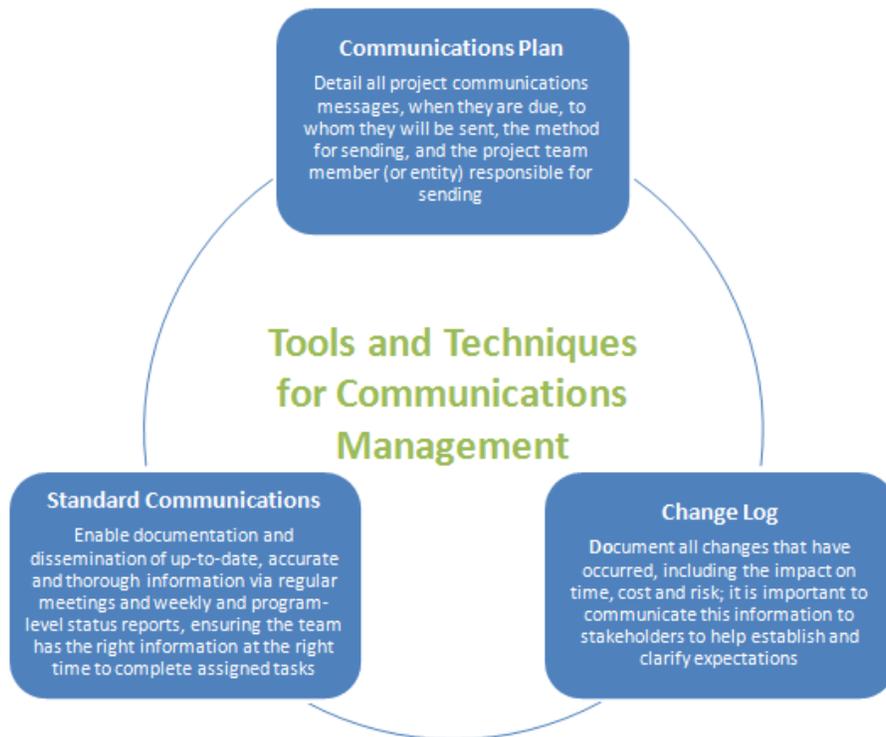

Figure 17: Tools and Techniques for Communications Management

Templates for a Communications Plan, Status Report and Change Log can be found in the PM Templates zip file as: 14.Communications_Plan_Template.xls, 15.Status_Report_Template.doc, and 3.Change_Log_Template.xls

Risk Management

Proactive management of risks can minimize the disruptive challenges and barriers that will inevitably be encountered during the course of a complex, multi-stakeholder project such as the State HIE Cooperative Agreement Program. A good PMP not only identifies potential risks to the project, but also defines mitigation strategies and contingency plans to ensure they do not develop into issues. While a **Risk** is a factor that has complex, difficult or uncertain results that has potential to negatively impact project commitments, an **Issue** has already occurred and is now having a detrimental effect on the project.

Potential risks are generally classified as one of the following:

Table 5: Risk Classifications

Process Risks	Risks relating to the process, level of detail, methodology, end-user expectations, and cost control related to the project.
People Risks	Risks relating to the project team, third party vendors and/or operational staff.
Policy Risks	Risk associated with the lack of common understanding or mutually-agreed upon policies.
Application and Technology Risks	Risks associated with the respective applications and the underlying technical infrastructure.

It is important for project team leaders and members to have a plan for dealing with risks. Project teams commonly use a **Risk Management Plan** to document the process for identifying, analyzing and prioritizing, planning responses, and controlling risk.

A template for a Risk Management Plan can be found in the PM Templates zip file as: 16.Risk_Management_Plan_Template.doc

To develop and implement an effective Risk Management plan**,** there are several steps that a project team can follow as described in more detail below:

Figure 18: Risk Management Cycle

Risk Management

Identify Risks

Various methods can be used to identify, analyze and prioritize risks, including the following:

Tools and Techniques to Identify Risks

Brainstorming
Collect a comprehensive list of project risks from project team members and / or other experts; categorize and further define them in the context of the project

Interviewing
Conduct group or individual interviews with team members, stakeholders, experts, customers, etc.

Root Cause Analysis
Identify a potential problem using one of the methods above, then drill down to uncover the underlying cause

Diagram
Use cause and effect diagrams or an analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT)
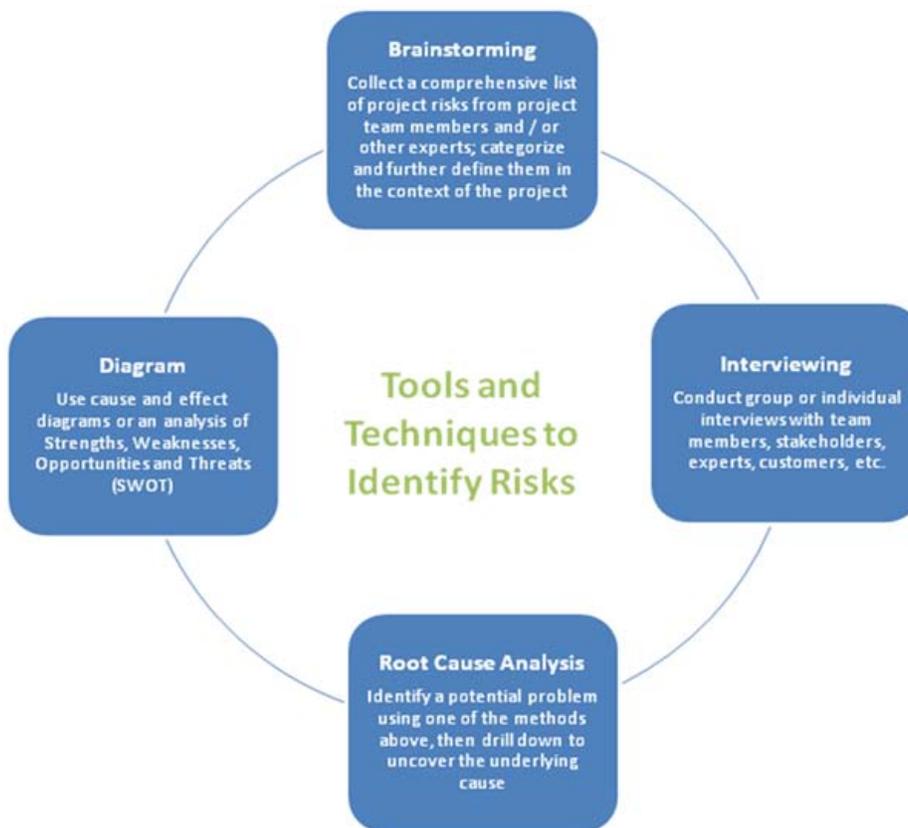
Figure 19: Tools and Techniques to Identify Risks

Plan Risk Responses

Sharing potential risks that have been identified with project team members can help the team recognize a potential problem and prevent it from becoming an actual issue. Some governing boards may wish to see a list of risks and planned responses on a regular basis, which helps to build awareness, inform decision-making and build trust for the project.

Project teams often use a **Risk and Issue Log** to track risks, monitor status of mitigation strategies and address issues as they arise. For each potential risk or issue, the following information is commonly included:

Table 6: Risk and Issue Log Inputs

Name	A brief description of the risk/issue in question.
Probability	Identifies the relative likelihood of the risk occurring. Probability of occurrence is provided as 'low,' 'medium,' or 'high.'

Risk Management

Impact	Identifies the impact on the project, should the risk event actually materialize. Impacts are grouped into the following four categories: • **High** – The risk may result in a significant reduction in effectiveness, quality, and project goals desired results. • **Medium** – The risk could result in delays, missed milestones, and not achieving benefits. • **Low** – The risk could result in minor difficulties, hassles, and dissatisfaction.
Mitigation	Recommended activities to prevent risks from materializing. These mitigation strategies should be incorporated into the overall work plan and approach, with a view of achieving the target "go-live/end" date.
Contingency	Actions that could be taken to respond, should the event occur. Should mitigation strategies not be effective, the contingency plans would be to extend the project timelines and defer the "go-live/end" date.

Below is an example of a Risk and Issue Log that demonstrates how organization of information into a functional spreadsheet can be conducive to guide project discussions and to inform decision-making by project leaders and team members:

Table 7: Example Risk and Issues Log

Risk	Probability	Impact	Key Mitigation Strategies
Organization will experience resistance to change.	Medium	High	Ensure organization has solid foundation – through education, training and process review sessions. Develop a comprehensive change management plan and continually monitor/revised the plan as required.
Interface development to legacy systems will take longer or be more difficult than anticipated.	High	Medium	Reduce the reliance on interfaces by adopting standard functionality where practical.
System testing takes longer to complete than anticipated	Medium	High	Engage lead developer early in the project to expedite development.

State HIE project team members might encounter other types of risks, including:

- Scope creep
- Inadequate funding
- Inadequate staffing / expertise

- Misalignment of expectations
- Lack of clear accountability for performance

Risk Management

- Functionality gaps
- Inadequate technology
- Under-performance by Vendor
- Competing priorities for resource allocations and / or tasks completion
- Cost overrun

As project risks are identified, responses should be documented, agreed upon and included in the Risk and Issue Log.

A template for a Risk and Issue Log can be found in the PM Templates zip file as: 17.Risk_and_Issue_Log_Template.xls

Monitor and Control Risks

After risks have been identified and responses defined, risks should be monitored and controlled in accordance with the planned and agreed-upon mitigation strategies. Several methods are useful for this purpose:

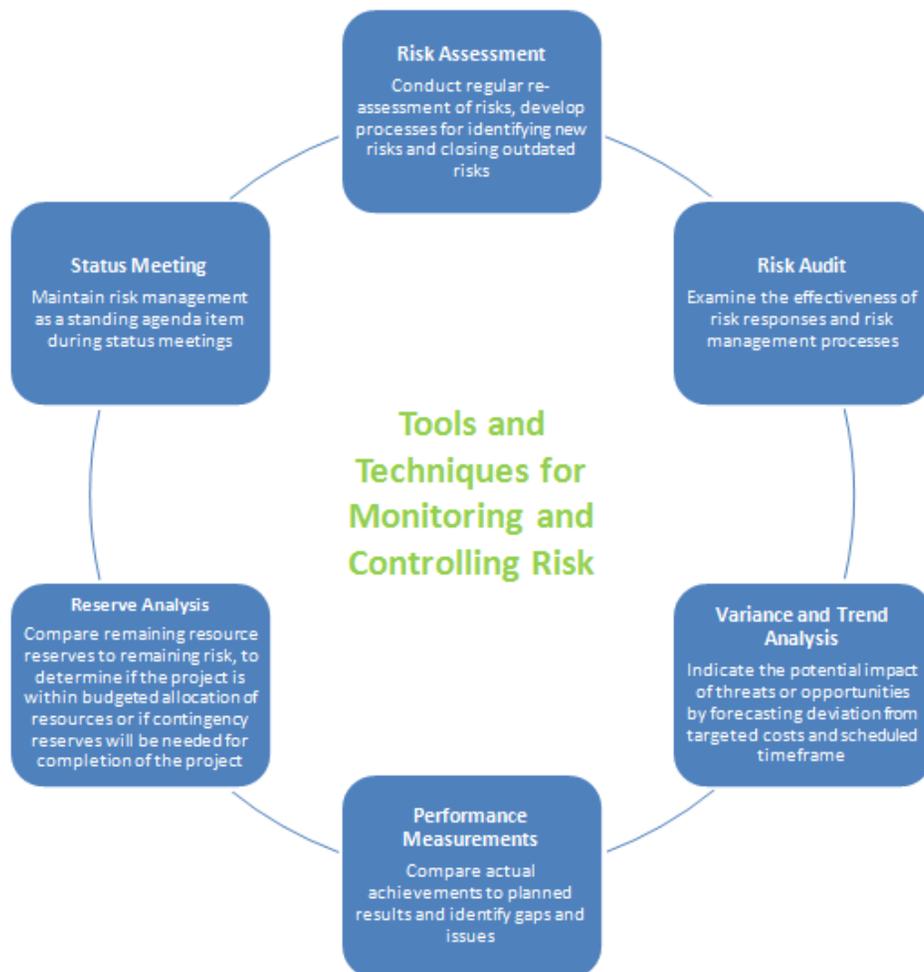**Figure 20: Tools and Techniques for Monitoring and Controlling Risk**

Figure 10: Tools and Techniques for Monitoring and Controlling Risk

Procurement Management

Procurement Management refers to the processes through which a project team purchases necessary goods, products, or services. There are several key steps in the process, each of which must be defined and communicated to the appropriate audiences to assure clear expectations and inform effective decision-making and oversight:
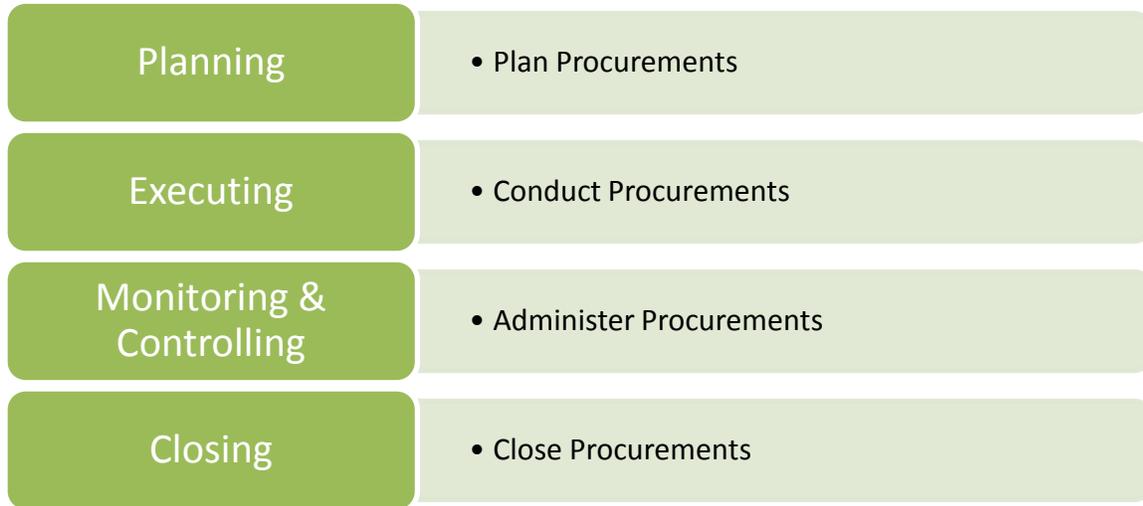
Planning	• Plan Procurements
Executing	• Conduct Procurements
Monitoring & Controlling	• Administer Procurements
Closing	• Close Procurements

Figure 21: Procurement Management Cycle

Plan Procurement

Whether for technical, legal, communications or other organizational infrastructure, effective planning for procurement begins with a clear definition of resource requirements, including the level of support needed from inside and outside the project team. Potential providers of resources must be identified and considered, as well as the relative risk / benefit of procuring goods, products or services from outside the organization – all with special care given to minimize any potential conflict of interest. Procurement timeframes are heavily influenced by the requirements of the project schedule; in the case of State HIE Cooperative Agreement Program, the timeframe for providers to meet Meaningful Use requirements is a critical factor which must be considered.

As a first step, using a **Build-or-Buy analysis**, project team members should analyze whether the work—in part or in whole— should be performed by the project team ("build") or outsourced to another entity ("buy"), or a combination ("design-build") of project team and vendor representatives working in collaboration. Typically, the project will have defined the overall approach and requirements when utilizing the first two strategies. The third approach—"design-build"— is frequently used where there is no readily-available solution in

Procurement Management

the market, and can provide a more tailored solution for the customer while also leading to a new or improved product for the solution vendor; however, questions of intellectual property ownership and allocation of public funds for this purpose must be considered.

There are various factors for the project team to consider when conducting this Build or Buy analysis, including:

- Direct (hardware, software, personnel) and indirect costs (administrative overhead, contingency fee, depreciation, and travel)
- Availability of internal resources to provide oversight, as well as day-to-day operational support
- Technical and business requirements, particularly those that are very specific to the project's stakeholders (flexibility to accommodate variations in staffing levels, payment terms, or legal requirements)
- Current HIE environment and gaps from both geographic and functional perspectives
- Subject matter expertise requirements, including the ability to communicate effectively to stakeholders at differing levels of awareness
- Unique business dynamics—ability to navigate through changes in political, personal or inter-organizational relationships
- Potential risks and benefits

If the organization decides to use external resources, the next step is to determine the type of contract vehicle to be used, from among one of three types: **Fixed-Price, Cost-Reimbursable,** or **Time and Materials.**

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Table 8: Fixed Price Contract

</div>

Sets a fixed price for the product or service	
Firm Fixed Price (FFP)	- Most commonly used - Favored by buying organizations - Price is set at the outset - Buyer must precisely specify the product - Seller is obligated to complete the work - Cost overruns are the responsibility of the seller
Fixed Price Incentive Fee (FPIF)	- Financial incentives are tied to achieving agreed-to metrics - Final contract cost determined after completion - All costs above the price ceiling are the responsibility of the seller
Fixed Price with Economic Price Adjustment (FP-EPA)	- Used when performance spans over many years - Protects the buyer and seller from external conditions - Pre-defined final adjustments to cost for inflation, etc. - EPA should be related to a reliable financial index

Procurement Management

Table 9: Cost Reimbursable Contract

Payment of actual costs plus a fee (seller's profit)	
Cost Plus Fixed Fee (CPFF)	• Seller reimbursed for all allowable costs • Fixed fee as a percentage of initial estimated cost • Fee paid for completed work and does not change
Cost Plus Incentive Fee (CPIF)	• Seller is paid a pre-determined fee based on performance • If final costs are less or greater than original estimates, the seller and buyer share the cost, according to a pre-negotiated formula (e.g. 80/20)
Cost Plus Award Fee	• Seller is reimbursed all legitimate costs • Fee based on broad subjective performance parameters • Subjective assessment by the buyer, not subject to appeal

Table 10: Time and Material Agreement

Hybrid type of agreement	
Time and Materials (TM)	• Aspects of fixed price and cost reimbursement • Used for support, such as precise statement of work cannot be done quickly or expert and staff acquisition are required • Can increase in contract value • May require not-to-exceed values and limits • Unit labor or material rates can be preset

After determining the type of contracting vehicle to be used, the project team should decide how to execute the procurement process and document that decision. The **Procurement Management Plan** typically documents the following information:

- Contract types
- Risk management issues
- Estimate types
- Project team action required
- Pre-qualifications and procurement metrics
- Standardized documents
- Constraints and Assumptions
- Quality requirements
- Coordination
- Lead times and build or buy decisions

A template for a Procurement Management Plan can be found in the PM Templates zip file as: 18.Procurement_Management_Plan_Template.doc

Procurement Management

Upon approval of the Procurement Management Plan, project teams can define a **Procurement Statement of Work.** Drawing from information documented in the project's **Scope Management Plan, WBS** and **WBS Dictionary,** the Procurement Statement of Work describes the goods or services to be procured in sufficient details for a prospective seller to determine if it can be provided, and at what cost.

When selection of vendor is to be made with price being the primary criteria, then a **Request for Bid, Tender or Quotation** is most useful. When other considerations—such as technical approach—are most important, then **Request for Proposal** offers an appropriate vehicle for requesting and receiving information from potential vendors. Either of these types of solicitations should include **source selection criteria**, other than price, such as: understanding of need, capability, business size / type / experience, and approach.

Conduct Procurements

Once planning for procurement has been completed, the project team can conduct the procurement in accordance with the Procurement Management Plan, to select a vendor from among those considered. After the preferred vendor has been identified, the project team must define a **Contract Award**, which typically includes the following components:

- Contract term
- SOW and deliverables
- Schedule baseline
- Performance reporting
- Period of Performance
- Roles and Responsibilities
- Seller's place of performance
- Pricing
- Payment of terms
- Place of Delivery
- Acceptance criteria
- Warranties/remedies
- Product support
- Limitations of liability
- Fees and retainers
- Penalties
- Incentives
- Insurance and performance bonds
- Subcontractor approval
- Handling of change requests
- Termination and alternative dispute

It is common for there to be a period of negotiation with the vendor of choice, during which the contracting entity and the vendor come to mutual agreement on each of these specific terms in the contract. The contract award must then be signed by authorized personnel from both the offering entity and the vendor providing goods or services.

Procurement Management

Administer the Procurement

After the contract has been mutually agreed to and executed, a member of the project team who has been designated to serve as **Project Officer** is charged with overseeing the successful completion of work within the agreed-upon terms under the contract. For the following activities, procedures should be documented and shared to assure that all parties are fully-informed and clearly understand expectations:
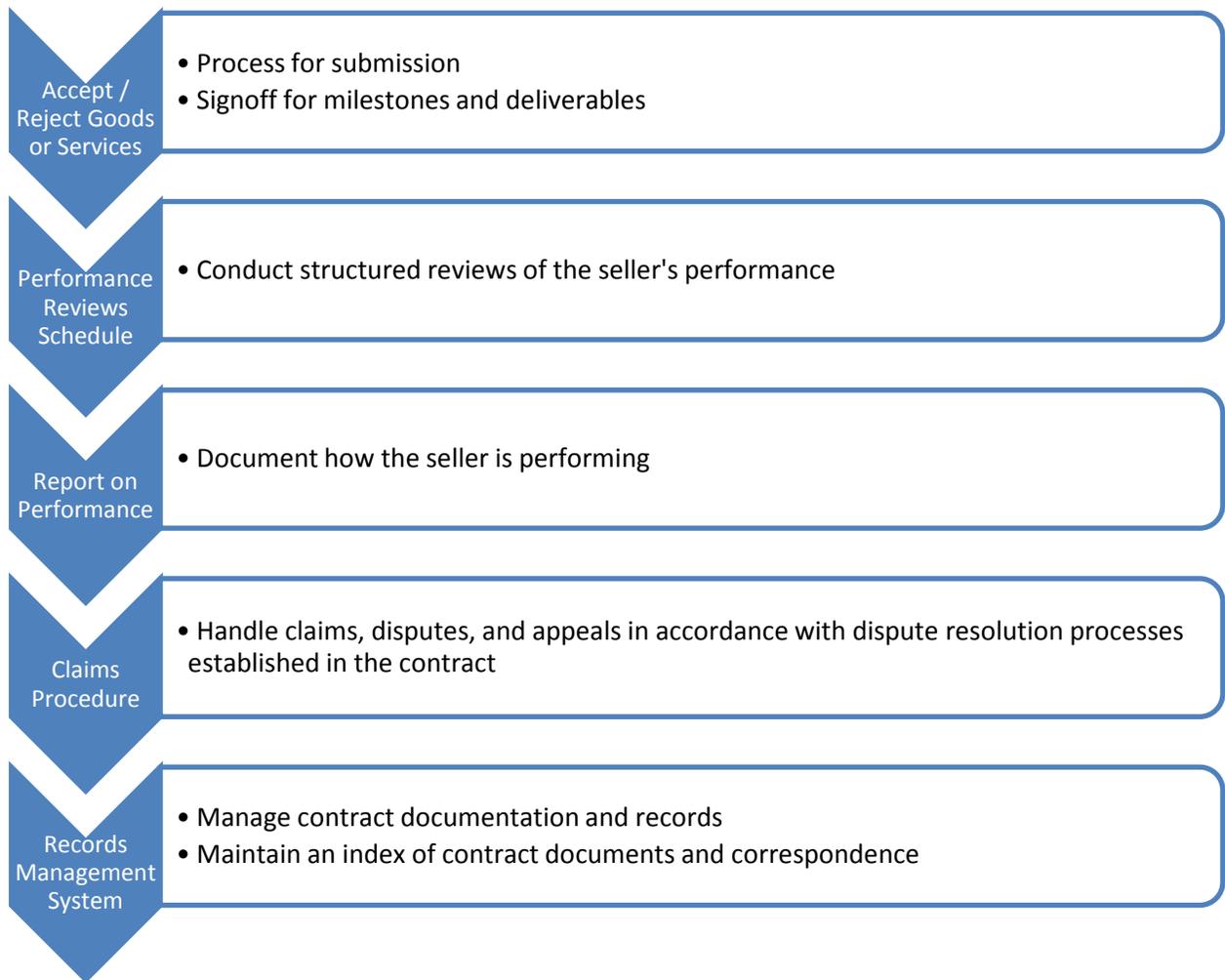
Accept / Reject Goods or Services	• Process for submission • Signoff for milestones and deliverables
Performance Reviews Schedule	• Conduct structured reviews of the seller's performance
Report on Performance	• Document how the seller is performing
Claims Procedure	• Handle claims, disputes, and appeals in accordance with dispute resolution processes established in the contract
Records Management System	• Manage contract documentation and records • Maintain an index of contract documents and correspondence

Figure 22: Procurement Administration Process

Project milestones indicate whether a project is on track to finish as expected, planned and required. Managing milestones is part of the Project Officer's role, and is integral to measuring overall and specific project progress. It is important that the Project Officer and contractor agree to milestones and how they should be fulfilled. The contractor also must accept or sign-off to the project milestones.

Procurement Management

Close Procurements

When the term of the contract expires, it is good practice to formally **Close the Procurement.** The Project Manager should assure that the following administrative tasks are conducted:

- Finalize any open claims
- Verify that all deliverables were submitted and accepted
- Resolve any outstanding issues or items

The project team should review contract terms and conditions to ensure that all terms of the contract have been satisfied, and provide formal written notice to the vendor that the contracted has been completed.   Information should be archived, and a person or entity designated as steward of this information.

Quality Management

Quality Management is a process by which the project team assures that processes and deliverables are executed in accordance with the state or SDE's mission and goals, agreed-upon and approved strategic and operational plans, requirements as reflected in the Public Information Notice, and governance policies and regulations. Using this process, the project team can verify that the project satisfies the need(s) for which it was originated, evaluating overall project performance and monitoring specific project results to eliminate the cause of unsatisfactory performance. Often, the Quality Management process leads to the definition of standards that may be used in other projects.

Quality Management is a responsibility that is shared among all project team members. Each team member may have responsibility for a specific area of the project, but should participate in the overall Quality Management process to understand the impact of one project activity upon another, and to assist in evaluating benefits versus risks and opportunities for improvement.

There are three steps in any Quality Management process, which are described in more detail below:

Planning	• Plan Quality
Executing	• Perform Quality Assurance
Monitoring & Controlling	• Perform Quality Control

Figure 23: Quality Management Cycle

Plan Quality

To **Plan for Quality,** a project team identifies requirements and standards for the project, and then defines strategies for how those will be achieved. The process components are described below:

Quality Management

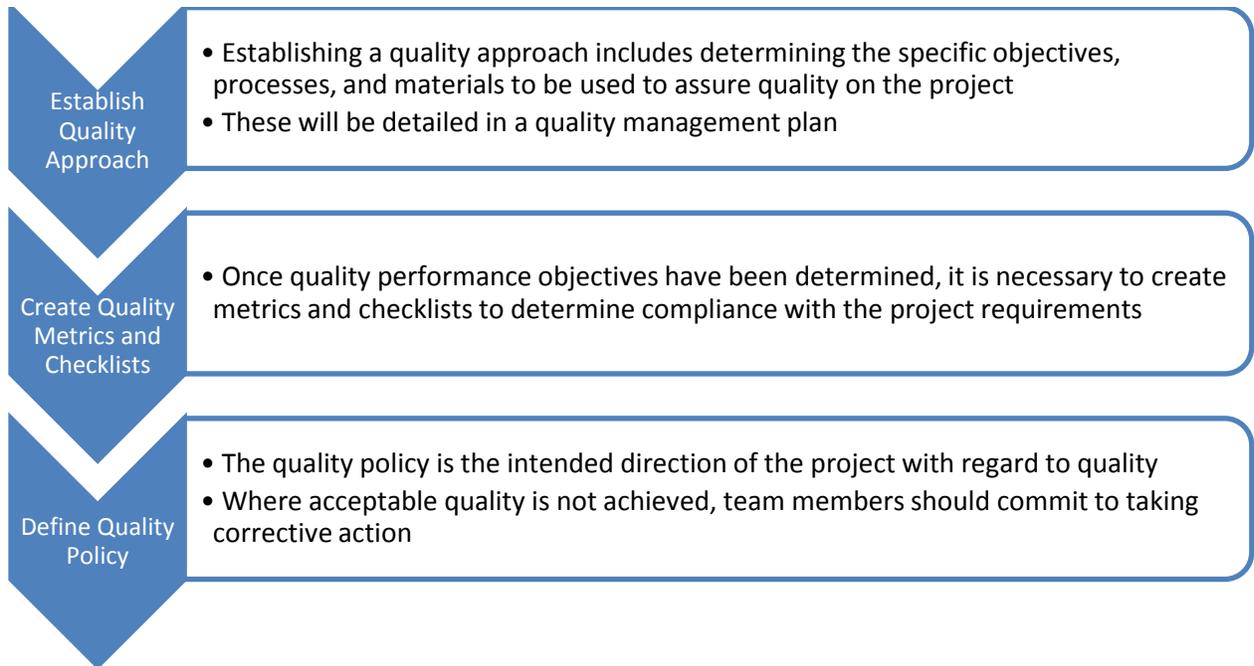|	
Establish Quality Approach	• Establishing a quality approach includes determining the specific objectives, processes, and materials to be used to assure quality on the project • These will be detailed in a quality management plan
Create Quality Metrics and Checklists	• Once quality performance objectives have been determined, it is necessary to create metrics and checklists to determine compliance with the project requirements
Define Quality Policy	• The quality policy is the intended direction of the project with regard to quality • Where acceptable quality is not achieved, team members should commit to taking corrective action

Figure 24: Quality Planning Process

As a result of this process, the project team can document a **Quality Management Plan,** describing how to implement a quality policy through a quality system (including organization, responsibilities, procedures, processes and resources).

A template for a Quality Management Plan can be found in the PM Templates zip file as: 19.Quality_Management_Plan_Template.doc

Perform Quality Assurance

Quality Assurance is the process of tracking compliance with the agreed-upon quality requirements and standards. The process for assuring quality compliance is described below:
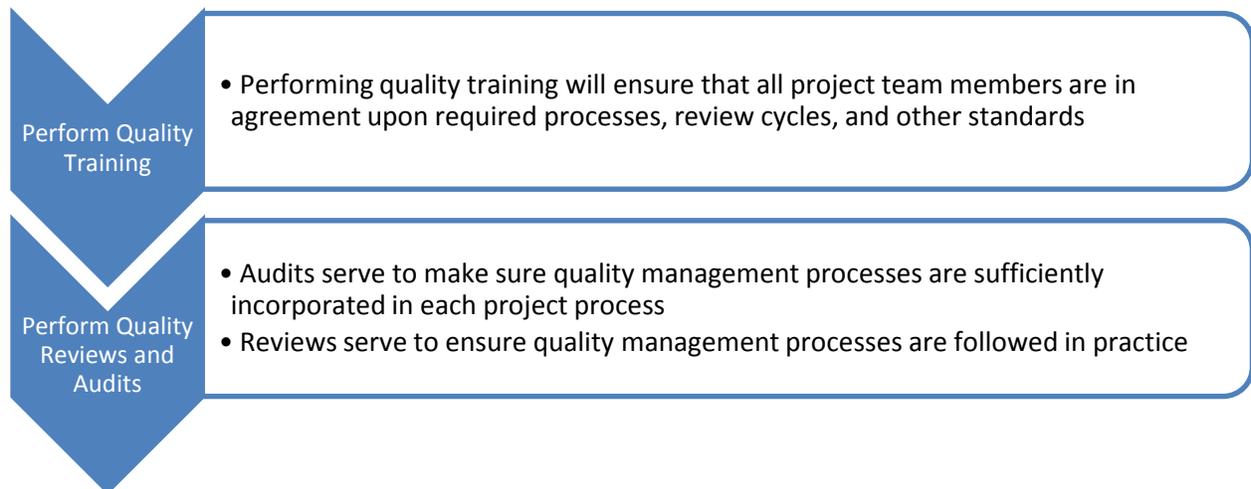
Quality Management

| Perform Quality Training | • Performing quality training will ensure that all project team members are in agreement upon required processes, review cycles, and other standards |
| Perform Quality Reviews and Audits | • Audits serve to make sure quality management processes are sufficiently incorporated in each project process
• Reviews serve to ensure quality management processes are followed in practice |

Figure 25: Quality Assurance Process

Perform Quality Control

Quality Control is achieved through verification that project management and project deliverables are of high quality, and that they meet the criteria for completeness and correctness as established in the **Quality Plan.** Quality control activities include execution of processes for review and acceptance of project deliverables as established in the **Procurement Management Plan** and the **PMP**. If and when project deliverables are determined to be of insufficient quality, it may be necessary to review and adjust the quality assurance process or approach. Typically, the contract award includes terms for remedies in the case of unacceptable work by a vendor, so that a strategy for redress is therefore included in the quality control measures.

Conclusion

Given the highly complex nature of enabling and facilitating health information exchange capacity at the state-level, effective project management is critical to achieving success within the State HIE Cooperative Agreement Program. To garner maximum stakeholder support, avoid potential risks, meet goals and objectives, and achieve long-term sustainability, state leaders should consider how the nine core competencies as discussed in this module will help HIE leaders and Project Managers throughout the project lifecycle – from planning to implementation and operations, if applicable.   More detailed information on some of the core competencies can be found in other modules including the Change Management module.
 Additional project management questions and technical assistance can be addressed by the ONC Technical Assistance Team at by contacting Cara Campbell at carcampbell@deloitte.com.

Project Management Appendix A

Earned Value Management

Earned Value Management (EVM) is a method to determine how a project is going in terms of schedule, cost, and efficiency. It integrates project scope, cost, and schedule measures. EVM involves comparing several measures. The graph below depicts EVM and the four key associated measures.
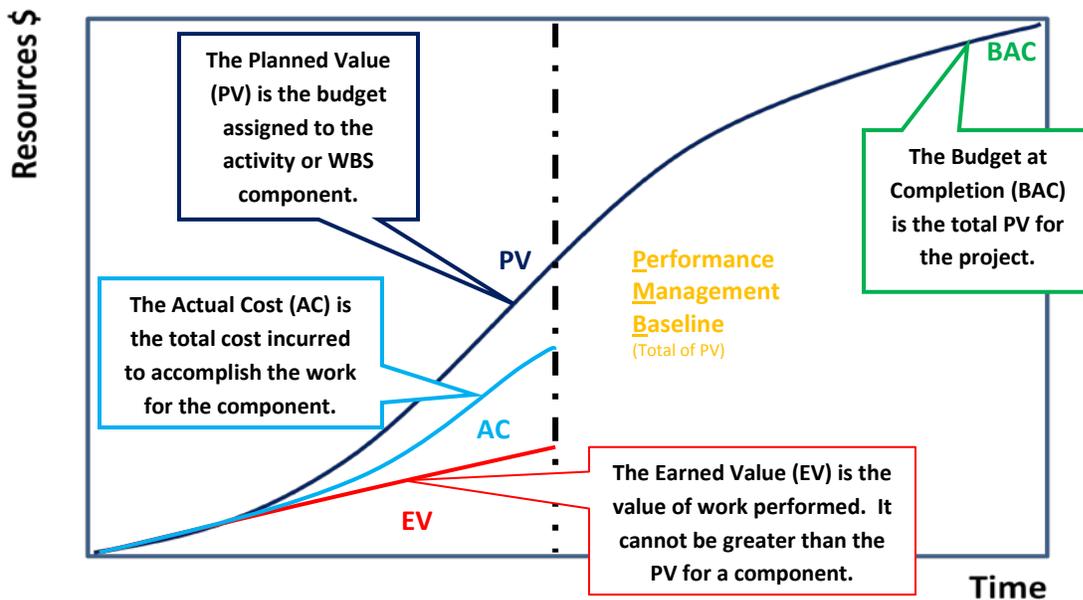
These measures should be used to assess your project's performance based upon your schedule and cost. Schedule performance measurements are used to assess the magnitude of variation to the original schedule baseline. The project's **schedule variance (SV)** is a measure of the project's schedule performance and is equal to EV minus the PV.

$$Schedule\ Variance\ (SV) = \ Earned\ Value\ (EV) - Planed\ Value\ (PV)$$

Thus, at project completion, the SV will equal zero because all the planned values will have been earned. The project's **schedule performance index (SPI)** is a comparison of the progress achieved to the planned progress and can be calculated as the ratio of the EV to PV.

Project Management Appendix A

$$Schedule\ Performance\ Index\ (SPI) = \frac{Earned\ Value\ (EV)}{Planed\ Value\ (PV)}$$

Accordingly, an SPI value less than 1.0 indicates that project is behind schedule; conversely, a value greater than 1.0 indicates that the project is ahead of schedule.

Similarly, the **cost variance (CV)** and the **cost performance index (CPI)** are measures of the project's cost performance and the cost efficiency of the work performed, respectively. The CV is equal to EV minus AC and the CPI is the ratio of the EV to AC.

$$Cost\ Variance\ (CV) = \ Earned\ Value\ (EV) - Actual\ Cost\ (AC)$$

$$Cost\ Performance\ Index\ (CPI) = \frac{Earned\ Value\ (EV)}{Actual\ Cost\ (PV)}$$

A CPI value less than 1.0 indicates a cost overrun for work completed, while a value greater than 1.0 signifies that the project is under budget for performance to date.
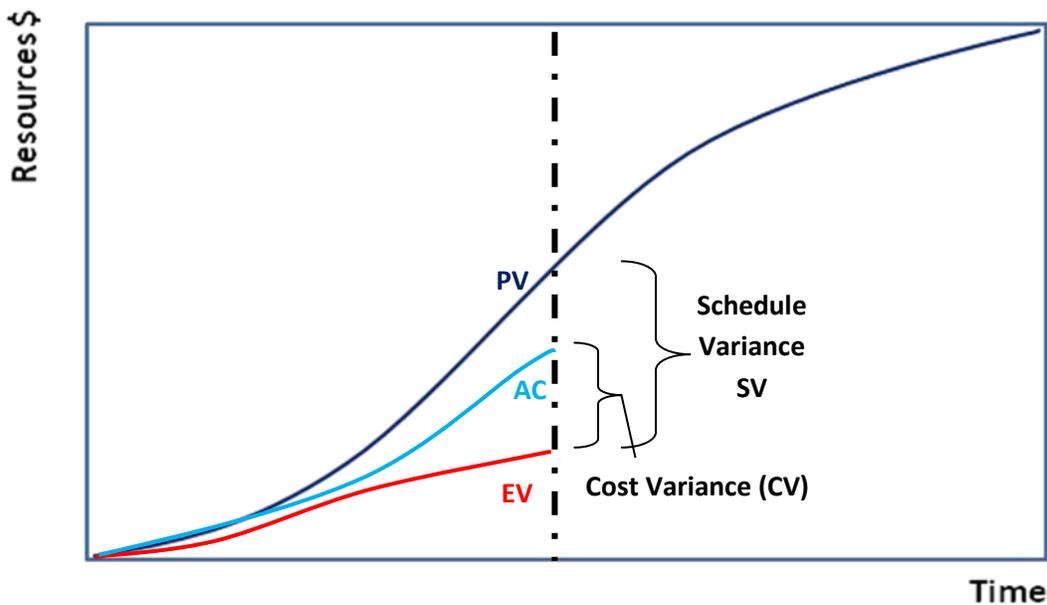
Project Management Appendix B

Project Management Resources

Below are additional resources to provide guidance in the project management process.

1) The Project Management Institute (publisher of the Guide to the Project Management Body of Knowledge, or PMBOK): http://www.pmi.org/Pages/default.aspx
2) HRSA Project Management & Oversight Toolkit Module: http://healthit.ahrq.gov/portal/server.pt?open=512&objID=1096&PageID=0&cached=true&mode=2