



## Module 4:

# Requirements Engineering in Business Analysis

## Requirements Development

# Survey or Questionnaire Definition

- An elicitation technique that seeks to obtain information from a broad audience of participants by asking a series of questions in a prepared format that is distributed for their completion by a specified and communicated date/time.
- Surveys can be distributed through:
  - Mail
  - E-mail
  - Internet

# Survey or Questionnaire

- Purpose
  - Means of eliciting information from many people from many people, anonymously, in a short period of time
- Description
  - Administers a set of written questions to stakeholders and subject matter experts
  - Responses are analyzed and distributed to appropriate parties

# Survey or Questionnaire Usage Considerations

- Advantages
  - Effective for obtaining quantitative data for statistical analysis (Closed-ended questions)
  - Yield insights/opinions not obtainable through other techniques (Open-ended)
- Disadvantages
  - Open-ended questions require more analysis
  - Specialized skill in statistical sampling methods are needed
  - Not well suited for collecting info on actual behaviors

# Workshops Definition

- A form of facilitated elicitation that is pre-planned and scheduled and uses a predetermined list of stakeholder attendees to achieve a stated objective.
- Workshops are conducted in a formal and structured manner.
- Workshops can be specialized for a single purpose, e.g. requirements workshop, planning workshop etc.

# Workshops

- **Purpose**
  - Structured way to elicit information for the stated objective
  - Used to scope, discover, define, prioritize and reach closure on requirements
- **Description**
  - Highly productive focused event attended by carefully selected key stakeholders and Subject Matter Experts (SME) for a set, intensive period

# Workshops

## Usage Considerations

- **Advantages**
  - Focused way to elicit detailed requirements in a relatively short period of time
  - Promotes collaboration, decision making, and mutual understanding of information
  - Time savings
- **Disadvantages**
  - Stakeholder availability
  - Too few participants may overlook relevant information
  - Reaching consensus
  - Requires sufficient planning and strong facilitation

# Exercise: Planning for Elicitation

Prepare for an elicitation session with one of the stakeholders

○ Stakeholder:

\_\_\_\_\_

○ Elicitation Technique:

\_\_\_\_\_

○ Objective:

\_\_\_\_\_

○ Questions:

\_\_\_\_\_

- 1.
- 2.
- 3.





## Polling Question

Rajiv was describing to Tina what he would like the main screen of the kiosk system to look like. While he was sharing his ideas, Tina was sketching what the main screen might look like. What best describes the activity that Tina was performing?

- A. Interview
- B. Throwaway prototype
- C. Interface Analysis
- D. Evolutionary prototype



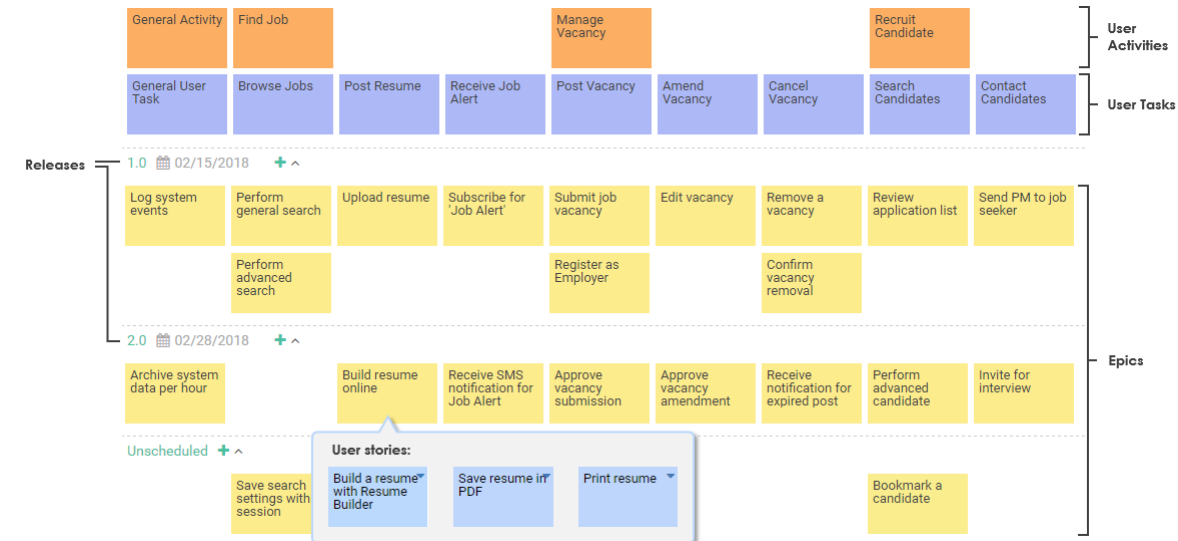
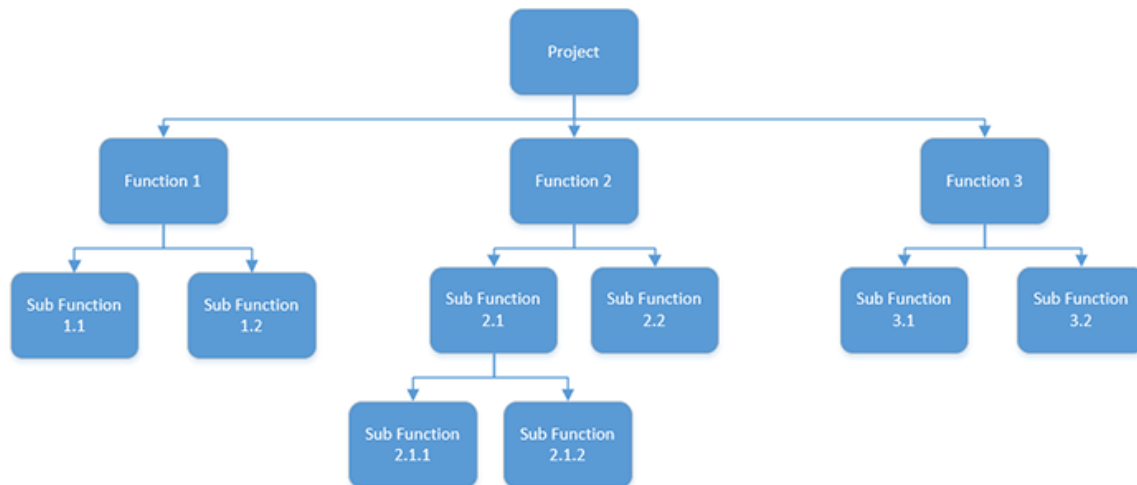
## Polling Question

In eliciting requirements, you have decided to conduct a requirements workshop instead of holding individual interview sessions. This could be because:

- A. It will be less expensive
- B. The stakeholders will be able to collaborate
- C. It will be faster
- D. All of the above

# Requirements Analysis & Modeling

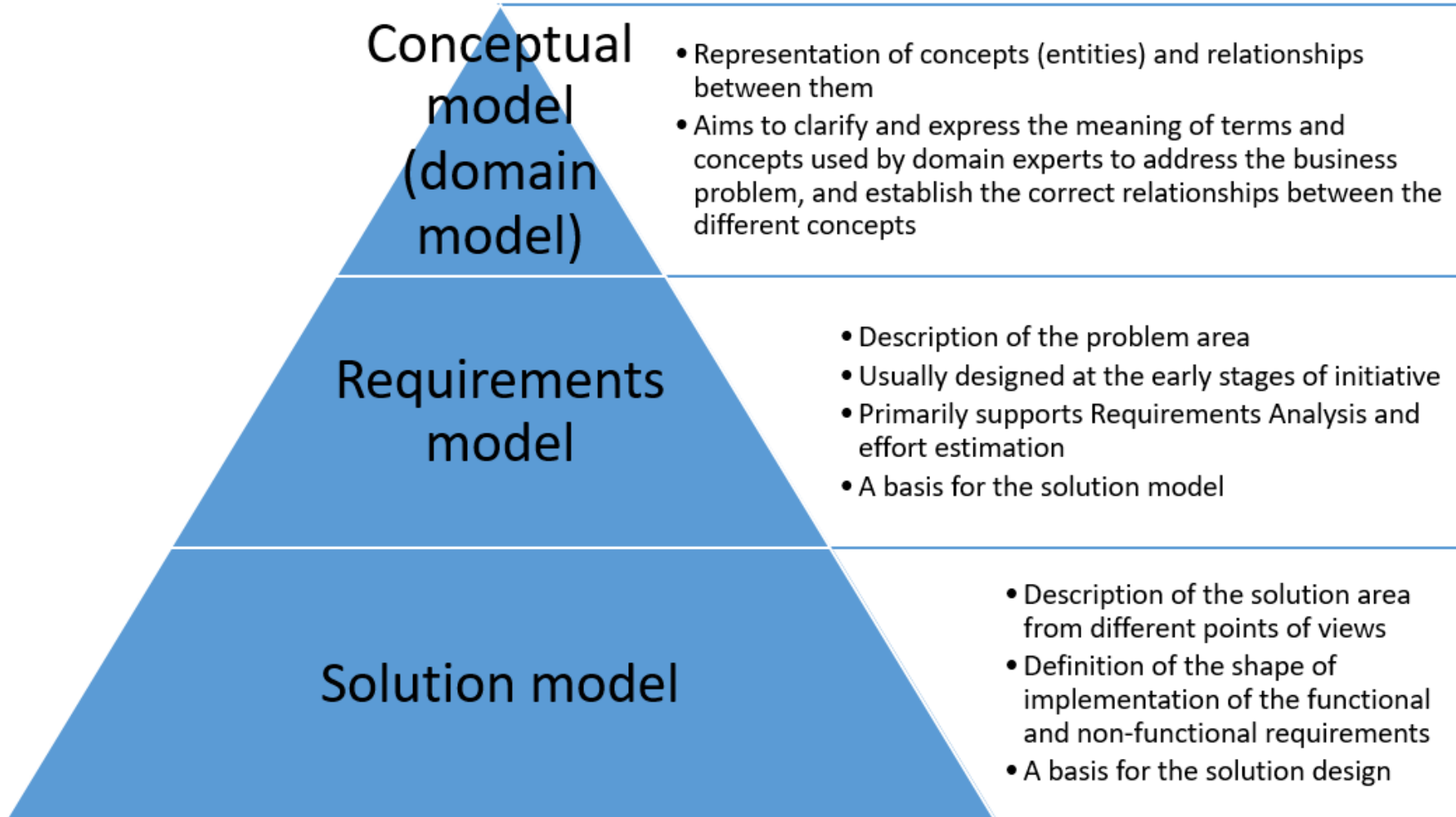
- **Requirements Analysis** – a set of tasks, activities and tools to determine whether the stated (elicited) requirements are unclear, incomplete, ambiguous, or contradictory, and then documenting the requirements in a form of a consistent model.
- Analysis is done to detail and structure the collected information so that a solution design can be defined.
- Specific techniques supporting analysis are decomposition and structuring.



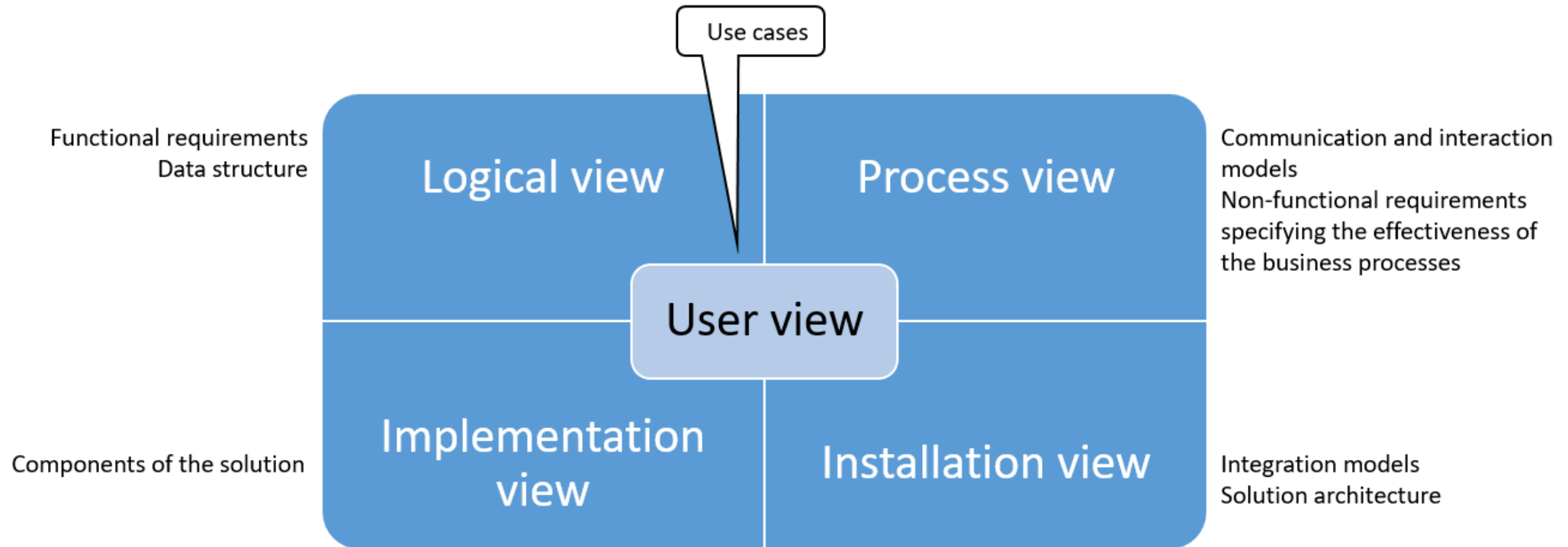
# Requirements Analysis & Modeling

- Analysis often includes modeling activities.
- Modeling is a way of expressing real objects by representing parts or the whole of the proposed solutions.
- Models may contain textual elements, matrices and diagrams, and are used to reflect the relationships and dependencies between the requirements that fulfill the identified business needs.
- In the case of large and complex solutions, modeling is helpful in expressing the overall structure of the solution.

# Levels of modeling



# Perspective of Solution modelling



# Benefits of modeling

- The benefits of using requirements modeling are:
  - Models are perceived as a simplified expression of real processes and allow the Business Analyst and other stakeholders to focus on the important aspects and areas of the solution
  - Models describe a complex solution in the clearest and most unambiguous way
  - Models are more readable than written text
  - Models present the whole solution and its context in a single diagram and therefore help to look at the problem from the overall perspective

# Common modeling techniques

- Common techniques of modeling requirements and solutions include:
  - Using UML notation to express requirements as use case diagrams, activity diagrams, state machine diagrams, etc.
  - Using BPMN notation to express business processes
  - Using SysML requirements diagrams to express requirements and relationships between them
  - Using prototyping as a technique of GUI modeling and/or creating prototypes of solution concepts



# UML

- Common method of solution modeling is UML (Unified Modeling Language). UML is a unified notation for the analysis and design of systems.
- The notation provides several types of diagrams to describe different views of the solution.
- These diagrams are divided into behavior and structure diagrams, where behavior diagrams depict behavioral features of a system or business process, and structure diagrams depict the structural elements composing a system or function.

# Prototyping Definition

- An elicitation technique that utilizes the development of a working model of the expected solution in order to engage stakeholders into conversation about their requirements.

# Prototyping

- **Purpose**
  - Details user interface requirements and integrates them with use cases, scenarios, data and business rules
- **Description**
  - Prototypes can be high fidelity or low fidelity
  - Prototypes can be throw-away or evolutionary
  - Prototypes can be horizontal or vertical

# Prototyping Usage Considerations

- **Advantages**

- Allows for early interaction and feedback
- Vertical demonstrates feasibility with technology
- Vehicle for designers to learn users' interface needs and evolve system requirements

- **Disadvantages**

- May take considerable time if bogged down by “how” instead of “what”
- May lead users to unrealistic expectations

# Requirements Specification

- Requirements Specification describes the problem area of interest (a business solution proposal for a given business problem, need, or objective, etc.) and contains at least the following information:
  - Business requirements together with their acceptance criteria
  - Limitations and assumptions
- In the specification, requirements are described in a structured way and are modeled separately.
- An approved requirements specification serves as a formal agreement on the solution scope and capabilities, and provides input information for the other members of the solution delivery or maintenance team.

# User story

- Another type of a specification is a User Story:
  - **User Story** – a short, simple description of a feature told from the perspective of the person who desires the new capability, usually a user or customer of the system.
- User Stories are often used with Agile development methodologies.
- User Stories are a quick way of handling customer/user requirements.
- The intention of the User Story is to be able to respond faster and with less overhead to rapidly changing real-world requirements.
  
- Structure of user story:
  - **As a [role], I want [feature] so that [benefit]**
  
- User Stories are often used together with Personas (i.e., archetype characters) representing a specific type of end user role.

# User personas

- **Persona** – a fictional character, an archetype description, which represents the different types of users who will be using the final product or solution.
- A persona should represent a group of people with the same needs, attitude, behavior or expectations towards the product.

## Alex

**Age:** 33  
**Location:** Venice, Florida  
**Job:** Software Engineer  
**Status:** Engaged



*"Water has always been part of my life. I can't imagine my life without it"*

**Alex has been enjoying many different water sports since she was a child. Water is her element and can't imagine living too far from the Ocean. Alex works full-time but it's crucial for her to stay active everyday.**

### NEEDS AND GOALS

- Alex needs one place to check weather conditions for different activities and nearby locations.
- Alex plans her activities on daily / weekly basis so she needs accurate forecasts to make the most of her time on the water.
- Alex is familiar with weather terminology but needs a quick and intuitive way of analysing the data.
- Alex is very mobile and needs to have an overview of different locations within 1h drive.

### MOTIVATIONS

- Loves being active but spends a lot of time at the office so it's important for her to maximise the time spent outdoors.
- Water is her element - Alex wants to experience as many water sports as possible.

### ACTIVITIES

- Alex practices many water sport activities such as: surfing, kayaking, scuba diving or board paddling.
- Alex is adventurous and loves trying new things and sports.
- Alex usually checks several websites and apps before heading outdoors.

### PAIN POINTS:

- Having to check many different apps and forecasts to plan her activities.
- Weather apps look dated and unattractive.
- Wasted time due to inaccurate weather conditions.
- Alex find advertising and not relevant information annoying.

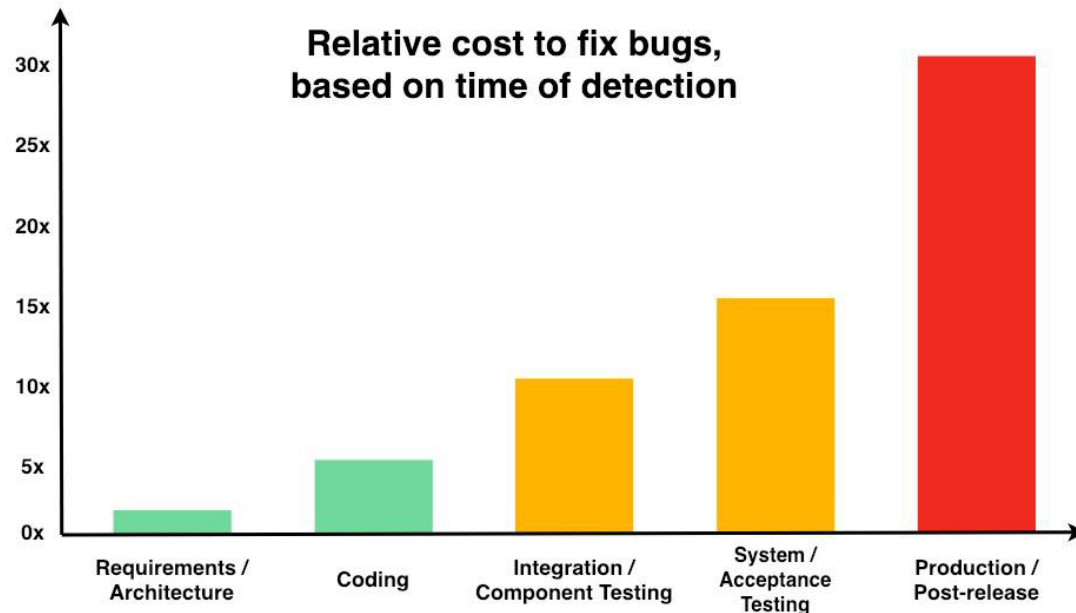
# Conflict management

- **Conflict** – a situation appearing when different values, perspectives or opinions are contradictory in nature.
- Some of common conflicts in Requirements Engineering include:
  - Business requirements and their ability to be implemented
  - Stakeholders having contradictory requirements
  - The proposed solution for requirements' implementation may be contradictory
- **Conflict Management** – the process of limiting the negative aspects of conflict while increasing the positive aspects of conflict.
  - Conflict identification
  - Conflict analysis
  - Conflict resolution



# Verification and Validation

- **Verification** is a Quality control process that is used to evaluate whether or not a product, service, or system complies with regulations, specifications, or conditions imposed at the start of a development phase.
- **Validation** is a Quality assurance process of establishing evidence that provides a high degree of assurance that a product, service, or system accomplishes its intended requirements.



# Verification Activities

Verification activities include:

- Requirements and models are complete
- Specifications are well written, clear
- Models use proper syntax and modeling notation
- Terminology used is understandable and consistent
- Deliverables are in alignment with organizational standards

# Requirements Validation

- Ensures that all requirements support the delivery of value to the business, fulfill its goals and objectives, and meet a stakeholder need.
- An ongoing process to ensure that stakeholder, solution, and transition requirements align to the business requirements

# IQBBA for the Verification and Validation

- Requirements validation and verification should be done continuously during the development of the solution to ensure that the product being developed meets the quality criteria and will satisfy the stakeholders' needs.
- The best practice is to plan and perform validation and verification of requirements from the early phases of solution development – ideally starting with requirements elicitation.



# Exam Questions

# Question 1

You are working on requirements elicitation. You are analyzing business documentation and interviewing stakeholders to collect specific needs and expectations regarding the planned solution.

What task of requirements elicitation is most probably addressed by your activities?

- [A] Analyzing collected information in order to establish the final design of the solution
- [B] Identifying risks impacting the ability to meet business requirements
- [C] Identifying desired capabilities of the planned solution needed to meet stated business needs
- [D] Establishing business context, including customers and market, and business processes affected by the solution

## Question 2

You are a senior business analyst responsible for delivering a solution for a stated business problem. The problem refers to low usability of a solution supporting the sales process. In order to understand the problem correctly and to be able to identify potential areas for improvement, you decided to collect more information about the customers and their expectations.

You would like to collect the following information:

- Who are the customers (age, background, experience, preferences, etc.)?
- What kind of problems do the customers experience?
- What are the expectations of the customers?
- What business operations should be covered by the solution?

Which of the following answers define a useful set of techniques to be used to support your goal?

- [A] Direct observation of customers' behavior, workshops, solution prototyping
- [B] Questionnaire to collect information about the customers, scenarios and prototypes to detail the scope and shape the solution, workshops with customer representatives to validate and confirm requirements
- [C] System use cases to be validated by project team, questionnaire to collect information about the customers and their usability requirements, prototyping
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- [D] Workshops with randomly selected customers in order to collect information about target business process, personas and user story defined by the lead of the development team, interviews with all outstanding business stakeholders

## Question 3

Which of the following statements for solution modelling is true?

- [A] Requirements models clarify the meaning of terms and concepts used by domain experts to address the business problem and are supplemented by solution models.
- [B] Conceptual models aim to express functional and non-functional requirements from different points of view and they detail requirements models.
- [C] Requirements models aim to represent the business area and support creating solution models.
- [D] Solution models aim to express business and stakeholder requirements for the purpose of effort estimation and they are detailed by conceptual models.



## Question 4

Which of the following statements for solution modelling is true?

- [A] Usage view, Logical view, Program view, Implementation view, Initialization view
- [B] Usage view, Logical view, Process view, Implementation view, Installation view
- [C] Usability view, Logical view, Project view, Implementation view, Installation view
- [D] Usability view, Logical view, Product view, Implementation view, Installation view

## Question 4

○ Which of the following activities is one of the main activities of requirements development?

[A] Requirements quality assurance

[B] Requirements tracing

[C] Requirements prototyping and documentation

[D] Requirements modeling and specification

## Question 5

You are a business analyst working on creating a solution for a given business problem. During requirements analysis, you discover a conflict in the requirements. After some investigation you identify the potential cause of the conflict – imprecise statements in regulations impacting the business domain. You also identify the authors of the contradictory requirements and connect with them to get some additional information.

Which conflict management activity is taking place?

- [A] Conflict resolution
- [B] Conflict identification
- [C] Conflict reduction
- [D] Conflict analysis

## Question 6

Which of the following statements about validation and verification is true?

- [A] Validation and verification have a common goal but use different approaches.
- [B] Validation and verification may focus on checking if requirements are documented and then tested against the quality criteria.
- [C] Validation and verification can be done only after completing requirements analysis and specification activities.
- [D] Validation and verification should involve all stakeholders in order to ensure quality criteria for the product are met.

# Section Learning Objectives Reflection

The learning objectives for this section are:

- Requirements Development
- Requirements elicitation
- Elicitation techniques
- Analysis and Modeling
- Solution modelling
- Conflict management
- Requirements Specification
- User story & Personas
- Verification and Validation