



PMINJ Chapter
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*Requirements Management –
“Yeah, I need that!”*

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Requirements Gathering

Requirements Management – “Yeah, I need that!”

Planning An Effective Requirements Gathering Process

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Phases of a Project

- Initiation
- Wild enthusiasm
- Disillusionment
- Chaos
- Search for the guilty
- Punishment of the innocent
- Promotion of the non participant
- Gather Requirements
- A Systems Approach to Planning Scheduling and Controlling-Kerzner



Why Do Projects Fail?

- What do we know from our personal experience?

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The Challenges

- Establishing a supported and accepted process
- Scope creep
- Feasibility and integration of requirements
- Disagreement about requirements among end users, key stakeholders, and sponsor
- Political influence
- Organizations power and bias
- Obtaining the “real requirements”
 - Customer / client articulation of actual needs

Identify Challenges and Obstacles to Req. Gathering

- Changes in needs
- Conflicting opinions for resolutions
- Disagreement among sponsoring groups
- Stakeholder disagreements
 - Functional requirements
 - Regional differences
 - Interpretation of job function
 - Different priorities
 - Geographic location
 - Culture
 - Managerial style



Challenges & Obstacles to Obtaining Requirements

- Poor Communication – between stakeholders
- Business processes – not clearly defined, some “grandfathered”, over designed, some don’t exist, not aware of some processes, the execution of processes that are approved and in place,
- Growth of or changes within the organization
- Confusion about ownership / responsibility of assets, operations, and maintenance functions
- Failure to understand project user needs
- Time constraints
- Budget / funding constraints
- Confidentiality / security issues

Challenges & Obstacles to Obtaining Requirements

- Conflicting priorities and interpretations
- No understanding of the specific reasons behind imposed constraints
- Disregarding the defined constraints
- Clients and end users are unresponsive to requests for information about requirements
- Strategic planners are not sure what they need
- Converting implied needs from the client / user into stated needs that are agreed upon

Common Requirements Issues

- Incorrect or non-validated assumptions
- Missing or omitted requirements
- Inconsistent requirements – conflicting requirements
- Ambiguities
- Overlapping requirements / duplications (connections and inter-dependencies with other projects)
- External dependencies – projects that affect impact a project's critical path (interfaces)
- Outdated standards

Definition of a Requirement

- A necessary attribute in a system. A statement that identifies a capability, characteristic, or quality factor of a system or product in order for it to have value and utility to a stakeholder
 - Quantified and documented needs and expectations
- Externally observable characteristics that shall be present in the product / deliverable



Ten Attributes to a Requirements Gathering Process

- Defined
- Documented
- Planned
- Supported
- Trained
- Communicated
- Practiced
- Enforced
- Measured
- Improvable

Requirements Management Process

- **Definition of RM**- Collection, analysis, control, filtering, and documentation of requirements
- **Process**
 - **Elicitation**- understanding the needs. Collecting and storing the information
 - **Analysis**- deciding on the appropriate features and functions
 - **Specification**- detailing exact functions and features (engineering)

Obtaining Requirements

- Determine the project drivers
 - Mandated projects – penalties, fines (Compulsory)
 - Investment strategy / Strategic initiatives
 - Improve reliability (upgrades, changes)
 - Administrative (new tools, training, methods, data bases, infrastructure)
 - Customer needs (includes end users)
- Perform appropriate sizing and scoping activities. Identify all stakeholders
- Determine the stakeholder **mission critical issues**

Constraints

- Resources (availability and skill levels)
- Compliance, regulatory
- Infrastructure (e.g. - must support existing operating systems, other system interfaces)
- Budget / funding
- Organizational / political issues
- Vendor / stakeholder relationships
- Defined / imposed targets (milestones & contractual agreements)

Requirements Triage



- Deciding which features are the appropriate features to include in the product.(after elicitation)
- It is generally not possible to include every requested feature gathered from every stakeholder
- Consider what can be built now, built later or deferred to a much later time (or eliminated completely)

Planning for Requirements Gathering

- Business reason, project objectives, critical milestones (refer to the project charter)
- Project Scope Statement is developed and approved (Detailed information about what must be accomplished)
- Request for funding (obtain senior mgt. approval of project budget)
- Define and document the roles and responsibilities of each team member
- Define the **Requirements Gathering Deliverables** – captured requirements and associated documentation
- Prepare to collect requirements - documents, surveys, interviews, prototypes, meetings, conference calls, documentation reviews, analysis, specification, revision control, final acceptance
- Communications plan

Prepare Assumptions (what is believed to be true)

Examples:

- Funding will be available
- Management fully supports this project
- We have sufficient resources (contractors) with skill set to complete the project
- Sufficient time will be allocated for obtaining requirements, project planning and execution
- The community / jurisdiction will support the project
- Material will be available
- Project does not violate any existing laws and regulations
- Stakeholders will be cooperative

**assumptions must be validated*

Risk Identification

Examples:

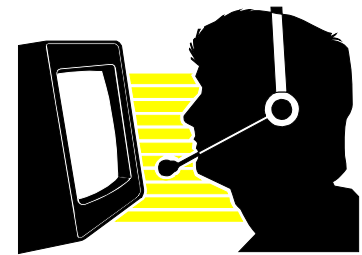
- Environmental Risks
 - Political Risks
 - Community opposition
 - Administration changes
 - Organizational risks
 - Internal communications
 - Safety
 - Economic / Financial
 - Market
 - Materials and Equipment
 - Project management
- Project dependencies
 - Resource turnover
 - Requirements
 - Functional & Non-Functional
 - Connection to other systems
 - Specifications: Design and performance
 - User training
 - Cost
 - Usability
 - Wrong requirements

Requirements Gathering Steps

- Documentation
 - Obtain and review existing standards and guidelines
 - Review and validate design specifications
 - Review and finalize procurement specifications
 - Review required load levels for service reliability and performance criteria
- Observe the operation of the existing product.
 - Does it meet the needs of the stakeholders / users?
 - Identify gaps and areas for improvement
- Replace existing product or upgrade?

Process Steps

- Observe the System or Service in operation
 - Functionality, inconsistencies
 - Inspect facilities
 - Conduct interviews (formal or informal)
 - Find out what is important
 - Find out what is not being used and why
- Evaluation
 - Perform analysis of the service or obtain existing operations performance metrics



Information Gathering Techniques

- Interviews
- Document Analysis
- Brainstorming
- Requirements Workshops
- Story Boarding
- Interface Analysis
- Modeling / mock systems / simulations / prototyping
- Performance and Capacity Gap Analysis
- Back up systems and their specifications

Source-Ralph R. Young : Recommended Requirements Gathering Practices

Information Gathering

- Department manuals, documented processes, SOPs
- Job Descriptions
- Intra and Inter- department dependencies
- Identify external interfaces, dependencies
- Glossary of Terms
- Previous requirements documents and procedures (templates)
- Compliance specifications
- Prior Contracts / Statements of Work / Historical documents
- Security- access to documents, systems, facilities

Information Gathering

- Detailed interviews
 - Initial requirements – (Trawling) to gather info for analysis
 - Triage : identify “real requirements”
 - Detailed questionnaire / surveys – based on initial req. analysis
 - For developers, engineers, designers
 - Validation of Requirements (confirming needs vs. wants)
 - Prepare requirements for detailed specification process

Process Control

- Reviews and quality assurance
 - Validation of approved processes
 - Use of approved templates
- Version control procedures (revision control)
- Proactive problem identification
- Risk management
- Use feedback from stakeholders to address problems throughout the project
- Acceptance testing process

Process Outputs

- Provides more complete and detailed scope of work
- Improvement of the requirements management process
- Confirms the need for the solution
 - Validates stakeholder roles, influence, and needs
 - May result in identification of alternatives
- Identifies action items
- Identifies potential opportunities
- Further identifies risk areas

Stakeholder Requirements Gathering

Things to consider....

- Economic / Financial: Will the requirement meet cost constraints
- Environmental factors
- Technical: Is it practical? Can the system / product accommodate the requirement?
- Benefit – Does the requirement offer a sufficient level of value?
(benefit if present and penalty if absent) Technical and operational merit
- Operational: Does it fit within current processes?
 - Acceptable Time Frame (time to develop)
 - Fulfillment of the need. Provides the functions /solution desired
(full or partial fulfillment)

Detailed Requirements Gathering

- For changes, upgrades and replacements
 - Assess performance of the current product or service
 - Create flow charts or diagrams of existing products and services to determine performance gaps, redundancies, and improvement opportunities
 - Identify features / functions that require improvement
 - Identify functions/features/services that can be eliminated
 - What are the essential features
 - What features / functions must remain available? (must haves, directives)
 - Current capacity / load and future capacity

Detailed Requirements Gathering

- Organizational Policies and Constraints
- Organizational Politics / Inter-department Politics / External
- Existing records and documentation for:
 - Sites
 - Products
 - Maintenance logs
 - Trouble reports
 - Performance history

Requirements Analysis

- Review all information obtained
- Compare requirements identified with established parameters and constraints (Triage)
- Determine true requirements Vs. wants and “nice to haves”
 - Eliminate unnecessary, out of scope, and unimportant requirements
 - Use a scoring process (benefit if present / penalty if absent)
- Review findings with the stakeholders and obtain agreement

Functional Requirements

- What will the product do? What data or information will it provide?
- The fundamental purpose of the product:
 - Checks, calculates, regulates, records, retrieves, balances, accepts data, produces data, monitors, controls
- Integration and compatibility with other systems

Training Requirements

- End-user / Operations
- Management (technical overviews)
- How much training is needed?
- What level of training? Overview, administrator, detailed technical

Operational Requirements

- System availability
- Remote access
- Back -up , UPS, redundancy, disaster recovery
- Support
- What procedures must be written for using the system?
- Maintenance, spare parts, tools

Quality Criteria

- Testing and Acceptance criteria
- Validation process
- Certification and compliance (pre-energization check list)
 - Testing
 - Documentation
 - Phasing

Requirements Gathering Best Practices

- Write and iterate a project vision and scope
- Develop a project glossary
- Elicit and Triage
- Evolve “real requirements”-necessary vs. wanted
- Prioritize requirements

- Document the rationale for each requirement
- Establish a change control process
 - Version control
 - Scope creep

Source-Ralph R. Young, Recommended Req. Gathering Practices

Requirements Gathering Best Practices

- Use an incremental development approach for volatile or “unknowable” requirements
- Use SMEs
- Use an organized approach (project methodology)

- Establish a quality process for continuous improvement
- Involve stakeholders throughout the development process
- Perform Requirements validation and verification

Key Words for Requirements Definition

- Accessibility
- Compatibility
- Complexity
- Functionality
- Integration
- Maintainability
- Purpose
- Redundancy

- Platform /System dependency
- Reliability
- Security
- Speed
- Stability
- User Friendliness
- Environment

Key Words Continued

- Interoperability
- Portability
- Traceability

- Cost
- Design
- Optimization

Characteristics of a “Good” Requirement

- Clarity
- Thorough
- Well written
- Has a deadline
- Relevant
- Supporting documentation
- Measurable

- Is Met
- Encompasses goals
- All parties agree
- Constraints and assumptions identified
- Stakeholders identified
- Communicate the value to the project team

Attributes of a Well Written Requirement

- Necessary
- Verifiable
- Attainable
- Unambiguous
- Complete
- Consistent
- Traceable
- Concise

- Implementation Free
- Unique identifier

Managing Scope Creep

- Definition- adding features or functionality without approval that are not part of the original PSD
- Techniques:
 - Define project boundaries at the start
 - Review / restate the original scope (agreed upon scope) during meetings
 - Awareness of bias: personal need, social pressure, politics
 - Establish and enforce a change control process

Requirements: The Greatest Challenge

- The effort required to find out what the stakeholders / end-user needs, not documenting what they want is the major factor
- Requirements are the Achilles' heel of a project
- Plan for requirements gathering and management (8% to 14% of the project effort)
- Be prepared for exceptions and special requests
- Don't forget the final end user (downstream user)



Questions?

Thank You!

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