

Requirements Validation and Functional Decomposition

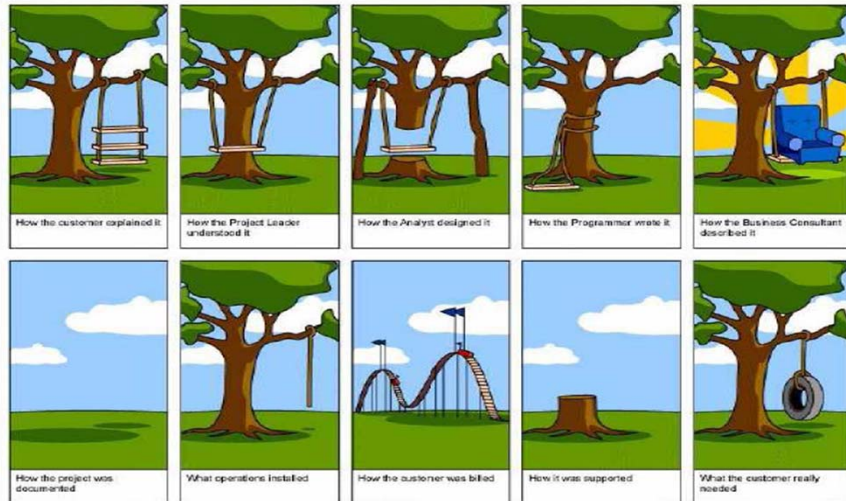
Lesson 4: Requirements
Gathering – Challenges &
Techniques

Lesson Objectives

- To understand the following topics:
 - Requirements Gathering – A Typical Illustration
 - Requirement Gathering Patterns
 - Challenges in Requirements
 - Challenges – Clarity of requirements
 - Challenges – Communication
 - Ambiguity From a Requirements Perspective - Pitfalls of the English language
 - Ambiguity and Pitfalls
 - Ambiguity Checklist
 - Ambiguity Review
 - Requirement Gathering - Skills Required
 - Tips to Requirement Gathering
 - Identification and Verification of Requirements
 - Summary
 - Review Questions

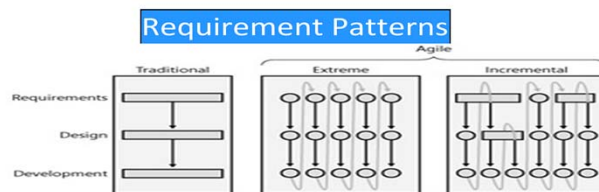


Requirements Gathering – A Typical Illustration



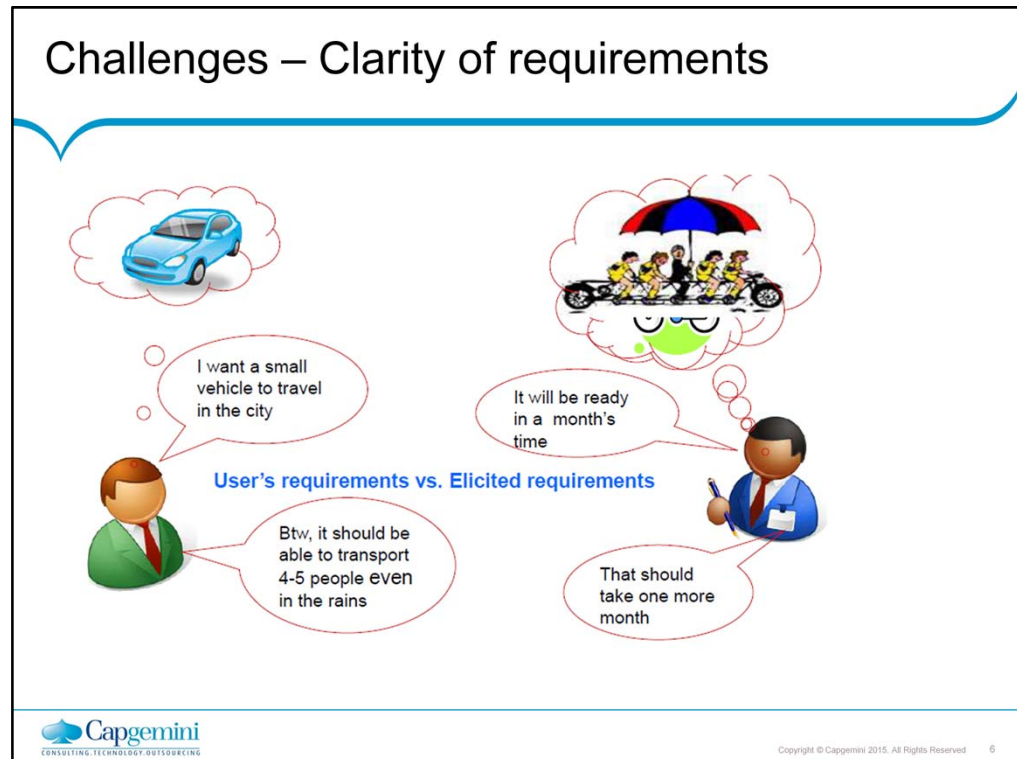
Requirement Gathering Patterns

- Traditional approach
 - Requirements are specified in detail and passes thru multiple reviews and sign-offs
- Extreme approach
 - Strives to make product/application ASAP and generally requirements needs to be elaborated
- Incremental approach
 - Some of the requirements are detailed up-front and some as the project proceeds



Challenges in Requirements

- User Involvement
 - “It is month end, quarter end ,year end. I have to do all my reports so
 - can’t spend time on requirements”
- Customer Expectations
 - Unreasonable, Infeasible, Conflicting in many occasions
- Scope and Vision not clearly defined
 - All requirements are critical, no priority is defined
- Improper Change Management
 - New requirements get added in the middle of the project
 - Users/customers are busy and not available to specify requirements
 - Signed-off requirements keep changing
- Functionality built, rarely or never used



Challenges – Communication

- Language barriers
 - Have interpreter
 - E.g. Japanese projects
 - Use more visual communication tools
- Difference in terminologies
 - Understand the customer's terms
 - "He wants an elevator, we make only lifts"
 - Use Pictures and Diagrams



Ambiguity From a Requirements Perspective - Pitfalls of the English language

- There are 5,790 languages in the world today
- More than one half of English speaking people did not grow up speaking it
- English has more words than any other language
- Estimates range from 490,500 words to nearly 2,000,000 words



Ambiguity and Pitfalls

- Sloppiness

- From an airline safety booklet (found in the seat pocket)

- "If you are sitting in an exit row and you cannot read this card or cannot see well enough to follow these instructions, please tell a crew member."

- Linguistic Ambiguity

- One half of two and two = ??

Ambiguity Checklist

- Dangling Else
- Ambiguity of reference
- Scope of action
- Omissions
 - Causes without effects
 - Missing effects
 - Effects without causes
 - complete omissions
 - Missing causes
- Ambiguous statements
 - Verbs, adverbs, adjectives
 - Variables, unnecessary
 - Aliases
- Random organization
 - Mixed causes and effects
 - Random case sequence



Ambiguity Checklist

- Ambiguous Logical Operators

- OR, AND
- Implicit connectors
- Compound operators
- Negation
- Scope of negation
- Unnecessary negation
- Double negation




- Built-in assumptions

- Functional/environmental knowledge
- Unclear sequence
- Implicit case
- i.e. versus e.g.
- Temporal ambiguity
- Boundary ambiguity

Ambiguity Checklist

Dangling Else	Ambiguity of Reference
<p>Must be, will be, is one of, should be, could be, can be, shall</p> <p>EXAMPLE:</p> <p>"The loan type must be first or second."</p> <p>Else?</p> <p>An error condition?</p>	<p>EXAMPLE 1:</p> <p>"Add Purchase-Amount to Account-Balance. This number must be positive."</p> <p>EXAMPLE 2:</p> <p>"Transaction 1 displays the customer's name and address. Transaction 2 displays the customer's account numbers. Transaction 3 displays the customer's account balances. Such transactions require the security code."</p>

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Ambiguity Checklist

Omissions

■ Causes without effects:

"Codes 1 through 4 produce the message. It is also possible for the code to be a 5."

■ Effects without causes:

"This message sometimes appears."

"It is sometimes necessary for the operator to re-initialize the field."

■ Complete omissions

A Blank page.

Page unintentionally left blank.

■ Missing causes:

EX.1 - "If you drive through a red light you will get a ticket."

Missing - you must be caught doing it.

EX.2 - "If the number is 1, 3, 5, 7, 11, 13, 19,23, or 29 it is a prime number."

Missing - 2, 17.

■ Missing effects:

EX.1 - "If the account is overdrawn reject the check."

Missing - notify the customer.

Ambiguity Checklist

■ Ambiguous Logical Operators

OR:

If A or B then C.

What people write:

"A and B each produce C."

"A and B produce C."

AND:

If A and B then C.

What people write:

"A and B produce C."

"A and B together are required to produce C."

■ Implicit Connectors:

Harry's "Going to the Party" Rules

Rule 1: If either Sally or Sarah go, Harry will go.

Rule 2: If Sally does not go with John, Harry will go.

Rule 3: If Sarah does not go with Bob, Harry will go.

What happens if Sarah goes and Bob goes?

Rule 1: Says Harry will go.

Rule 3: Implies Harry will not go.

■ Confusing Compound Connectors:

Confusing compound operators:

"If A or B and C produce D."


If [A or B] and C produce D?

OR

If A or [B and C] produce D?

Ambiguity Checklist

- Ambiguous Statements
- Ambiguous verbs:
Calculate, update, produce, modify:
"If it is month end calculate the interest earned."
- Ambiguous variables:
"If the interest amount is greater than \$100, send the customer the notice."
Interest accrued?
Interest earned?
Interest paid?
Interest anticipated?
- Ambiguous adjectives:
"It is against the law to ride down the street on an *ugly* horse." *Law in Wilbur, Washington*
- Ambiguous adverbs:
"The delete transaction must be processed quickly."
"Field A is usually positive."

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Ambiguity Review

■ Ambiguity Review Tips

- Be sensitive to the language issue by using simple, straightforward words
- Ambiguity reviews should eliminate instances of careless writing
- Ambiguity reviews by non-domain experts help eliminate assumed functional knowledge. Jargon should be avoided or at least defined in the glossary
- Acronyms must be defined in the data dictionary
- Do not write like you are being paid by the word

■ Benefits of Ambiguity Reviews

- Timely feedback early in development life cycle
- Feedback leads to defect avoidance
- SA writing skills are improved



Requirement Gathering - Skills Required

- Inter-Personal Skills
 - Effective communication
 - Probing, Right questioning !
 - Awareness
 - Listening
 - Compassion
- Engaging with the Customer
 - Expectations
 - Executive and User level
 - Organize Users and IT groups
 - Changes to Scope or terms of contract
 - Organization dynamics Skills for
 - Requirement Gathering
- Consulting Ability
 - Domain expertise
 - Business terms, Regulatory and statutory knowledge
 - Technology expertise
 - Ability to anticipate requirements
 - Pro-activeness, Problem Solving
 - Project Management
- Risk Management
 - Business, technology, operation
- Creativity, Innovation, Team work!!

Tips to Requirement Gathering

- It is a team work!
 - Form the requirements elicitation team
 - Business & technical knowledge, experience
 - Gather knowledge on similar projects
- Training
 - Domain, Soft skills

Tips to Requirement Gathering

- Know your Customer
 - Customer's profile and history
 - Market positioning, competitive edge/ differentiators
 - Business areas and core business domain
 - Business processes
 - Business risks
 - Confidentiality and sensitivity of business information
 - Regulatory and statutory knowledge
 - Customers' org structure, reporting structure of the key contacts-up
 - Organizational culture
 - Regional culture and language
 - Client Holidays
 - Our prior experience with the same customer

Tips to Requirement Gathering

- Identify stake holders and set the expectations
 - Identify single point contacts
 - Availability of business users
 - Ground work or preparation required from customer
 - Decision makers
- Identify participants
 - For interviews
 - Joint Application Development/Design [JAD] sessions
 - Brainstorming
 - Representatives from various groups
 - IT, Business, Users

Tips to Requirement Gathering

- General principles for requirements
 - Specify the problem – not the solution
 - Specify the system – not the project
 - Separate the formal and in-formal parts
 - Avoid repetition
 - Use the same lingo

Identification and Verification of Requirements

- Verify the gathered requirements with the customer
 - Can be done periodically through review meetings and status reports
 - Reverse walk through to eliminate bad or wrong requirements
- Summarize and present the requirements as understood by you to the user/stakeholder
 - Clarify any unclear requirements or conflicts
 - Clarify any unclear requirements or conflicts
- The requirements are presented “as you told” to the user

Once the identification and verification of requirements is done. Approved SRS will be given to testing team. It is used for designing test cases.
Once SRS is received it is necessary to study those requirements and itemize those requirements in simple requirements.

Summary

- In this lesson, you have learnt:

- Requirements Gathering
- Requirement Gathering Patterns
- Challenges in Requirements
- Ambiguity From a Requirements Perspective - Pitfalls of the English language
- Ambiguity and Pitfalls
- Ambiguity Checklist
- Ambiguity Review
- Requirement Gathering - Skills Required
- Tips to Requirement Gathering
- Identification and Verification of Requirements



Review Question

- Question 1: Extreme approach strives to make product/application ASAP and generally requirements needs to be elaborated.
 - True/ False
- Question 2: Different terms used while stating requirements improves the understanding of requirement in the team.
 - True/ False
- Question 3: _____ approach emphasize on detailing the requirements in an incremental manner.
- Question 4: Probing and right questioning falls under _____ requirement gathering skills.



Review Question

- Question 5: In which of the following requirement gathering patterns requirements are specified in detail and passes thru multiple reviews and sign-offs?
 - Option 1: Traditional approach
 - Option 2: Extreme approach
 - Option 3: Incremental approach
 - Option 4: None of the above

