Requirements Analysis and Design Definition

Chapter Study Group
Learning Materials
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# Study Session Schedule

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AGENDA

- (6:00 – 6:10) Review of Chapter 6 (10 minutes)
- (6:10 – 6:35) 7.1 Specify and Model Requirements (25 minutes)
- (6:35 – 6:55) 7.2 Verify Requirements (20 minutes)
- (6:55 – 7:15) 7.3 Validate Requirements (20 minutes)
- (7:15 – 7:30) Break (15 minutes)
- (7:30 – 7:50) 7.4 Define Requirements Architecture (20 minutes)
- (7:50 – 8:10) 7.5 Define Design Options (20 minutes)
- (8:10 – 8:30) 7.6 Analyze Potential Value and Recommend Solutions (20 minutes)
- (8:30 – 8:45) Group practice
INTRODUCTION

• Chapter 7 of BABOK v3

• Consists of tasks performed to:
  • Describe requirements using analytical techniques
  • Ensure requirements and designs are internally consistent and high quality
  • Ensure requirements and designs deliver business value
  • Structure requirements and designs so they cohesively support the business purpose
  • Identify potential solutions
  • Recommend the solution that provides the greatest overall value
INTRODUCTION

• 7.1 Specify and Model Requirements
• 7.2 Verify Requirements
• 7.3 Validate Requirements
• 7.4 Define Requirements Architecture
• 7.5 Define Design Options
• 7.6 Analyze Potential Value and Recommend Solutions
INTRODUCTION

Business Analysis
Planning and Monitoring

Strategy Analysis

Requirements Analysis and Design Definition

Solution Evaluation

Elicitation and Collaboration

Requirements Life Cycle Management
INTRODUCTION

Requirements Analysis and Design Definition

Input
- Requirements (any state)
- Potential Value
- Information Management Approach
- Solution Scope
- Change Strategy

Tasks
- Specify and Model Requirements
- Verify Requirements
- Validate Requirements
- Define Requirements Architecture
- Define Design Options
- Analyze Potential Value and Recommend Solution

Output
- Requirements (specified and modelled)
- Requirements (verified)
- Requirements (validated)
- Design Options
- Solution Recommendation

Requirements Analysis and Design Definition 8
INTRODUCTION - APPLYING THE BUSINESS ANALYSIS CORE CONCEPT MODEL

<table>
<thead>
<tr>
<th>Core Concept</th>
<th>Usage in Requirements Analysis &amp; Design Definition</th>
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<tbody>
<tr>
<td>Change</td>
<td>Use requirements and designs to define the change</td>
</tr>
<tr>
<td>Need</td>
<td>Analyze needs to recommend a solution that meets those needs</td>
</tr>
<tr>
<td>Solution</td>
<td>Define solution options and recommend one that is most likely to address the need</td>
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<tr>
<td>Stakeholder</td>
<td>Tailor requirements and designs so they are understandable by stakeholder groups</td>
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<tr>
<td>Value</td>
<td>Analyze and determine the potential value of each solution option</td>
</tr>
<tr>
<td>Context</td>
<td>Model an describe the context in ways that are understandable by all stakeholders</td>
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</table>
7.1 Specify and Model Requirements
7.1 SPECIFY AND MODEL REQUIREMENTS

• **Purpose**
  • Analyze information derived from stakeholders.
  • Synthesize information derived from stakeholders.
  • Refine information derived from stakeholders.

• **Description**
  • Describes the practices for analyzing information elicited from stakeholders.
    • Where focused on understanding needs, outputs are REQUIREMENTS
    • Where focused on specifying solutions, outputs are DESIGNS
  • Includes capturing information about attributes or metadata about the requirements.
  • Specifying and modelling activities relate to all requirement types.
7.1 SPECIFY AND MODEL REQUIREMENTS

Input

4.2, 4.3 Elicitation Results (any state)

Guidelines and Tools
- Modeling Notations/Standards
- Modeling Tools
- Requirements Architecture
- Requirements Life Cycle Management Tools
- Solution Scope

Output

7.1 Specify and Model Requirements

7.1 Requirements (specified and modelled)

Tasks Using This Output
- 7.2 Verify Requirements
- 7.3 Validate Requirements

Requirements Analysis and Design Definition
## Requirements vs Designs

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Designs</th>
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<tbody>
<tr>
<td>View six months sales data across multiple organizational units in a single view.</td>
<td>A sketch of a dashboard.</td>
</tr>
<tr>
<td>Reduce amount of time required to pick and pack a customer order.</td>
<td>Process model.</td>
</tr>
<tr>
<td>Record and access a medical patient’s history.</td>
<td>Screen mock-up showing specific data fields.</td>
</tr>
<tr>
<td>Develop business strategy, goals, and objectives for a new business.</td>
<td>Screen mock-up showing specific data fields.</td>
</tr>
<tr>
<td>Provide information in English and French</td>
<td>Prototype with text displayed in English and French.</td>
</tr>
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</table>
7.1 SPECIFY AND MODEL REQUIREMENTS

1. Inputs

- **Elicitation Results (any state)**
  - Begin with eliciting input from stakeholders.
  - May be iterative, sequential or concurrent.
  - Driven by audience and audience capabilities
  - May require expansion or clarification.
7.1 SPECIFY AND MODEL REQUIREMENTS

- **Model Requirements**
  - Models are descriptive and visual.
  - Provide support for analysis and communication and understanding.
  - Confirm knowledge and knowledge gaps.
  - Modeling formats include:
    - Matrices
    - Diagrams
  - Model categories include:
    - People and Roles
    - Rationale
    - Activity flow
    - Capability
    - Data and information
7.1 SPECIFY AND MODEL REQUIREMENTS

- **Analyze requirements**
  - Process of decomposing information into smaller pieces to understand and address:
    - Any changes to meet business needs
    - What should stay the same to meet the business needs
    - What is missing to meet the business needs
    - What is unnecessary or superfluous to meet the business needs
    - Constraints and assumptions that impact the business needs
7.1 SPECIFY AND MODEL REQUIREMENTS

2. Elements

- **Represent requirements and attributes**
  - Explicitly represent and articulate requirements.
    - Must show characteristics of requirements
    - Must show design qualities
  - Requirements may differ based on stakeholders.
    - Typical to have multiple points of view – hence multiple requirements
      - Express as multiple views
    - BAs must maintain integrity and meaning of all requirements across all stakeholders
7.1 SPECIFY AND MODEL REQUIREMENTS

2. Elements

- Implement the appropriate levels of abstraction
  - Level of detail varies.
    - Based upon audience
    - Based upon type of requirement
  - Not all stakeholders require full requirements.
  - May provide different viewpoints based on stakeholder audience.
  - Business analysis approach and selected model may influence abstraction views.
7.1 SPECIFY AND MODEL REQUIREMENTS

- **Modelling and Notation / Standards**
  - Provides syntax and commonality.
  - Right information and right level and context.

- **Modelling tools**
  - Software tools may improve ease of visual representation.

- **Requirements architecture**
  - Ensure models are consistent and complete.
7.1 SPECIFY AND MODEL REQUIREMENTS

- **Requirements life cycle management tools**
  - Software that facilitates recording, viewing, reporting, storing and sharing of work product.

- **Solution scope**
  - The ‘guardrails’ that keep you and your stakeholders on track.
7.1 SPECIFY AND MODEL REQUIREMENTS

- **Acceptance and evaluation criteria**
  - Represent the criteria attributes for acceptance.

- **Business capability analysis**
  - Represents the features and functions that the enterprise is capable of.

- **Business model canvas**
  - Provides one-page view of business drivers for requirements.
7.1 SPECIFY AND MODEL REQUIREMENTS

- **Business rules analysis**
  - Used to analyze business rules with requirements.

- **Concept modelling**
  - Defines terms and relationships important to the requirements and the enterprise.

- **Data dictionary**
  - Used to list attributes of data elements.
7.1 SPECIFY AND MODEL REQUIREMENTS

- **Data flow diagrams**
  - Visualize data flow requirements – helps stakeholders “see” the data flow.

- **Data modelling**
  - Visualization of how data will be used in systems.

- **Decision modelling**
  - Visualization of decisions required to enable process or tasks.
7.1 SPECIFY AND MODEL REQUIREMENTS

4. Techniques

- **Functional decomposition**
  - Reduce to constituent component requirements.

- **Glossary**
  - Provide meaning of business and system terms.

- **Interface analysis**
  - Identify and validate inputs and outputs of process or system solution.
7.1 SPECIFY AND MODEL REQUIREMENTS

- **Non-functional requirements analysis**
  - Define and analyze service quality of service attributes.

- **Organizational modelling**
  - Model roles and responsibilities and communications lines within enterprise.

- **Process modelling**
  - Visualization of steps required to complete a process or task.
7.1 SPECIFY AND MODEL REQUIREMENTS

- **Prototyping**
  - An aid for stakeholders to “see” what the process or system will “look” like.

- **Roles and permissions matrix**
  - Provide separation of duties (SoD) and other relevant information about work effort and interfaces using the solution.

- **Root cause analysis**
  - Provides understanding of root cause requiring solution.
7.1 SPECIFY AND MODEL REQUIREMENTS

• **Scope modelling**
  - Visualization of the “guardrails” of the solution.

• **Sequence diagram**
  - Visualization of process steps and their interactions.

• **Stakeholder list, map, or personas**
  - List of stakeholders, their relationships and their characteristics.
7.1 SPECIFY AND MODEL REQUIREMENTS

• **State modelling**
  - Visualization of different states of solution based upon events throughout solution life cycle.

• **Use cases and scenarios**
  - Describe behaviors of people and systems acting with the solution or system.

• **User stories**
  - Describe what people do or react to when using the solution.
7.1 SPECIFY AND MODEL REQUIREMENTS

- All stakeholders are key at this step for definition
  - BAs may perform this step alone, or
    - Engage stakeholder groups
    - Engage individual stakeholders

- Key information
  - Current operating state
  - Desired operating state
  - Gaps between the states
7.1 SPECIFY AND MODEL REQUIREMENTS

- **Requirements (specified and modeled)**
  - Requirement /Design specifications:
    - Ensure complete specifications
  - Requirement / Design models:
    - Provide models, as required to “see” and to explain requirements
    - Provide stakeholders the ability to “see” solution

6. Outputs
7.2 Verify Requirements
7.2 VERIFY REQUIREMENTS

• Purpose
  • Confirm that requirements and designs meet quality criteria.

• Description
  • Ensures correct definition of requirements and designs.
  • Check point for BA and stakeholders before validation.
  • Provides basis for further work.
  • Validates fitness for use.
  • Validates use of formal and informal notations.
7.2 VERIFY REQUIREMENTS

Guidelines and Tools
Requirements Life Cycle Management Tools

Input
7.1 Requirements (specified and modeled)

7.2 Verify Requirements

Output
7.2 Requirements (verified)

Tasks Using This Output
5.5 Approve Requirements
7.2 VERIFY REQUIREMENTS

1. Inputs

- Requirements (specified and modelled)
  - Requirements, designs or combinations are
    - Well documented
    - Well written
    - Matrices and models correctly expressed
7.2 VERIFY REQUIREMENTS

• Characteristics of Requirements and Designs Quality
  • Atomic
    • Self-contained
    • Capable of being independently understood
  • Complete
    • Sufficient to guide further work
    • Appropriate level of detail to continue work
    • May differ based upon perspective or methodology
    • Point in life cycle
  • Consistent
    • Aligned with identified needs of stakeholders
    • Does not conflict with other requirements
7.2 VERIFY REQUIREMENTS

2. Elements

• Characteristics of Requirements and Designs Quality
  • Concise
    • No extraneous or unnecessary detail or content
  • Feasible
    • Reasonable and possible within
      • risk tolerance
      • Schedule and budget
      • Ability to investigate further
  • Unambiguous
    • Clearly stated to demonstrate that it does or does not meet associated need
7.2 VERIFY REQUIREMENTS

2. Elements

• Characteristics of Requirements and Designs Quality
  • Testable
    • Able to verify requirement or design fulfillment
      • Acceptable levels of fulfillment depend on level of abstraction of requirement or design
  • Prioritized
    • Ranked or grouped in terms of importance and value
  • Understandable
    • Uses common terminology understood by audience
7.2 VERIFY REQUIREMENTS

Verification Activities

- Typically performed iteratively
- Includes:
  - Checking for compliance with organizational performance standards such as right tools, right methods
  - Checking for correct use of modelling, notation, templates, forms
  - Checking for completeness within each model
  - Comparing models against other relevant models
    - Checking for elements mentioned in one but missing from others
    - Ensuring terminology is understandable and consistent
  - Adding examples where clarification is needed
7.2 VERIFY REQUIREMENTS

2. Elements

- Checklists
  - Used for quality control.
  - May include:
    - Standard set of qualifying elements
    - May be specifically developed to capture issues of importance
  - Designed to ensure that important items are included.
  - Ensures that important requirements are included in designs and solution.
7.2 VERIFY REQUIREMENTS

3. Guidelines and Tools

• Requirements Life Cycle Management Tools
  • Software tools that facilitate:
    • Recording
    • Organizing
    • Storing
    • sharing
7.2 VERIFY REQUIREMENTS

- **Acceptance and evaluation criteria**
  - Represent the criteria attributes for acceptance.

- **Item Tracking**
  - Ensure that any issues identified are managed and resolved.

- **Metrics and Key Performance Indicators (KPIs)**
  - How to evaluate quality of requirements.

- **Reviews**
  - Inspect requirements documentation to identify requirements not of acceptable quality.
7.2 VERIFY REQUIREMENTS

- All stakeholders are key at this step for definition
  - BAs may perform this step alone, or
    - Engage stakeholder groups
    - Engage individual stakeholders

5. Stakeholders
7.2 VERIFY REQUIREMENTS

- Requirements (verified)
  - Verified set of requirements:
    - Quality sufficient to move to next step
  - Verified set of designs:
    - Quality sufficient to move to next step
7.3 Validate Requirements
7.3 VALIDATE REQUIREMENTS

• Purpose
  • Ensure that requirements and designs align to business requirements.
  • Ensure that requirements and designs satisfy the requirements.

• Description
  • Ongoing process to ensure:
    • Stakeholder alignment with business requirements
    • Solution and transition designs align to business requirements
    • Designs satisfy the requirements
  • Need to understand what desired future state looks like for stakeholders.
  • Overall goal is to achieve stakeholder’s desired future state.
  • Conflicting needs should be exposed during this step.
7.3 VALIDATE REQUIREMENTS

Guidelines and Tools
- Business Objectives
- Future State Description
- Potential Value
- Solution Scope

Input
- 7.1 Requirements (specified and modelled)

Output
- 7.3 Validate Requirements
- Requirements (validated)

Tasks Using This Output
- 7.5 Define Design Options
- 8.1 Measure Solution Performance
7.3 VALIDATE REQUIREMENTS

1. Inputs

- Requirements (specified and modeled)
  - Any requirements can be validated.
  - Any designs can be validated.
  - Any requirements and designs can be validated while in process or as completed.
  - Validation cannot conclude until all requirements are completely verified.
7.3 VALIDATE REQUIREMENTS

2. Elements

- **Identify Assumptions**
  - New requirements do not have precedents.
  - Need to list and validated assumptions made
    - Stakeholder responses
    - Customer responses
  - May be difficult to identify root cause.
  - List cause assumptions even if not root cause
  - List variables that may cause assumptions
  - Identify and quantify risks associated with assumptions.
7.3 VALIDATE REQUIREMENTS

• Define Measurable Evaluation Criteria
  • Define metrics for expected benefits.
    • Often not defined as part of requirements gathering
    • What does “good” look like
  • Define the evaluation criteria to identify appropriate metrics.
  • Baseline metrics based on current state.
  • Target metrics based on desired future state.
    • Base on business objectives
    • Other measurement of success
7.3 VALIDATE REQUIREMENTS

• Evaluate Alignment with Solution Scope
  • Requirement may provide benefit to a stakeholder but not provide overall alignment to desired future state.
  • Need to view benefit vis-à-vis alignment to desired state.
    • Consider eliminating or modifying those that do not align
    • Consider altering the desired future state
• If design cannot be validated:
  • Likely some benefit was missed
  • Likely some requirement was missed or miscommunicated
  • Design may need to change
# 7.3 Validate Requirements

## Business Objectives
- Ensure the requirements deliver desired business benefits.

## Future State Description
- Align requirements to desired future state.
- Solution delivers desired business benefits.

## Potential Value
- To be used as a benchmark against value delivered by requirements.

## Solution Scope
- Ensure that requirements in scope provide desired benefit.
7.3 VALIDATE REQUIREMENTS

4. Techniques

- **Acceptance and Evaluation Criteria**
  - Describe quality metrics that must be met for acceptance.

- **Document Analysis**
  - Identify documented business needs to validate requirements.

- **Financial Analysis**
  - Define financial benefits associated with requirements.

- **Item Tracking**
  - Ensure that identified problems are tracked, managed and resolved.
7.3 VALIDATE REQUIREMENTS

4. Techniques

- **Metrics and Key Performance Indicators (KPIs)**
  - Select appropriate performance measures for:
    - Solution
    - Solution component
    - Requirement

- **Reviews**
  - Confirm whether stakeholder agrees or not that needs are met.

- **Risk Analysis Management**
  - Identify possible scenarios that would alter benefit delivered by a requirement.
7.3 VALIDATE REQUIREMENTS

- All stakeholders are key at this step for definition
  - BAs have primary responsibility along with:
    - Stakeholder groups
    - Engaged individual stakeholders
7.3 VALIDATE REQUIREMENTS

- **Requirements (validated)**
  - Validated requirements:
    - Can be demonstrated to deliver benefits to stakeholders
    - Aligned with business goals and objectives of the change
  - Requirements that cannot be validated either:
    - Do not benefit the organization
    - Do not fall within the scope
7.4 Define Requirements Architecture
7.4 DEFINE REQUIREMENTS ARCHITECTURE

• **Purpose**
  - Requirements collectively support each other.
  - Requirements fully achieve the business objectives.

• **Description**
  - Represents the structure of all requirements of a change.
  - Fits the individual models and specifications together.
    - Form a WHOLE
  - Used to:
    - Understand which models are appropriate for domain
    - Organize requirements into structures relevant to stakeholders
    - Illustrates how requirements interact and relate
    - Allow for trade-off decisions
7.4 DEFINE REQUIREMENTS ARCHITECTURE

Input

- Requirements (any state)
- 3.4 Information Management Approach
- 6.4 Solution Scope

Output

7.4 Define Requirements Architecture

Tasks Using This Output

- 5.3 Prioritize Requirements
- 7.1 Specify and Model Requirements
- 5.4 Assess Requirements Changes
- 7.5 Define Design Options

Guidelines and Tools

- Architecture Management Software
- Legal/Regulatory Information
- Methodologies and Framework
7.4 DEFINE REQUIREMENTS ARCHITECTURE

1. Inputs

- **Information Management Approach**
  - Defines how the business analysis information is:
    - Stored
    - Accessed

- **Requirements (any state)**
  - Every requirement stated at least/only once.
  - Incorporated into requirements architecture.
  - Allows entirety to be viewed and evaluated

- **Solution Scope**
  - Review to ensure alignment with boundaries of desired solution.
7.4 DEFINE REQUIREMENTS ARCHITECTURE

2. Elements

• **Requirements Viewpoints and Views**
  • Set of conventions define how requirements are presented and related.
    • Provide templates for different stakeholder groups
    • May include standards and guidelines for
      • Model types used
      • Attributes included and used
      • Model notations used
      • Analytical approaches used to identify and relate
  • No single viewpoint can represent all viewpoints.
  • Each viewpoint may use different models, notations, etc.
  • Collection of viewpoints makes an architecture.
7.4 DEFINE REQUIREMENTS ARCHITECTURE

2. Elements

- **Template Architectures**
  - Framework is a collection of viewpoints.
  - Standard across:
    - An industry
    - A sector
    - Organization
  - May be populated with domain specific information.
  - May provide a more complete picture

- **Completeness**
  - Ensures completeness of requirements.
  - Must be able to be understood by all audiences.
  - Cohesive and tells a full story.
7.4 DEFINE REQUIREMENTS ARCHITECTURE

• Relate and Verify Requirements Relationships
  • Requirements may be related to each other.
  • BAs study and analyze to define relationships.
    • See 5.1 Trace Requirements
  • Requirements relationships must satisfy quality criteria:
    • Defined – relationship does exist and is expressed
    • Necessary – to understand requirements holistically
    • Correct – relationship described does exist
    • Unambiguous – do not link elements in more than one or conflicting manner
    • Consistent – described in the same manner, same set of standard descriptions per viewpoints

2. Elements
7.4 DEFINE REQUIREMENTS ARCHITECTURE

2. Elements

- **Business Analysis Information Architecture**
  - Structure of business analysis information is also an information architecture.
    - See Section 3.3 Plan Business Analysis Information Management
  - Component of requirements architecture:
    - Describes how all business analysis relates
    - Defines relationships for types of information
      - Requirements
      - Designs
      - Types of models
      - Elicitation results
  - Verify relationships are complete.
7.4 DEFINE REQUIREMENTS ARCHITECTURE

3. Guidelines and Tools

- **Architecture Management Software**
  - Can help to manage:
    - Volume, Complexity, Versions

- **Legal / Regulatory Information**
  - Legislative rules that must be followed may impact requirements architecture or outputs
  - Contractual or standard-based rules may impact as well

- **Methodologies and Frameworks**
  - Predetermined set of models and relationships between models
  - Represent different viewpoints
7.4 DEFINE REQUIREMENTS ARCHITECTURE

4. Techniques

- **Data Modelling**
  - Describe requirement structure relationship to data.

- **Functional Decomposition**
  - Used to breakdown into relevant elements.
    - Organizational unit, Product, Scope, Other elements

- **Interviews**
  - Define requirements structures collaboratively.

- **Organizational Modelling**
  - Understand various organizational relationships to develop relevant viewpoints.
7.4 DEFINE REQUIREMENTS ARCHITECTURE

4. Techniques

- **Scope Modelling**
  - Identify elements and boundaries of requirements architecture.

- **Workshops**
  - Used to define boundaries collectively.
5. Stakeholders

7.4 DEFINE REQUIREMENTS ARCHITECTURE

• Domain Subject Matter Expert, Implementation Subject Matter Expert, Project Manager, Sponsor, Tester
  • May assist in:
    • Defining requirements architecture
    • Confirming requirements architecture

• Other Stakeholders
  • May assist in assessing completeness of requirements.
7.4 DEFINE REQUIREMENTS ARCHITECTURE

- Requirements Architecture
  - Competed requirements
  - Completed interrelationships
  - Contextual information as required

6. Outputs
7.5 Define Design Options
7.5 DEFINE DESIGN OPTIONS

• **Purpose**
  • Define solution approach.
  • Identify opportunities to improve the business.
  • Allocate requirements across solution components.
  • Represent design options to meet desired future state.

• **Description**
  • There may be more than one design option.
    • Design options are tactical not strategic
  • BAs must assess solution options, and:
    • Their ability to meet customer requirements
    • The trade-offs represented by each solution
  • As the initiative progresses designs may evolve.
7.5 DEFINE DESIGN OPTIONS

Input
- 5.3, 7.3 Requirements (validated, prioritized)
- 6.4 Change Strategy
- 7.4 Requirements Architecture

Output
- 7.5 Define Design Options

Tasks Using This Output
- 6.4 Define Change Strategy
- 7.6 Analyze Potential Value and Recommend Solution

Guidelines and Tools
- Existing Solutions
- Future State Description
- Requirements (traced)
- Solution Scope
7.5 DEFINE DESIGN OPTIONS

1. Inputs

- **Change Strategy**
  - Describes approach to follow to transition.
  - May have impact on design decisions.

- **Requirements (validated, prioritized)**
  - Only validated requirements are considered in design options.
  - Prioritized requirements aid in suggesting design options.
    - Highest priorities have more weight in design

- **Requirements Architecture**
  - Complete set of requirements and relationships.
    - Define design options that can address holistically
Define Solution Approaches
- Describes whether the solution components will be:
  - Purchased, Created, Hybrid
- BAs assess merits of each approach for each design.
- Solution approaches include:
  - Create – assembled, constructed, developed
  - Purchase – selected from offerings that fulfill requirements
  - Combination of both – includes both creation and purchase
- Consideration of integration elements is extremely important.
7.5 DEFINE DESIGN OPTIONS

• **Identify Improvement Opportunities**
  • Opportunities to improve the business may occur during analysis and design.
    • Increase efficiencies
    • Automate or simplify
    • Reengineering or sharing processes
    • Changing responsibilities
    • Outsourcing
  • Improve Access to Information
    • Provide greater amounts of clear data and information
  • Identify Additional Capabilities
    • Capabilities that may have potential to provide future value
2. Elements

7.5 DEFINE DESIGN OPTIONS

- **Requirements Allocation**
  - Assigns requirements to solution components and releases to best achieve desired state.
  - Trade-offs need to be considered
  - Must maximize value.
  - May be allocated between:
    - Organizational units
    - Job functions
    - Solution components or releases of solution
  - Begins when solution approach is determined.
  - Continues throughout the initiative.
7.5 DEFINE DESIGN OPTIONS

- **Describe Design Options**
  - Investigated and developed while considering desired future state.
  - Ensures that design option is valid.
  - Solution performance measures are defined for each design option.
  - Design options consist of many design components.
    - Business policies and business rules
    - Business processes to be performed and managed
    - People who operate and maintain the solution
    - Operational business decisions
    - Software applications and components used in solution
    - Organizational structures, including interactions between organization, customers, suppliers
7.5 DEFINE DESIGN OPTIONS

• **Existing Solutions**
  • Current in use products or services may be a component of eventual solution.

• **Future State Description**
  • Articulates future state of enterprise that designs will be part of.
  • Helps ensure that design details are viable.

• **Requirements (traced)**
  • Define design options that best fulfill requirements.

• **Solution Scope**
  • Defines boundaries when selecting viable design options.
7.5 DEFINE DESIGN OPTIONS

4. Techniques

• Benchmarking and Market Analysis
  • Used to identify and analyze existing solutions and market trends.

• Brainstorming
  • Used to help identify Improvement opportunities and design options.

• Document Analysis
  • Used to provide information needed to describe design options and design elements.

• Interviews
  • Used to help identify Improvement opportunities and design options.
7.5 DEFINE DESIGN OPTIONS

- **Lessons Learned**
  - Used to help identify opportunities for improvement.

- **Mind Mapping**
  - Used to identify and explore possible design options.

- **Root Cause Analysis**
  - Used to understand underlying cause of problems being addressed.
  - Allows proposed solutions to address problems.

- **Survey or Questionnaire**
  - Used to help identify Improvement opportunities and design options.
7.5 DEFINE DESIGN OPTIONS

- **Vendor Assessment**
  - Used to couple 3\textsuperscript{rd} party offering with vendor.
    - Ensure viability of vendor
    - Ensure appropriateness of solutions
    - Develop and maintain healthy relationships

- **Workshops**
  - Used to identify improvement opportunities and design options.
7.5 DEFINE DESIGN OPTIONS

- **Domain Subject Expert**
  - Provides expertise in terms of design options.
  - Helps assess benefits of solution alternatives.

- **Implementation Subject Matter Expert**
  - Provides expertise in terms of design options.
  - Provides input about solution constraints and costs.

- **Operational Support**
  - Help evaluate difficulty and cost of integrating proposed solution with existing systems.
7.5 DEFINE DESIGN OPTIONS

- **Project Manager**
  - Plans and manages solution definition process.
    - Solution scope
    - Risks

- **Supplier**
  - Provides information on functionality associated with a particular design option.

5. Stakeholders
7.5 DEFINE DESIGN OPTIONS

- **Design Options**
  - Describe various ways to satisfy requirements in a context.
  - May include:
    - Solution approach
    - Potential improvement opportunities
    - Components that define the solution options
7.6 Analyze Potential Value and Recommend Solution
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

• Purpose
  • Estimate potential value of each design option.
  • Establish which potential solution is most appropriate.

• Description
  • Describes how to estimate and model potential value delivered by:
    • A set of requirements
    • Designs or design options
  • Process is iterative.
  • May be a planned event or triggered by a modification or change.
  • Includes consideration of uncertainty in estimates.
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

• Description
  • Value can be described in terms of:
    • Finance
    • Reputation
    • Impact on marketplace
  • May include increase or decrease in value or a mix.
  • Options are evaluated by comparing options of one design to another.
    • Each option has a mix of pros / cons
    • There may be no BEST option or there may be a clear winner
    • Where no best option
      • May need to work several concurrently to make further determinations
      • All options may be rejected
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

Guidelines and Tools
- Business Objectives
- Current State Description
- Future State Description
- Risk Analysis Results
- Solution Scope

Input
- 6.2 Potential Value
- 7.5 Design Options

Output
- 7.6 Analyze Potential Value and Recommend Solution
- 7.6 Solution Recommendation

Tasks Using This Output
- 6.4 Define Change Strategy
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

1. Inputs

- **Potential Value**
  - Can be used as a benchmark against which value for a design may be evaluated.

- **Design Options**
  - Need to be evaluated one against another to recommend one option for solution.
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

• **Expected Benefits**
  • Describe positive value a solution is intended to deliver.
  • Value can include:
    • Benefits
    • Reduced risk
    • Compliance with business policies and regulations
    • Improved user experience
    • Other positive outcomes
  • Can be calculated at:
    • Single requirement
    • Grouping of requirements
  • Benefits often realized over a long period of time.
7.6 Analyze Potential Value and Recommend Solution

- **Expected Costs**
  - Include:
    - Any potential negative value
    - Cost to acquire the solution
    - Negative effects on stakeholders
    - Cost to maintain over time
  - Costs may include:
    - Timeline
    - Effort
    - Purchase and/or implementation costs
    - Operating costs
    - Maintenance costs
    - Physical resources
    - Information resources
    - Human resources
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

• **Expected Costs**
  - Costs for a design option consider cumulative costs of design components.
  - Must consider opportunity costs.
    - Alternative results that might have been achieved if:
      - Resources dedicated to one solution were otherwise dedicated
      - Funds dedicated to one design were otherwise dedicated
    - Opportunity cost of any design is equal to the value of the best opportunity NOT selected.
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

**Determine Value**
- Potential value to a stakeholder is based on:
  - Benefits to stakeholder
  - Costs to stakeholder
- Value to enterprise typically outweighs value to any single stakeholder.
- Potential value is uncertain.
  - Estimates of costs and benefits take into account
  - Degree of uncertainty at time of estimates
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

• Assess Design Options and Recommend Solution
  • Each design option is assessed based on potential value to be delivered.
    • May need to reevaluate if no clear benefits
  • As costs and effort are understood for each design option analysts.
    • Evaluate each design option to ensure that it represents best trade-offs
    • Factors include:
      • Available resources – may be limitations
      • Constraints on the solution – regulatory or business
      • Dependencies between requirements – some may provide limited value but are needed for higher value requirements to be implemented
Assess Design Options and Recommend Solution

Other considerations include:
- Relationships with proposed vendors
- Dependencies on other initiatives
- Corporate culture
- Sufficient cash flow

BAs recommend option or options deemed most valuable.
- Possible that none of the options are recommended
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

- **Business Objectives**
  - Used to calculate expected benefit.

- **Current State Description**
  - Provides context for work.
  - Can be used to identify and quantify value to be derived.

- **Future State Description**
  - Describe desired future state.
  - Ensure that design options are appropriate.
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

3. Guidelines and Tools

- **Risk Analysis Results**
  - Level of risk associated with design options.

- **Solution Scope**
  - Define scope of proposed solution.
  - Ensure scope is within boundaries.
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

- **Acceptance and Evaluation Criteria**
  - Express requirements in form of acceptance criteria makes them most useful when evaluating proposed solutions.
  - Helps determine if solution meets defined business needs

- **Backlog Management**
  - Used to sequence potential value.

- **Brainstorming**
  - Identify potential benefits in collaborative manner.

- **Business Cases**
  - Used to assess recommendations against goals and objectives.
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

- **Business Model Canvas**
  - Tool to help understand strategy and initiatives.

- **Decision Analysis**
  - Supports assessment and ranking of design options.

- **Estimation**
  - Forecasts costs and efforts in order to estimate value.

- **Financial Analysis**
  - Evaluate financial return of different options.
  - Choose the best possible ROI.
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

4. Techniques

- **Focus Groups**
  - Get stakeholder inputs on:
    - Which design option best meets needs
    - Evaluate small stakeholder group value expectations

- **Interviews**
  - Get stakeholder inputs on:
    - Which design option best meets needs
    - Evaluate small stakeholder group value expectations

- **Metrics and Key Performance Indicators (KPIs)**
  - Create and evaluate measurements used in defining value.
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

4. Techniques

- **Risk Analysis and Management**
  - Identify and manage risks that could affect potential value.

- **Survey or Questionnaire**
  - Get stakeholder input on which designs best met requirements and value expectations.

- **SWOT Analysis**
  - Identify areas of strengths and weaknesses that will impact value of solutions.

- **Workshops**
  - Get stakeholder input on which designs best met requirements and value expectations.
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

5. Stakeholders

Customer

- Represents market segments affected.
- Involved in analyzing benefits and costs.

Domain Subject Matter Expert

- Use expert domain knowledge to:
  - Analyze potential benefits and value

End User

- Insight into potential value of solution.

Implementation Subject Matter Expert

- Provide expertise in implementing design option.
- To identify potential risks and costs

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5. Stakeholders

7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

- **Project Manager**
  - Manage selection process to ensure:
    - Awareness of potential impacts and risks

- **Regulator**
  - Involved in risk evaluation concerning possible regulatory requirements.
  - May find constraints due to regulatory requirements.

- **Sponsor**
  - Approves expenditure of resources and funds.
  - Final approval of solution and delivery quality.
7.6 ANALYZE POTENTIAL VALUE AND RECOMMEND SOLUTION

- **Solution Recommendation**
  - Identifies suggested, most appropriate solution.
  - Solution should maximize value provided