Project Management

Brief Outline

What is a project ?

- It's a temporary endeavor undertaken to create a unique product, service or result. - ***PMBOK***
- A project is **temporary** in that it has a defined beginning and end in time, and therefore defined scope and resources.
- And a project is **unique** in that it is not a routine operation, but a specific set of operations designed to accomplish a singular goal. So a project team often includes people who don't usually work together – sometimes from different organizations and across multiple geographies.
- The development of software for an improved business process, the construction of a building or bridge, the relief effort after a natural disaster, the expansion of sales into a new geographic market

What is Project Management?

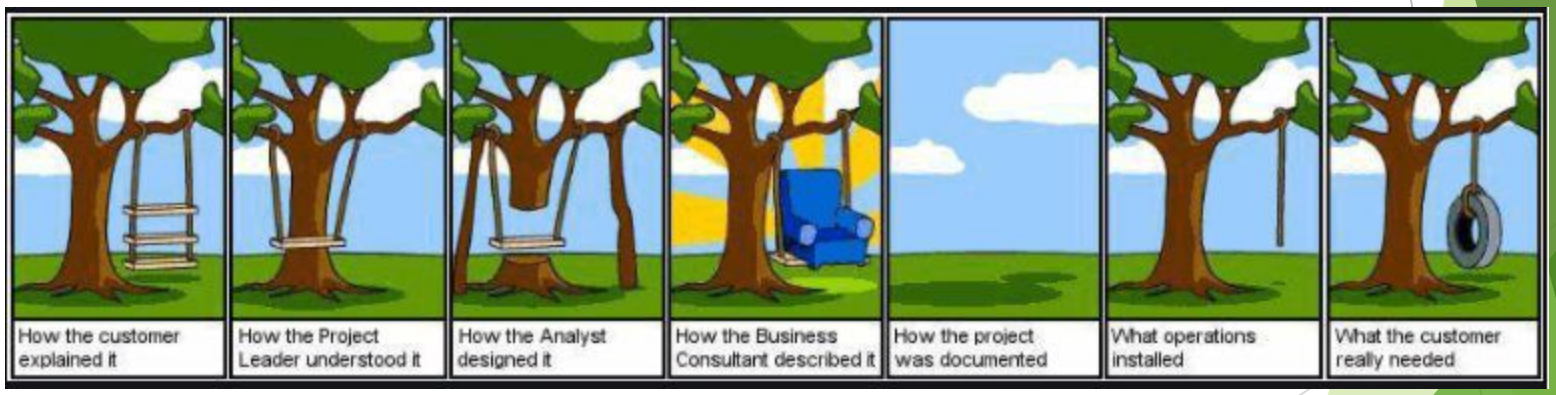
- **Project management**, is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.
- **Project management** processes fall into five groups:
  - Initiating
  - Planning
  - Executing
  - Monitoring and Controlling
  - Closing

Project Management Knowledge Areas (PMBOK)

- **Project management** knowledge draws on ten areas**:**
  - Integration
  - Scope
  - Time
  - Cost
  - Quality
  - Procurement
  - Human resources
  - Communications
  - Risk management
  - Stakeholder management

Project Management

- Project Management is a set of procedures and disciplines to translate the project objectives into outputs ensuring project requirements are met.



Project Initiation

- What would you look for in the Scope of Work in a project ?
- What would you be concerned about in initiating a project ?

Initiation

- Essential Inputs
  - Written SoW (No exceptions)
  - Project Workings / Back Papers
- Outputs
  - Action items based on review
  - Draft Project Plan / Key inputs for Project Plan

Initiation

- Business Review
  - Schedule
  - Resources
  - Acceptance Criteria
  - Cost
  - Training
  - Scope
  - SLAs
  - Customer CTQs

Initiation

- Technical Review
  - Scope
  - Hardware
  - Software
  - Customer Supplied Items
  - Test Data
  - Technology
  - Standards
  - Reuse Opportunities

Scope

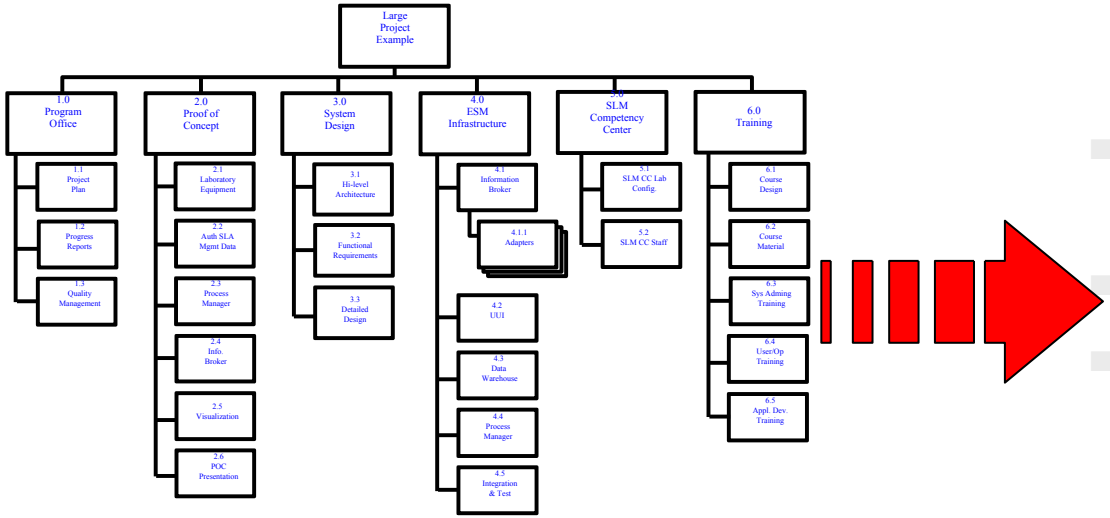
- **Scope** refers to the generic and aggregated representations of requirements (and/or environments) elaborated to achieve the defined objectives of the project.
- **Business Scope** outlines the needs of the organization or institution in which business operations are carried out.
  - *The financial system should comply with taxation policy of Nepal.*
  - *The system should support Double Entry system for transactional recording.*
  - *The system should support financial calculations based on both BS and AD Calendar.*
- **Technical Scope** defines the technical necessity based on which the expected deliverables and outputs should be carried out.
  - *The system should have audit trial against each transactional update and provide an interface to govern transactions.*
  - *The system should be built on policy of creator-reviewer-approval as three level authorization system against each transactions.*
  - *The system should adopt soft delete policy where any committed data would never exit the system.*

Scope

- Scope is comprised of the following essential components
  - What are we doing, what are the deliverables?
  - What dependencies do we have on the customer or other "external" parties?
  - What assumptions have we made?
  - How do we know we're done? - acceptance criteria
- Scope Definition forms the basis for contract with the customer!
- Clarity is key !

Scope

Relationship to WBS



- WBS Provides the outline for the scope statement
- Narrative in nature
- Scope statement clearly and completely describes each deliverable in the WBS

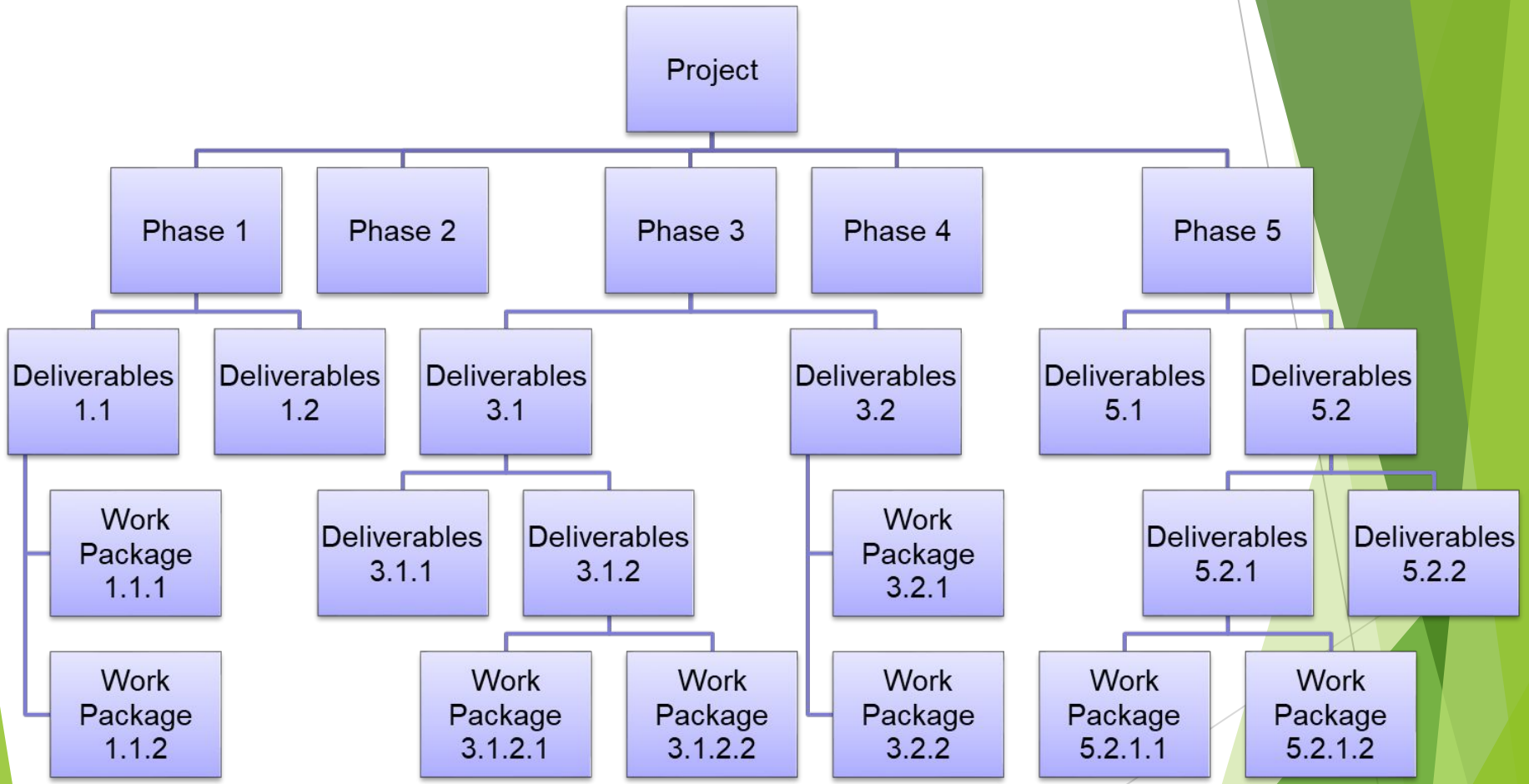
WBS

Outlines Deliverables

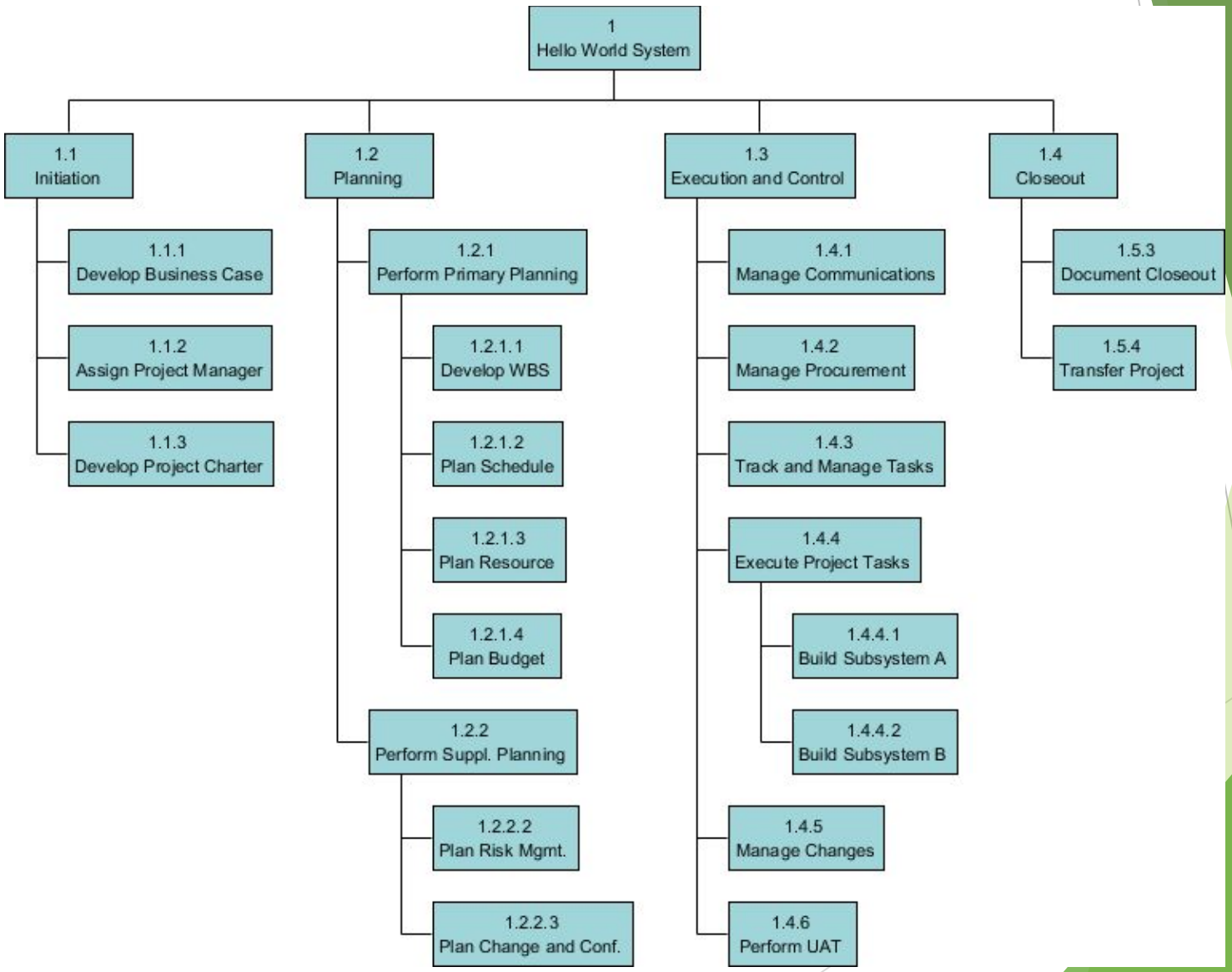
SOW

Statement of Work
Defines Deliverables

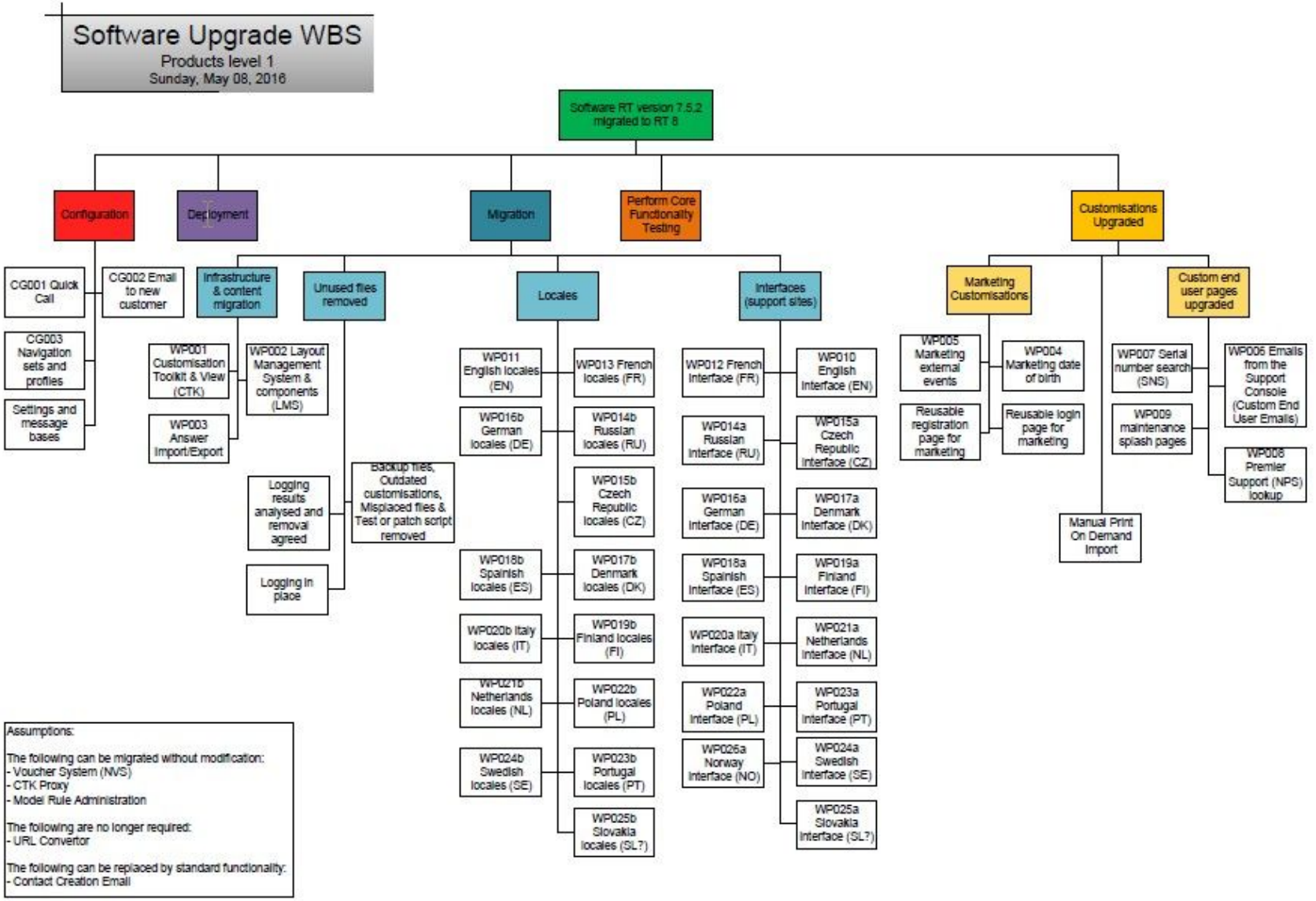
WBS


Project
Phase 1
Phase 2
Phase 3
Phase 4
Phase 5
Deliverables 1.1
Deliverables 1.2
Deliverables 3.1
Deliverables 3.2
Deliverables 5.1
Deliverables 5.2
Work Package 1.1.1
Work Package 1.1.2
Deliverables 3.1.1
Deliverables 3.1.2
Work Package 3.1.2.1
Work Package 3.1.2.2
Work Package 3.2.1
Work Package 3.2.2
Deliverables 5.2.1
Deliverables 5.2.2
Work Package 5.2.1.1
Work Package 5.2.1.2

WBS


1
Hello World System
1.1
Initiation
1.2
Planning
1.3
Execution and Control
1.4
Closeout
1.1.1
Develop Business Case
1.1.2
Assign Project Manager
1.1.3
Develop Project Charter
1.2.1
Perform Primary Planning
1.2.1.1
Develop WBS
1.2.1.2
Plan Schedule
1.2.1.3
Plan Resource
1.2.1.4
Plan Budget
1.2.2
Perform Suppl. Planning
1.2.2.2
Plan Risk Mgmt.
1.2.2.3
Plan Change and Conf.
1.4.1
Manage Communications
1.4.2
Manage Procurement
1.4.3
Track and Manage Tasks
1.4.4
Execute Project Tasks
1.4.4.1
Build Subsystem A
1.4.4.2
Build Subsystem B
1.4.5
Manage Changes
1.4.6
Perform UAT
1.5.3
Document Closeout
1.5.4
Transfer Project

WBS


Software Upgrade WBS
Products level 1
Sunday, May 08, 2016
Software RT version 7.5.2 migrated to RT 8
Configuration
Deployment
Migration
Perform Core Functionality Testing
Customisations Upgraded
CG001 Quick Call
CG002 Email to new customer
CG003 Navigation sets and profiles
Settings and message bases
Infrastructure & content migration
WP001 Customisation Toolkit & View (CTK)
WP002 Layout Management System & components (LMS)
WP003 Answer Import/Export
Unused files removed
Logging results analysed and removal agreed
Logging in place
Backup files, Outdated customisations, Misplaced files & Test or patch script removed
Locales
WP011 English locales (EN)
WP013 French locales (FR)
WP016b German locales (DE)
WP014b Russian locales (RU)
WP015b Czech Republic locales (CZ)
WP018b Spainish locales (ES)
WP017b Denmark locales (DK)
WP020b Italy locales (IT)
WP019b Finland locales (FI)
WP021b Netherlands locales (NL)
WP022b Poland locales (PL)
WP024b Swedish locales (SE)
WP023b Portugal locales (PT)
WP025b Slovakia locales (SL?)
Interfaces (support sites)
WP012 French Interface (FR)
WP010 English Interface (EN)
WP014a Russian Interface (RU)
WP015a Czech Republic Interface (CZ)
WP016a German Interface (DE)
WP017a Denmark Interface (DK)
WP018a Spainish Interface (ES)
WP019a Finland Interface (FI)
WP020a Italy Interface (IT)
WP021a Netherlands Interface (NL)
WP022a Poland Interface (PL)
WP023a Portugal Interface (PT)
WP026a Norway Interface (NO)
WP024a Swedish Interface (SE)
WP025a Slovakia Interface (SL?)
Marketing Customisations
WP005 Marketing external events
WP004 Marketing date of birth
Reusable registration page for marketing
Reusable login page for marketing
Manual Print On Demand Import
Custom end user pages upgraded
WP007 Serial number search (SNS)
WP006 Emails from the Support Console (Custom End User Emails)
WP009 maintenance splash pages
WP008 Premier Support (NPS) lookup
Assumptions:
The following can be migrated without modification:
- Voucher System (NVS)
- CTK Proxy
- Model Rule Administration
The following are no longer required:
- URL Convertor
The following can be replaced by standard functionality:
- Contact Creation Email

Deliverables

- Dos
- Be precise & concise
- Define measurable acceptance criteria
- Avoid adjectives like "fast, complete, etc."
- Include a documentation review process
- Do an independent review
- Review verbally with customer

- Don't
- Use words like:
  - by mutual agreement
  - optimize
  - will be defined later
  - of the highest quality
- Offer performance guarantees (unless you must!)
- Assume customer has same expectations as you
- Say its "secure"

Acceptance Criteria

- Acceptance Criteria must be measurable and objective. They should relate back to agreed upon requirements.
- Good:
  - Accepted upon delivery
  - Accepted upon completion of document review process
  - Accepted upon passing acceptance test suite as defined in document XYZ
  - Accepted when it is used (e.g. put in production)
- Bad:
  - Accepted when approved by customer project manager
  - Accepted when bug count is zero
  - No criteria at all

Acceptance Criteria

- 4 Categories of acceptance criteria
  - Test (e.g. a system test to verify data)
  - Demo (e.g. showing them a GUI works)
  - Analyze (e.g. the data is right so the program must be OK
  - Inspect (e.g. looking at documentation)

Opportunities for Reuse

- Watch out from project commencement
- And monitor throughout
- Reuse can be for
  - Technical Aspects - Domain aspects, Design aspects, Code Snippets, Test Cases, …
  - Project Management Aspects – Estimation models, Configuration Methods, Coding Standards, Review Checklists, …..
- Reuse can be a powerful aid in – Acheiving Quality, Managing Schedule, Improving Productivity

Defect Prevention

- Focus on prevention before you start the work
- Traditional Root Cause Analysis happens after the work is done and defects have occurred
- Use past data / past experiences
- Use judgement around current project context
- Ensure actions to prevent defects
  - Impact the project's process
  - Are present in the WBS
  - Are specific, implementable, verifiable

Project Planning

Planning covers

- Project's Process
  - What should I do ?
  - What should I not do ?
  - What should I do differently ?
  - What should I not do differently
  - Work backwards from the desired results to the project's (defined, tailored) process
- Assumptions / Constraints / Dependencies – How do they relate / differ ?

Planning covers

- Schedule Characterestics
- Near Term – Granularity
- Long Term – Vision
- Integration – Dependencies, Risk Management Steps, Defect Prevention Steps, Issue Resolution Steps
- Milestones
  - Major / Minor / Customer Touching
  - Completion should be determinable in binary terms

Planning covers

- Size
- Effort
- Resources
- Trainings
- Configuration Management
- Quality Management

Planning covers

- Elaboration of all aspects identified during initiation
- Traceability to SoW; SoW is the basis for project planning
- Revisit to opportunities for reuse
- Approach for preventing defects
- Deliverables

Responsibility Assignment Matrix

Note: List all the activities and then assign the role for all the stakeholders in the project. For each Activity the
R = Responsible (Responsible to execute the job), A = Accountable (Person who is held accountable), S = Su

Role / Activity	COO	VP	SEPG	QA Manager, MR	QA Group	Metrics & Estimation Group	DP Group
Audits and MRM	I	C	I	R,A	R	I	I
Causal Analysis and Resolution	I	I	I	C	I	I	R,A
Configuration Management	-	R	R	R,A	R	-	-
Defining SPI Processes	I	C	R	A	S	C,I	I
Metrics Baselines	-	C	C	R,I	I	R	-
OID	I	C	R	I	I	-	-
Process Improvements	I	R	I	I	S	C,I	I
Project Planning and Management	I	C	C	R,A	S	-	-
Risk Management	C	R	R	R,A	S	R	R

Reusable Components/Artifacts

Artifact Reference Id	Artifact Description	Derived or Developed
1	Datacom usage sheet used for impact analysis	Developed
2	XRDSB303--- Template for Business layer program	Developed
3	XRDSD301---- Template for CRUD program	Developed
4	XRDSD401--- Template for Cursor program	Developed
5	XRDSEKXP --- Template for event coordinator	Developed
6	XRDSP100 ---- Template for presentation layer program	Developed
7	XRDSMXT --- Template for Mainline program	Developed

Planning covers

- Goals for team members, based on project goals
- Goal setting is key to managing expectations
- While setting goals, While Planning – Negotiate, always
- Negotiation is the key to achieving buy in

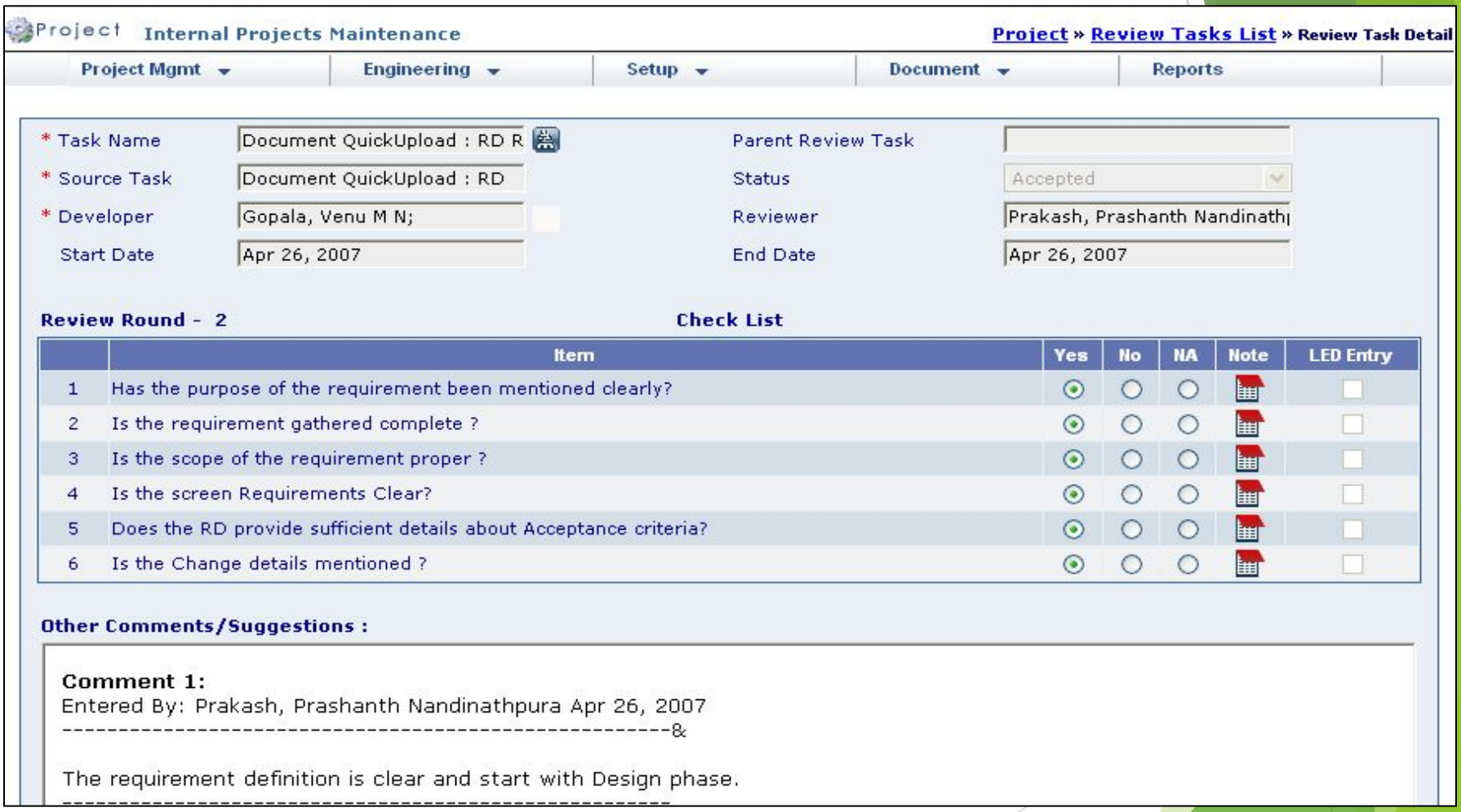
Planning Review

- Sr. Management Review and Approval is essential
- Sr. Management signoff implies commitment

Why Planning and its review is important ?

Shoe Tower Construction Concept

Shoe Tower


Project
Internal Projects Maintenance
Project » Review Tasks List » Review Task Detail
Project Mgmt
Engineering
Setup
Document
Reports
* Task Name
Document QuickUpload : RD R
Parent Review Task
* Source Task
Document QuickUpload : RD
Status
Accepted
* Developer
Gopala, Venu M N;
Reviewer
Prakash, Prashanth Nandinathp
Start Date
Apr 26, 2007
End Date
Apr 26, 2007
Review Round - 2
Check List
Item
Yes
No
NA
Note
LED Entry
1 Has the purpose of the requirement been mentioned clearly?
2 Is the requirement gathered complete ?
3 Is the scope of the requirement proper ?
4 Is the screen Requirements Clear?
5 Does the RD provide sufficient details about Acceptance criteria?
6 Is the Change details mentioned ?
Other Comments/Suggestions :
Comment 1:
Entered By: Prakash, Prashanth Nandinathpura Apr 26, 2007
----------&
The requirement definition is clear and start with Design phase.

Project Tracking and Management

Project Tracking and Management

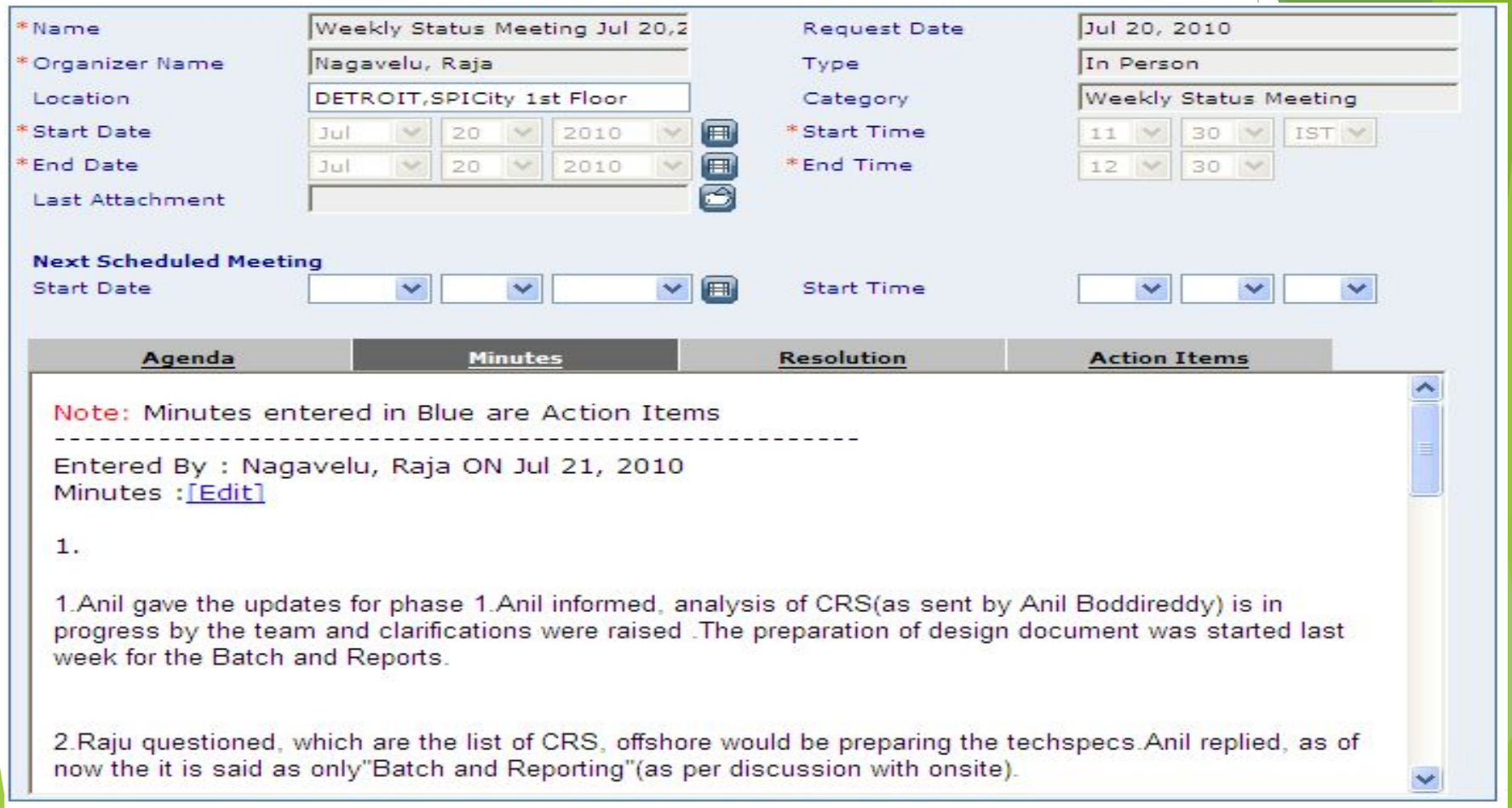
- Project Tracking / Project Reviews consume time !
- What if I don’t have time for project tracking / project review ?

Project Tracking …

- Per PMIBOK (dated)
  - Scope
  - Time
  - Cost / Revenue
  - Quality
  - Resource
  - Communication
  - Risk
  - Contract
  - Client Satisfaction

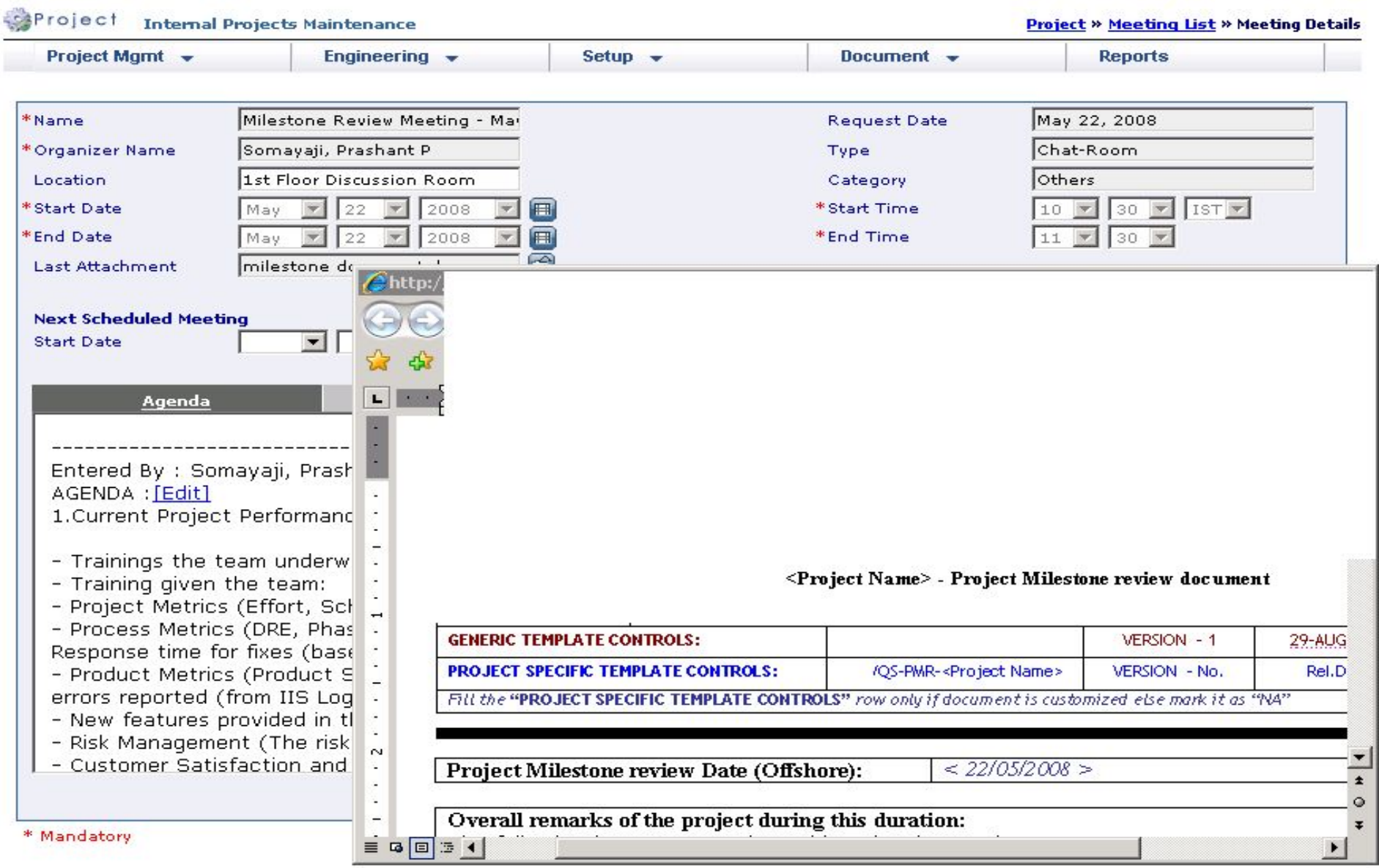
Project Tracking …

- Everything that you had planned for
- Weekly Reviews
  - Ongoing progress monitor
  - Operational issue resolution forum
  - Negotiations on short term objectives
  - Focus on achieving short term objectives
  - Trigger for a Milestone review / Detailed Review


*Name
Weekly Status Meeting Jul 20,2
Request Date
Jul 20, 2010
*Organizer Name
Nagavelu, Raja
Type
In Person
Location
DETROIT,SPICity 1st Floor
Category
Weekly Status Meeting
*Start Date
Jul 20 2010
*Start Time
11 30 IST
*End Date
Jul 20 2010
*End Time
12 30
Last Attachment
Next Scheduled Meeting
Start Date
Start Time
Agenda
Minutes
Resolution
Action Items
Note: Minutes entered in Blue are Action Items
Entered By : Nagavelu, Raja ON Jul 21, 2010
Minutes :[Edit]
1.
1.Anil gave the updates for phase 1.Anil informed, analysis of CRS(as sent by Anil Boddireddy) is in progress by the team and clarifications were raised .The preparation of design document was started last week for the Batch and Reports.
2.Raju questioned, which are the list of CRS, offshore would be preparing the techspecs.Anil replied, as of now the it is said as only"Batch and Reporting"(as per discussion with onsite).

Project Tracking …

- Monthly Reviews / Milestone Reviews
  - Opportunity to take stock
  - Replan
  - Negotiations on achieving medium term objectives
  - Evaluate Options
  - Opportunity to take a view on overdue issues
- Project Health – Visual Indicators to declare project health


Project
Internal Projects Maintenance
Project » Meeting List » Meeting Details
Project Mgmt
Engineering
Setup
Document
Reports
*Name
Milestone Review Meeting - Ma
*Organizer Name
Somayaji, Prashant P
Location
1st Floor Discussion Room
*Start Date
May 22 2008
*End Date
May 22 2008
Last Attachment
Request Date
May 22, 2008
Type
Chat-Room
Category
Others
*Start Time
10 30 IST
*End Time
11 30
Next Scheduled Meeting
Start Date
Agenda
Entered By : Somayaji, Prash
AGENDA : [Edit]
1.Current Project Performanc
- Trainings the team underw
- Training given the team:
- Project Metrics (Effort, Sch
- Process Metrics (DRE, Phas
Response time for fixes (base
- Product Metrics (Product S
errors reported (from IIS Log
- New features provided in th
- Risk Management (The risk
- Customer Satisfaction and
* Mandatory
<Project Name> - Project Milestone review document
GENERIC TEMPLATE CONTROLS:
VERSION - 1
29-AUG
PROJECT SPECIFIC TEMPLATE CONTROLS:
/QS-PMR-<Project Name>
VERSION - No.
Rel.D
Fill the "PROJECT SPECIFIC TEMPLATE CONTROLS" row only if document is customized else mark it as "NA"
Project Milestone review Date (Offshore):
< 22/05/2008 >
Overall remarks of the project during this duration:

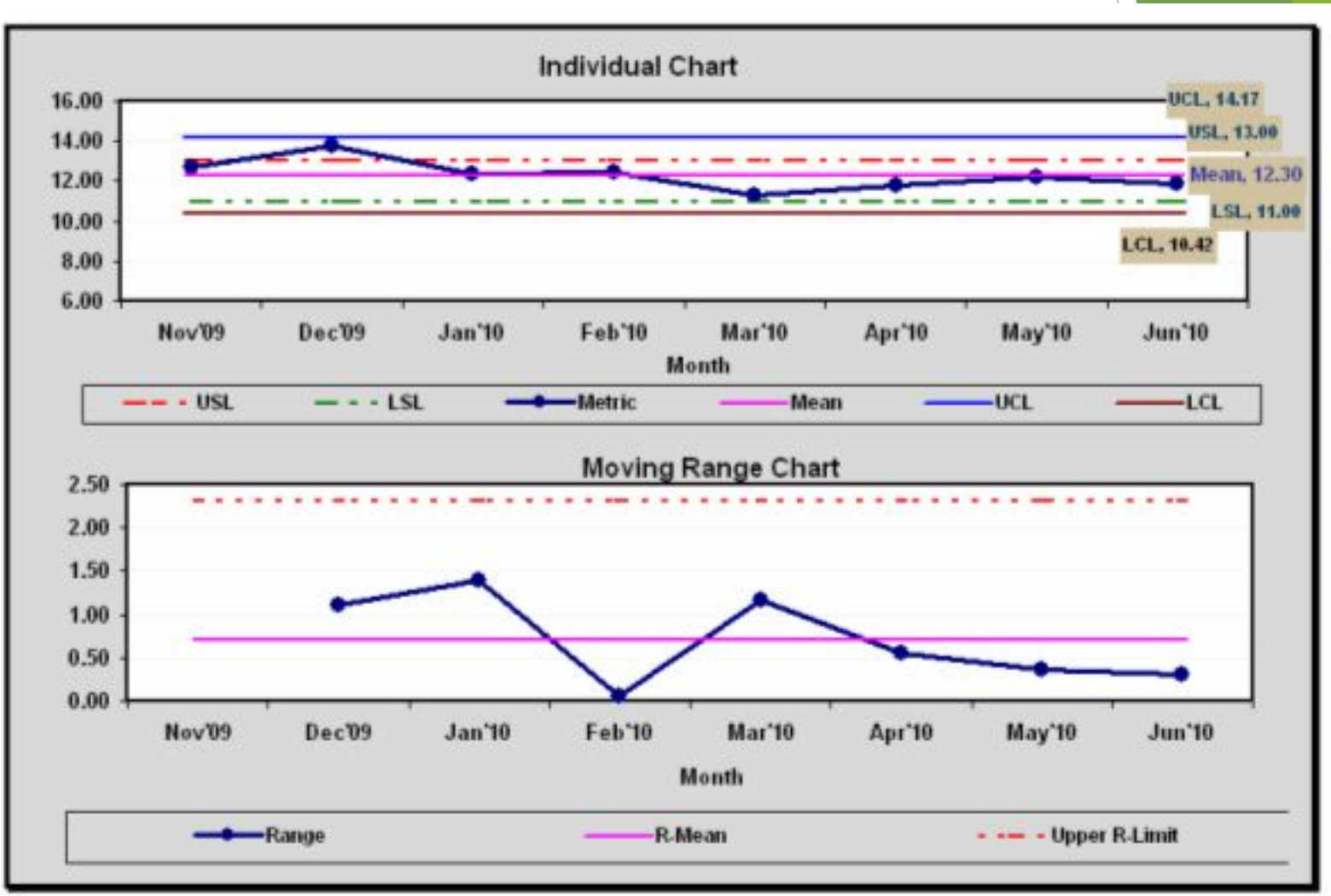
Project Tracking …

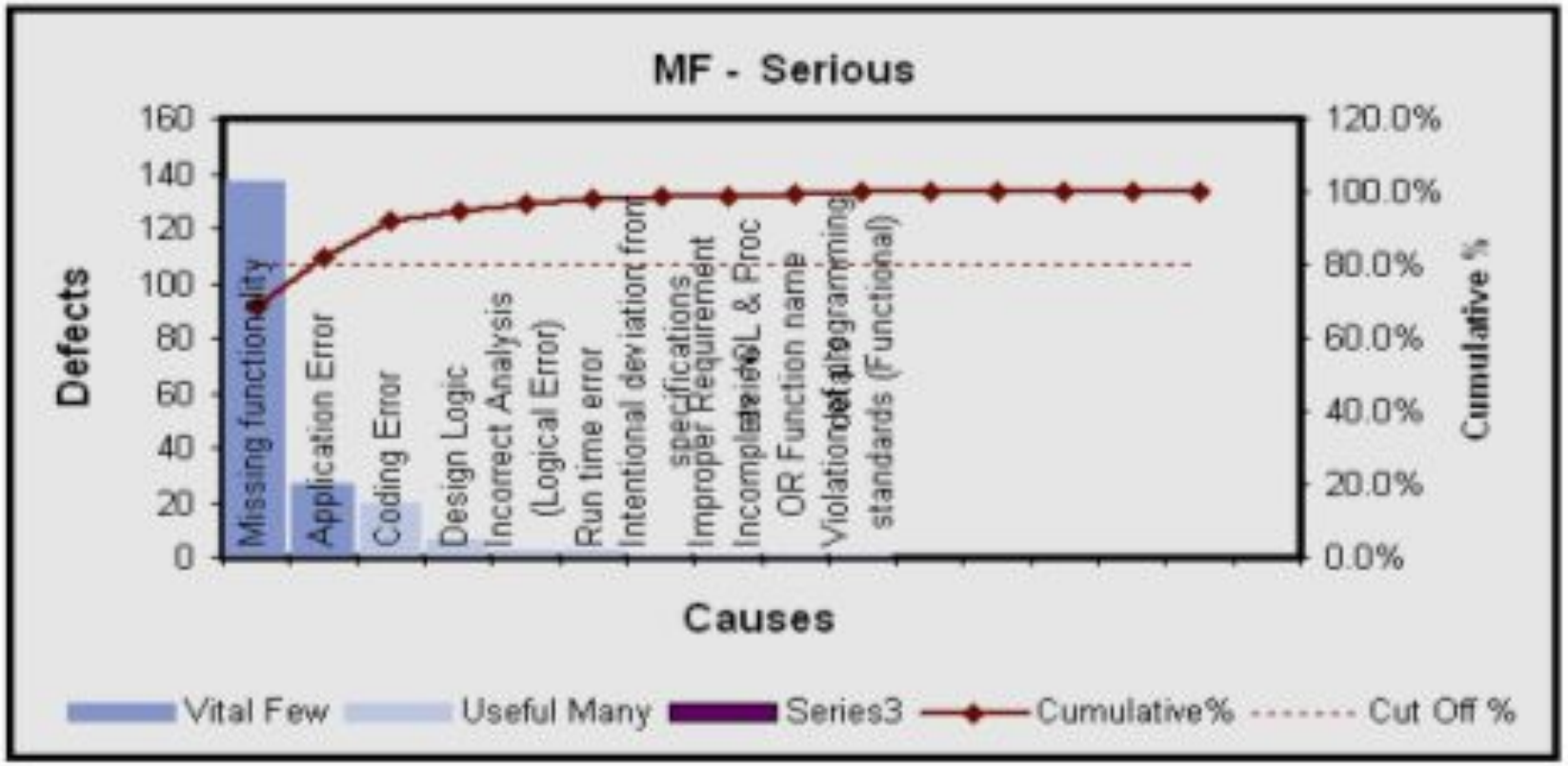
- Importance of planning / replanning is essential
- Replanning is the output of tracking
- Leverage on flexibility analysis prior to replanning
- Issue tracking and closure is important
- Better the plan, easier to track and manage
- Use planning / replanning to bubble up the high priority aspects to track and manage

Sl. No.	Metric	Units	Organization Norms		Project Norms		Jun-10	Jul-10
			USL	LSL	USL	LSL		
1	Effort Variance : Analysis activity	%	10%	-10%	10%	-10%	-0.3%	0.7%
2	Effort Variance : Requirement activity	%	10%	-10%	10%	-10%		
3	Effort Variance : Design activity	%	10%	-10%	10%	-10%		
4	Effort Variance : Coding activity	%	10%	-10%	10%	-10%		
5	Effort Variance : Testing activity	%	10%	-10%	10%	-10%		
6	Effort Variance : Development activity	%	10%	-10%	10%	-10%	-0.3%	0.7%
7	Effort Variance : Maintenance activity	%	10%	-10%	10%	-10%		
8	Effort Variance : Engineering activity	%	10%	-10%	10%	-10%	-0.3%	0.7%
9	Effort Variance : Overall Effort Variance	%	10%	-10%	10%	-10%	-0.3%	0.7%
10	Effort Variance : Analysis Review	%	10%	-10%	10%	-10%	-4.2%	5.3%
11	Effort Variance : Requirement Review	%	10%	-10%	10%	-10%		
12	Effort Variance : Design Review	%	10%	-10%	10%	-10%		
13	Effort Variance : Coding Review	%	10%	-10%	10%	-10%		
14	Total Development Effort	Hrs					1755	1360
15	Total Maintenance Effort	Hrs					0	0
16	Total Engineering Effort	Hrs					1755	1360
17	Total Non-Engineering Effort	Hrs					40	80

:: CTQ Metrics

Metrics Name	Target		5 Most Recent Actu	
	USL	LSL		
Productivity - MF	4	2.5	1.13 (7/2)	1.17 (7/31)
Defect Density	0.8	0.01	0.00 (7/2)	0.00 (7/31)
Effort Variance	10	-10	0.00 (7/2)	0.00 (7/31)
Productivity - .Net	11.59		9.48 (7/2)	9.51 (7/31)


Individual Chart
16.00
14.00
12.00
10.00
8.00
6.00
UCL, 14.17
USL, 13.00
Mean, 12.30
LSL, 11.00
LCL, 10.42
Nov'09
Dec'09
Jan'10
Feb'10
Mar'10
Apr'10
May'10
Jun'10
Month
USL
LSL
Metric
Mean
UCL
LCL
Moving Range Chart
2.50
2.00
1.50
1.00
0.50
0.00
Nov'09
Dec'09
Jan'10
Feb'10
Mar'10
Apr'10
May'10
Jun'10
Month
Range
R-Mean
Upper R-Limit



The first 2 Causes cover 82. % of the Total Defects

Risk Management

Risk Identification

- Based on risk originating Sources
  - Customer, Technology, …..
- Scan the SoW, WBS, Project Plan contents including tailoring
- Leverage on Past experience
- Risks are dependent on the context; they may not be absolute

Risk Categorization

- What does the risk impact
  - Customer, Quality, Schedule, Productivity, Cost ?
- When does the risk occur
  - Requirements, Design, Code, Test, …..

Risk Assessment

- Probability/Likelihood – Measured on a scale (1-5; 1-10)
- Severity / Magnitude – Measured on a scale (1-5; 1-10)
- Risk Priority as a product of the above (RPN) – Ranges can be named as High, Moderate, Low

Filtered for : All Risks

Risks Identified	Analysis			Status
	Likelihood (1-10)	Impact (1-10)	RPN	
Category : Configuration Management				
Version control on source Code	3	3	9	Not Occurred
Category : Resource Risk				
CICS competency with the resources	5	5	25	Not Occurred
Category : Testing Risk				
Access to new Db2 Table	3	7	21	Not Occurred
Category : Schedule and Estimation Risk				
Issues not resolved	3	3	9	Not Occurred

Note : Risks marked in RED Color are Critical
Threshold value - **25**

Role of measurements

- Typically, Metrics does not change what you manage
- Metrics results in a change to how you manage

Risk Management

- Avert – Build Fire Proof Building
- Mitigate – Ban smoking, Careful handling of inflammable substances, Educate People
- React (Contingency) – Call Fire Service / Use Fire extinguisher
- Revisit to take stock of existing risks
- Revisit to identify and add new risks

Risks vs Issues

- If it has hit you, it is an issue
- If it is likely to hit you, it is a risk

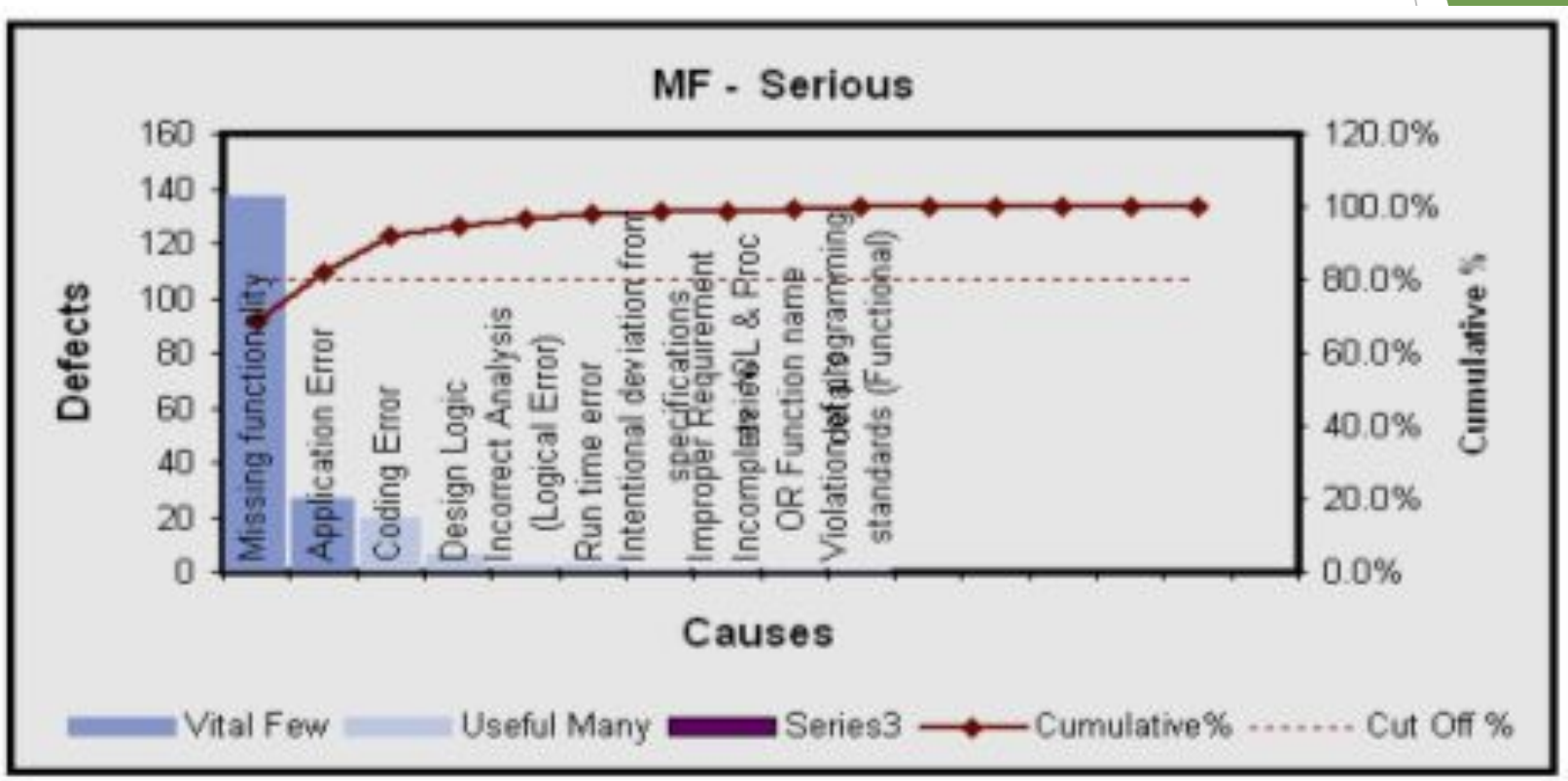
Tracking and Management Case Study

Measurement

Hypothesis :	H0 : There is no significant improvement in the Error types between the quarters Vs H1 : There is a significant improvement in the Error types between the quarters

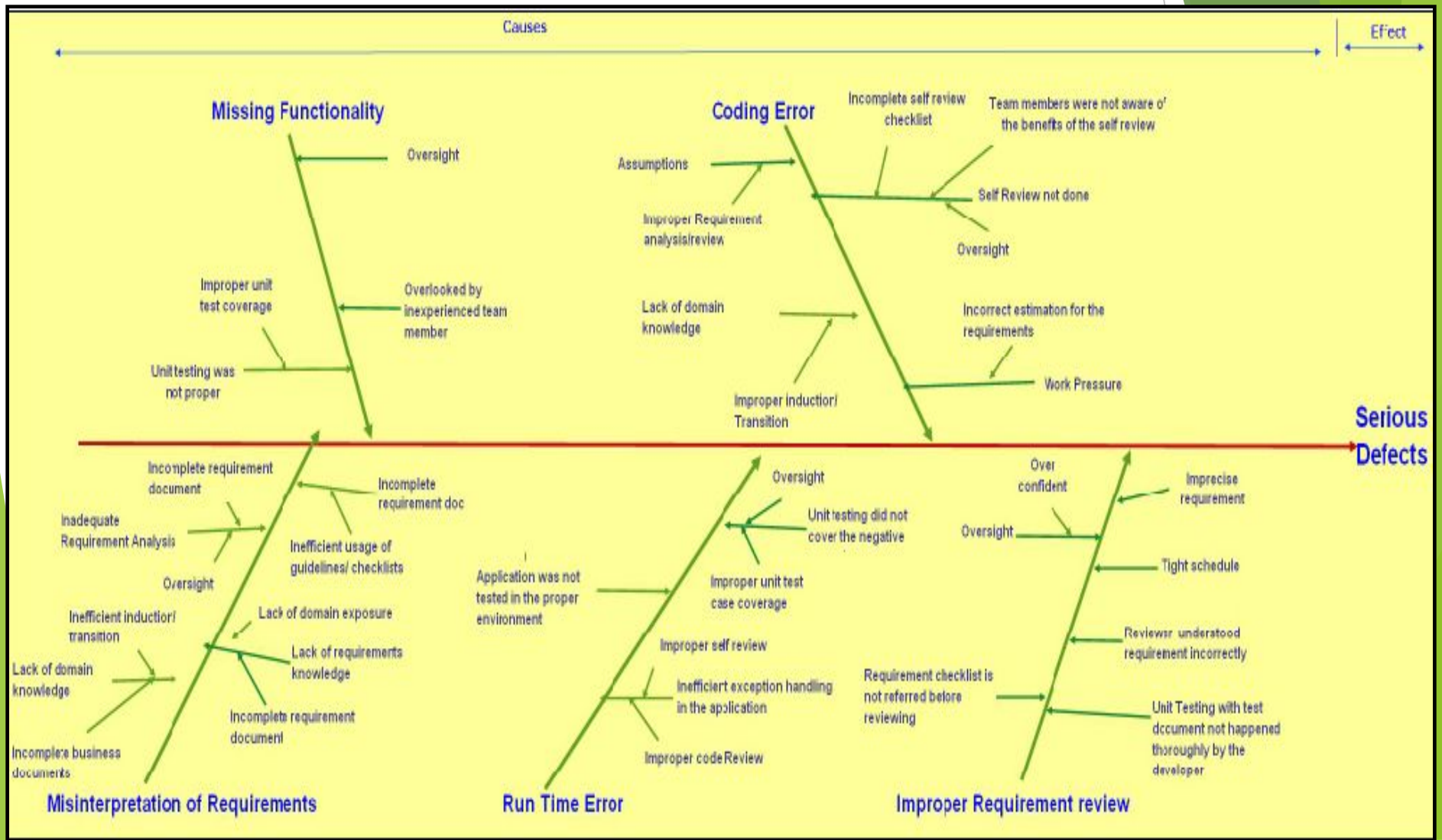
	Last Quarter 09		Quarter 1		Last Quarter 09 vs Quarter 1 - Comparison	
Error Types	Month	Defects Oct 09 - Dec09	Month	Defects Jan10 - Mar1	t -Test	Improvements
Missing Functionality	Oct-09	29	Jan-10	6		
	Nov-09	25	Feb-10	7		
	Dec-09	14	Mar-10	8	0.03	Yes
Application Error	Oct-09	2	Jan-10	1		
	Nov-09	1	Feb-10	1		
	Dec-09	4	Mar-10	2	0.35	No
Improper Requirement Revi	Oct-09	4	Jan-10	3		
	Nov-09	5	Feb-10	1		
	Dec-09	0	Mar-10	5	1.00	No

Quantification



The first 2 Causes cover 82. % of the Total Defects

Fish Bone Analysis



Prevention/Correction

Sl.No.	Error Types	Root Causes	Corrective/Preventive Actions
1	Coding Error	Team members were not aware of the benefits of self review	Project team needs to educate the resources on the importance of self review
		Oversight	
		Incomplete self review checklist	Project teams needs to update the review checklist to cover all the scenarios of the application with the help of Engineering group
		Incorrect estimation for the requirements	Project team need to do proper estimation for the requirements and get it reviewed by the Estimation Review Team before they start any activity
		Improper requirement analysis/ review	1. Projects can plan for a joint discussion on the requirements received 2. Project team needs to raise clarifications during the requirement review phase in order to obtain more clarity on the requirements
		Improper Induction/ Transition	Training needs to be provided to the team members to increase their level of competency by project teams with the help of training dept. SPC training was given to the resource to make aware of the statistical analysis and how to take corrective measures at project level.
2	Improper Requirement review	Overconfidence	Project manger need to guide their resources to perform proper review using the checklists and not be overconfident

Prevention and Correction

Sl.No.	Error Types	Root Causes	Corrective/Preventive Actions
1	Coding Error	Team members were not aware of the benefits of self review	Team members need to be make aware of the benefits of the self review by giving the training on weekly/monthly basis
		Incorrect estimation for the requirements	Formation of estimation team has been done at the org level
		Improper requirement analysis/ review	Requirements needs to be understood properly and analysis needs to be done throughly. Knowledge on requirement analysis and reviews needs to be shared to the resources from seniors
		Improper Induction/ Transition	Resources needs to be trained on the domain knowledge at the beginning of the activities and whenever requried
2	Application Error	Improper design review	Design document need to be updated complete based on the business of the project and resources need to be asked to folllow the design douments and checklists during the time of design and review
		Improper test scenario coverage	Boundary condintions need to be tested before peer testing happens and all the test scenarios need to be covered before testing starts

Project Closure

- Armed with the power of hindsight
  - What would you continue to do ?
  - What would you stop doing ?
  - What would you start doing ?

Project Closure

- A postmortem process
- Not a performance Appraisal Session
- Not a blaming session
- Opportunity to take stock and learn to improve future performance
  - Learn and Adopt
- Timing is of essence
  - Do this before ramping down the team
  - Do this every six months for long running projects

Methods

- Survey with Team
- Independent collation and team session
- Presentation with stakeholders
- Project Artifacts Review
- Project Indicators Review

Project Closure

- Reuse possibilities
- Best Practices
- Lessons Learnt
- Risks That hit / hurt
- Customer / Project / Process / Product measurements
- Customer report defect data analysis
  - Input for preventing defects in subsequent phases / projects
- Customer Satisfaction Survey Analysis

Project Closure

- Performance Management is important
- Conduct Project End Appraisals / Provide Project End Feedback seperately
- Can be clubbed into periodic appraisal cycles (if appraisal cycles are 6 monthly)