

SUBJECT

RISK ANALYSIS

SESSION 3 Statistics for Risk Analysis

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Risk Management Process

Process Goals and Objectives

The two (2) main objectives of the Risk Assessment and Management Process methodology are to:

1. **Focus attention on minimizing threats in order to achieve the project objectives** by performing a high-level assessment of project risk with all project stakeholders, and
2. **Provide a systematic approach for detail risk analysis and appraisal** by:
 - Identifying and assessing risks.
 - Determining effective risk reduction actions.
 - Monitoring and reporting progress in reducing risk.

The overall goal of this process is to progressively reduce the project's exposure to events that threaten the timely delivery of project objectives by:

- Incorporating approaches into the project management plan that minimize, mitigate, or avoid identified and potential risks,
- Developing proactive, contingency plans or risk response plans, and
- Ensuring timely risk responses based on the concise identification of risk occurrence and risk opportunity.

Risk Management Process Methodology

The risk management process methodology involves five (5) basic steps:

1. ***Identify the risks*** - Understand the typical problems that might adversely affect the project.
2. ***Assess the risks*** - Rank the risks in order of importance based on probability of occurrence, impact of occurrence, and degree of risk certainty.

3. **Plan the risk response** – Analyze risk assessment alternatives and modify the project management plan and project schedule to adjust for the risk.
4. **Monitor the risks** – Throughout the project, continue to revisit the risk profile, re-evaluate major risks, and update the risk profile with action taken.
5. **Document lessons learned** – Learn from the risk identification, assessment, and management process. Use the risk database from past projects to plan current projects, and, use your risk management experience to update the organization risk database.

Risk Categories

The following types of risk categories may be used as a high level view of potential risk areas. The major **risk categories** are defined in table 1:

Table 1 - Risk Categories

CATEGORY	EXAMPLES
Financial	Cost overruns, budget constraints, funding issues
Resource	Availability of people and facilities, attrition, skills limitations
Schedule	Completion date slippage, target date constraints
Technical	Failure to meet performance requirements, new or untested technologies
Management	Inexperienced project manager, project complexity
Communication	Failure to satisfy user requirements / expectations
Operational	Failure to meet usability, trainability, and/or maintainability requirements
Political	Impact of loss of service to citizens, possible exposure and liability to state / county government.
Organizational	Alignment to strategic goals / vision

Refer to Appendix B for a sample list of questions that will probe the major risk categories. ***Caution: The sample list contained at Appendix B may not be comprehensive. The questions are designed to initiate the risk analysis portion of the assessment and may only be indicators of potential risk areas in the system development life cycle. Specific questions may need to be developed and analyzed by the project team based on the project type, scope, and schedule.***

As a key factor in project planning and project outcome, risk management must be included in all project planning activities. At a minimum, the software development project management plan should reflect:

- Relationship and contribution of project management to risk management - This section should summarize the key contributions made by various project management components to the reduction of project risks.
- Risk management process - This section summarizes the risk, identification, assessment, analysis, documentation, handling, and reporting process at the overall project and individual function levels.
- Overview of risk management methods and techniques - This is a summary of the methodologies to be used in the project risk management process.

Risk Management Responsibilities

Risk management is the responsibility of the Project Manager. However, all project stakeholders should participate in the risk identification and analysis process. Overall the extended project team carries out risk management and mitigation activities.

Refer to Table 2 for a high-level view of basic project risk management responsibilities.

Table 2 - Risk Management Responsibilities

<i>RISK MANAGEMENT TASKS</i>	<i>RESPONSIBLE PARTY</i>
Overall direction of risk management plan	Project Manager

Plan development and execution of risk management plan	Project Manager
Provide counsel and assistance regarding risk identification/assessment/analysis/handling	Business Analyst, Development Team, Quality Assurance
Risk Watch List	Project Manager
Preparation and issuance of risk reporting	Project Manager as part of normal project status reporting

Members of the application development project team and the Project Manager will conduct risk management activities for technical risks. Monitoring these activities will be the responsibility of the Project Manager, assisted by other members of the project team. These activities include:

- Develop and maintain a project software development plan.
- Develop and maintain a project risk management plan.
- Identify high-level risks applicable to the project through the Kulik and Lazarus **Project Self-Assessment**.
- Identify additional project-specific risks through the *Risk Analysis* tool.
- Assess and analyze risks.
- Incorporate risk mitigation / avoidance approaches in the Project Management Plan.
- Maintain, monitor, and update a detailed project risk profile.

2. Project Self-Assessment

License Information

The Office of Information Technology Services (ITS), Enterprise Technology Strategies (ETS) organization has purchased a license for the “*Project Self-Assessment Kit*” from **Kulik and Lazarus Consulting, Inc.**

Purpose

The **Kulik and Lazarus** “*Project Self-Assessment Kit*” combines powerful software risk management techniques with innovative statistical models. Results are based on industry research, process standards, and experience managing software projects and conducting risk assessments.

To measure project success metrics, the “*Project Self-Assessment Kit*” uses the individuals involved with the project as the primary source of data. By responding to a common set of specially developed questions, project staff become a source of statistically reliable information. Results of using the “*Project Self-Assessment Kit*” for a project include:

- Measurements for twenty-two Project Success Metrics,
- Identification of project strengths and risk areas,
- Quantified overall project risk level,
- Customized action plans to leverage strengths, and
- Customized action plans to reduce risk.

In project management, **tomorrow’s problems are today’s risks**. With data from the “*Project Self-Assessment Kit*”, a project manager should be able to anticipate and eliminate risks. The goal of risk management is to facilitate project management activities leading to on time, within budget, full-function, and high quality project deliverables. In addition, agency management may use the results of self-assessments to identify targets for process improvement and areas to enhance organizational capabilities.

The analysis tool utilizes input from the major stakeholders of a project effort. Input is obtained from the project sponsor, the I/T project manager, the intended primary client/customer, internal QA staff, and major project stakeholders; i.e., ITS operations, telecommunications, and network support. The tool provides an analysis of the twenty-two (22) project success metrics and provides for a comparison to each other and to industry norms.

Project Success Metrics

The twenty-two (22) areas measured and analyzed by the tool are:

- Requirements Definition
- Requirements Stability
- Technical Complexity

- Schedule Scoping
- Project Management Plan / Project Schedules
- Planning Involvement
- Management Sponsorship
- Project Management Tools
- Budget
- Staffing
- Schedule Reality
- Checkpoints
- Risk Management
- Problem / Action Log
- Metrics
- Technical Training
- Change Control
- Development Environment
- Teamwork
- Third-party Involvement
- Process Stability and
- Deployment Planning

In addition to the twenty-two (22) identified metrics, the **Kulak and Lazarus** “*Project Self-Assessment Kit*” for Software Projects also provides an analysis of project:

- Quality Orientation,
- Schedule Orientation,
- Cost Orientation, and
- Overall Risk.

Action Planning Guide

The **Kulik and Lazarus** “*Action Planning Guide*” leads the project through the following steps:

1. Gather Self-Assessment Data,
2. Identify Project Strengths and Risks,
3. Quantify Overall Project Risk, and
4. Develop Action Plans to Leverage Strengths and Reduce Risk

Project Self-Assessment Guidelines

The roadmap to project self-assessment is shown in Figure 1:

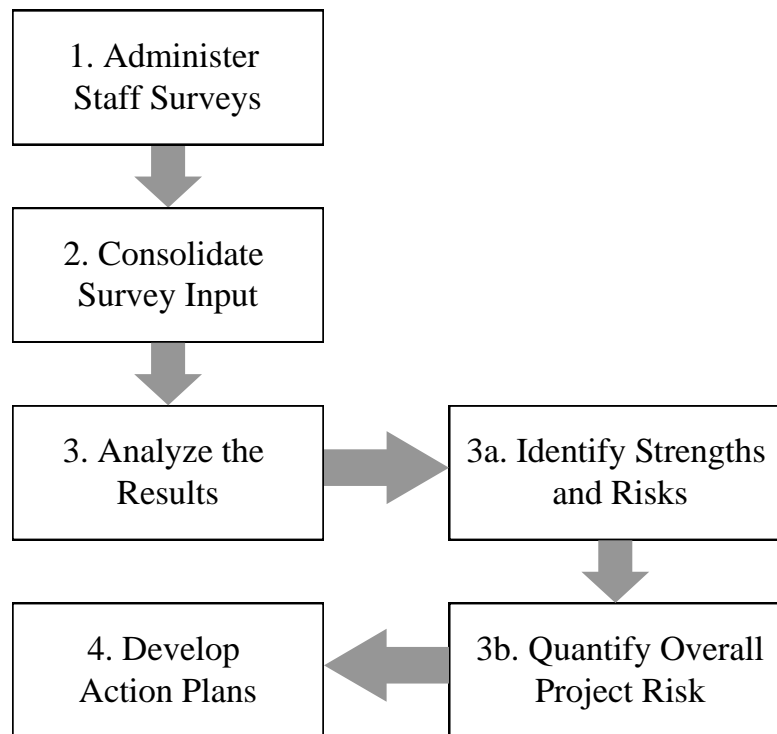


Figure 1

Administer Staff Surveys (1)

Staff surveys will take 10 to 15 minutes for most staff members to complete. The ITS/ETS staff recommends that a single 15-minute meeting be scheduled for all staff members to complete the survey. This technique has proven effective to gather consistent, timely feedback. It is easier for project staff – the survey doesn't get added to an already long to-do list. It is also easier for the self-assessment sponsor – project data will be available sooner for analysis.

To administer the Staff Survey, follow these guidelines:

- Contact the ITS/ETS Staff at IRMPO@ncmail.net to schedule the “*Project Self-Assessment*”.
- Schedule the *Assessment Survey* meeting.
- Distribute surveys to all those involved in planning and/or implementing the project. This includes (as applicable) engineering and development staff, functional managers, project and / or program managers, quality assurance, integration testing, product planning or product management, cross-functional team members, ITS, etc.

Keep survey feedback confidential:

- *Do:*
 - Tell staff that their feedback is confidential and anonymous.
 - Identify a neutral collection point (e.g., a survey administrator from the ITS/ETS staff).
 - Discard any surveys that have been accidentally marked.
- *Don't:*
 - Ask staff to write their name on their survey.
 - Mark surveys with any identifying marks.
 - Comment on feedback from any individual survey.
- Collect all surveys.

Consolidate Survey Input (2)

After all surveys are returned to the ITS/ETS Staff, survey answers will be entered into the “Project Self-Assessment Tool”. Surveys will be returned to the project office after data entry is complete.

Analyze the Results (3)

Identifying Project Strengths (3a)

After data from all staff surveys has been consolidated into the PSAK Software Tool, project strengths and weaknesses may be identified. Strengths will be identified as **Highs** and weaknesses will be identified as **Lows** (refer to figures 2 and 2.1):

Highest / Lowest Values

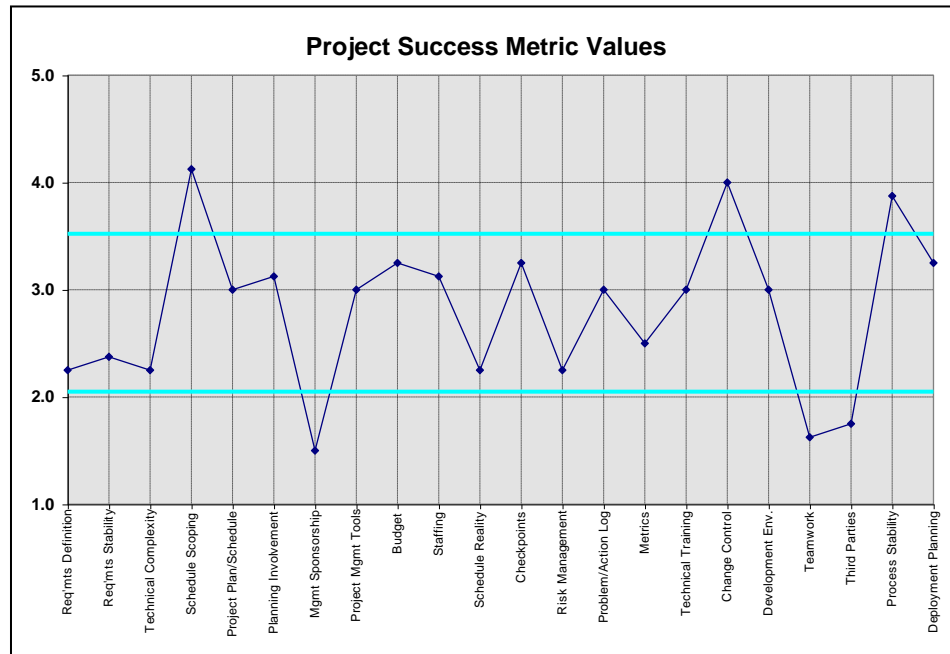


Figure 2

Most High / Most Low Ratings

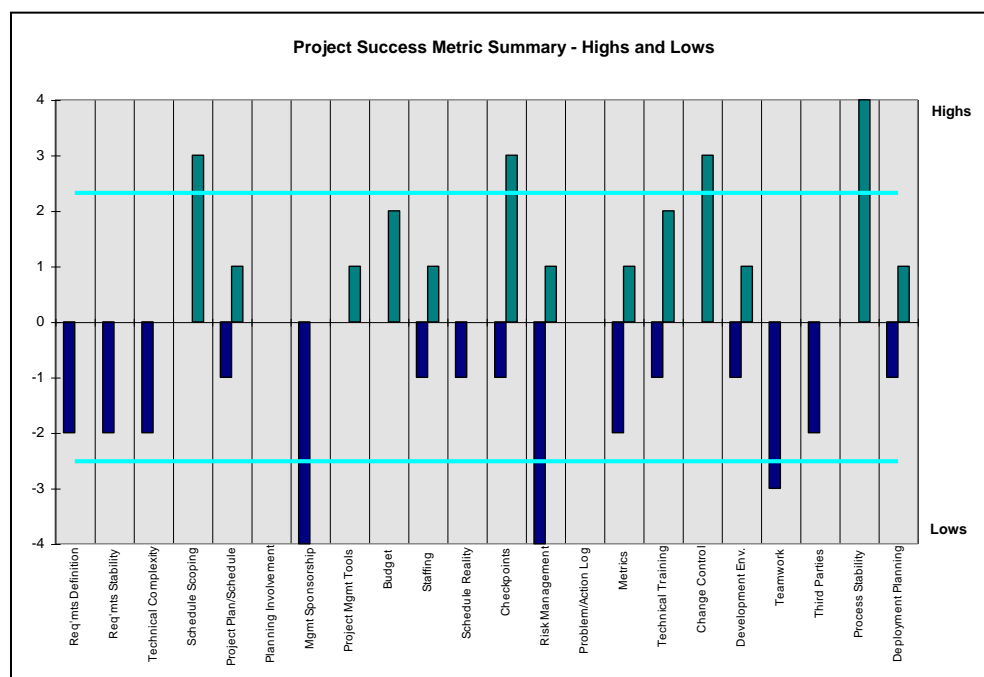


Figure 2.1

Understanding Quality/Schedule/Cost Tradeoffs (3a)

1. Making tradeoffs between Quality (including content), Schedule and Cost is at the heart of software project management. Frequent tradeoffs are made by project staff, often outside the control of the project manager, which have a significant impact on the project's success.

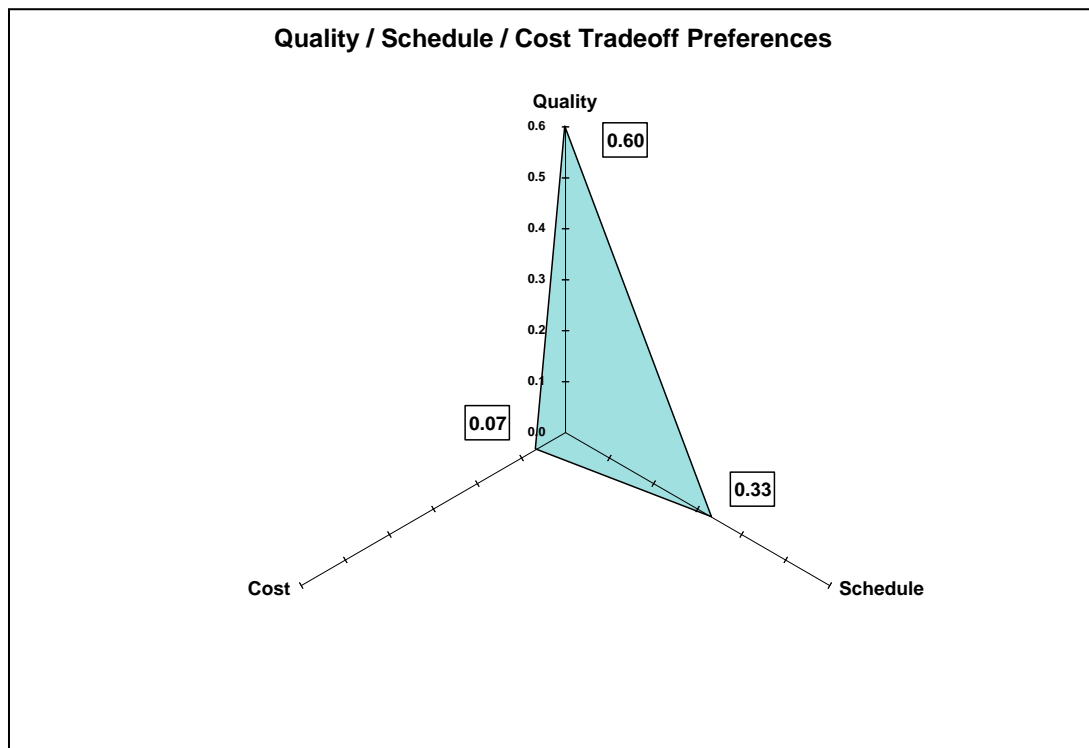


Figure 3

Note, in figure 3, that all tradeoff preferences are measured as an aggregate of individual project staff preferences, rather than individual values. Individual project staff members influence other staff members, providing a system of checks and balances for making project tradeoffs. Figure 3 factors in these checks and balances to describe overall staff preferences.

Quantifying Overall Project Risk (3b)

To understand overall project risk, select the worksheet “Overall Risk” in the PSAK Workbook. An example is shown in Figure 4:

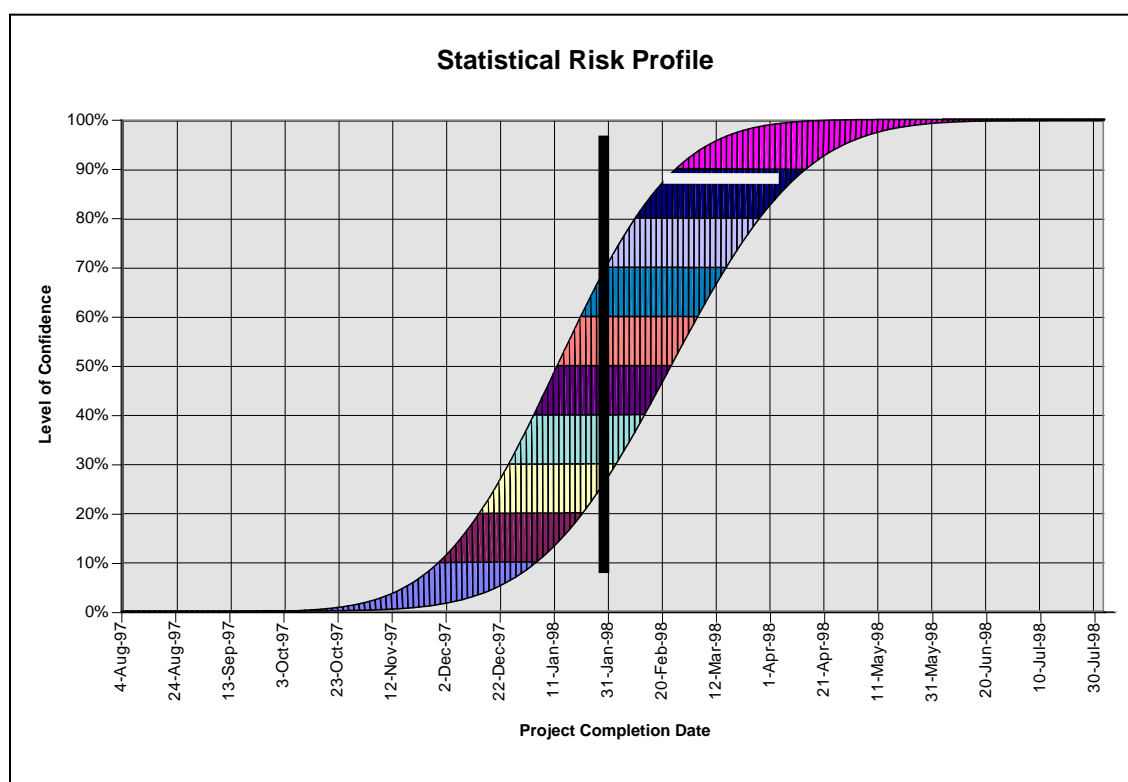


Figure 4

Figure 4 maps the level of confidence in project completion to the scheduled completion date. The upper edge of the curve shows the most-likely relationship, and the lower edge of the curve shows the worst-case relationship.

Develop Action Plans (4)

After completion of the automated section of the project risk analysis, the ITS/ETS staff will generate a project risk analysis report. Copies of the risk analysis report will be provided to all survey respondents and should be used to develop project risk profiles and action plans.

Schedule

Kulik and Lazarus Project Self-Assessments should be conducted as part of the project planning and initiation phase prior to the first independent quality assurance review. Based on the results of the initial assessment, additional risk assessments may be conducted at various milestones in the system development life cycle.

Contact the Information Resource Management (ITS/ETS) staff at IRMPO@ncmail.net for more information about the assessment process.

3. Project Risk Impact Analysis

Project Risk Impact Analysis is a risk management database that is designed to help the project team identify, prioritize, and communicate project risk. The database is an Excel spreadsheet with detail project risk information (riskreport.xls). Detailed instructions for completing the companion spreadsheet are contained in this section of the document.

Risk impact analysis is a plan for identifying, quantifying, analyzing, mitigating, and reporting project risks. This section includes descriptions of risks and corresponding mitigation actions that have been identified. It guides the project-wide risk reduction efforts. It is applicable to all projects and its requirements affect all functions of a project management office.

The questions "How Much?" and "How Long?" must be answered by most organizations before specific project risk information is known. As a result, project estimates inherently include uncertainties, assumptions, and risks. Successful project planning and implementation requires risk management, change management, and meaningful contingency planning.

Risk management helps to align the expectations of the project stakeholders and the Project Manager regarding project process, issue resolution, and project outcome. Clients often have involuntary risks or constraints imposed upon them. They often are taking project risks they don't even know they are taking due to poor articulation of the risks and their possible impact on the project. As a result, clients are often surprised by negative consequences and unmet expectations. It is the Project Manager's job to identify and to articulate the potential risks and their possible impacts to the client. The clients then assume the risks on a voluntary basis and can be actively involved in assisting with risk management.