Module 4:

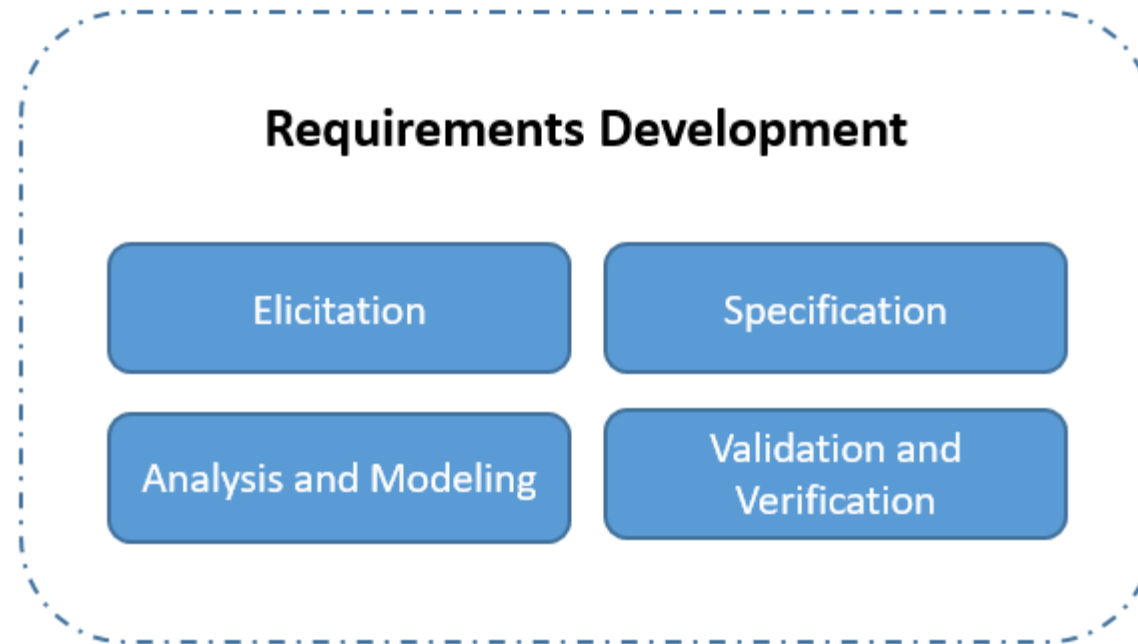# Requirements Engineering in Business Analysis

Requirements Development

Section Learning Objectives

- Requirements Development

- Requirements elicitation

- Elicitation techniques

- Analysis and Modeling

- Solution modelling

- Conflict management

- Requirements Specification

- User story & Personas

- Verification and Validation

Requirements Development

- **Requirements Development** – a collection of activities, tasks, techniques and tools to identify, analyze and validate requirements. Includes the process of transforming needs into requirements.

Requirements Development

Elicitation	Specification
Analysis and Modeling	Validation and Verification

Requirements development activities

- Requirements Development includes activities aiming to:
- • Elicit requirements with the aim to clarify the scope and collect all required features and qualities of the solution
- • Analyze and validate requirements to confirm the understanding of stakeholders on the content and scope of delivery
- • Model requirements and solutions to create solution options
- • Specify requirements in a defined form
- • Validate and verify requirements and other Business Analysis and Requirements Engineering work products

Elicitation Skillset

- In elicitation, the business analyst must be capable of identifying relevant business analysis information needed to formulate the product requirements.

- Skills in interviewing, facilitation, leadership, problem solving, negotiating, and organizing are critical (many more too).

- The analyst must be able to lead discussions from high level to detail.

- It is imperative to be effective with a number of elicitation techniques.

Types of Elicitation Techniques

- **Collaborative** - elicitation that involves direct interaction with the stakeholders e.g. interview

- **Research** – involves discovering information needed to formulate requires from data and documentation e.g. document analysis

- **Experiments** – consists of the elicitation techniques used to obtain requirements or requirements related information through a series of controlled tests e.g. prototyping

Polling Question

One of the characteristics of active listening is:

A. Playing back what was heard to ensure accuracy

B. Taking lots of notes

C. Actively looking for an opportunity to provide your input

D. Sharing ideas provided by other stakeholders

Techniques for Performing Elicitation

• Benchmarking and Market Analysis	• Focus Groups
• Brainstorming	• Interface Analysis
• Business Rules Analysis	• Interviews
• Collaborative Games	• Observation
• Concept Modeling	• Process Modeling
• Data Mining	• Prototyping
• Data Modeling	• Survey or Questionnaire
• Document Analysis	• Workshops

Benchmarking/Market Analysis Definition

Benchmarking – "a comparison of a decision, process, service, or system's cost, time, quality, or other metrics to those of leading peers to identify opportunities for improvement."

Market analysis – "involves researching customers in order to determine the products and services that they need or want, the factors that influence their decisions to purchase, and the competitors that exist in the market."

BABOK® Guide, version 3

Benchmarking

- **Purpose**
  - An elicitation technique that can be used to obtain information about how leading companies are attaining success in the industry.
- **Description**
  - Use benchmarking to understand what is considered 'best in class' in the industry.
  - Learn from competitors, and avoid making similar mistakes
  - Obtain information on what is working well and compare against your own organization to identify gaps (areas for improvement)

Market Analysis

- **Purpose**
  - To obtain information about the external market environment
- **Description**
  - Elicit information about the market conditions and competitors as an input into strategy analysis
  - A business analyst can use this technique to look for trends and understand products/services of competitors and preferences of customers.

Benchmarking Usage Considerations

- **Advantages**
  - Generates data that can feed a new product development process
  - A technique used to remain competitive
  - Provides rationale for why a competitor is successful
  - Feeds strategic planning work

- **Disadvantages**
  - Time consuming to perform
  - Can be difficult to obtain competitor data
  - Does not create innovative ideas

Market Analysis Usage Considerations

- **Advantages**
  - Identifies competitor weaknesses, which can become opportunities to pursue
  - Helps an enterprise clearly envision their business needs
  - Feeds strategic planning work

- **Disadvantages**
  - Time consuming and expensive to perform
  - Requires specific training/skill to perform
  - Cannot be used to identify problems with existing environment

Brainstorming Definition

- A group creativity and elicitation techniques designed to generate a large number of ideas in short amount of time.

Brainstorming

- **Purpose**
  - Excellent for fostering creative thinking
  - Derive themes for review
- **Description**
  - Produce broad/diverse set of options
  - Answer specific questions
- **Elements**
  - Preparation
  - Session
  - Wrap Up

Brainstorming
Usage Considerations

- **Advantages**
  - Ability to elicit many ideas in a short time period
  - Non-judgmental environment
  - Enables creative thinking
  - Useful to reduce tension of participants

- **Disadvantages**
  - Dependent on participant's creativity and willingness to participate
  - Limited by organizational or interpersonal politics
  - Process can lead to ideas being debated

Business Rule Analysis Definition

Business rule – "A specific, practicable, testable directive that is under the control of the business and that serves as a criterion for guiding behavior, shaping judgments, or making decisions."
BABOK® Guide version 3

- Business rules analysis is used to elicit, review, and revise the business rules that govern the enterprise and control how decisions are made across operational boundaries.

- Business analysts obtain this information through elicitation.

Business Rule Analysis

- **Purpose**
  - To understand the business rules which govern the decision making conducted across the enterprise.
- **Description**
  - Business rules impose constraints on a solution.
  - Rules control policies, processes, solution options, and requirements.
  - The business analyst must understand what rules exist today and understand which are candidates for change and which are not.

Business Rule Analysis Usage Considerations

- **Advantages**
  - Understanding business rules provides insight into how the enterprise operates
  - Can be managed centrally to avoid embedded rules in solutions
  - Can be reused

- **Disadvantages**
  - Establishing a rules repository takes time and funding
  - A large effort to remove logic from systems to a central location
  - Rules often contradict and the conflicts must be sorted through

Collaborative Games Definition

Collaborative games – a category of techniques which are used to promote engagement of team members (the participants) in an effort to address a business problem or obtain a shared understanding of an issue.

- Collaborative games have gained in popularity with the increase in the number of projects utilizing an agile approach to development.

Collaborative Games

- **Purpose**
  - Utilize game play to break down communication barriers among stakeholders and to get participants working together toward a common goal.
- **Description**
  - A group of techniques that share the common feature of game place, collaboration, team engagement to work toward an understanding of a presented topic.

Collaborative Games
Usage Considerations

- **Advantages**
  - Inspires creativity
  - Encourages involvement of all participants
  - Helps identify new ideas or unspoken needs
  - Team is empowered to own the issue and seek resolution

- **Disadvantages**
  - May intimidate stakeholders who are quiet or more reserved
  - May be deemed as unproductive or unprofessional
  - Requires a skilled facilitator to ensure objective is met

Concept Modeling Definition

Concept model – "an analysis model that develops the meaning of core concepts for a problem domain, defines their collective structure, and specifies the appropriate vocabulary needed to communicate about it consistently." *BABOK® Guide*, version 3

Concept modeling is the process of building the concept model. Assembling the model requires business subject matter experts, hence elicitation skills to draw out the information from the business stakeholders.

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Concept Modeling

- **Purpose**
  - Concept modeling is conducted in order to understand the business vocabulary and the key concepts that are important to the business.
- **Description**
  - Begins with the creation of a glossary.
  - Establishes a common business language
  - Requires that the business analyst sort through conflicting terms and establish agreement
  - Concept models use natural language.

Concept Modeling Usage Considerations

- **Advantages**
  - Helps improve communication
  - Supports other modeling techniques by reducing ambiguity and providing common vocabulary
  - Model is independent from solution design

- **Disadvantages**
  - Requires competency in abstract thinking to create the model
  - Must be able to separate terms from solutions
  - Requires a tool to enforce common use of terms across communications

Data Mining Definition

- Data mining is a term used to refer to a set of techniques that are can be used to process through larges sets of data in order to uncover patterns for drawing conclusions that organizations can use to support decision making.

Data Mining

- **Purpose**
  - Used to identify patterns in data that may efficiently uncover solution performance issues
- **Description**
  - Assists with processing large amounts of data
  - A tool to support effective decision making
  - Outputs of data mining are fed into models and tools to provide deep analysis of patterns.
  - The results produced can be used as input into elicitation sessions to provide context to requirements discussions.

Data Mining Usage Considerations

- **Advantages**
  - Can be used to analyze a large amount of data efficiently
  - Effective way to identify trends/variances in performance not easily identified in unstructured raw data

- **Disadvantages**
  - Must be trained in analyzing results or decisions can be based off of false assumptions
  - Complex and requires special tool set to enable use

Data Modeling Definition

- Data models visually depict the data that is relevant and important to the business domain.

    - Data models are a group of techniques each having their own modeling language and constructs to build the model
  - Models include a diagram with associated text
  - Use to model data (called entities) and specifics about the data (called attributes)

Data Modeling

- **Purpose**
  - To document information about the data that is used in business processes or in IT solutions
- **Description**
  - Data models can represent a conceptual (business) viewpoint or a physical (design) viewpoint
  - Data models represent the data and the relationships between the data
  - Models are constructed and help support elicitation activities by providing common terminology and understanding of business concepts
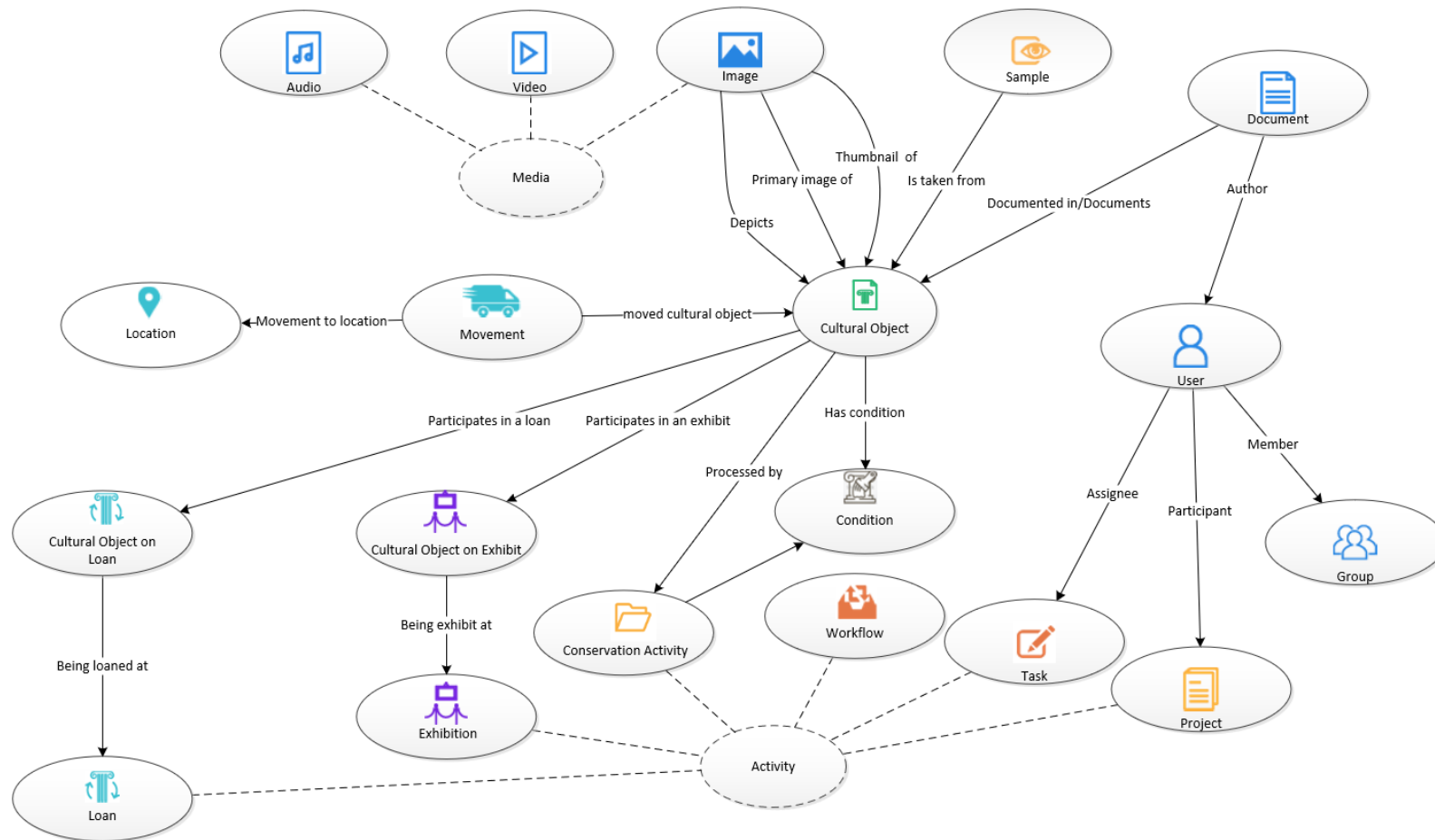
Data Modelling

There are several variations of data models:

- **Conceptual data model**: is independent of any solution or technology and can be used to represent how the business perceives its information.

- **Logical data model**: is an abstraction of the conceptual data model that incorporates rules of normalization to formally manage the integrity of the data and relationships. It is associated with the design of a solution.

- **Physical data model**: is used by implementation subject matter experts to describe how a database is physically organized. It addresses concerns like performance, concurrency, and security.
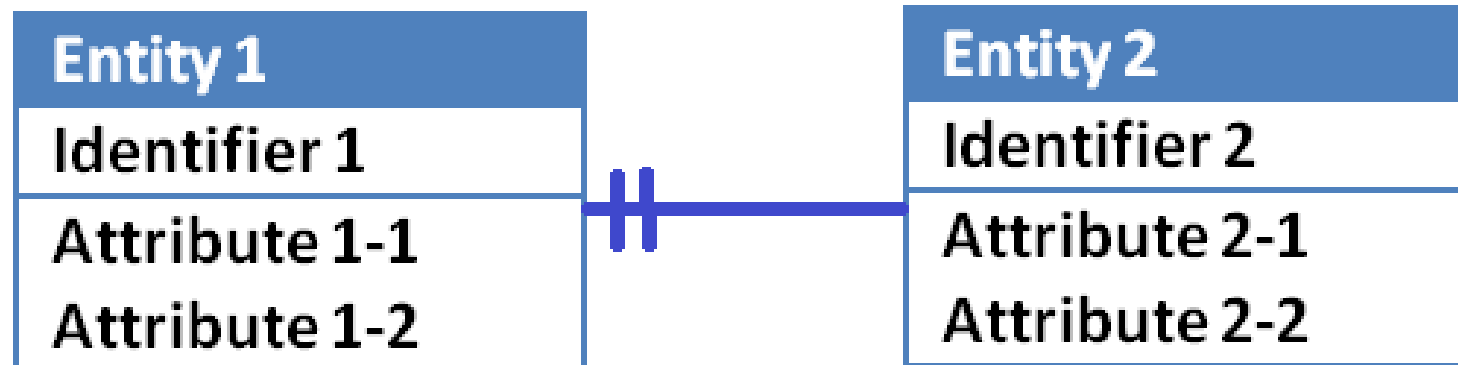
Data model

Conceptual data model

Entity Relationship Diagram (ERD)

○ Data modeling technique that creates a graphical representation of the entities and the relationships between them
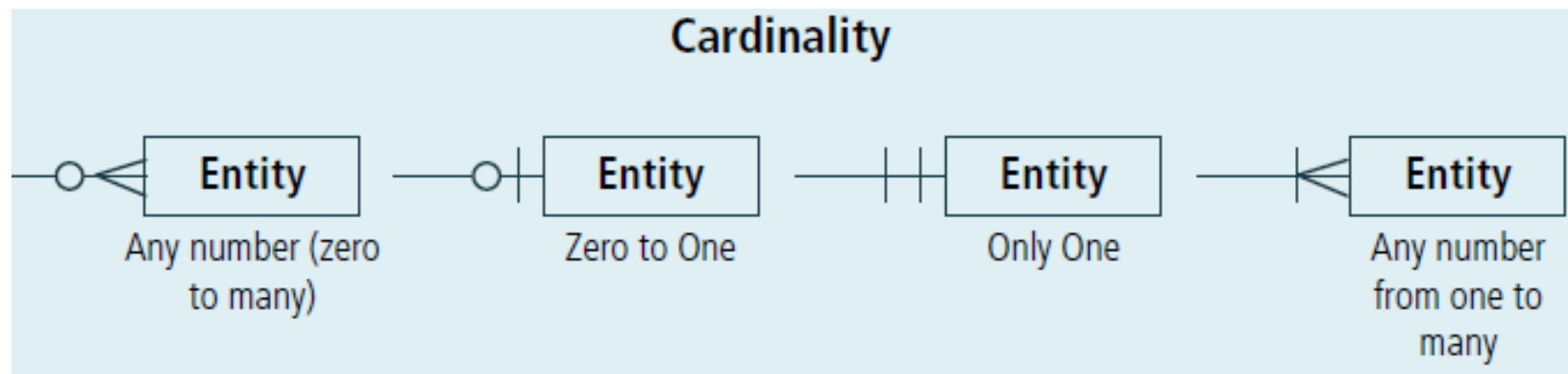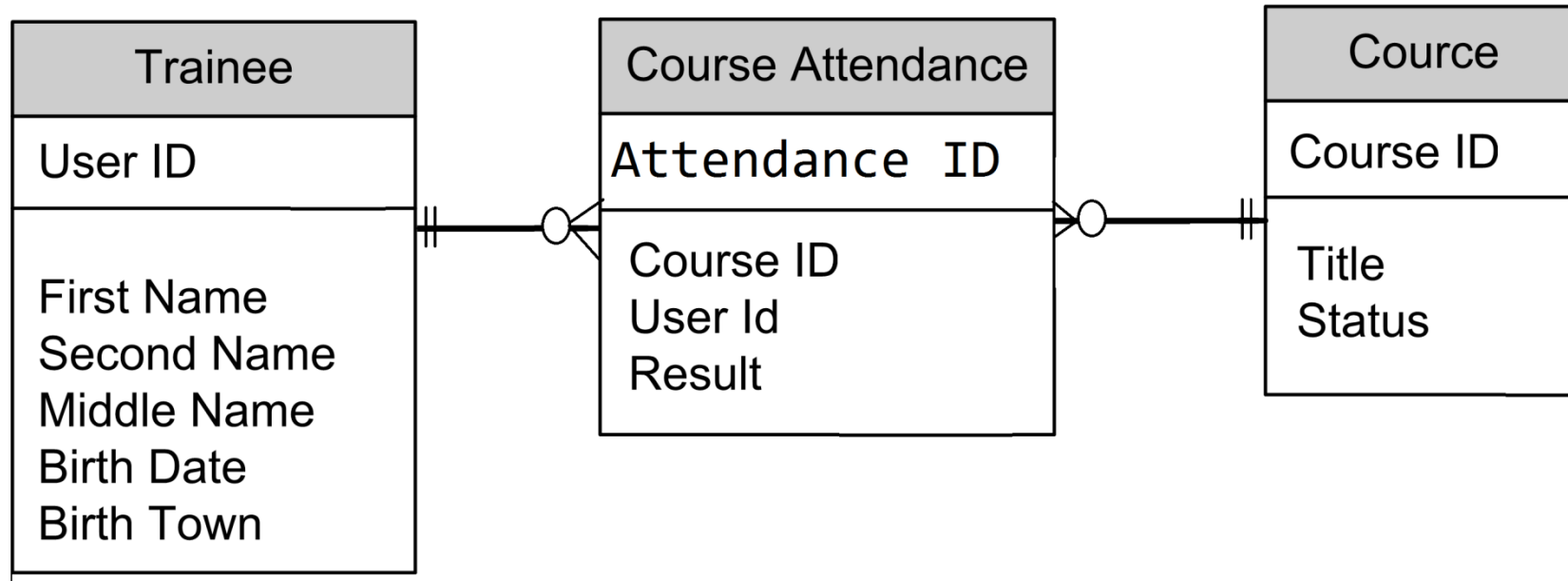
ERD Elements

- **Attribute**
  - Defines a particular piece of information associated with an entity
  - Attributes can be described in a data dictionary

- **Relationship:** Indicating which entities relate to which others and how

- **Cardinality:** The minimum and maximum number of occurrences to which an entity may be related. Typical cardinality values are zero, one, and many

Cardinality

Entity — Any number (zero to many)
Entity — Zero to One
Entity — Only One
Entity — Any number from one to many

Example

Data Modeling Usage Co Considerations

- **Advantages**
  - Provides a consistent vocabulary to use to discuss business concepts
  - A visual approach to describe data that is difficult to achieve with text alone
  - Works in conjunction with a glossary

- **Disadvantages**
  - Models can get complex or technical for stakeholder's interest
  - Models can get large and difficult to manage
  - Best developed with use of a tool that has an associated database

Document Analysis Definition

- The process of reviewing existing documentation for the purpose of eliciting business analysis information and requirements.

- Often referred to as a passive form of requirements elicitation since the business analyst works independently without stakeholder involvement.

Document Analysis

- **Purpose**
  - To obtain information about existing solutions or the business environment by reviewing available documentation.
- **Description**
  - Documentation can be built by the existing business or attained through 3rd parties
  - Can include electronic and printed mediums and text based as well as visual artifacts
  - Typically one of the first elicitation techniques performed on a project.

Document Analysis Usage Considerations

- **Advantages**
  - An easy technique to perform.
  - Provides the business analyst context prior to performing other elicitation techniques
  - Reduces elicitation time needed with stakeholders

- **Disadvantages**
  - Documentation may be difficult to locate or may be out of date
  - Documentation may not be a true representation of how the solution or business currently operates
  - Can only study current state

Focus Group Definition

- A techniques that consists of participants that are pre-qualified and a skilled moderator who come together to share their opinions, preferences, and needs about a particular product, service, problem, or opportunity.

- The session is led by a trained facilitator who elicits information from the participants to meet the session objectives.

Focus Groups

- **Purpose**
  - Means to elicit ideas/attitudes about a specific opportunity in an interactive group environment
- **Description**
  - Objective is to discuss and comment on a specific topic
  - Composed of pre-qualified individuals whose objective is to discuss/comment on the topic
  - Qualitative research where results are analyzed and reported as themes/perspectives

Focus Group
Usage Considerations

- **Advantages**
  - Participants can consider their personal view in relation to other perspectives
  - Ability to elicit data from a group of people in a single session saving time and costs

- **Disadvantages**
  - Data collected may not be consistent with how people actually behave
  - Homogeneous group responses may not represent the complete set of requirements

Polling Question

Which of the following statements about focus groups is true?

A. Homogeneous groups are always better than heterogeneous

B. The strength of the focus group lies in the ability to see a mock-up

C. People may be unwilling to speak up about a sensitive issue

D. Focus groups should never result in qualitative data

Interface Analysis Definition

Interface analysis is "used to identify where, what, why, when, how, and for whom information is exchanged between solution components or across solution boundaries."

BABOK® Guide, version 3

Interface Analysis

- **Purpose**
  - Identify interfaces between solutions and/or solution components and define requirements that describe how they will interact.
- **Description**
  - Helps clarify boundaries of interfacing applications.
  - Necessary for a software solution but also useful for a non-software solution when defining requirements for deliverables that will be produced by third parties.

Interface Analysis
Usage Considerations

- **Advantages**
  - Early identification of interfaces provides early and high-level view of interoperability for planning
  - Can help uncover root causes of problems
  - Helps estimate level of effort

- **Disadvantages**
  - Does not provide insight into other aspects of the solution since analysis does not assess internal components
  - End users usually have little knowledge of interfaces

Interviews Definition

- An elicitation technique where the interviewer asks a series of questions of the interviewee for the purpose of obtaining the necessary information to achieve the objectives of the elicitation session.

- Interviews may be structured or unstructured

- Interviews may be conduct in a synchronous or asynchronous fashion

Interviews

- **Purpose**
  - Systematic approach designed to elicit information in a formal or informal setting
- **Description**
  - Interviewer directs questions to stakeholder in order to obtain answers that will be used to create formal requirements.
  - One-on-One interviews are most common
  - Interviewers must be careful to elicit responses from all attendees when doing a group interview

Interview Usage Considerations

- **Advantages**
  - Encourages participation and establishes rapport
  - Allows for full discussions and explanations of questions and answers

- **Disadvantages**
  - Not good for reaching consensus across groups
  - Depth of follow-up questions may depend on the interviewer's knowledge of the business domain

Observation Definition

- A business analysis technique where business analysis information including requirements are obtained from the 'observation' or watching of a person performing their work in their work environment.

- The business analyst can observe how the worker performs their job as well as how they interact with an existing solution.

- Observation can be <u>passive</u> , <u>active</u>, or <u>participatory</u>

Observation

- **Purpose**
  - Elicit requirements by assessing the stakeholder's work environment.
  - Used for documenting details about current processes
- **Description**
  - Relies on studying people performing their jobs
  - Also called Job Shadowing
  - Understanding current processes is necessary to better assess process modifications

Observation Usage Considerations

- **Advantages**
  - Provides realistic and practical insight into business by getting hands-on feel for how current state business process works
  - Fills in details missed from other elicitation methods
  - Produces quantitative data

- **Disadvantages**
  - Only possible for existing processes
  - May not work well if current process involves high level of intellectual activity or other work not easily shadowed
  - Unusual scenarios may not occur

Process Modeling Definition

- A technique utilized to construct models/diagrams of either existing or desired future state processes to visually depict how work is performed.

- Models constructed show processes, the flow of work, who performs the work, relationships between processes, and decision logic.

- Models can be built to model business processes or system processes.

Process Modeling

- **Purpose**
  - Gain understanding of how work involving multiple roles and departments is performed
- **Description**
  - Process linked by sequence
  - Shows events by people, rules, or passage of time
  - May include manual or automated activities or both
  - Complete when objective or goal is completed
  - Used for current and future state processes

Process Modeling Usage Considerations

◎ Advantages

- Users are comfortable with elements / concepts
- Effectively show how to handle large number of scenarios

◎ Disadvantages

- May be complex and hard to understand when contain too much activity
- Problems are not always readily identifiable by looking at model