Req. Validation & Functional Decomposition for V&V Automation Testing

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

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Lesson Objectives

- Ambiguity and Pitfalls
- Ambiguity Checklist
- Ambiguity Review
- Requirement Gathering - Skills Required
- Tips to Requirement Gathering
- Identification and Verification of Requirements
- Summary
- Review Questions

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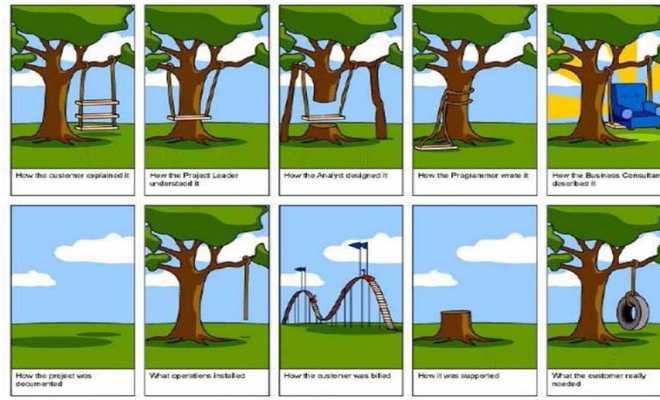
Requirements Gathering – A Typical Illustration



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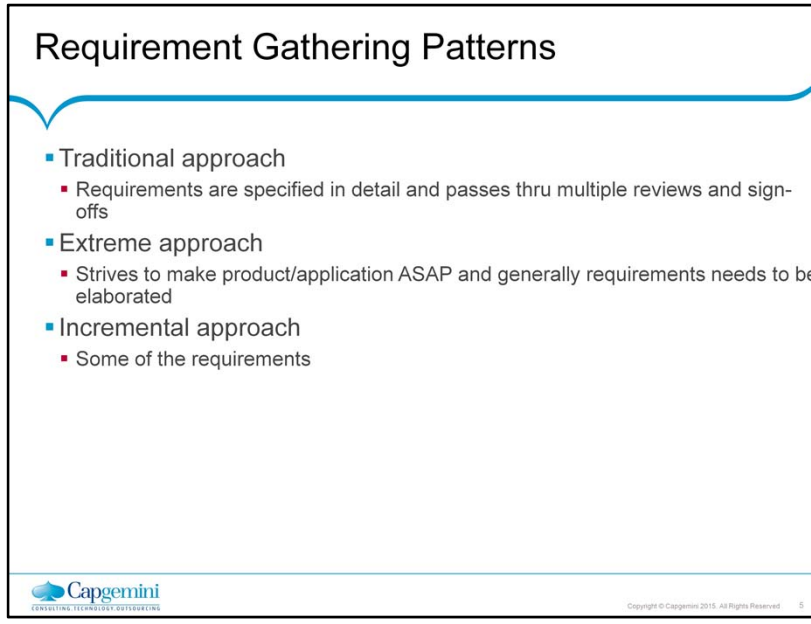
Requirement Gathering Patterns
Traditional approach
Requirements are specified in detail and passes thru multiple reviews and sign-offs
Extreme approach
Strives to make product/application ASAP and generally requirements needs to be elaborated
Incremental approach
Some of the requirements
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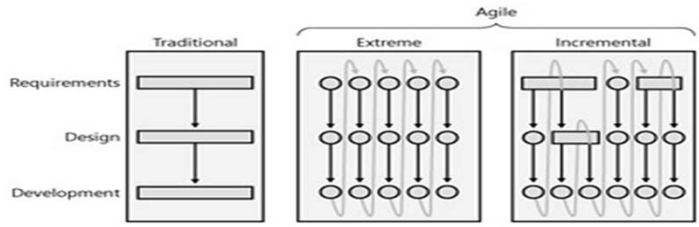
Requirement Gathering Patterns

Requirement Patterns



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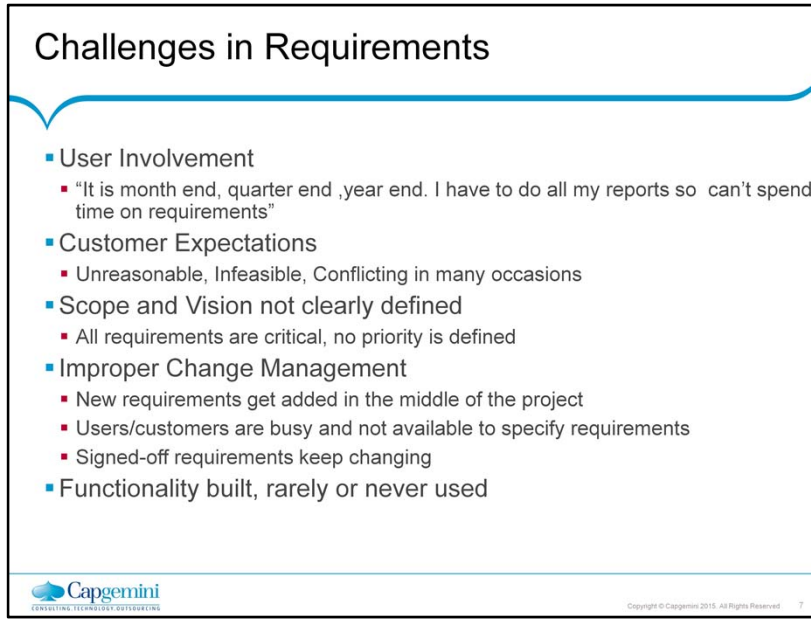
Challenges in Requirements
User Involvement
"It is month end, quarter end ,year end. I have to do all my reports so can't spend time on requirements"
Customer Expectations
Unreasonable, Infeasible, Conflicting in many occasions
Scope and Vision not clearly defined
All requirements are critical, no priority 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
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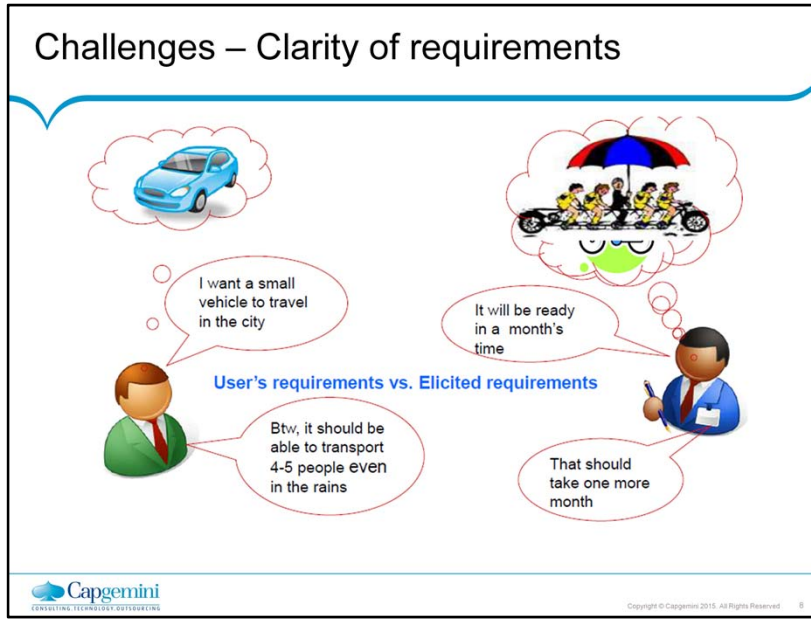
Challenges – Clarity of requirements
I want a small vehicle to travel in the city
It will be ready in a month's time
User's requirements vs. Elicited requirements
Btw, it should be able to transport 4-5 people even in the rains
That should take one more month
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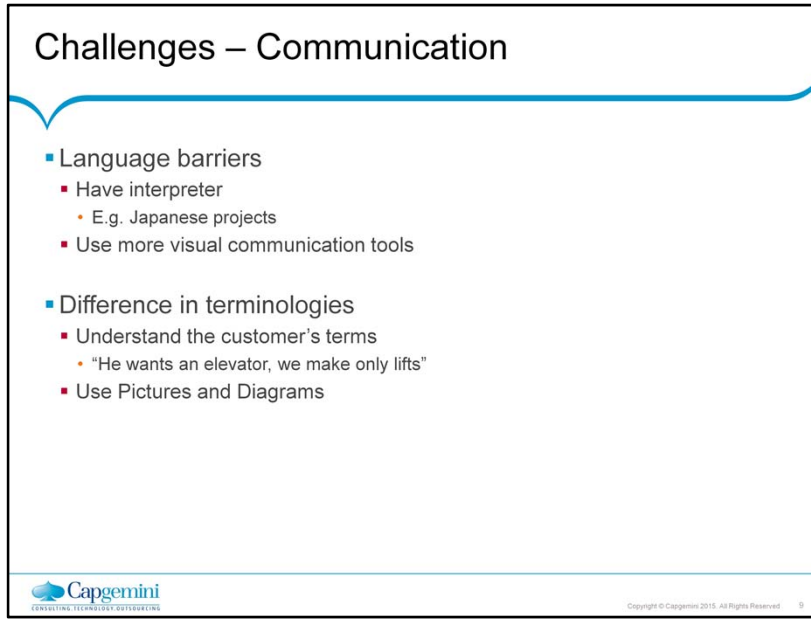
Challenges – Communication
Language barriers
Have interpreter
E.g. Japanese projects
Use more visual communication tools
Difference in terminologies
Understand the customer's terms
"He wants an elevator, we make only lifts"
Use Pictures and Diagrams
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Ambiguity 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

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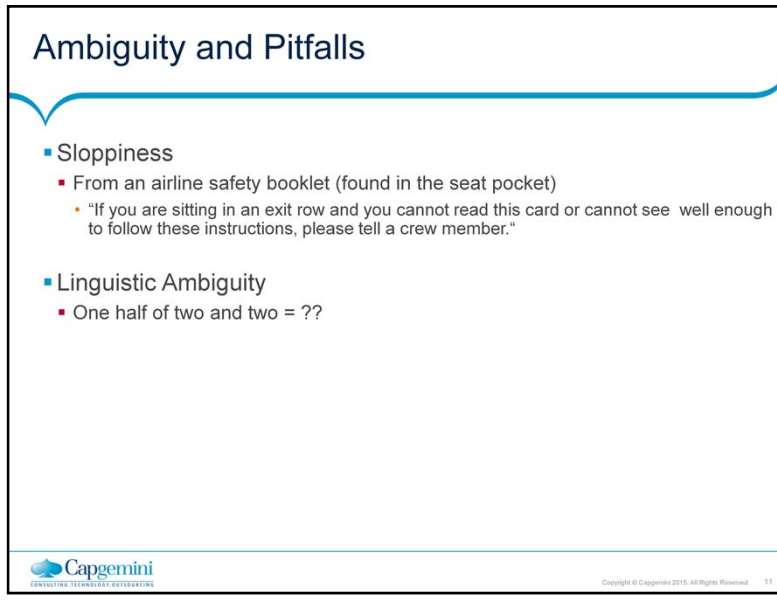
Ambiguity and Pitfalls
Sloppiness
From an airline safety booklet (found in the seat pocket)
"If you are sitting in an exit row and you cannot read this card or cannot see well enough to follow these instructions, please tell a crew member."
Linguistic Ambiguity
One half of two and two = ??
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Ambiguity 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

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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

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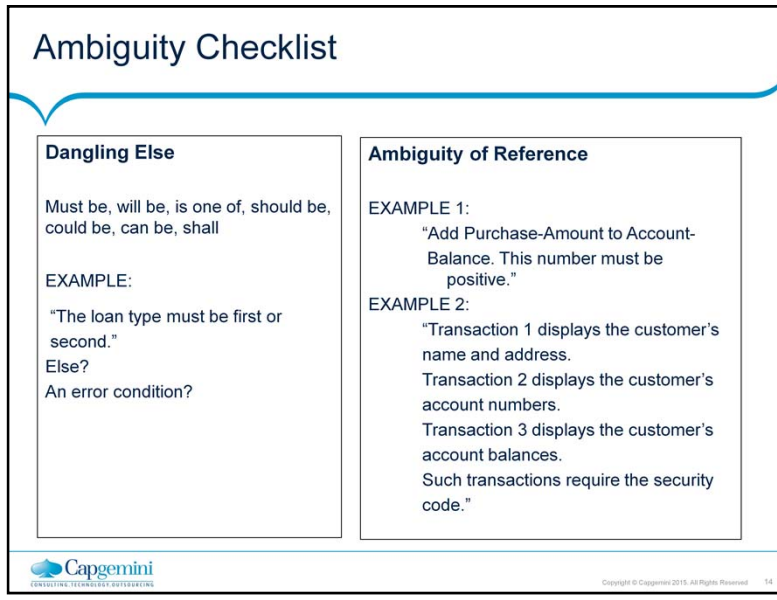
Ambiguity Checklist
Dangling Else
Must be, will be, is one of, should be, could be, can be, shall
EXAMPLE:
"The loan type must be first or second."
Else?
An error condition?
Ambiguity of Reference
EXAMPLE 1:
"Add Purchase-Amount to Account-Balance. This number must be positive."
EXAMPLE 2:
"Transaction 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."
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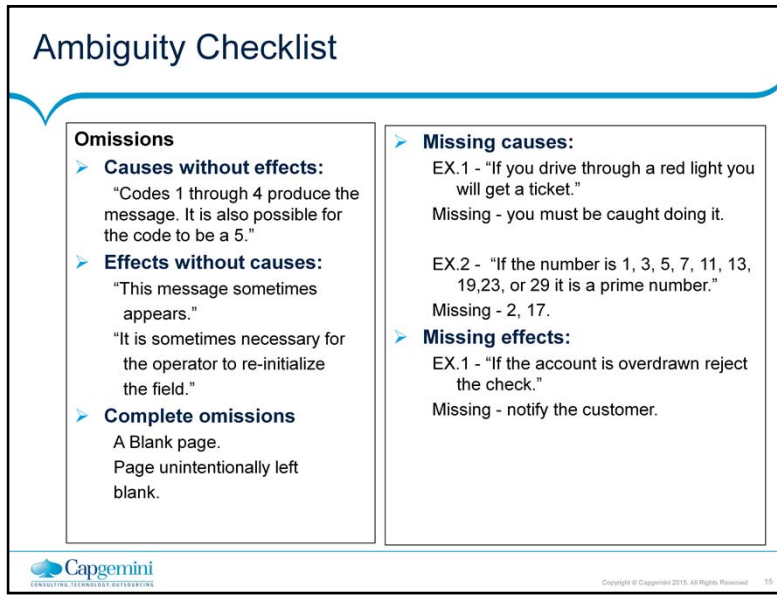
Ambiguity Checklist
Omissions
Causes without effects:
"Codes 1 through 4 produce the message. It is also possible for the code to be a 5."
Effects without causes:
"This message sometimes appears."
"It is sometimes necessary for the operator to re-initialize the field."
Complete omissions
A Blank page.
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.
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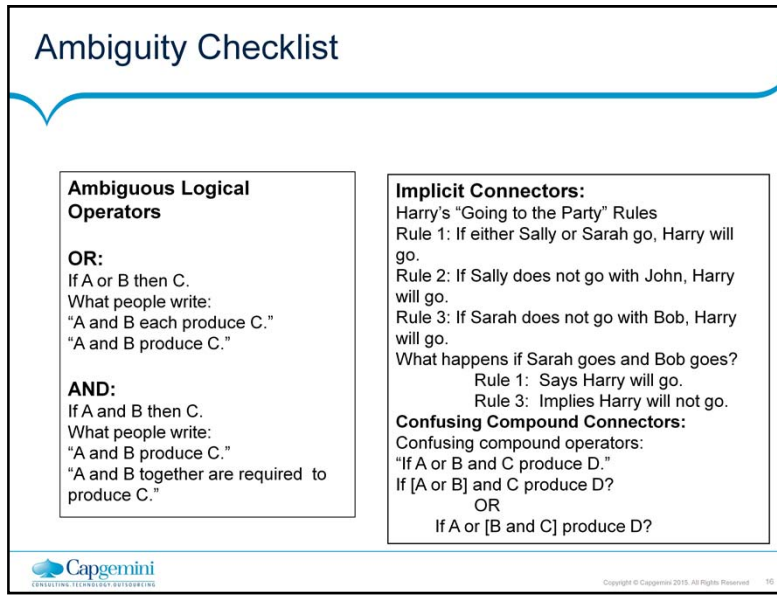
Ambiguity Checklist
Ambiguous Logical Operators
OR:
If A or B then C.
What people write:
"A and B each produce C."
"A and B produce C."
AND:
If A and B then C.
What people write:
"A and B produce C."
"A and B together are required to produce C."
Implicit Connectors:
Harry's "Going to the Party" Rules
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?
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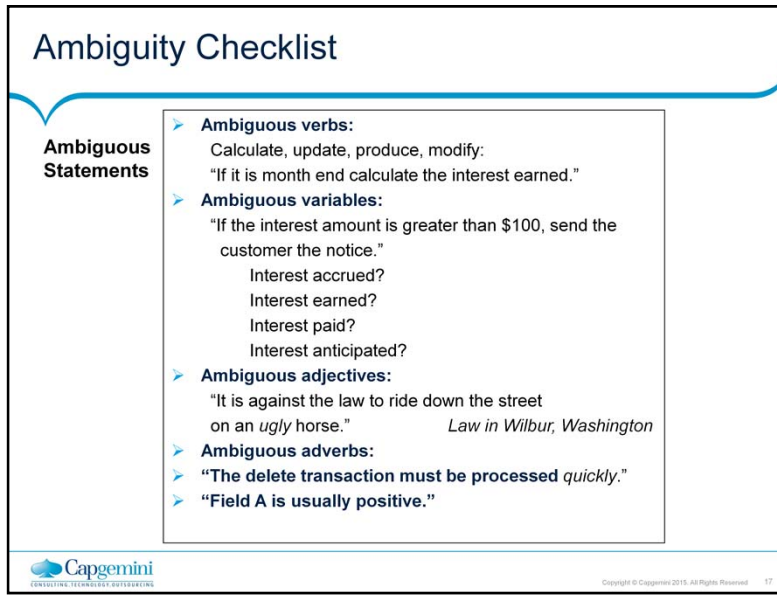
Ambiguity Checklist
Ambiguous Statements
Ambiguous verbs:
Calculate, update, produce, modify:
"If it is month end calculate the interest earned."
Ambiguous variables:
"If the interest amount is greater than $100, send the customer the notice."
Interest accrued?
Interest earned?
Interest paid?
Interest 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

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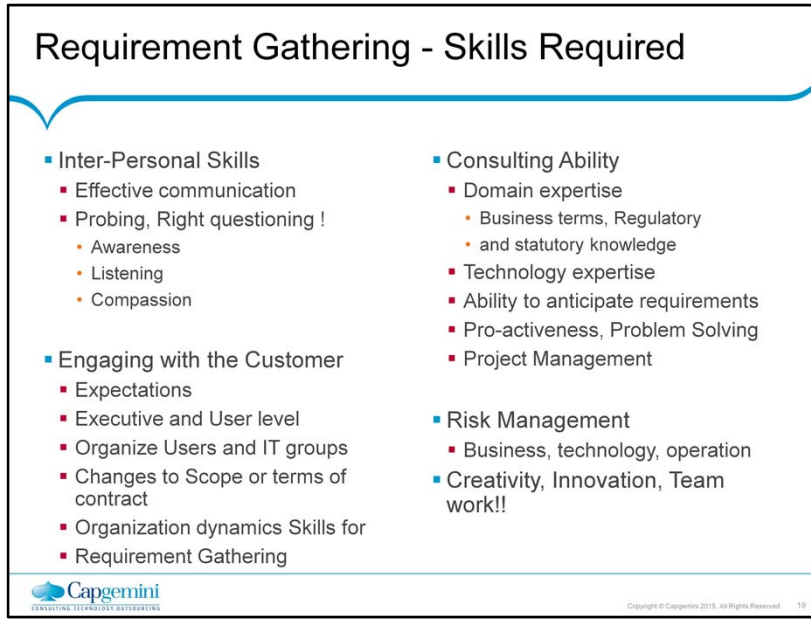
Requirement Gathering - Skills Required
Inter-Personal Skills
Effective communication
Probing, Right questioning !
Awareness
Listening
Compassion
Engaging with the Customer
Expectations
Executive and User level
Organize Users and IT groups
Changes to Scope or terms of contract
Organization dynamics Skills 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!!
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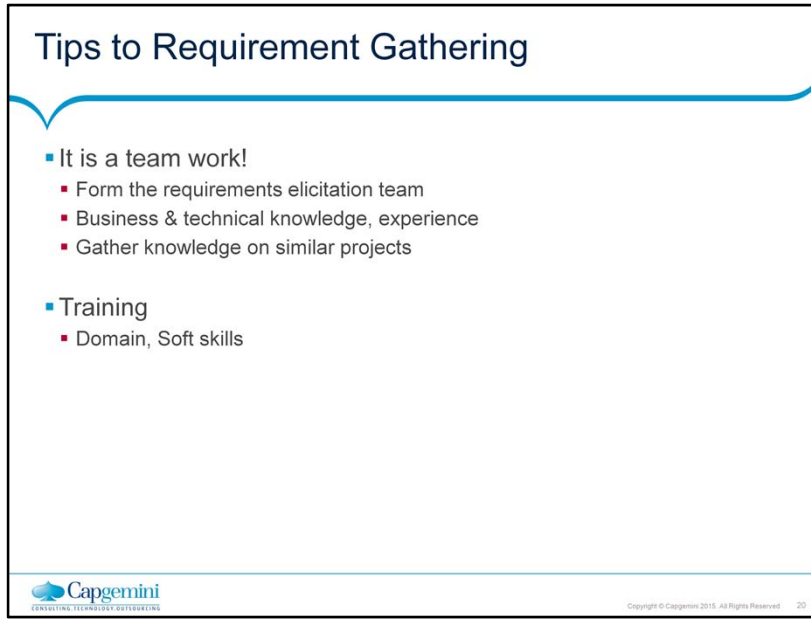
Tips to Requirement Gathering
It is a team work!
Form the requirements elicitation team
Business & technical knowledge, experience
Gather knowledge on similar projects
Training
Domain, Soft skills
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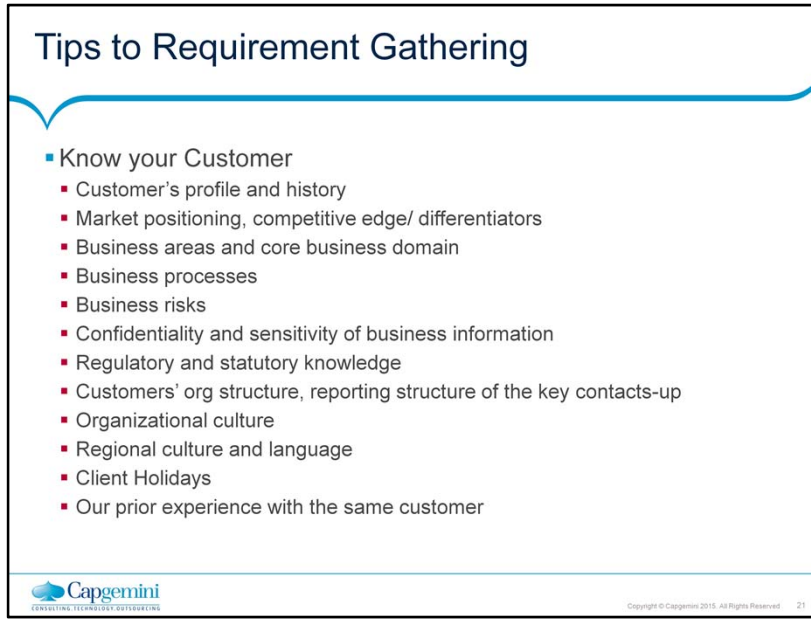
Tips to Requirement Gathering
Know your Customer
Customer's profile and history
Market positioning, competitive edge/ differentiators
Business areas and core business domain
Business processes
Business risks
Confidentiality and sensitivity of business information
Regulatory and statutory knowledge
Customers' org structure, reporting structure of the key contacts-up
Organizational culture
Regional culture and language
Client Holidays
Our prior experience with the same customer
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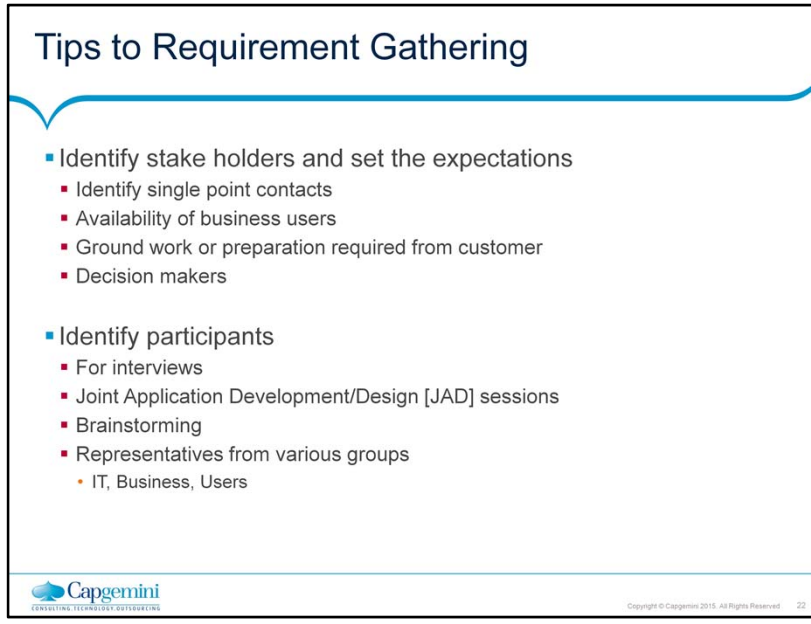
Tips to Requirement Gathering
Identify stake holders and set the expectations
Identify single point contacts
Availability of business users
Ground work or preparation required from customer
Decision makers
Identify participants
For interviews
Joint Application Development/Design [JAD] sessions
Brainstorming
Representatives from various groups
IT, Business, Users
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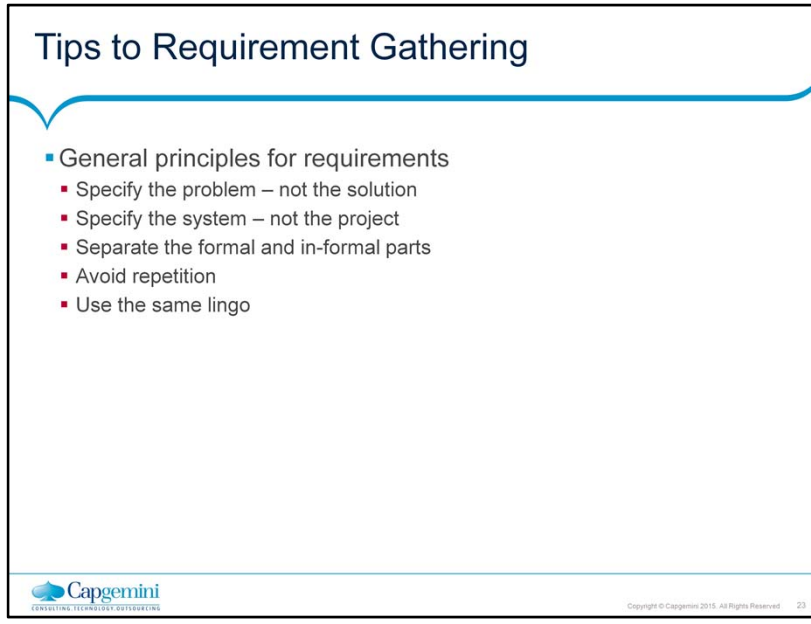
Tips to Requirement Gathering
General principles for requirements
Specify the problem – not the solution
Specify the system – not the project
Separate the formal and in-formal parts
Avoid repetition
Use the same lingo
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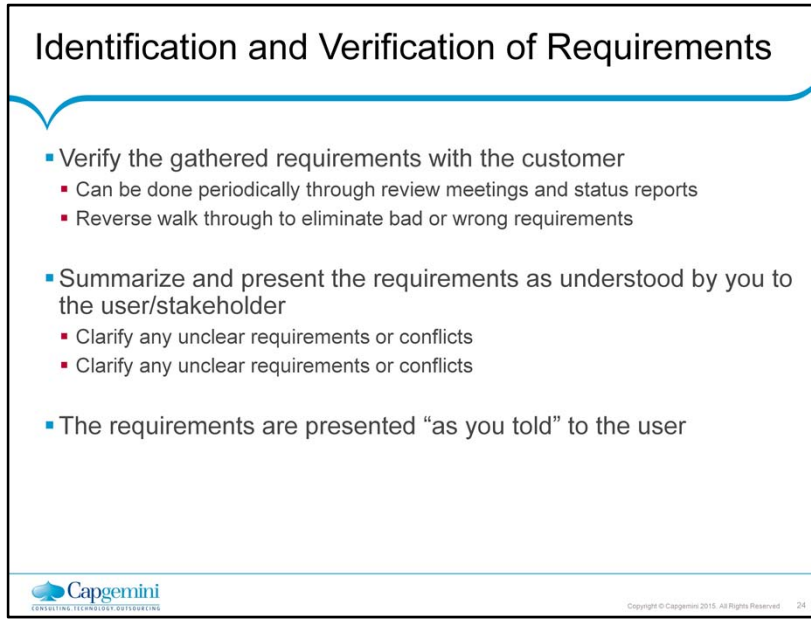

Once the identification and verification of requirements is done. Approved SRS will be given to testing team. It is used for designing test cases.
Once SRS is received it is necessary to study those requirements and itemize those requirements in simple requirements.

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

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Answers:

Question1: True

Question2: False

Question3: Incremental approach

Question4: Inter-Personal Skills

Question5: Traditional approach

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

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