

Introduction to the ITS Project Management Methodology

In September 1999 the Joint Legislative Committee on Performance Evaluation and Expenditure Review (PEER) produced a report entitled *Major Computer Systems in Mississippi's State Agencies: A Review of Their Development and Implementation*. The study was undertaken as a result of less than successful application development projects in the state.

Among Peer's recommendations were the following:

- "ITS should develop comprehensive computer system project management guidelines and require state agencies to use them." (p. viii)
- "Under its authority to approve or disapprove contracts as specified in MISS. CODE ANN. §25-53-5, ITS should require as precondition to contract approval that agencies follow the promulgated guidelines and requirements in performing feasibility studies of proposed systems and in designing, developing, and implementing computer systems improved by the ITS board." (p. ix)
- "At a minimum, the ITS Board should require an annual independent quality assurance assessment of each computer system project...The purpose of the annual independent quality assurance assessment is to have an independent review of the project to identify problems that could cause the project to be over budget or delay its implementation...This review should be conducted by ITS unless ITS staff are participating in the design, development, and implementation of the system, in which case an independent consultant should conduct the review." (p. ix)
- "The results of the independent quality assurance assessment, along with recommendations for addressing any problems noted in the project, should be reported to the ITS Board. The ITS Board should endorse recommendations it believes are needed to correct problems noted and, if problems persist, take aggressive action to ensure that such problems are addressed. Such action could range from refusal to approve further change orders on troubled projects directing the ITS Executive Director to cancel a project vendor's contract, if warranted." (p. ix)

ITS agreed with those recommendations and has since developed this methodology in response.

State of Mississippi Project Management Methodology
Function: Project Initiation

1. Include Project In Agency IT Plan

Description: Each year agencies prepare a three-year Strategic Information Technology Plan. It is important that agencies consider projects in prior years rather than waiting until the current year to show a project on the plan for the first time. For example, if a agency is planning a significant project to start in FY 2002, the project should be included at the latest in the plan for FY 2001-2003, which they would turn in by August 2000. This gives the agency the opportunity to adequately plan and budget for the project. All projects in the plan should include a project rating. The Project Rating is a process whereby the agency and ITS determine if a project should be classified as a Strategic Project. All projects on the agencies' plan should be matched against the four criteria for Mission Critical Systems. For any project matching one or more of the criteria, the entire Project Rating package must be complete. Any project falling in a high-risk level or high severity level on the Project Rating will be classified as a strategic project and will be subject to oversight.

Responsible: Agency Planning Committee
ITS Strategic Services Division

Inputs: Agency 5-Year Business Plan

Tools &

Techniques: Strategic Information Technology Planning Guidelines
Strategic Project Rating Guidelines

Outputs: Agency Information Technology Plan
Project Rating

2. Prepare Initial Planning Report (IPR)

PMBOK: *High Level of all Core Planning Processes/11.1 Risk Identification/11.2 Risk Quantification/11.3 Risk Response Development*

Description: The IPR is a process whereby the agency documents objectives, functional requirements, technical environment, and proposed solution, all in support of the project. The purpose of this activity is to provide adequate planning for the project.

Responsible: Agency
ITS Information Systems Services Division or Strategic Services Division

Inputs: Agency IT Plan
Project Rating

Tools &

Techniques: Initial Planning Report Guidelines

Outputs: Initial Planning Report

Standards: The following standards apply to this project management activity:
Initial Planning Report Standards

3. Conduct ITS Review of Initial Planning Report

Description: ITS reviews the Initial Planning Report to determine if the agency has adequately planned for the project. The committee may send the report back to the agency for additional work if not adequate.

Responsible: ITS Review Committee
Agency IT Director

Inputs: Initial Planning Report
Project Rating

Tools &

Techniques: Initial Planning Report Guidelines

Outputs: Initial Planning Report Review Document

Standards: The following standards apply to this project management activity:
Feasibility Study Standards

4. Recommend Project To ITS Board

Description: Based on a adequate Initial Planning Report, ITS and the agency ask the ITS Board for approval to proceed with a Strategic Project.

Responsible: Agency
ITS Review Committee
ITS Board

Inputs: Project Rating
Initial Planning Report

Tools &

Techniques: NA

Outputs: Board Approval

5. Submit CP-28 for Project (Note - if there is no procurement associated with this project, this step is not required)

Description: The agency submits a CP-28 to ITS for the Strategic Project.

Responsible: Agency

Inputs: Initial Planning Report
Board Approval

Tools &

Techniques: NA

Outputs: CP-28

6. Assign an ITS Project Oversight Coordinator

Description: Upon receipt of the CP-28, ITS assigns a ISS Consultant to the project as the ITS Project Oversight Coordinator.

Responsible: ITS Information Systems Services Division
ITS Project Oversight Coordinator
Inputs: CP-28
Tools &
Techniques: NA
Outputs: Assigned Consultant

7. Conduct the RFP Process (Note - if there is no procurement associated with this project, this step is not required)

PMBOK: *9.1 Organizational Planning/9.2 Staff Acquisition/12.1 Procurement Planning/12.2 Solicitation Planning*
Description: ITS and the agency create and issue the RFP, hold vendor conferences, develop a scoring methodology, etc.
Responsible: Agency Staff
ITS Information Systems Services Division
ITS Project Oversight Coordinator
Other ITS Divisions
Vendors
Inputs: Initial Planning Report
CP-28
ITS Procurement Handbook
Tools &
Techniques: NA
Outputs: RFP
Scoring Methodology

8. Select Winning Vendor (Note - if there is no procurement associated with this project, this step is not required)

Description: ITS and the agency evaluate vendor proposals, score proposals based on the scoring methodology, and select the lowest and best vendor.
Responsible: Agency Staff
ITS Information Systems Services Division
ITS Project Oversight Coordinator
Inputs: RFP
Vendor proposals
ITS Procurement Handbook
Tools &
Techniques: Scoring methodology
Outputs: Chosen Vendor
Backup Documentation
Recommendation Writeup

9. Recommend Winning Vendor To ITS Board (Note - if there is no procurement associated with this project, this step is not required)

Description: ITS and the agency present the chosen vendor to the ITS Board for approval.

Responsible: Agency
ITS Information Systems Services Division
ITS Project Oversight Coordinator
ITS Board

Inputs: Winning Vendor
Recommendation Writeup

Tools &
Techniques: Scoring Methodology
Outputs: Board Approval

10. Negotiate Contract With Winning Vendor (Note - if there is no procurement associated with this project, this step is not required)

Description: Based on ITS Board approval of the chosen vendor, ITS and the agency work with the vendor to negotiate a contract acceptable to both.

Responsible: Agency
ITS Information Systems Services Division
ITS Project Oversight Coordinator
ITS Attorney
Winning Vendor

Inputs: Proposed Contract(s)
RFP
Vendor Proposal

Tools &
Techniques: Contract Negotiation Techniques
Outputs: Executed Contract

11. Initiate the Project/Contract

Description: The development activities of the project are officially begun with this task. This should include a kickoff overview meeting for all members of the project and any actions needed for organizational purposes.

Responsible: Agency Project Director & Project Manager, Development Contractor Project Manager, QA Contractor Project Manager, ITS Project Oversight Coordinator, Other Project Members

Inputs: Project Documentation

Tools &
Techniques: Project Organization
Team Building

Outputs: Positive Project Start

State of Mississippi Project Management Methodology
Function: Project Planning

Note: Every process contained in the Project Planning function can be performed several times during the life cycle of the project:

- **Some of the processes will be performed at a high level during Project Initiation as part of the Feasibility Study process and as part of the Conduct the RFP process.**
- **All of the processes will be performed at the beginning of the project to ensure that all of the project entities (Development Contractor, QA Consultant, State Technical, State Functional, ITS Project Oversight Coordinator) agree on the plan.**
- **All of the processes will be performed at the beginning of each subsequent phase of the project. ITS recommends that strategic projects be divided into small, easy-to-manage phases. Each phase is planned at a high level until that phase is ready to execute, at which time the plan is developed into a detailed one.**

1. Plan the Scope of the Project

CMM: Level 2 – Software Project Planning

ESP: 1. Understand Context - Define Approach

PMBOK: 5.2 Scope Planning

Description: This process involves developing a written scope statement and a scope management plan. The scope statement is a narrative document that accurately describes the objectives and major deliverables of the project. The scope management plan should identify the steps that will be taken to manage the scope of the project. This should include ensuring that: 1) work is not performed out of scope and 2) there is a mechanism, such as a change order process, for changing the scope if necessary.

The planning of the scope may take place at three distinctly different times during a project. These are: 1) during the IT Planning/Feasibility Study process, 2) at the actual beginning of the project when all project entities are together, and 3) at the beginning of each phase. It is important to understand that the scope may/will be different each time due to the availability of more recent information.

Responsible: Agency Project Director & Project Manager, Development Contractor Project Manager, QA Contractor Project Manager, ITS Project Oversight Coordinator

Inputs: Project Feasibility Study
Prior Scope Documents
Assumptions
Constraints
Contract(s)

Tools & Techniques: Project Management Methodology
Analysis of prior project documents

Cost/Benefit Analysis
Alternatives Considered
Expert Judgement
Outputs: Refined Statement of Project Scope
Scope Management Plan

2. Initiate Work Breakdown Structure

CMM: Level 2 – Software Project Planning

ESP: 1. Understand Context - Define Approach

PMBOK: 5.3 Scope Definition

Description: This process involves breaking down the major project deliverables into smaller, more manageable components. The purpose is to identify sub-deliverables that can be more easily managed and controlled than the large deliverables. This is the task where the Work Breakdown Structure (WBS) initially comes into play.

Responsible: Agency Project director & Project Manager, Development Contractor Project Manager, QA Contractor Project Manager

Inputs: Statement of Project Scope
Assumptions
Constraints

Tools &

Techniques: Project Management Methodology
Work Breakdown Structure Templates
Decomposition
Project Management Software

Outputs: Work Breakdown Structure - containing major deliverables broken down into sub-deliverables.

3. Define Project Tasks

CMM: Level 2 – Software Project Planning

ESP: 1. Understand Context - Define Approach

PMBOK: 6.1 Activity Definition

Description: This process involves defining and documenting the tasks necessary for the completion of all deliverables. This is the point where the high-level WBS entities are extended by the placement of detail tasks to support them. For example, you may have a WBS entity called Confirm Functional Requirements. The WBS after adding tasks for producing that deliverable could be:

Confirm Functional Requirements
Identity Functional Requirements Team
Meet with Functional Requirements Team To Review Requirements
Modify Functional Requirements Based On Meeting(s)

Receive Confirmation from Functional Requirements Team on Modified Requirements

Responsible: Agency Project Director & Project Manager, Development Contractor Project Manager, QA Contractor Project Manager

Inputs: Statement of Project Scope
Work Breakdown Structure
Assumptions
Constraints

Tools &

Techniques: Project Management Methodology
Work Breakdown Structure Templates
Decomposition
Project Management Software

Outputs: Update to Work Breakdown Structure - containing deliverables and tasks needed to produce deliverables.

4. Plan Project Resources

CMM: Level 2 – Software Project Planning

ESP: 1. Understand Context - Define Approach

PMBOK: 7.1 Resource Planning

Description: This process involves the identification and quantification of the resources (people, including stakeholders; hardware; software) that will be assigned to the project to ensure performance of project tasks.

Responsible: Agency Project Director & Project Manager, Development Contractor Project Manager, QA Contractor Project Manager

Inputs: Feasibility Study
Work Breakdown Structure
Scope Statement
Resource Pool Documentation (personnel, hardware, software)
Organizational Policies

Tools &

Techniques: Project Management Methodology
Expert Judgement
Alternatives Identification
Project Management Software

Outputs: Resource Requirements - Documentation of what types of resources and capabilities are needed for the various tasks in the Work Breakdown Structure.

5. Define Project Task Dependencies

CMM: Level 2 – Software Project Planning

ESP: 1. Understand Context - Define Approach

PMBOK: 6.2 Activity Sequencing

Description: This process involves determining the dependencies of project tasks. Often, the start of a particular task depends upon the completion of one or more other tasks. For example, Task C may not be able to start before the completion of Tasks A and B. This would more than likely be because Task C requires information produced in A and B. The creation of network diagrams effectively illustrates the effect that understanding of dependencies can have on project schedules.

Responsible: Agency Project Director & Project Manager, Development Contractor
Project Manager, QA Contractor Project Manager

Inputs: Work Breakdown Structure
Known Dependencies (mandatory, discretionary, external)
Assumptions
Constraints

Tools & Techniques: Project Management Methodology
Precedence Diagramming Techniques
Network Templates
Project Management Software

Outputs: Network Diagram
Updates to Work Breakdown Structure containing dependencies between tasks.

6. Estimate the Duration of Project Tasks

CMM: *Level 2 – Software Project Planning*

ESP: *1. Understand Context - Develop/Update Estimate of Situation*

PMBOK: *6.3 Activity Duration Estimating*

Description: This process involves estimating the amount of time it will take to complete each task.

Responsible: Agency Project Director & Project Manager, Development Contractor
Project Manager, QA Contractor Project Manager

Inputs: Work Breakdown Structure
Assumptions
Constraints
Resource Requirements

Tools & Techniques: Project Management Methodology
Expert Judgement
Top-down Estimating
Simulation
Project Management Software

Outputs: Task Duration Estimates
Basis of Estimates
Updates to Work Breakdown Structure containing task duration

7. Create Project Cost Management Plan

CMM: Level 2 – Software Project Planning
ESP: 1. Understand Context - Develop/Update Estimate of Situation
PMBOK: 7.2 Cost Estimating
Description: This process involves developing estimates of the cost of performing the project based on the resource estimates developed earlier and developing a cost management plan. The cost management plan should identify the steps that will be taken to manage the costs of the project. This should include ensuring that: 1) all project costs are accounted for, 2) cost overruns are highlighted and explained and 3) there is a mechanism for changing the cost estimates if necessary. **The planning of the costs may take place at three distinctly different times during a project. These are: 1) during the IT Planning/Feasibility Study process, 2) at the actual beginning of the project, and 3) at the beginning of each phase.**
Responsible: Agency Project Director & Project Manager, Development Contractor
Project Manager, QA Contractor Project Manager
Inputs: Work Breakdown Structure
Resource Requirements
Resource Rates
Task Duration Estimates
Tools &
Techniques: Project Management Methodology
Top-Down Estimating
Bottom-Up Estimating
Project Management Software
Outputs: Cost Estimates
Cost Management Plan

8. Develop Project Schedule

CMM: Level 2 – Software Project Planning
ESP: 1. Understand Context -Develop/Update Estimate of Situation
PMBOK: 6.4 Schedule Development
Description: This process involves determining beginning and ending dates for project activities and the development of a schedule management plan.
Responsible: Agency Project Director & Project Manager, Development Contractor
Project Manager, QA Contractor Project Manager
Inputs: Project Network Diagram
Activity Duration Estimates
Resource Requirements
Resource Pool
Calendars
Constraints
Assumptions
Known time delays
Tools &
Techniques: Project Management Methodology

CPM
 PERT
 Simulation
 Resource Leveling
 Project Management Software
 Outputs: Project Schedule
 Supporting Detail
 Schedule Management Plan
 Resource Requirement Updates

- 9. Identify Project Roles and Responsibilities** (Note - This process, on a very high level, will more than likely be performed first by the agency during the Feasibility Study, which is a part of Project Initiation. It is documented here because it is crucial that the process be performed again as part of the overall planning for the project when all project entities are together, possibly for the first time. It is also a process that can be performed many times during a project as new roles and responsibilities are defined.)

CMM: Level 2 – Software Project Planning

ESP: None identified

PMBOK: 9.1 Organizational Planning

Description: This process involves the identification, documentation, and assignment of project roles, responsibilities, and reportability.

Responsible: Agency Project Director & Project Manager, Development Contractor
 Project Manager, QA Contractor Project Manager

Inputs: Staffing Requirements
 Constraints

Tools &

Techniques: Project Management Methodology
 Role Standards
 Agency’s Human Resource Practices
 Stakeholder Analysis

Outputs: Roles and Responsibilities
 Staffing Management Plans
 Project Organization Chart
 Training Needs

Standards: The following standards apply to this project management activity:
Project Role Standards

- 10. Acquire Project Staff** (Note - This process, on a very high level, will more than likely be performed first by the agency during the Feasibility Study, which is a part of Project Initiation. It will also be performed first by the contractor when they prepare their proposal. It is documented here because it is crucial that the process be performed again as part of the overall planning for the project when all project entities are together, possibly for the first time. It is also a process that can be performed many times during a project as new roles and responsibilities are defined.)

CMM: *Level 2 – Software Project Planning*
ESP: *None identified*
PMBOK: *9.2 Staff Acquisition*
Description: This process involves acquiring the staff necessary for filling all the roles identified for the project.
Responsible: Agency Project Director & Project Manager, Development Contractor Project Manager, QA Contractor Project Manager
Inputs: Staffing Management Plans
 Development Contractor Proposal
 Project Contract
 Staffing Pool Description
 Recruiting Practices
Tools & Techniques: Project Management Methodology
 Role Standards
 Negotiations
 Pre-assignment
 Procurement
Outputs: Project Staff Assigned
 Project Team Directory
Standards: The following standards apply to this project management activity:
Project Role Standards

11. Identify Project Risks

CMM: *Level 2 – Software Project Planning*
ESP: *2. Analyze Risks - Perform Risk Analysis*
PMBOK: *11.1 Risk Identification*
Description: This process involves identifying and documenting all of the risks that may affect the project.
Responsible: Agency Project Director & Project Manager, Development Contractor Project Manager, QA Contractor Project Manager, Other Stakeholders, ITS Project Oversight Coordinator
Inputs: Other Planning Outputs
 Historical Information
 Constraints
Tools & Techniques: Project Management Methodology
 Risk Management Methodology
 Project Risk Management Standards
 Interviews
 Questionnaires
 Brainstorming
Outputs: Sources of Risks
 Potential Risk Events
 Risk Symptoms

Inputs to Other Processes
Risk Identification Questionnaires

Standards: The following standards apply to this project management activity:
Project Risk Management Standards

12. Analyze Project Risks

CMM: Level 2 – Software Project Planning

ESP: 2. Analyze Risks - Perform Risk Analysis

2. Analyze Risks - Review Risk Analysis

PMBOK: 11.2 Risk Quantification

Description: This process involves the analysis of identified risks to determine those risks that must be addressed by a Risk management Plan.

Responsible: Agency Project Director & Project Manager, Development Contractor
Project Manager, QA Contractor Project Manager, Other Stakeholders, ITS
Project Oversight Coordinator

Inputs: Stakeholder Risk Tolerances
Sources of Risks
Potential Risk Events
Cost Estimates
Activity Duration Estimates

Tools &

Techniques: Project Management Methodology
Risk Management Methodology
Project Risk Management Standards
Expected Monetary Value
Expert Judgement
Risk Assessment Workshops

Outputs: Opportunities To Pursue
Threats To Respond To
Opportunities To Ignore
Threats To Accept

Standards: The following standards apply to this project management activity:
Project Risk Management Standards

13. Develop Risk Management Strategies

CMM: Level 2 – Software Project Planning

ESP 2. Analyze Risks - Plan Risk Aversion

2. Analyze Risks - Commit to Risk Aversion Strategy

PMBOK: 11.3 Risk Response Development

Description: This process involves the development of responses to the opportunities and threats identified in the previous step.

Responsible: Agency Project Director & Project Manager, Development Contractor
Project Manager, QA Contractor Project Manager, Other Stakeholders, ITS
Project Oversight Coordinator

Inputs: Opportunities To Pursue
 Threats To Respond To
 Opportunities To Ignore
 Threats To Accept

Tools & Techniques: Project Management Methodology
 Risk Management Methodology
 Project Risk Management Standards
 Procurement
 Contingency Planning
 Alternative Strategies
 Insurance

Outputs: Risk Management Strategies
 Inputs to Other Processes
 Contingency Plans
 Contractual Agreements

Standards: The following standards apply to this project management activity:
Project Risk Management Standards

14. Develop Quality Management Plan

CMM: *Level 2 – Software Project Planning*
PMBOK: *8.1 Develop Quality Plan*
Description: This process involves identification of quality standards that are relevant to the project and the development of a plan to address them.
Responsible: Agency Project Director & Project Manager, Development Contractor
 Project Manager, QA Contractor Project Manager

Inputs: Quality Policies
 Scope Statement
 Standards
 Other Process Outputs

Tools & Techniques: Project Management Methodology
 Quality Assurance Methodology

Outputs: Quality Management Plan
 Quality Checklists
 Quality Definitions
 Inputs To Other Processes

Standards: The following standards apply to this project management activity:
Quality Standards

15. Prepare Project Communications Management Plan

CMM: *Level 2 – Software Project Planning*
PMBOK: *10.1 Communications Planning*

Description: This process involves the identification and documentation of the project stakeholders needs for communications from and about the project.

Responsible: Agency Project Director & Project Manager, Development Contractor Project Manager, QA Contractor Project Manager, Other Stakeholders

Inputs: Project Status Meetings Standard
 Project Status Reports Standard
 Project Issues Standard
 Communications Requirements
 Communications Technology
 Constraints
 Assumptions

Tools & Techniques: Project Management Methodology
 Stakeholder Analysis

Outputs: Communications Management Plan
Note: The Communications Management Plan must address status reporting and issues reporting needs to the ITS Board.

Standards: The following standards apply to this project management activity:
Project Status Meetings Standards
Project Status Reporting Standards
Project Issues Standards

16. Prepare Overall Project Plan

CMM: Level 2 – Software Project Planning
PMBOK: 4.1 Project Plan Development

Description: This process involves the consolidation of the results of all planning processes into a coherent document that will be used during project execution and project control processes.

Responsible: Agency Project Director & Project Manager, Development Contractor Project Manager, QA Contractor Project Manager, ITS Project Oversight Coordinator

Inputs: Outputs From Other Planning Processes
 Historical Information
 Organizational Policies
 Constraints
 Assumptions

Tools & Techniques: Project Management Methodology
 Project Management Software

Outputs: Project Plan
 Supporting Detail

State of Mississippi Project Management Methodology
Function: Project Executing

1. Execute the Project Plan

ESP: 4. Develop Product – Develop and Verify Product

PMBOK: 4.2 Project Plan Execution

Description: This process is the most costly and time-consuming process of the entire project. This process involves the coordination and direction of all of the project entities from both technical and organizational perspectives. **Note: The project must follow an industry standard application development methodology.**

Responsible: Agency project management, Development Contractor project management, QA Contractor project management

Inputs: Project Plan
Supporting Detail
Organizational Policies
Corrective Action

Tools &
Techniques: General Management Skills
Technology Skills and Knowledge
Status Meetings
Project Management Software
Organizational Procedures

Outputs: Work Results
Change Requests

Standard: The following standards apply to this project management activity:
Change Management Standard
Application Development Methodology Standard

2. Verify Project Scope

ESP: 4. Develop Product – Develop and Verify Product

PMBOK: 5.4 Scope Verification

Description: This process involves the review of project work and the verification that all work performed is correct and satisfactory and is within the scope of the project.

Responsible: Agency project management, Development Contractor project management, QA Contractor project management

Inputs: Work Results
Product Documentation
QA Contractor Reports
Scope Management Plan

Tools &
Techniques: Inspection
Outputs: Formal Acceptance

3. Verify Project Resources

Description: This process involves the review of project resources and the verification that resources are being allocated to the project as planned in the Project Planning function *Plan Project Resources*.

Responsible: Agency Project Manager, Development Contractor Project Manager, QA Contractor Project Manager

Inputs: Work Results
Resource Requirements
QA Contractor Reports

Tools &

Techniques: Inspection

Outputs: Formal Acceptance

4. Maintain and Update Project Plan

Description: This process involves the continuous review of the project plan and modification to the plan based on situations encountered.

Responsible: Agency Project Manager, Development Contractor Project Manager, QA Contractor Project Manager

Inputs: Project Plan
Work Results
Resource Requirements
QA Contractor Reports

Tools &

Techniques: Inspection
Project Management Software

Outputs: Modified Plan

5. Perform Project Communications

ESP: 4. Develop Product – Monitor and Review

PMBOK: 10.2 Information Distribution

Description: This process involves the implementation of the Communications Management Plan. It ensures that stakeholders receive adequate communications of project correspondence, memos, reports, and documents describing the project.

Responsible: Agency Project Manager, Development Contractor Project Manager, QA Contractor Project Manager

Inputs: Communications Management Plan
Work Results
Project Plan

Tools &

Techniques: Communications Skills
Information Distribution Systems

Outputs: Project Records
Standards: The following standards apply to this project management activity:
Project Status Meeting Standards
Project Status Reporting Standards

6. Perform Project Team Professional Development

PMBOK: 9.3 Team Development
Description: This process involves the development of project individuals and teams to be able to carry out their roles in the most effective way for the success of the project. The process also includes assuring that knowledge transfer occurs from the Development Contractor to the State.
Responsible: Agency Project Manager, Development Contractor Project Manager, QA Contractor Project Manager, ITS Project Oversight Coordinator
Inputs: Project Staff
Project Plan
Staffing Management Plan
Staff performance Reports
External Feedback
Tools &
Techniques: Team Building Activities
General Management Skills
Reward and Recognition Systems
Training
Outputs: Performance Improvements
Input to Performance Appraisals
Knowledge Transfer

7. Perform Quality Assurance Assessments

CMM: Level 2 – Software Quality Assurance
PMBOK: 8.2 Quality Assurance
Description: This process involves overall monitoring of the project by the ITS Project Oversight Coordinator or a separate QA Contractor to ensure that quality practices are being followed by the State, Development Contractor, and the QA Contractor and that the project is progressing in a satisfactory manner. This process includes periodic Quality Assurance Assessments.
Responsible: ITS Project Oversight Coordinator or Independent QA Contractor
Inputs: Quality Management Plan
Work Results
Quality Definitions
Quality Checklists
Tools &
Techniques: Quality Assurance Methodology
Quality Audits
Outputs: Quality Improvements

Project Quality Assurance Review Report
Standards: The following standards apply to this project management activity:
Quality Assurance Standards

8. Perform Project Contract Administration

CMM: Level 2 – Software Subcontract Management

PMBOK: 12.4 Contract Administration

Description: This process involves ensuring that the Development Contractor's contract and the QA Contractor's contract are met by their performance.

Responsible: ITS Project Oversight Coordinator and Agency Contract Management

Inputs: Contract
Work Results
Change Requests
Contractors' Invoices

Tools &

Techniques: Contract Change Control System
Performance Reporting
Payment System

Outputs: Correspondence
Contract Changes
Payment Requests

Standards: The following standards apply to this project management activity:
Change Management Standards
Contract Management Standards

State of Mississippi Project Management Methodology
Function: Project Controlling

1. Prepare Performance Reporting

CMM: Level 2 – Software Project Tracking and Oversight

ESP: 5. Manage and Plan – Review Progress

PMBOK: 10.3 Performance Reporting

Description: This process involves the preparation and dissemination of project performance information to stakeholders.

Responsible: Agency Project Manager, Development Contractor Project Manager, QA Contractor Project Manager

Inputs: Project Plan
Work Results
Other project Records

Tools &

Techniques: Performance Reviews
Variance Analysis
Trend Analysis
Earned Value Analysis
Information Distribution Tools and Techniques

Outputs: Status Meetings, Performance Reports (Status Reports, Actuals vs Estimates, Issues, etc)

Standards: The following standards apply to this project management activity:
Project Status Meeting Standards
Status Reporting Standards
Project Issues Standards

2. Conduct Project Scope Change Control

CMM: Level 2 – Software Project Tracking and Oversight

ESP: 5. Manage and Plan – Project Change Control

PMBOK: 5.5 Scope Change Control

Description: This process involves ensuring that scope changes are beneficial, recognizing that a scope change has occurred and managing the scope change.

Responsible: Agency Project Manager, Development Contractor Project Manager, QA Contractor Project Manager

Inputs: Work Breakdown Structure
Performance Reports
Change Requests
Scope Management Plan
Contract

Tools &

Techniques: Scope Change Control System
Performance Measurement
Additional Planning

Outputs: Scope Changes
Corrective Action
Lessons Learned

Standards: The following standards apply to this project management activity:
Change Management Standards
Contract Management Standards

3. Conduct Project Schedule Change Control

CMM: Level 2 – Software Project Tracking and Oversight
ESP: 5. Manage and Plan – Project Change Control
PMBOK: 6.5 Schedule Control

Description: This process involves ensuring that schedule changes are beneficial, recognizing that a schedule change has occurred, and managing the schedule change.

Responsible: Agency Project Manager, Development Contractor Project Manager, QA Contractor Project Manager

Inputs: Project Schedule
Performance Reports
Change Requests
Schedule Management Plan
Contract
Risk Management Plan

Tools &
Techniques: Schedule Change Control System
Performance Measurement
Additional Planning
Project Management Software

Outputs: Schedule Updates
Corrective Action
Lessons Learned

Standards: The following standards apply to this project management activity:
Change Management Standards
Contract Management Standards

4. Conduct Project Cost Change Control

CMM: Level 2 – Software Project Tracking and Oversight
ESP: 5. Manage and Plan – Project Change Control
PMBOK: 7.5 Cost Control

Description: This process involves ensuring that cost changes are beneficial, recognizing that a cost change has occurred and managing the cost change.

Responsible: Agency Project Manager, Development Contractor Project Manager, QA Contractor Project Manager

Inputs: Cost Baseline
Performance Reports

Change Requests
 Cost Management Plan
 Contract
 Risk Management Plan

Tools &
 Techniques: Cost Change Control System
 Performance Measurement
 Additional Planning
 Computerized Tools

Outputs: Revised cost Estimates
 Budget Updates
 Corrective Action
 Estimate at Completion
 Lessons Learned

Standards: The following standards apply to this project management activity:
Change Management Standards
Contract Management Standards

5. Conduct Project Change Control

CMM: Level 2 – Software Project Tracking and Oversight
ESP: 5. Manage and Plan – Project Change Control
PMBOK: 4.3 Overall Project Change Control

Description: This process involves the final determination and justification of the need for scope, schedule, and cost changes, reflecting the changes in the Project Plan and Project Scope, monitoring that the changes are implemented, and coordinating the changes across the entire project

Responsible: Agency Project Manager, Development Contractor Project Manager, QA Contractor Project Manager

Inputs: Project Plan
 Project Scope
 Performance Reports
 Change Requests

Tools &
 Techniques: Change Control System
 Configuration Management
 Performance Measurement
 Additional Planning
 Project Management Information System

Outputs: Project plan Updates
 Corrective Action
 Lessons Learned

Standards: Change Management Standards
 Contract Management Standards

6. Conduct Project Quality Control

CMM: *Level 2 – Software Quality Assurance*
ESP: *5. Manage and Plan – Review Progress*
PMBOK: *8.3 Quality Control*
Description: This process involves the monitoring and testing of project results and deliverables to determine if they comply with project plans and requirements.
Responsible: Agency Project Manager, Development Contractor Project Manager, QA Contractor Project Manager
Inputs: Work Results
 Test Plans
 Quality Management Plan
 Quality Definitions
 Quality Checklists
Tools & Techniques: Inspection
 Control Charts
 Pareto Diagrams
 Statistical Sampling
 Trend Analysis
 Functional and Technical Testing
Outputs: Quality Improvements
 Acceptance Decisions
 Rework
 Completed Checklists
 Process Adjustments

7. Conduct Risk Management Control

CMM: *Level 2 – Software Project Tracking and Oversight*
ESP: *3. Plan Development – Execute Risk Aversion*
PMBOK: *11.4 Risk Response Control*
Description: This process involves executing the Risk Management Strategies over the project in order to ensure the projects response to risks.
Responsible: Agency project management, Development Contractor project management, QA Contractor project management
Inputs: Risk Management Strategies
 Actual Risk Events
 Additional Risk Identification
Tools & Techniques: Workarounds
 Additional Risk Response Development
Outputs: Corrective Action
 Updates To Risk Management Plan
Standards: The following standards apply to this project management activity:
Risk Management Standards

State of Mississippi Project Management Methodology
Function: Project Closing

1. Perform Phase or Project Contract Closing

PMBOK: 12.3 Contract Closing

Description: This process involves generating, gathering, and disseminating information needed to formalize the closing of a phase or of the project.

Responsible: Agency project management, Development Contractor project management, QA Contractor project management

Inputs: Contract and supporting documentation

Tools &

Techniques: Contract Administration

Outputs: Contract File

Formal Acceptance and Closure

2. Perform Phase or Project Administrative Closing

PMBOK: 10.4 Administrative Closure

Description: This process involves verification and documentation of phase or project results.

Responsible: Agency project management, Development Contractor project management, QA Contractor project management

Inputs: Performance Documentation

Project Product Documentation

Other Project Records

Tools &

Techniques: Performance Reporting

Outputs: Project Archives

Formal Acceptance

Lessons Learned

Best Practices

State of Mississippi Project Management Methodology Project Management Standards

Standard: Project Issues

An issue is a need for a decision or action that is holding up the progress of some project activity.

Projects must maintain a database of issues. The database should contain:

- Issue Description
- Issue Identification Date
- Person Identifying the Issue
- Person(s) Assigned To the Issue Resolution
- Issue Resolution Date
- Description of the Resolution of the Issue
- Issue Type – (Functional or Technical)

Outstanding Issues must be identified and discussed during Project Status Meetings and on Project Status Reports.

State of Mississippi Project Management Methodology Project Management Standards

Standard: Project Management References

In the development of the State of Mississippi Project Management Methodology, two references were used. Those references are being included as standard references in support of the methodology. The references are:

1. *A Guide To The Project Management Body of Knowledge(PMBOK)* - This document is produced by the Standards Committee of the Project Management Institute. The document covers all aspects of the project management discipline and is used worldwide as a reference, textbook, and methodology source. The State of Mississippi Project Management Methodology indicates on each process what the corresponding process(es) are in the PMBOK.
2. *Evolutionary Spiral Process (ESP) Model Guidebook - Volume 1 Concepts and Principles* - This document is produced by the Software Productivity Consortium. The document describes a flexible way to respond dynamically to the unique circumstances present in a software development effort. The ESP model encourages users to seek alternative solutions for satisfying project objectives within identified constraints and to make decisions that eliminate alternatives from further consideration while keeping other options open. An overview of the ESP process follows:

State of Mississippi Project Management Methodology Overview of the Evolutionary Spiral Process (ESP)

The ESP Model provides a method that can be used to plan and evolve your project development process incrementally based on current project situations. ESP focuses on high-risk items early in the development life cycle, preventing them being hidden in the hope that they will go away. ESP measures project progress by how well the project is meeting the defined objectives and reducing the risks.

There are 5 steps to the ESP Model. Each step is performed once during a cycle (phase). A spiral is one or more cycles (phases) that accomplish a specific objective, usually to complete a project. The steps and their activities are:

1. Understand Context – This step is similar in function as the scoping activities in the Project Management Methodology. The activities are:
 - A. Define Approach
 - Stakeholders
 - Objectives
 - Alternatives
 - Constraints

- B. Develop/Update Estimate of the Situation
 - Scope of Spiral
 - Process Drivers
 - Mission and History
 - Stakeholders and Expectations
 - Spiral Objectives and Success Criteria
 - Current Cycle Objectives
 - Inherited Decisions and Assumptions
 - Characteristics of Known Requirements and Operations
 - Known Constraints
 - Factors Affecting Success of Spiral and Current Cycle

- C. Review Context

- 2. Analyze Risks – Perform risk analysis to help identify, address, and eliminate risk items before they become threats to stakeholder win conditions, successful software operation, or overall spiral success.
 - A. Perform Risk Analysis
 - Identify Risks – Attempt to identify all of the risks to your spiral and current cycle objectives.
 - Analyze Risks – Once the risks have been identified, you categorize them and determine the likelihood and consequence of them occurring.
 - Evaluate Risks – Evaluate the risks to identify potential risk aversion strategies and examine the impact of the strategy on a particular risk.
 - B. Review Risk Analysis – this is a team review of the risks identified, analyzed and evaluated above.
 - C. Plan Risk Aversion – Evaluate and select risk aversion strategies to be followed.
 - D. Commit to Risk Aversion Strategy – Brief stakeholders on previous activities and solicit their commitment to the risk aversion strategies selected by the project team.

- 3. Plan Development – Plan and schedule the development and development support activities.
 - A. Execute Risk Aversion – Perform to the risk aversion plan and select one or more alternatives.
 - B. Review Alternatives – Review the selected alternatives,

- C. Plan and Schedule – Identify, organize, schedule, and assign resources to technical activities after any risks associated with development alternatives for the cycle have been averted.
 - D. Commit to Plan – Review and commit to the cycle plan for the current cycle development activities.
4. Develop Product – Perform, monitor, and review the development and development support activities.
- A. Develop and Verify Product – Perform the development activities to produce deliverables and to verify that deliverables meet requirements, development goals, and development success criteria.
 - B. Monitor and Review – Monitor and review the technical development activities as they are performed.
 - C. Review Technical Product – Review the product to ensure that cycle objectives, development goals, and development success criteria were met.
5. Manage and Plan – Take stock of progress based on the outcome and lessons learned during the cycle, compare actual results against cycle objectives, reevaluate and update spiral planning documents and decide what to do next.
- A. Product Change Control – Place the product produced as a result of Step 4 under product change control.
 - B. Review Progress – Evaluate development plan actuals versus estimates, success criteria, and lessons learned. Update process drivers, including spiral objectives, success criteria, alternatives, constraints, risks, estimates.
 - C. Update Spiral Planning Documents – Update all planning documents, as necessary, to record actual progress, reflect lessons learned, update estimates based on actual data, and update process drivers.
 - D. Commit to Proceed – Review updates to the spiral planning documents and commit to proceed with next cycle.

Typically over the life of a project using ESP, risk levels decrease significantly over time, thus reducing the amount of time needed to be spent on ESP activities.

**State of Mississippi Project Management Methodology
Project Management Standards**

Standard: Initial Planning Report

Agencies must prepare a Initial Planning Report (IPR) for every strategic project. The IPR should be prepared in accordance with the *State of Mississippi Initial Planning Report Guidelines*.

**State of Mississippi Project Management Methodology
Project Management Standards**

Standard: Project Risk Management

Every project must identify, categorize, analyze, and mitigate risks. The management of the associated processes must follow a risk assessment and management methodology such as the one specified in the *State of Mississippi Risk Management Methodology*.

State of Mississippi Project Management Methodology Project Role Standards for the State Project Team

Standard: Project Roles

Projects must contain key roles for carrying out the project activities. Recommended roles are:

- **Project Director** - This agency person, if present, is usually functionally-oriented with management experience in the functionality being addressed by the project. This person has overall direction responsibilities (agency, ITS, and vendors) over the project and coordinates all non-technical project activities between division and department directors to ensure that the necessary user resources are available.
- **Project Advisor** - If the project is a large one and the agency has a Project Manager, this is a ITS person who has the responsibility of providing advice to the Project Director and/or the Project Manager, performing Independent QA Assessments, and managing the contract.
- **Project Manager** - This person works closely with Contractor Project Managers and is responsible for managing the day-to-day activities of state staff.
- **Technical Team Leader**- This person, if present, will usually be responsible for state technical personnel resources on the project.
- **Technical Team Member** - This person works on the project in a technical role, usually as part of a development team.
- **Functional Team Leader** - This is a person with a high level of functional knowledge and management support who is responsible for a team of functional users who work on the project.
- **Functional Team Member (State)** - This is a person, with knowledge of specific functionality, who will perform key input, review, and testing activities on the project.
- **Project Steering Committee Member** - This is usually an Agency or ITS management person. In a typical agency, all departments or divisions affected by the project should be represented on the steering committee.
- **Project Stakeholders** - Individuals and organizations who are actively involved in the project, or whose interests may be positively or negatively affected as a result of project execution or successful project completion.

State of Mississippi Project Management Methodology Project Management Standards

Standard: Project Status Meetings

Project Status Meetings must be held on at least a bi-weekly basis. Attendees of status meetings should include at a minimum:

- State Project Director
- State Project Manager
- State Functional Team Leader
- State Technical Team Leader
- Development Contractor Project Manager
- QA Contractor Project Manager
- ITS Project Oversight Coordinator

Agenda items for status meetings should include:

- Review of Outstanding Project Issues or New Issues
- Review of Project Status (QA and Development)
 - Risk Management Status
 - Identification and Discussion of Task Overruns
 - Identification and Discussion of Resource Shortages
 - Identification and Discussion of Potential Scope Changes
- Review of Knowledge Transfer Status

Minutes of the status meeting should be distributed to attendees no later than the second working day after the meeting

State of Mississippi Project Management Methodology Project Management Standards

Standard: Project Status Reporting

Project Status Reports must be completed on a monthly basis by the Development Vendor Project Manager and the QA Vendor Project Manager. Recipients of status reports should include:

- State Project Director
- State Project Manager
- State Functional Team Leader
- State Technical Team Leader
- Development Contractor Project Manager
- QA Contractor Project Manager
- ITS Project Oversight Coordinator

Items for Status Reports should include:

- Completed Activities for the Previous Month
 - Deliverables Completed Ahead of or On Schedule
 - Deliverables Completed Behind Schedule - identify actions taken to maintain overall Phase schedule.
- Deliverables Running Behind Schedule - identify actions taken to maintain overall Phase schedule.
- Planned Activities for the Upcoming Month
- Outstanding Project Issues at End of Month
- Project Resource Shortages
- Potential Scope Changes
- Phase To Date Gantt Chart Showing Projected and Actual

Project Status Reports should be distributed to recipients no later than the fifth working day after the end of the month.

State of Mississippi Project Management Methodology Project Quality Standards

Standard: Project Quality

The following standards apply to quality on projects:

1. **Quality Assurance Assessments** must be performed for all strategic projects on a quarterly or semi-annual interval, determined by ITS and the agency at the time of project initiation based on the complexity, severity, risks, and costs of the project. The ITS Board may recommend a change in assessment interval at any time.

A quality assurance assessment will be performed by the ITS Project Oversight Coordinator (IPOC) or, if the project is managed by ITS, an independent contractor.

A quality assurance assessment uses the *Quality Assurance Assessment Guidelines* as the methodology for performing the assessment. These guidelines may be amended on certain projects by agreement of ITS and the project agency.

The results of a quality assurance assessment will be presented to the project agency and to the ITS Board.

2. Each strategic project must develop a **Quality Management Plan**. This plan must specify the quality objectives of the project and internal activities of the project to ensure that the deliverables and other outputs of the project meet those objectives. This plan will become a part of the overall project plan.
3. Each strategic project must perform **Project Quality Control** throughout the life cycle of the project. Project quality control consists of those activities that monitor and test project results to determine if they comply with plans and requirements.

Project Rating for Mission Critical Systems

1. Automated systems that are essential to the agency to complete required legal obligations or legislatively mandated business functions.
2. Any system that by failing could jeopardize the health, safety, or financial well being of the citizens or employees of the State of Mississippi.
3. Systems responsible for the administration of benefits to the public, the exchange of data with other governmental jurisdictions and business taxpayers, or otherwise required for the state to meet its legal obligations to the public and its employees.
4. Systems under the state's control that link to mission critical systems and that, if altered, could undermine the state's integrity.

Project Rating for Severity Level

	Impact on Citizens	Visibility	Impact on State Operations	Nil Consequence
High	* Direct contact with citizens including benefits to, payment by, and transactions with individuals.	* Highly visible to public and Legislature. * Total budget of \$\$\$\$ or more. * Multiple agency involvement.	* Statewide or multiple agency impact. * Mainframe acquisitions and networks.	* Inability to meet legislative mandate or agency mission. * Loss of significant funding.
Medium	* Indirect impact on citizens - activity management systems that support decisions are viewed as important by the public.	* Some visibility to the Legislature; the system or the program(s) it supports are likely to be subject to hearings.	* Agency wide.	* Potential failure of aging systems.
Low	* Agency operations	* Internal agency only.	* Work group.	* Loss of opportunity for improved service delivery or efficiency.

Project Rating for Risk Level

	Organizational Impact	Development Effort	Technology	Capability
High	<ul style="list-style-type: none"> * Significant change to business rules. * Complex business processes. * Multiple organizations involved. 	<ul style="list-style-type: none"> * High development and system integration costs. * Over 3 years in development. * More than 30 staff years. 	<ul style="list-style-type: none"> * Emerging. * Unproven. * New for state. 	<ul style="list-style-type: none"> * Immature organization. * Uses ad-hoc processes. * Agency track record suggests inability to mitigate risk on project requiring a give level of development effort.
Medium	<ul style="list-style-type: none"> * Moderate changes to business rules. * Medium complexity. 	<ul style="list-style-type: none"> * Up to 30 staff years. * \$\$\$\$\$ * 2 - 3 years in development. 	<ul style="list-style-type: none"> * Proven in industry or at state level. * New to agency or program areas. 	<ul style="list-style-type: none"> * Maturing organization. * Agency track record indicates reasonable level of success but without the structure for repeatability.
Low	<ul style="list-style-type: none"> * Insignificant or no change to business rules. * Low complexity business process(es). 	<ul style="list-style-type: none"> * Under 10 staff years. * Under \$\$\$\$\$. * Under 2 years in development. 	<ul style="list-style-type: none"> * Standard, proven agency technology. 	<ul style="list-style-type: none"> * Mature organization. * Agency track record indicates strong ability to mitigate risk to a project requiring a given level of development effort. * Stable organization, documented and repeatable processes for tracking status, problems, and change.

Project Rating for Oversight

High Severity	Level 1	Level 2	Level 3
Medium Severity	None	Level 1	Level 2
Low Severity	None	None	Level 1
	Low Risk	Medium Risk	High Risk

Oversight Criteria

	Justification & Approval Decision	Project Management Approach/Execution	Oversight
Level 3	<ul style="list-style-type: none"> * Agency executive approval * ITS review and comment * Board approval 	<ul style="list-style-type: none"> * Board approval * Prototype required at discretion of ITS * Private sector participation encouraged or required 	<ul style="list-style-type: none"> * Independent Validation & Verification as indicated * ITS discretionary * Reported as part of plan
Level 2	<ul style="list-style-type: none"> * Agency executive approval * ITS review and comment 	<ul style="list-style-type: none"> * Agency executive approval * ITS support 	<ul style="list-style-type: none"> * Internal or external QA * ITS audit as indicated * Reported as part of plan
Level 1	<ul style="list-style-type: none"> * Agency executive approval with option of ITS consultation 	<ul style="list-style-type: none"> * Agency-defined methods 	<ul style="list-style-type: none"> * Internal QA at agency determination * May be reported as part of portfolio

Role Identification

ITS Project Oversight Coordinator (IPOC)

Role Responsibilities:

Assist the Agency with Initial Planning Report - Actually performing the study for a client agency or assisting them in the performance of the study. At a minimum, this role should involve high-level assistance the first time an agency is performing an Initial Planning Report. See Project Initiation - Step 2.

Facilitate the ITS Review of the Initial Planning Report - Work with the ITS Review Committee and the client agency IT Director to ensure the compliance of the Initial Planning Report. See Project Initiation - Step 3.

Recommend Project To ITS Board - Based on acceptable review of the project Initial Planning Report, represent the ITS Review Committee and the client agency by presenting the project to the ITS Board. See Project Initiation - Step 4.

Lead the Procurement Effort - Based on Board approval of the project, work with the client agency and ITS to conduct the RFP process, select the winning vendor(s), recommend the winning vendor to the ITS Board, and negotiate the contract with the winning vendor(s). See Project Initiation - Steps 7 - 10.

Participate in Project Planning - At the beginning of the project, and the beginning of subsequent phases, work with the project team on the development of the project plan. See Project Planning - Steps 1-16. Note: Depending on the size and complexity of the project, Steps 11-13 (Risk Management) and Step 16 (Overall Project Plan) may be the only planning activities in which the role would need to participate.

Participate in Project Status Meetings - Attend all or selected status meetings. For example, if the project has an informal status meeting weekly and a formal status meeting monthly, the role may want to attend the monthly meeting. See Project Controlling - Step 1.

Review Project Status Reports - Receive all project status reports and review for correctness, issues, unresolved problems, etc. See Project Controlling - Step 1.

Review Selected Deliverables - Based on the nature of the project, review deliverables that are considered to be key to the success of the project. For example, this review may include General Design Documents, Testing Results, Training Plan, etc. See Project Controlling - Step 6.

Perform Periodic QA Assessments - Perform periodic assessments of the project as defined in the Quality Assurance Assessment Guidelines. See Project Execution - Step 7.

Perform Project Management Mentoring - As needed, perform mentoring to client agency staff on Project Management and Quality Assurance techniques.

Perform Problem Resolution - As needed, assist the client agency in resolving project problems.

Perform Contract Administration - Ensure that the Client Agency, the Development Contractor and the QA Contractor are fulfilling their contractual obligations. See Project Execution - Step 8.

Project Closing - Work with project staff to document lessons learned on the project. See Project Closing - Step 2.

Advocate - Represents the best interests of the agency, the vendor(s), and ITS in situations where to do so adds value to the project.

**DEPARTMENT OF INFORMATION
TECHNOLOGY SERVICES**

QUALITY ASSURANCE

ASSESSMENT GUIDELINES



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ITS QUALITY ASSURANCE ASSESSMENT GUIDELINES

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I. INTRODUCTION

ITS is dedicated to ensuring that all projects designated as “strategic” follow Project Management and Quality Assurance Guidelines and result in a quality product. The purpose of the assessment process is to provide a mechanism for periodically assessing how effectively State agencies and vendors are managing projects and implementing quality assurance techniques into their projects. The results of the assessments provide continuous feedback to the projects, facilitating identification and correction of individual project discrepancies, enhancement of QA and Project Management guidelines, and retraining of Project Managers in their use.

Sections VII and VIII are included in these guidelines to address the assessment of Independent Quality Assurance (IQA) functions on strategic projects and provide a checklist for IQA functions.

DRAFT

II. OBJECTIVES

The objectives for the quality assurance assessments are as follows:

1. To improve the effectiveness of the project management and independent quality assurance functions on strategic state projects.
2. To evaluate the degree of success with which strategic projects are managed.
3. To provide a periodic assessment of the health of a strategic project conducted by a entity that is not involved in the day-to-day activities of the project.
4. To provide early identification of projects in trouble, and recommendations for rehabilitation of such projects.

III. PREPARING FOR THE ASSESSMENT

It is important to notify affected agencies/individuals in advance about pending Quality Assurance (QA) Assessments in order to schedule a convenient time for all participants. In some cases, people may be out of town or the timing may be especially bad for the project; such as a tight deadline for a deliverable.

Listed below are steps in preparing for the assessment:

1. Approximately one month prior to the planned assessment for a large project, or two weeks for a small project, submit a memorandum to the Client Project Director (if any), the development and quality assurance Vendor Project Manager(s) (if any), and the Client Information Technology (IT) Director outlining the desired schedule for the assessment. For a small project, the correspondence may only need to go to the Client IT Director. Copies of this memorandum and all assessment related correspondence should be sent to the ISS Director and anyone participating in the actual assessment.

The memorandum should outline the planned agenda for performing the assessment, including suggested dates and times for each activity and explanations of what will occur in each activity. Also, include a list of deliverables or other items that will be reviewed. The memorandum should solicit corrections to dates and times.

2. Upon receipt of confirmation or corrections to dates and times, make any necessary modifications to the agenda and submit to the same correspondents.
3. Prepare checklists for the project, using previously created templates and modifying as needed for anything unique to the project. This should be included, along with results of previous assessments of the same project, in the work papers that will be used for the assessment.
4. Prior to the starting date of the assessment, contact the Client Project Director or IT Director to ensure that the needed resources are available to start the assessment.

IV. CONDUCTING THE ASSESSMENT

The assessment should be conducted in a professional, helpful manner, that encourages rather than discourages. ITS is assessing a project in this process, not the abilities of any individuals. The following suggested process for conducting the assessment, and the accompanying checklist, would be for a large project. It would need to be scaled down, as necessary by the QA Assessor based on project size and complexity.

1. Interview ISS and other ITS management to receive an overview of the project situation.
2. Interview any ITS staff assigned to or working with the project.
3. Interview the Project Director (if any) and other key functional personnel from the client agency.
4. Interview the Quality Assurance and Development Vendor Project Manager(s) (if any).
5. Interview the IT Director and other key IT personnel from the client agency who are assigned to or supporting the project.
6. Review Project Plans, status reports, and time reports.
7. Review requirements tracking and issue tracking mechanisms.
8. Conduct an overview of project deliverables.

Following are some suggestions for the QA Assessor to keep in mind while conducting the assessment:

- The QA Assessor should take all precautions to assure that the assessment is conducted in such a way as to cause minimal, if any, disruption of the project.
- Interviews should be brief and to the point. However, if someone, particularly from the client agency, wishes to elaborate on any issues, they should be allowed.
- When holding interviews, the QA Assessor should be aware of the need for privacy if sensitive issues need to be discussed.
- The QA Assessor should be careful to convey a positive, helpful image about the assessment process. The assessment is being held to determine the health of the project. Negative issues must be followed up on, but care should be taken not to dwell on them in such a way as to cause additional problems on the project.

Note: Sections VI and VIII are checklists intended to assist the QA Assessor in performing the process. The checklists should be modified, as needed, for the particular project being assessed.

V. CONDUCTING THE POST-ASSESSMENT EVALUATION

The post-assessment evaluation should begin immediately after the assessment has been concluded. This process involves analysis and evaluation of the information obtained during the assessment and the preparation of a QA Assessment Report. Following are suggested steps for this process:

1. Review notes, checklists, and other materials gathered during the assessment.
2. Analyze and classify the information. Information should be organized into the following major classifications:
 - **Project Strengths:** Project strengths is narrative information about the positive things being done by the project. The results of the assessment should not dwell on negatives only. The positive things about the project should be emphasized.
 - **Client Agency Challenges:** Client agency challenges is narrative information about the inadequate things observed about the project resulting from problems at the client agency.
 - **Project Challenges:** Project challenges is narrative information about the inadequate things observed about the project resulting from insufficient project management and/or quality assurance.
 - **ITS Challenges:** ITS challenges is narrative information about the inadequate things observed about the project resulting from problems at ITS in its role of facilitating and supporting strategic projects.

Each challenge identified above and its effect on the project should be described.

3. Develop recommendations for addressing the client agency challenges, project challenges, and ITS challenges.
4. Prepare the first draft of the QA Assessment Report. This should be reviewed with ISS management.
5. Make necessary modifications based on the review.
6. Meet with ISS management and management of the project to discuss all points in the report and to ensure that all parties know their responsibilities. Generally, these responsibilities should be:
 - The Project Director, Quality Assurance and Development Vendor Project Manager(s), and the Client IT Director will be responsible for addressing the client agency and project challenges.
 - ITS management will be responsible for addressing the ITS challenges.
7. These responsibilities are finalized and the final document is produced and distributed.
8. The QA Assessment Report is presented to the ITS Board at the next meeting after completion of the assessment.
9. ITS Board recommendations become action items and are included into the final document by a repetition of steps 6 and 7.

VI. PROJECT MANAGEMENT ASSESSMENT CHECKLIST

This checklist is representative of the types of questions that should be asked about the management of the project. These questions and the answers to them should elicit other questions. For example, many of the questions ask if something was done and should be answered with a "yes" or "no". If the answer is "no", the next question may be "why not?" The answer to that question may bring up still other questions. Many potential problems may be uncovered in this way.

QUESTION	COMMENTS
1. Were objectives developed for the project and approved by ITS and the client agency prior to the start of the project?	
2. Have the attainment of these objectives been communicated to project personnel?	
3. Were constraints identified for the project and approved by the client agency prior to the start of the project?	
4. Have the constraints been communicated to project personnel?	
5. Were risks assessed for the project resulting in a Risk Management Plan that was approved by the client agency?	
If so, has the Risk Management Plan been followed and updated when necessary?	
7. Was a Project Plan developed for the project including: <ul style="list-style-type: none"> • Work Breakdown Structure • Roles and Responsibilities • Estimates and Schedules • GANTT Chart • Deliverables 	
8. What techniques were used in estimating work for project tasks?	
9. Was the ITS Project Management Methodology reflected in the Project Plan?	
10. Was the Project Plan reviewed and approved by client agency management prior to the start of the project?	
11. Is the Project Plan currently in use?	
12. Are project personnel aware of the Project Plan and its importance?	
13. Are project personnel aware of where the tasks they are working on are reflected on the Project Plan and where the project stands on schedule and estimates?	
14. Is the Project Plan periodically reviewed and modified, as necessary?	
15. Are schedules and estimates continuously reviewed and modified, as necessary, based on actual experience?	
If so, are client agency management and ITS management aware of the revisions?	
If so, are project personnel aware of the revisions?	
17.	
18. Is the monetary budget of the project monitored closely to assure that the project will stay within budget?	
19. Are the proper client agency resources dedicated or available to the project?	
20. If not, have commitments of these resources been requested?	
21. Are the proper ITS resources dedicated to the project?	
22. If not, what steps have been taken to try to obtain them?	
23. Have project standards been developed?	
24. Do all project members understand their roles and responsibilities on the project and who fills the other roles and responsibilities?	
25. Has the project development environment been established?	
If so, is it functioning properly?	
26.	

27. Has special training been obtained for project members, if necessary?	
28. Are client agency approvals received in writing on a deliverable prior to starting on a deliverable that is dependent on the successful completion of the first deliverable?	
29. Are efforts made to keep the project within scope?	
30. Have there been scope changes on the project?	
31. Are scope changes highlighted and documented to the client agency along with the affect they will have on the project?	
32. What process was used to ensure that scope changes are justified and that project resources (people, hardware, software, funds) are adequate to handle the change?	
33. What process was used to ensure that scope changes included analysis of all completed deliverables to determine any rework needed.	
34. Do deliverables reflect good software engineering techniques?	
35. Have the proper people been involved in the review of project deliverables?	
36. Are internal Quality Assurance practices being applied such as:	
<ul style="list-style-type: none"> • Continuous emphasis of importance of producing a quality product? • QA testing of all deliverables. • Acceptance testing by client functional and technical staff. • Full acceptance of and cooperation with the Independent Quality Assurance function (if any)? • Use of a requirements tracking mechanism? • Use of an issues tracking mechanism? • Internal walkthroughs on deliverables prior to presentation to the client agency? 	
37. Are conflict resolution procedures identified and used for the project?	
38. Are project priorities continuously reviewed and adjusted as necessary?	
39. If so, are client agency management and project personnel aware of new priorities?	
40. If roles and/or responsibilities change on the project, are client agency management and project personnel aware of changes?	
41. Are project status meetings held regularly to update key project members and client agency personnel on status and issues?	
42. Are agendas prepared for project meetings? Are meeting notes distributed to all attendees of project meetings?	
43. Are unresolved issues allowed to remain unresolved to the point where they affect project progress?	
44. Has adequate change control been established on the project?	
45. Are there any problems with ITS involvement in the project?	
46. If so, how have they been handled?	
47. Have all ITS problems been resolved?	
48. Has a steering committee been established for the project?	
49. If so, is it active?	
50. Are any client agency personnel reporting to managers on the project?	
51. If so, have management agreements been reached for them?	

52. Is there a good relationship with between the Development Vendor and the client agency?	
53. If not, what are the reasons? What steps have been taken to address the situation?	
54. Is the Development Vendor performing adequately on the project?	
55. If not, what are some examples and what is being done about it?	
56. Is adequate time being captured for project members to determine problems on work estimates or schedules?	
57. Are project time reports being produced that allow for early warning of problems with work overages or missed deadlines? If so, are these reports being monitored adequately?	
58.	
59. Are tasks or activities that show signs that they may go over on estimates analyzed to determine the problems and then a plan developed for addressing the problems?	
60. IS client agency management informed of overages or missed deadlines, along with causes and ways to keep similar occurrences from happening?	
61. Are project status reports prepared for client agency management and ITS that reflect the true status of the project and emphasize the issues that are affecting the progress of the project?	
62. Is project documentation adequate and easily available for review?	
63. Is the client agency satisfied with the way that the project is progressing?	
64. If not, what are the major complaints?	
65. Is the Development Vendor Project Manager aware of the client agency major complaints?	
66. If so, what is being done to address them?	
67. Is the Development Vendor (if any) satisfied with the way the project is progressing?	
68. If not, what are the major complaints?	
69. Is the client agency aware of the vendor complaints?	
70. If so, what is being done to address them?	
71. Have recommendations from the last Quality Assurance Assessment been implemented?	
72. If not, what are the reasons?	
73. If so, what are the results?	

VII. ASSESSING A INDEPENDENT QUALITY ASSURANCE (IQ) FUNCTION

INTRODUCTION

In addition to Project Management functions on strategic projects, vendors can also provide the Independent Quality Assurance functions on such projects. These guidelines provide information to guide the QA Assessor in the activities necessary to provide independent QA monitoring of the effectiveness of Independent Quality Assurance functions on strategic projects.

All activities for the assessment of the Independent Quality Assurance function should be conducted as part of the overall project assessment and are the same as for assessing the management of the project except as specified below:

- The Quality Assurance Project Manager and key QA team members are to be interviewed for both assessments.

-
- A different checklist should be used for the Independent Quality Assurance assessment (see Section VIII for the checklist).
 - The assessment of Independent Quality Assurance focuses on activities specified in the Independent Quality Assurance Guidelines.
 - The Post-Assessment Evaluation should contain a separate section, structured the same as the one for management of the project and dealing with Independent Quality Assurance issues.

Draft

VIII. ITS INDEPENDENT QUALITY ASSURANCE ASSESSMENT CHECKLIST

This checklist is representative of the types of questions that should be asked about the Independent Quality Assurance (IQA) function on a project. These questions and the answers to them should elicit other questions. For example, many of the questions ask if something was done and should be answered with a "yes" or "no". If the answer is "no", the next question may be "why not?" The answer to that question may bring up still other questions. Many potential problems may be uncovered in this way.

QUESTION	COMMENTS
1. Was a Project Plan developed for the IQA function?	
2. Does the IQA Project Plan closely follow the activities and deliverables of the project?	
3. What techniques were used in estimating work for IQA tasks?	
4. Was the IQA Project Plan reviewed and approved by ITS prior to the start of the project?	
5. Was the IQA Project Plan reviewed and approved by client agency management prior to the start of the project?	
6. Is the IQA Project Plan currently in use?	
7. Are IQA personnel aware of the IQA Project Plan, its importance, and how it ties in with the overall Project Plan?	
8. Are IQA personnel aware of where the tasks they are working on are reflected on the IQA Project Plan and where IQA stands on schedule and estimates?	
9. Is the IQA Work Plan periodically reviewed and modified, as necessary?	
10. Is the IQA function properly staffed to deal technically and functionally with the number of development project activities and deliverables?	
11. If not, what has been done to address the situation?	
12. Have IQA review checklists been created or modified to reflect the methodology used on the project and other project specific situations?	
13. Are these checklists being used in the review processes?	
14. Are IQA deliverables being met on time?	
15. Are Deliverable Review Documents (DRD) being adequately prepared?	
16. Are issues identified in DRDs being adequately addressed by the project?	
17. Is there a good IQA relationship with the Client agency?	
18. If not, what are the reasons? What steps have been taken to address the situation?	
19. Is there a good IQA relationship with the Development Vendor?	
20. If not, what are the reasons? What steps have been taken to address the situation?	
21. Is there a good IQA relationship with State project members?	
22. If not what are the reasons? What steps have been taken to address the situation?	
23. Is the IQA function seen as an overall asset to the project or as a liability?	
24. Are requirements tracking mechanisms functioning effectively?	
25. Are issue tracking mechanisms functioning effectively?	
26. Is adequate time available for review of deliverables by IQA?	
27. Are IQA findings and recommendations followed up on by the Client Agency and the Development vendor?	

28. Have recommendations from the last assessment been implemented?	
29. If not, what are the reasons?	
30. If so, what are the results?	

Original

Initial Planning Report Guidelines

1.0 PROJECT OBJECTIVES

Project objectives define the results that must be achieved for a proposed solution to be effective. These objectives are the “success factors” against which the agency can measure the responsiveness of the recommended alternative.

It is essential that:

- each objective relate to a problem or opportunity that is to be addressed by the proposed project
- each objective be stated in programmatic and observable/measurable terms
- each objective be realistically achievable

In establishing objectives, decide whether the response should be concerned with costs, agency operations or both. If the response relates to the cost of one or more programs, determine whether it should be expected to reduce costs, avoid costs, or increase revenue. If the response relates to operations (how a program provides services or creates products), determine if responding to the problem will improve timeliness or quality. Improvements in the timeliness and quality of program operations must be related to established program requirements. In addition, applications of information technology are ordinarily expected to pay for themselves. The department should be able to translate operational improvements into reduced costs.

Establishment of business-oriented objectives should generally include the following steps:

Setting general objectives: Once a program process has been identified as a candidate for enhancement through the application of information technology, objectives should be stated in broad terms, such as to decrease costs, increase revenues, increase service levels, or avoid additional costs in meeting an increased workload.

Analyzing the program process: With the general objectives in mind, the program process can be analyzed in terms of information flow and management to determine how information technology may contribute to the accomplishment of those objectives. Automation of a program process can not be accomplished in an effective manner without a thorough study and understanding of the processes affected. Identify the operational areas in which change would directly contribute to the accomplishment of the general objectives. For example, if a general objective is to reduce program backlog without increasing program costs, a target might be to reduce the average time or effort required to locate needed records.

Setting specific program objectives: Develop specific program objectives for improving the program process. If the analysis of the program process indicates that the application of information technology is warranted, establish objectives that are specific and can be quantified, such as: “reduce the average amount of employee overtime worked by ?? hours per month, thereby saving \$\$\$ per year.” It is typically not enough to say that a new system will be faster than its predecessor. The department should be able to describe how the increased speed will translate into program cost or operational improvements.

2.0 FUNCTIONAL REQUIREMENTS

This section should provide a complete description of the essential characteristics that the proposed solution must incorporate to satisfy each objective. For example, an objective might be to “mail 98% of the benefit checks by the end of the fifth working day of each month.” A related functional requirement might be that “the response must be capable of producing a certain number of checks during one work

shift.” Describe the functional requirements in sufficient detail for executive and program management staff to understand the functions to be performed by the information technology.

In defining the function requirements, consider the following questions:

Input

- ✓ What types of data must be collected and entered into the system?
- ✓ What are the sources of the data?
- ✓ Who will be responsible for data entry?
- ✓ What is the input medium?
- ✓ How is the data grouped?
- ✓ What is the volume of data?
- ✓ Are there seasonal and cyclical variations?
- ✓ What is the expected accuracy and completeness?

Files

- ✓ What are the general characteristics of the databases or files that will be maintained?
- ✓ How will the data be grouped?
- ✓ What are the volumes of data?
- ✓ What is the frequency of updates?
- ✓ What are the security requirements?
- ✓ What is the period of time that the data must be maintained?

Outputs

- ✓ What types of output, such as printed reports or displays, must be provided?
- ✓ What are the output requirements in terms of content, media, frequency and distribution?

Software

- ✓ If software is required, how must the software interact with existing and planned software in your agency or the State Data Center?
- ✓ What operating systems, utility programs, and applications will be used?

Hardware

- ✓ What hardware (including telecommunications equipment) is required?
- ✓ How must this equipment interact with other existing and planned equipment in your agency or the State Data Center?

Other Requirements

- ✓ Are there any special requirements in terms of staffing and training? Are there any special characteristics of agency program and technical staff that will impact the project?
- ✓ Are there any special risks associated with maintaining the integrity of the data?
- ✓ Are there disaster recovery issues that need to be addressed?

3.0 TECHNICAL ENVIRONMENT

Agency staff will find it helpful to review the organizational, managerial, and technical environment within which the proposed solution will be implemented. Identify assumptions and constraints that affect the problem or opportunity and that will impact the implementation of an acceptable solution. Consider the following factors:

1. The expected operational life of a proposed solution.

2. The necessary interaction of a proposed solution with other systems, agency programs, and organizations (such as sharing of information or intergovernmental data exchange).
3. Financial constraints, including fiscal year limitations.
4. Anticipated changes in equipment, software, or the operating environment.
5. Availability of personnel resources for development and operation of information management applications, including required special skills and new positions.

4.0 PROPOSED SOLUTION

This section identifies the alternative which best satisfies the previously defined objectives and functional requirements. It also provides additional information on the course of action proposed in the FSR. This section should incorporate sufficient detail to allow decision-makers to confirm the advantages and disadvantages of the recommended alternative in terms of:

- objectives and functional requirements
- overall program costs and benefits
- resources (time, funding, people, expertise)
- potential risks associated with each alternative

4.1 Solution Description

Identify the proposed solution and discuss the business process upon implementation of the solution; graphic representation may be included, if applicable. Address each of the following subjects, if applicable to the solution:

1. **Hardware:** What type of equipment will the proposed solution require? Provide sufficient detail regarding the equipment components, such as processors, workstations, peripherals, and communications devices to allow a complete understanding of the requirements.
2. **Software:** What are the software requirements associated with the solution? Include operating system software, application software, and database management.
3. **Development approach:** Will any necessary application development be completed in-house by technical staff, by contract staff, or will a commercial off-the-shelf solution be purchased? Will the project team use a structured development methodology and, if so, does the project team have experience with the use of the methodology?
4. **Integration issues:** Are there other systems with which the solution must interoperate, and who will be responsible for ensuring successful integration?
5. **Technical interfaces:** Are there other systems, either internal or external, with which the proposed solution is required to interface? If so, are there any significant issues in establishing the interface, and how will this be accomplished?
6. **Personnel requirements:** Identify the expected personnel resource requirements, in terms of staffing for development, implementation, maintenance, and on-going operation of the proposed solution.
7. **Training requirements:** Describe the training requirements for the technical staff to develop, operate, and maintain the system. Also, briefly describe the agency's training plan for preparing program staff to use the system.

8. **Ongoing maintenance:** How will the agency provide for ongoing operations and maintenance of the system? What are the availability requirements of the proposed system?
9. **Impact on end users:** What is the anticipated impact of the new system on its end users and what actions are planned to address these issues? Consider change acceptance, training needs, and modifications in the way in which work activities will be completed.
10. **Impact on existing system:** What is the expected impact on the existing system? If the existing system will need to be supported for a period of time, have resources for this effort been considered? Have data conversion issues been addressed? If the proposed solution would divert staff or other resources from other projects, indicate the effect of such a diversion on agency programs.
11. **Consistency with overall plan:** Discuss the alignment of the proposed project with the agency Five Year Strategic Plan and Information Technology Plan.
12. **Impact on current infrastructure:** Will the proposed solution require any changes to the agency's existing technology infrastructure? Will additional processing or communications capacity be required to support the solution, and have related costs been included?
13. **Impact on Data Center:** If the solution requires processing support from the State Data Center, has the agency coordinated with the Data Center? Does sufficient support capability currently exist at the Data Center, or will the Data Center's infrastructure need to be augmented?
14. **Backup and operational recovery:** What are the business requirements for recovery of the proposed IT system following a site or regional disaster, and how will the agency address those requirements on an ongoing basis? Identify all one-time and ongoing costs associated with the proposed operational recovery plan.
15. **Sources of funding:** Explain how the proposed alternative is to be funded by fiscal year. If the project is to be funded from multiple sources, indicate the percentage from each source. Also indicate whether funds have been budgeted for this purpose.

Risk Management Methodology

1. Purpose of Risk Management Methodology

This methodology describes the standardized, structured process the project uses to identify, categorize, analyze, and mitigate risks. This methodology also describes the method used to determine risk status and measure the progress of risk mitigation efforts. In addition, this methodology contains the results of the risk identification (i.e., a risk list), categorization (i.e., risks grouped by category), analysis (i.e., risk analysis tables), and mitigation planning (i.e., mitigation strategies, analysis of the strategies, planned implementation, and results of implementing the planned mitigations).

The risk management approach documented in this methodology is based on proven risk management techniques developed by the Software Productivity Consortium. The Consortium and its members have successfully applied this methodology on numerous programs/projects, and the methodology is reliable, adaptable, and well suited to the current project.

The key ingredients of this methodology are:

1. A dedicated risk analyst is responsible for the risk analysis and management with a reporting line directly to Product Assurance (or Management, as appropriate). The risk analyst has been trained in the methodology (or is experienced with the methodology) and has been dedicated to the project. The risk analyst is also an integral part of the project team thus ensuring a comprehensive appraisal is conducted.
2. The risk management method is consistent and comprehensive. This method identifies, analyzes, and evaluates technical and non-technical risks. Risks are categorized to aid in analysis, selection of mitigation strategies, and tracking related risks. That is, risks that are tightly coupled or linked in some way are assigned to the same category because they are best tracked and evaluated together. Examination of the risk relationships provides insight into how the risks interact and their potential project impact. The risk analysis provides criteria for determining which risks are sufficiently significant and must be mitigated and continuously monitored.
3. Periodic risk reviews are conducted. During the reviews significant risks are re-analyzed and the progress of their mitigation efforts determined. Also, during the reviews, newly identified risks, or risks that were not considered significant, are reexamined. The methodology is then reapplied.

The following section, Section 2., describes in more detail the risk management methodology that is used on the project and includes techniques that ensure that risks, once identified, are properly tracked and mitigation strategies implemented at the appropriate time.

2. The Risk Management Method

The 7 steps in risk management are:

1. Determine Objectives and Stakeholders
2. Identify Risks
3. Analyze Risks
4. Review Risk Analysis
5. Evaluate Mitigation Strategies
6. Plan Risk Mitigation
7. Mitigate Risks

These steps are repeatedly performed, in order, during the life of the project.

2.1 Determine Objectives and Stakeholders

Project objectives scope the work to be done and ensure the work stays focused on the activities that determine project success. Understanding the project objectives helps limit the number of risks that must be analyzed, because risks that do not jeopardize project success can be eliminated from consideration.

The stakeholders are those who have a vested interest in the project or its outcome. Identification of the project stakeholders ensures that the stakeholder perspectives are considered during risk identification and mitigation. Although not all stakeholders participate in the risk management process, all stakeholders are represented.

Stakeholders - Users

K-12

Community Colleges and Universities

State Agencies (Internet Data Transfer, Special Apps)

Libraries

Stakeholders - Other

Legislature

Governor

ITS

BellSouth

Vtel

Cisco

GE Capital

DTX

Objectives - Users

No loss of current capability - (2)

More bandwidth - (1)

More secure environment (n)

Reliability

Availability

Transition of services

Constraints - Users

No interruptions current service - by stakeholder

Reliability

Availability

Cost of change to user

Federal Regulations

Objectives - Legislature & Governor

No complaints
System to support their programs

Constraints - Legislature & Governor

No more money

Objectives - ITS & Partners

Keep partners and users happy - (2)
Smooth transition
Proactive in regard to user needs - (1)
Network efficiency
Cost savings (\$/bandwidth cost is lower)
Make money
Deploy technology

Constraints - ITS & Partners

Budgets
Federal regulations
Resources (People, Infrastructure, \$)
Management Tools

2.2 Identify Risks

Risk identification is achieved by executing the following tasks:

- 1) Examination of project documentation. During the examination, the risk analyst and stakeholder representatives look for conflicting or ambiguous statements, assumptions, and differences between current capabilities and perceived needs.
- 2) Brainstorming session(s). Stakeholders meet and discuss possible risk areas.
- 3) Completion of a risk identification questionnaire. A blank questionnaire is attached. (See Table 2.)
- 4) Risk categorization. Risks are grouped into 6-20 groupings of related risks. Categorization schemes may be faceted or hierarchical depending on the number of risks that have been identified and how they relate to each other.

2.3 Analyze Risks

During risk identification, the stakeholders enter the risks they have identified and grouped into a risk table (see Table 1.) The table contains a unique identifier for each risk, the risk's name, a brief description of the risk, and the risk's grouping.

Table 1. Risk Table

Risk ID #	Risk Name	Description	Risk Grouping	Risk Timing	Risk Trigger	Original			Risk Mitigation	Results	Current		
						P	C	RE			P	C	RE

Risk Table Entries.

The following describes the entries in Table 1

- Item 1. Risk ID # - Sequential number
- Item 2. Risk Name - Identification of risk - entered by risk identifier (any stakeholder)
- Item 3. Risk Description - Description of risk - entered by risk identifier
- Item 4. Risk Grouping - Group that relates this risk to other risks that will impact this risk or that will be impacted by this risk - entered by risk identifier, updated by risk analyst
- Item 5. Risk Timing - When the risk must be mitigated - entered by the risk identifier, updated by the risk analyst
- Item 6. Risk Trigger - Early warning signs that will indicate the occurrence of the risk - entered by the risk identifier, updated by risk analyst

Items 7-9 Are computed for original risk

- Item 7. P - Probability of risk occurring- determined by the risk analyst
- Item 8. C - Consequence if risk occurs - determined by the risk analyst
- Item 9. RE - Risk exposure (Risk Exposure = Probability x Consequence) - computed
- Item 10. Risk Mitigation Options - Different strategies that might be used to mitigate the risk - entered by risk analyst after talking to affected groups
- Item 11. Results - Results of the risk mitigation strategy – entered by those who performed the risk mitigation or the risk analyst

Items 12-14 are computed based on the results of executing the risk mitigation as planned

- Item 12. P - Probability of risk occurring- determined by the risk analyst
- Item 13. C - Consequence if risk occurs - determined by the risk analyst
- Item 14. RE - Risk exposure (Risk Exposure = Probability x Consequence) – computed

Items 10-14 are repeated for every risk iteration.

The risk analyst computes the probability and expected consequence for each risk in the risk table. Both probability and consequence are determined by examining the factors that contribute to the risk and calculating a weighted average of the factors. The risk factors for the risk probability, P, are in Figure 2. The risk factors for the risk consequence, C, are in Figure 3. Experience has proven that using risk factors to establish the risk measures helps the risk analyst consider all aspects of the risk and, consequently, provides a more accurate analysis of the risk than can be determined by simple inspection.

The risk analyst also considers the temporal aspects of the risk. When is the risk most likely to occur? How frequently will the risk occur and will its impact change over time? Consideration of issues like these helps the risk analyst determine the profile of the risks over time. After individual risk analysis is performed, the risk analyst examines the risk groupings to determine how the risks will interact with each other. As the risk analysis continues, the risk calculations and the groupings are revised so that more accurate risk measures can be created. These risk measures are the main input for creation of the detailed risk management methodology.

For each risk, P and C are plotted on an ISO-risk contour (see Figure 4.) The ISO-risk contour helps the risk analyst and the stakeholders visually compare the results of the risk analysis. However, the ISO-risk contours are a static representation of the risk analysis. They represent the risk calculations at a specific point in time. Another technique, the risk referent, is used to communicate risk exposure over time. Risk referents help the risk analyst and the program manager understand the interaction between the life-cycle phases and the risk groupings. (More details regarding the use of the risk referent are described in Section 2.6.)

Figure 2. P Table

	Maturity Factor	Complexity Factor	Dependency Factor	Stability Factor
0.1 Low	Technology exists and can be used "as is"	Simple relative to current environment	Entirely within project control	External factors will not make any changes
0.3 Moderate	Technology requires minor changes before use (<25%)	Minor complexity relative to current environment	Depends on existing product supplied from outside organization	External factors will make minor changes (<25%)
0.5 High	Technology requires major changes before	Moderately complex relative to current environment	Depends on supply and modifications of existing production from outside organization	External factors will make major changes (<50%)
0.7 Very High	Technology requires significant design and engineering before use (<75%)	Significantly complex relative to current environment	Depends on new development from outside organization	External factors will make significant changes (<75%)
0.9 Extremely High	State of the art, some research done	Extremely complex relative to current environment	Depends on finding development from outside organization	External factors will make constant changes

Figure 3. C Table

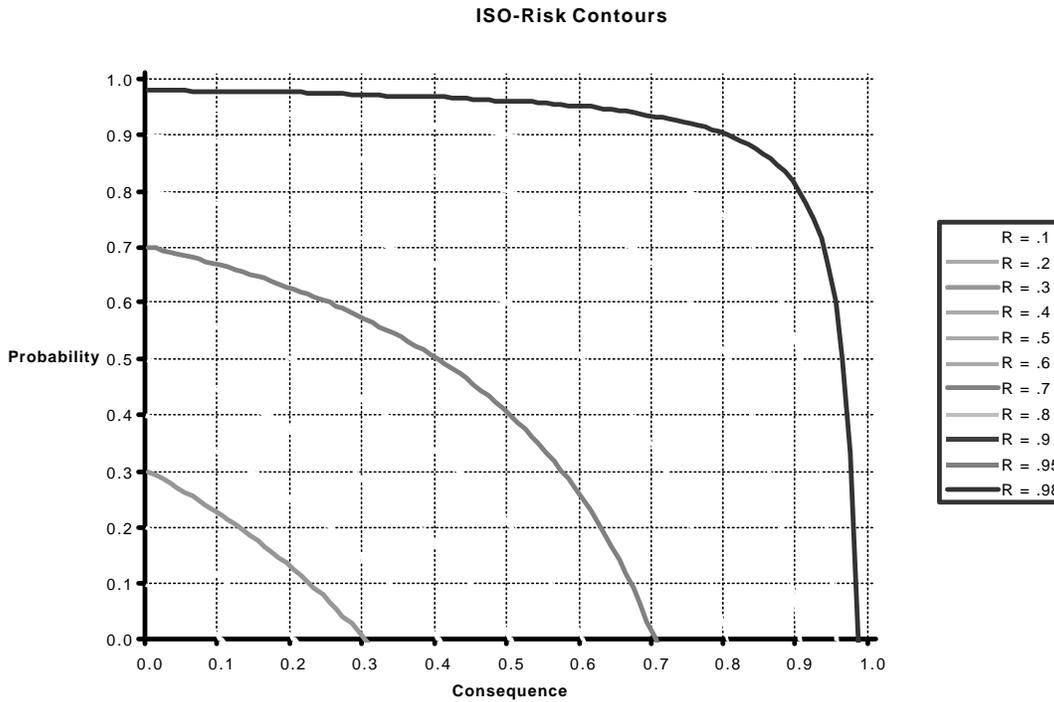
	Capability Factor	P. R. Factor	Cost Factor	Schedule Factor
0.1 Low	Minimal or no consequences, unimportant	Occasional harsh write-ups in the newspaper	Budget estimate not exceeded, some transfer of money	Negligible impact on other development schedules, changes compensated by available slack
0.3 Minor	Small reduction in capability (10% requirements not met)	Called before Legislature or Investigative body	Cost estimates exceed budget by 1 to 5%	Minor slip in schedules (less than 1 month), small adjustments in milestones required
0.5 Moderate	Some reduction in capability (25% requirements not met)	Unfavorable public opinion	Cost estimates exceed budget by 5 to 20%	Other schedules slip in excess of 3 months, a few projects are shelved
0.7 Significant	Significant Capabilities missing (50% requirements not met)	Budget cuts as political retribution	Cost estimates exceed budget by 20 to 50%	Other schedules slip up to 12 months; many projects are shelved
0.9 Catastrophic	Technical goals cannot be achieved	Severe pressure to replace key officials	Cost estimates increased in excess of 50%	Other schedules slip more than twelve months; most projects are shelved

The risk profiles, ISO-risk contours, and risk referents are evaluated by the risk analyst. The purpose of the evaluation is to prioritize the risks and determine which risks and risk groupings will have significant impact on the program and warrant risk mitigation. In large programs/projects, all risks can not be actively tracked and controlled. Prioritizing risks is an approach for determining which risks will be managed.

2.4 Review Risk Analysis

The stakeholders review the results of the risk analysis to ensure that all risks are identified and that the relative impacts of the various risks are consistent. After the review is complete, the risk analyst makes changes, as appropriate, based on review comments, and stakeholder consensus is reached. Consensus does not necessarily mean that all stakeholders agree, but that there is no strong minority dissension among the stakeholders.

Figure 4. ISO-Risk Contour Chart



2.5 Evaluate Mitigation Strategies

The risk analyst works with stakeholders to develop risk mitigation strategies for each risk or risk group. The results of the risk analysis and the causes, sources, and components of each risk are considered when formulating risk mitigation strategies. The risk analyst also considers the interactions of risks and the impact each mitigation strategy may have on other risks. A matrix is developed which maps each mitigation strategy to one or more risks. The matrix provides a visual representation of which risk will be impacted by a specific strategy. Note: impact may be positive or negative. That is, some mitigation strategies will positively impact one risk while negatively impacting another. For example, providing necessary training for selected personnel positively impacts the risk of reduced productivity because the staff has insufficient skills to efficiently perform the necessary tasks. However, there may be a risk of not meeting the schedule commitments based on the number of tasks to be performed and the currently available staff to perform them. This risk would be negatively impacted by the mitigation strategy of sending the current staff to training since it would reduce the hours available to perform the scheduled tasks.

The risk analyst evaluates the potential risk mitigation strategies for each risk on the priority list. The risk analyst selects the appropriate mitigation strategies based on a prediction of how each of the strategies will impact the probability and consequence of the risk and the costs associated with implementing the strategy. Once a strategy has been selected, the execution of the strategy is added to the project plan and the results of the execution of the strategy are recorded in the risk table.

2.6 Plan Risk Mitigation

Planning risk mitigation ensures that the selected mitigation strategies are executed at the correct time. And, in many cases, the timing is critical for a strategy to succeed. Consequently, it is important to look for and recognize the warning signs that indicate the risk condition is approaching. These warning signs are called risk triggers. For example, if 10 skilled staff members are needed to perform a specific task, as that start date for the task approaches, there should be increasing confidence that the identified staff will be available. An appropriate set of risk triggers for this risk is:

- Trigger #1 - x% of the needed staff is not identified and committed to the program by 2 months prior to the task start
- Trigger #2 - x+y% of the needed staff is not identified and committed to the program by 1 month prior to the start date
- Trigger #3 - x+y+z% of the needed staff is not identified and committed to the program by 2 weeks prior to the task start date

And so on. Notice that the triggers indicate what is needed and when it is needed. If any of the trigger conditions occur, the action plan for the selected mitigation strategy is implemented. In the above example, the mitigation strategies are trigger related. The mitigation strategy for the first trigger condition might be to consider outside hires. The mitigation strategy for the second trigger condition might be to consider internal transfers and identify a number of consultants that could provide the skills temporarily, if needed. And the mitigation strategy for the third trigger condition might be to commence contracting with the identified consultants. Thus, risk triggers are a way to ensure the appropriate risk mitigation strategy is implemented at the right time. The risk triggers and their associated mitigation strategies are part of this risk management methodology and are input to the overall project plan.

The risk referent is a plan for the amount of risk that will be tolerated throughout the contract. A sample risk referent is shown in Figure 6. The risk exposures for all of the risks (or for each risk group) are summed to determine the risk referent for a particular point in time. The planned risk mitigation strategies are then estimated to determine how the risk exposure should be impacted over time. As the project progresses, the risk exposure for the risks are computed and compared with the plan. The deviation of actual risk exposures from the planned risk referent is handled just as deviations from other plans are handled. If the actual risk exposures are within the referent values, no additional action is required. If, however, the actual risk exposures are above the referent values, additional mitigation action is required.

2.7 Mitigate Risks

Risk mitigation is the execution of the risk plan. However, to effectively mitigate risks, the steps in the risk management method (i.e., steps 1-7) need to be performed regularly. The risk table should be reviewed periodically by the risk analyst and the other stakeholders, and risk status should be a part of the regular status reports.

3. Summary

This is a proactive risk management approach. Performing a risk analysis prior to estimating the program parameters enables the team to maintain project control and provide quality products within the proposed cost and schedule. We have successfully applied this method in the past on tightly constrained programs/projects and feel comfortable and confident with the approach.

Figure 5a. Initial Risk Referent

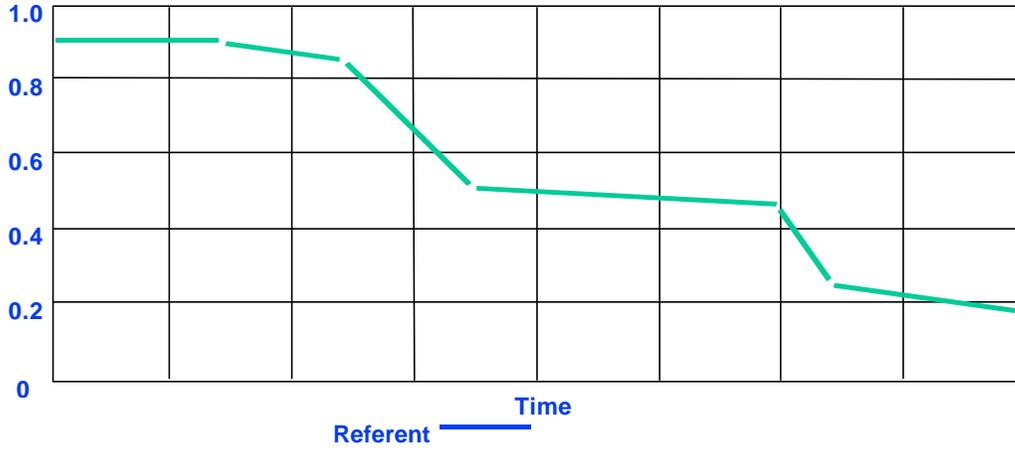
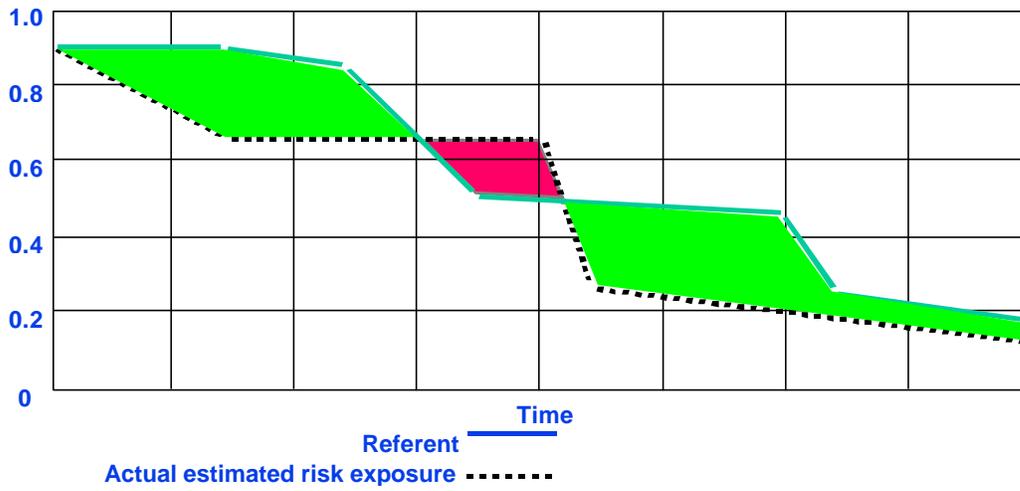


Figure 5b. Risk Referent Tracked Against Actuals



RISK IDENTIFICATION QUESTIONNAIRE

This table is used by the risk analysis to identify sources of risk to the project. The risk Analyst regularly assesses the completeness of the project documents to identify project risks. This table is organized in terms of three major classes of risk:

- **Organizational Risks.** These risks involve the aspects of the different approaches and capabilities that an organization can bring to a software-intensive development. Organizational risks are subdivided into organizational structure, organizational politics, organizational capability, and individual personnel capability risks.
- **Process Risks.** These risks involve the aspects of software/system engineering approaches used to develop the software-intensive system in question. Process risks are subdivided into life-cycle processes, phase-independent activities, phase-dependent activities, methods and automation risks. For the phase dependent activities, only the Project Definition phase was investigated for risks at this time. The other phases will be investigated at the appropriate time in the development.
- **Product Risks.** These risks are inherent within the software-intensive system itself. Product risks are subdivided into algorithm, architecture, and physical risks.

This questionnaire was based on the questionnaire developed by the Software Productivity Consortium. The Software Productivity Consortium has refined their questionnaire over the past four years based on inputs from member companies who have used the questionnaire and by investigating other questionnaires such as the risk questionnaire proposed by the SEI. A “yes” answer to a question implies lack of risk, and a “?” or “no” answer implies that a risk exists.

Organizational Risks

Risk Question	Y	?	N	Notes
Organizational Structure				
Is the organization's current structure adequate to support this project				
Have all managers for the project been designated?				
Has management authority and responsibility been clearly established and accepted?				
Do all managers communicate timely and effectively both up and down the organizational structure?				
Do those responsible for decisions consistently make good, rational choices?				
Other				
Organizational Policies				
Have conflicting organizational objectives been identified and resolved?				
Do personnel cooperate effectively across functional and organizational boundaries?				
Are all personnel oriented toward quality procedures?				
Is organizational morale good?				
Other				

Risk Question	Y	?	N	Notes
Organizational Capability				
Are the current support facilities sufficient for the project's needs?				
Is current customer support sufficient for the project's needs?				
Is the current customer communication sufficient for the project's needs?				
Are current policy guidelines clear, appropriate, and sufficient for the project's needs?				
Do the current procedures create plans that are sufficiently accurate and detailed for the project?				
Are existing procedures adequate for monitoring the status of the project?				
Are existing directing procedures appropriate and sufficient for the needs of this project?				
Are current staffing procedures sufficient for the needs of this project?				
Does the project currently have staffing for all currently required technical skills?				
Are all contract agreements and understandings in writing?				
Is the contract vehicle or customer agreement appropriate for this project?				
Is the current contract administration appropriate and sufficient for the needs of this project?				
Are the organization's standards sufficient and appropriate for the needs of this project?				
Is the staff adequately trained to accurately complete all the work required for this project?				
Is personnel turnover within the expected range?				
Is the current level of personnel back-up adequate to ensure proper completion of the project?				
Other				

Risk Question	Y	?	N	Notes
Individual Capability				
Do project personnel have sufficient relevant experience to perform their duties?				
Have all critical personnel previously performed in their current position?				
Do all project personnel have sufficient experience in the organization?				
Do all of the involved managers understand the project well enough to make informed decisions?				
Are the estimators known to produce estimates that are sufficiently accurate and precise for the project's needs?				
Are the available computer facilities sufficient and appropriate for all the needs of the project staff?				
Is current computer system and tool training sufficient and appropriate for the needs of the project staff?				
Other				
Subcontractor Management				
Is the coordination with subcontractors documented?				
Is the coordination with subcontractors appropriate and sufficient?				
Are all subcontract agreements and understandings in writing?				
Are the subcontract vehicles appropriate for this project?				
Is the current subcontract administration appropriate and sufficient for the needs of this project?				
Are there several possible suppliers for each segment (i.e., is competitive acquisition possible)?				
Do subcontractors have track records of quality, on time delivery?				
Do subcontractors practice effective risk management?				
Other				

PROCESS RISKS

Risk Question	Y	?	N	Notes
<i>PHASE-INDEPENDENT*</i>				
Is resource management adequate to the needs of the project?				
Are the project objectives clear and feasible?				
Are the budget estimates stable, reasonable, and precedented?				
Are the schedule estimates stable, reasonable, and precedented?				
Is existing cost and schedule monitoring sufficient and appropriate to the needs of the project?				
Are all support requirements specified and understood?				
Are all evolution requirements specified and understood?				
Is sufficient budget available for unanticipated updates?				
Is sufficient time scheduled for unanticipated updates?				
Is the available process documentation adequate for the needs of the project?				
Is the available product documentation adequate for the needs of the project?				
Is the available development tool documentation adequate for the needs of the project?				
Are contingency plans and reserves adequate to cover all likely situations?				
Is the amount of anticipated reuse of components reasonable and adequate for the project's needs?				
Is current productivity adequate to meet the budget and schedule?				
Is the likelihood of exceeding the project's budget acceptable?				
Is the likely schedule slippage acceptable?				
Other				

Risk Question	Y	?	N	Notes
Configuration Management				
Is the existing identification of components sufficient and appropriate for the project's needs?				
Is the existing configuration control of components sufficient and appropriate for the project's needs?				
Is the auditing of components sufficient and appropriate for the project's needs?				
Is the existing status accounting sufficient and appropriate for the project's needs?				
Other				
Quality Management				
Are the existing risk management practices sufficient and appropriate for the project's needs?				
Are the existing verification and validation techniques sufficient and appropriate for the project's needs?				
Other				
Methods				
Do the methods adequately support all aspects of the development project?				
Do the methods adequately support the application domain?				
Do the methods adequately embed sound engineering principles?				
Other				
Automation				
Do the selected tools adequately support the selected methods?				
Do the selected tools provide adequate support throughout the product development?				
Are the selected tools adequately integrated with one another and with the development environment?				
Are the selected tools well documented and easy to use?				
Other				

Risk Question	Y	?	N	Notes
<i>PHASE-DEPENDENT</i>				
Project Definition				
Are you sure that everybody understands the RFP or customer request?				
Are all required technologies stable and familiar?				
Is the customer's mission stable and familiar?				
Is the scope of work stable and well understood?				
Are all assumptions documented and based on a reasonable interpretation of the situation?				
Are the completion criteria well defined (can a test procedure be written to verify the completion criteria)?				
Are the user's current operations defined?				
Does the documentation of the user's operations reflect the way things are currently done?				
Are all assumptions about the user's current operations documented?				
Is there a clear distinction among the user's organizational roles?				
Is each current activity assigned to one responsible user role?				
Are the user's lines of reporting clear and effective?				
Is the user's current operations stable?				
Is the definition of the user's current operations verifiable?				
Are the user's current operations under change control?				
Do the user's internal operations currently control all of their inputs?				
Is the current training program sufficient and appropriate for the user's needs?				
Do you have sufficient understanding of how the data maintained by the system is used?				
Is the client sure that what they have requested is what they actually need?				

Risk Question	Y	?	N	Notes
Have all required technologies been used previously in a similar context?				
Other				
Concept of Operations				
Are all critical operations identified?				
Are all external interfaces documented?				
Are all changes to external interfaces under our control or visible to us?				
Are all changes to external systems under our control or visible to us?				
Is the planned system better than all the rejected alternatives?				
Are the user's planned operations supported within the project constraints?				
Are all assumptions about the user's planned operations documented?				
Is each intermediate stage well enough defined to represent as a system?				
Are the transitions between the stages well defined?				
Have human factors issues affecting the system deployment been sufficiently addressed?				
Can the user organization absorb each change in the time frame requested?				
Is the time required to deploy the system reasonable for the developers?				
Can the user organization function well at the end of each intermediate stage?				
Are the user's planned operations well-defined (look for words like "better," "more efficient")?				
Are the user's planned operations verifiable?				
Does every operation trace back to the mission (is there a reason for the change)?				
Are all proposed business or mission processes compatible with each other?				

Risk Question	Y	?	N	
When all changes are completed, will the user organization be operating under the concept of operations?				
Are the degraded modes reasonable and adequate for all expected situations?				
Are the maintenance modes reasonable and adequate for all expected situations?				
Is each planned activity assigned to one responsible user role?				
Are the new operations easy to perform (not overly demanding)?				
Do the documented changes include all actions necessary to get to the planned operations or mission?				
Are the planned changes within the project constraints?				
Will the changes be acceptable to user personnel (e.g., not decrease morale)?				
Will changes in the user's staffing profile be easy to effect?				
Are assumptions about the user's facilities and services explicitly stated?				
Are assumptions about the user's facilities and services reasonable?				
Can the user's facility and service changes be made without disrupting the organization?				
Are you confident that all facility and service changes will be well managed?				
Are assumptions about the need for the user's business or mission data stated?				
Are the new lines of reporting clear and effective?				
Are assumptions about the training requirements explicitly stated?				
Are assumptions about the training requirements reasonable?				
Do the current user personnel match the input into the training profile?				
Is existing training sufficient for new processes?				

Risk Question	Y	?	N	Notes
Are the available training facilities adequate?				
Other				
Requirements				
Do existing and planned prototypes provide a realistic interpretation of the system?				
Are all requirements justified (does each one address a specific direct or indirect business or mission need)?				
Are the requirement specifications unambiguous?				
Are all requirements compatible with each other?				
Are the requirement specifications testable?				
Are the functional requirements complete and feasible?				
Are the safety requirements clear and reasonable?				
Are the reliability requirements clear and reasonable?				
Have all other nonfunctional requirements been considered?				
If the requirements are satisfied, will the system match the new business process or mission?				
For each "shall" in the specification, is the requirement needed for the system to fulfill its purpose?				
Is every requirement specific (can they be verified by a test procedure)?				
Do the defined tests provide adequate coverage?				
Has every requirement been validated (matches user's needs and expectations)?				
Can the requirements be allocated into stages?				
Are the requirements reasonable to implement (not unusually demanding)?				
Are all new support requirements identified?				
Are all applicable standards included?				
Are all cited standards applicable?				

Risk Question	Y	?	N	Notes
Have all new facility requirements (power, cooling, etc.) been identified?				
Other				
Design				
Is the current architecture description accurate?				
Is each segment description complete?				
Are all required changes documented?				
Are all segment architecture (hardware, network, software, database, etc.) elements identified?				
Are all segment architecture elements described?				
Is each segment defined well enough to develop an acceptance test procedure for that segment?				
Are all segment architecture element descriptions complete?				
Can each segment architecture element be mapped to a specific planned requirement?				
Are derived requirements for the segment compatible with the project requirements?				
Is the planned architecture within the project constraints?				
Are all architecture elements (hardware, network, software, database, etc.) identified?				
Are all architecture elements described?				
Are all architecture element descriptions complete?				
Are all architecture elements justified (traceable to requirements)?				
Are all interfaces between architectural elements described clearly and completely?				
Is the attainment of the system requirements well within the architecture's ability?				
Are all modifications to the architecture (hardware, network, software, database, etc.) elements described?				
Can a mapping from the existing system to the planned architecture be developed?				

Risk Question	Y	?	N	Notes
Are all modifications to the architecture element descriptions complete?				
Can each modification be mapped to a specific requirement?				
Are all modifications to the interfaces between elements described?				
Is the new architecture designed in a modular fashion?				
Does the architecture allow for reasonable growth?				
Is the architecture and design flexible enough to absorb unanticipated changes?				
Is the new architecture designed to take advantage of newer technology?				
Have the feasibility and predictability of any new technology been evaluated?				
Is the design straightforward (not overly complex)?				
Does the design provide for efficient implementation?				
Are the design specifications unambiguous and consistent?				
Are the design specifications feasible?				
Are the design specifications testable?				
Do the design specifications satisfy the requirements accurately?				
Do the design specifications satisfy the requirements completely?				
Are internal interfaces clear and adequate?				
Is the build strategy consistent with the planned changes in the user's business process or mission?				
Is the rationale for each build clear and convincing?				
Can elements of each build be deployed in the existing environment?				
Are the system integration processes defined?				

Risk Question	Y	?	N	Notes
Are the system integration processes feasible?				
Are the system integration processes testable?				
Do the integration procedures adequately identify undiscovered logic errors?				
Do the integration procedures adequately identify undiscovered timing errors?				
Do the integration procedures adequately identify undiscovered throughput errors?				
Do the integration procedures adequately identify undiscovered recovery errors?				
Other				
Implementation				
Are the system components known to be of good quality?				
Does the implementation allow for reasonable growth?				
Does the implementation take advantage of newer technology?				
Has the feasibility and predictability of substituting new technology been evaluated?				
Is the implementation straightforward (not overly complex)?				
Does the implementation satisfy the design specification accurately?				
Does the implementation satisfy the design specification completely?				
Are internal interfaces clear and adequate?				
Is the implementation adequately defined by the product design?				
Are all nonfunctional (e.g., reliability) requirements satisfied?				
Are assigned personnel capable of performing all likely updates?				
Other				

Risk Question	Y	?	N	Notes
Installation				
Do the installation procedures adequately identify required materials?				
Do the installation procedures adequately identify site specific data?				
Do the installation procedures adequately define all power requirements?				
Have all sites been surveyed prior to installation?				
Are local laws regarding installation materials and procedures understood?				
Have proper plans been made to minimize impact to current operations?				
Are all materials marked properly before shipment to installation site?				
Are sufficient spare parts and consumables identified and available?				
Is the installation straightforward (not overly complex)?				
Does the installation plan include an accurate current layout?				
Do sufficient test procedures exist to verify proper installation?				
Is all necessary equipment defined and available for installation?				
Are assigned personnel capable of performing all installation procedures?				
Other				
Deployment				
Has each site received the necessary training?				
Are all affected personnel certified for the new system?				
Are all maintenance procedures documented and available to site personnel?				
Have all hot line connections been made?				
Have all personnel been checked out on the new system?				
Risk Question	Y	?	N	Notes

Have all consumables necessary for operation been deployed to site?				
Are all materials marked properly before shipment to site?				
Are sufficient spare parts and consumables identified and available?				
Is the implementation straightforward (not overly complex)?				
Have all installation procedures been successfully completed?				
Have proper contractor personnel been identified to support site as needed?				
Is all necessary support equipment defined and available for use at site?				
Are site personnel now capable of operating the system?				
Other				

PRODUCT RISKS

Risk Question	Y	?	N	Notes
Architecture				
Does the architecture provide a modular structure for the product?				
Are all defined interfaces necessary and appropriate?				
Are all defined components necessary and appropriate?				
Will any planned decentralized processing provide adequate and reliable performance?				
Will any planned decentralized database processing provide adequate and reliable performance?				
Will any planned decentralized control provide adequate and reliable performance?				
Other				

Risk Question	Y	?	N	Notes
Physical Realization				
Does the selected computer system provide adequate processing power?				
Does the selected computer system provide adequate memory?				
Does the communications environment provide adequate bandwidth?				
Have all availability requirements been met?				
Does each system component have sufficient reliability to meet system reliability?				
Have all maintainability requirements been verified?				
Does system usability match the ability of intended users?				
Have all interfaces to external systems been defined and implemented?				
Other				
Producability				
Can the system be reproduced for each deployed site?				
Other				

Risk Spreadsheet.xls

Risk #	Name	Original																P	C	RE
		P Factors				P Weights				C Factors				C Weights						
		MT	CP	DP	ST	MT	CP	DP	ST	TCH	PR	\$	SCH	TCH	PR	\$	SCH			
1						1	1	1	1					1	1	1	1	0.0	0.0	0.00
2						1	1	1	1					1	1	1	1	0.0	0.0	0.00
3						1	1	1	1					1	1	1	1	0.0	0.0	0.00
4						1	1	1	1					1	1	1	1	0.0	0.0	0.00
5						1	1	1	1					1	1	1	1	0.0	0.0	0.00
6						1	1	1	1					1	1	1	1	0.0	0.0	0.00
7						1	1	1	1					1	1	1	1	0.0	0.0	0.00
8						1	1	1	1					1	1	1	1	0.0	0.0	0.00
9						1	1	1	1					1	1	1	1	0.0	0.0	0.00
10						1	1	1	1					1	1	1	1	0.0	0.0	0.00
11						1	1	1	1					1	1	1	1	0.0	0.0	0.00
12						1	1	1	1					1	1	1	1	0.0	0.0	0.00
13						1	1	1	1					1	1	1	1	0.0	0.0	0.00
14						1	1	1	1					1	1	1	1	0.0	0.0	0.00
15						1	1	1	1					1	1	1	1	0.0	0.0	0.00
16						1	1	1	1					1	1	1	1	0.0	0.0	0.00
17						1	1	1	1					1	1	1	1	0.0	0.0	0.00
18						1	1	1	1					1	1	1	1	0.0	0.0	0.00
19						1	1	1	1					1	1	1	1	0.0	0.0	0.00
20						1	1	1	1					1	1	1	1	0.0	0.0	0.00
21						1	1	1	1					1	1	1	1	0.0	0.0	0.00
22						1	1	1	1					1	1	1	1	0.0	0.0	0.00
23						1	1	1	1					1	1	1	1	0.0	0.0	0.00
24						1	1	1	1					1	1	1	1	0.0	0.0	0.00
25						1	1	1	1					1	1	1	1	0.0	0.0	0.00
26						1	1	1	1					1	1	1	1	0.0	0.0	0.00
27						1	1	1	1					1	1	1	1	0.0	0.0	0.00
28						1	1	1	1					1	1	1	1	0.0	0.0	0.00
29						1	1	1	1					1	1	1	1	0.0	0.0	0.00
30						1	1	1	1					1	1	1	1	0.0	0.0	0.00
31						1	1	1	1					1	1	1	1	0.0	0.0	0.00
32						1	1	1	1					1	1	1	1	0.0	0.0	0.00
33						1	1	1	1					1	1	1	1	0.0	0.0	0.00
34						1	1	1	1					1	1	1	1	0.0	0.0	0.00
35						1	1	1	1					1	1	1	1	0.0	0.0	0.00
36						1	1	1	1					1	1	1	1	0.0	0.0	0.00
																		0.0	0.0	0.00

Total Risk Exposure	0.00
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