Managing Project Scope

Module 2 – Progressive Elaboration of Scope
Course Structure

- Getting Started
- Module 1 – Foundation Concepts
- Module 2 – Progressive Elaboration of Scope
- Module 3 – Monitoring and Controlling Scope
- Module 4 – Project Closeout
- Summary and Next Steps

Participant’s Notes:

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Each module builds upon the knowledge, skills, and techniques learned in the prior modules, so by the end of the course, you will have a complete understanding of this course content.
Module Overview

This module includes the following topics:

- Defining and Elaborating Scope
- Starting the Requirements Definition
  - Project work request
  - Requirements overview
  - Project proposal
  - Project charter
- More Detailed Documents
  - Scope statement
  - Work Breakdown Structure
  - Requirements definition document
  - Procurement statement of work
- Contracts and Plans

Participant’s Notes:

These are the main topics that will be covered in this module.
Module Learning Objectives

At the conclusion of this module, you’ll be able to:

• Define the intent and process of the progressive elaboration
• Discuss the purpose of a Systems Development Life Cycle (SDLC) process and its relationship to scope management.
• Explain the scope elaboration process steps and related documents
• Describe how to analyze stakeholder needs and requirements
• Recognize pitfalls and best practices in the progressive elaboration of scope
• Describe scope elaboration requirements within the vendor and contract management environment

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Participant’s Notes:

Review these performance-based learning objectives carefully.
Topic:

Progressively Elaborating Project Scope. Defining and Elaborating Scope

Participant’s Notes:

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Fill-in the Blanks: Progressive Elaboration

Did you record in your journal what you learned about progressive elaboration from Module 1? See if you can correctly fill in the blanks.

Progressive elaboration:
• _______ and _______ a plan
• Provides greater _______ and ____________

Participant’s Notes:

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Fill-in the Blanks: Progressive Elaboration Debrief

**Progressive elaboration:**
- Improves and expands a plan
- Provides greater accuracy and completeness

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**Participant’s Notes:**

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**Progressive Elaboration** – The iterative process of increasing the level of detail in a project management plan as greater amounts of information and more accurate estimates become available.

The CHAOS Report produced by The Standish Group International (1995) indicates that the major reasons that information technology projects are behind schedule and over budget is due mainly to incomplete or changing requirements or the quality of the customer relationship.

But before we can define detailed requirements, we need to start with the objectives defined in the project charter, as defined in the previous module. For there, we need to confirm the deliverables in the scope statement also developed in Initiating (but will be covered here in this module), describe the work it will take to achieve those deliverables (WBS), then write the detailed requirements, with possibly several iterations before we have a baseline document. Let’s look at how this critical process plays out.

### Why Scope/Requirements Are Important

<table>
<thead>
<tr>
<th>Reason for Project Failure</th>
<th>Percentage Due to this Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete requirements</td>
<td>13.1%</td>
</tr>
<tr>
<td>Lack of user involvement</td>
<td>12.4%</td>
</tr>
<tr>
<td>Unrealistic expectations</td>
<td>9.9%</td>
</tr>
<tr>
<td>Changing requirements/specs</td>
<td>9.3%</td>
</tr>
</tbody>
</table>

44.7% of project failures are linked to requirements and scope management activities!

A Closer Look at Progressive Elaboration?

- Incremental scope definition, design, and refinement of the initial concepts
- Generally referred to as Project Phases
- Rolling Wave Planning is a form of progressive elaboration and establishes a regular time schedule for progressive elaboration

All projects begin as a concept. A project concept, to create a new product or service, typically includes a broad vision (business objective) of what the end result will be. The temporary project results in the unique product or service through progressive elaboration. Progressive elaboration is the incremental scope definition, design, and refinement of the initial concepts. It is generally referred to as Project Phases.

Progressive Elaboration is found in the concept which allows project scope details to be progressively refined before work begins on an element of work. One form of progressive elaboration in large projects is called rolling wave planning which establishes a regular time schedule for progressive elaboration.

**Rolling Wave Planning** – An iterative planning technique in which the work to be accomplished in the near term is planned in detail, while the work in the future is planned at a higher level.

The objectives of the SDLC (System Development Life Cycle) process standard are:

- Break down the development process into phases and deliverables that the project team can act on.
- Provide enhanced structure for requirements management and analysis activities as well as construction and implementation activities.

The actual process for this SDLC provides for rigorous, measured, and progressive elaboration techniques.

The systems development life cycle (SDLC) is a conceptual model used in project management that describes the stages involved in an information system development project, from an initial feasibility study through maintenance of the completed application.
The phases in this sample SDLC are identified by unique major deliverables, such as an internal project work product like the integrated code is delivered to the systems testers. These deliverables may also be external work product delivered to the customer, such as the prototype product is delivered to the client for approval.

Frequently, the phases overlap in IT projects, due to schedule pressure or resource constraints. For example, we may:

- Start planning before the cost benefit analysis is complete
- Start design before all requirements are fully defined
- Start integrating before all units are complete
The systems development process or systems development life cycle (SDLC) is a model of how software and related systems are, or should be, developed. It is based on the project life cycle concept in which a project is divided into a set of phases for the purpose of increasing the ability to control the project and to promote consistency of performance between projects.

An SDLC Standard establishes the requirements and responsibilities for all aspects of the system development process, which include the following activities:

- Project initiation, approval, and prioritization
- Defining and analyzing requirements
- Building and implementing defined requirements
- Defining and implementing supporting processes for system implementation

SDLC is implemented to improve the quality of products, services, and performance. Every organization has a need to improve. The need to improve arises out of either the recognition of problems or the recognition that even though no immediate problems may exist, it is always appropriate to analyze the way one works to identify opportunities to preempt problems or to simply get better by adapting new techniques and tools.
Why an SDLC Standard?

• Provide structure and standardization that could range from moderately simple to tremendously complex depending on the nature of the project objectives.

• Provide a timing sequence that maximizes productivity through the planning and execution of activities in an optimized sequence throughout the project’s life cycle.

• Give structure to the analysis steps that is crucial to the efficient and effective construction and implementation of the system.

• Manage cost, timing, and functionality expectations through the entire SDLC.

The intent of a SDLC process is to help produce a product that is cost-efficient, effective, and of high quality. Once an application is created, the SDLC maps the proper deployment and decommissioning of the software once it becomes a legacy.
To understand the systems development process, we first need to understand the generic concept of a project life cycle (PLC).

A PLC defines a series of stages or steps which something (such as a project, program or product) passes through during its lifetime.

Project managers divide projects into phases to provide better management control with appropriate links to ongoing operations of the performing organization. These phases in the project life cycle (across a project’s life) are not the same as the project management process groups, which we will describe in a later section of this module.
Exercise 2.1 – Develop a SDLC

Based on what you learned about a SDLC, review the Sales and Customer Service Case Study to:
• Identify at least 4 phases for the project SDLC
• Include your rationale for the phase names and numbers of phases

Participant’s Notes:
Exercise 2.1 – Develop a SDLC Debrief

Proposed SDLC for the Sales and Customer Service Project

1. Initiation – needed for project authorization
2. Definition – needed for requirements gathering and analysis, and design
3. Building – needed to develop and test the solution
4. Implementation – needed to deliver the solution
This diagram displays the process of elaborating project scope. There are key deliverables that are created as part of the scope definition process.
The Work Request is the first document used in beginning the requirements definition process. It outlines the business need for the project, along with objectives. It identifies the customer audience and begins to define assumptions and constraints for the project.
The Next Step: Project Proposal/Business Case

Provides a project overview, including:

- Scope of the project
- Objectives
- Sponsor and stakeholders
- Business case summary
- High-level risk identification
- Preliminary project schedule
- Preliminary project business case
- Preliminary project budget
- Summary and recommendations

The Project Proposal is created to gain a high-level understanding of the project. It provides a general idea of the scope of the project, which is derived from the Requirements Overview document. It provides background on the business case for the project, as well as a preliminary assessment of the risks for the project. An idea is given of the project duration and identified constraints and assumptions are documented.

This document may also be used as a basis for comparing competed projects in the overall project governance process.

**Business Case** – A documented economic feasibility study used to establish validity of the benefits of a selected component lacking sufficient definition and that is used as a basis for the authorization of further project management activities.

Followed by a Project Charter

Document that formally authorizes a project

- Provides the project manager with authority to apply organizational resources to project activities
- Should be clear, concise, and easy to read
- Should be issued by a manager external to the project

Develop Project Charter – The process of developing a document that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.


Charters normally include:

- Project description
- Business need for project
- Product description – key deliverables, if known
- Objectives/constraints – cost and schedule
- Project scope (inclusions and exclusions)
- Key stakeholders and roles
- Project manager’s authority and responsibility
- Risks
- Assumptions

Participant’s Notes:
The Project Charter provides basic information regarding key stakeholders and responsibilities. It also provides an added level of description of the scope of the project, including technical approach, objectives, and constraints.
Supporting elements
- Completion criteria
- High-level WBS, milestones, and deliverables
- Assumption and constraints
- Risks
- Core team members
- Other key resource requirements

Any supporting information that is available should also be included in the Project Charter. This can include any of the information listed above.

Project Charter – A document issued by the project initiator or sponsor that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.

Developing a Project Objective for the Scope Statement

Make sure the objectives are SMART

Specific – Explicit, clear, understandable
Measurable – Process to assess expected value
Attainable – Reachable, within capabilities
Realistic – Relevant, right approach
Time-bound – Specific time period (date)

--------Not Subjective-------

The preliminary scope statement generally provides the project stakeholders with information about why the project was selected, a summary of the product, service, or result that will be delivered at the completion of the project, a summary-level explanation of major deliverables, and the project objectives that have been established.

The project objectives will be easier to validate upon completion if they are clear and measurable.
Defining the Levels of Objectives

**Business objectives**
- Value derived from project results
- Desired business change that has justified the project

**Project objectives**
- Deliverables
- Associated constraints (time and cost)

**Intra-project objectives**
- Interim deliverables
- Phase, activity, and/or task levels

**Participant’s Notes:**

Business objectives are the reasons for performing the project. For example, reducing cost, eliminating errors, etc. Because IT projects are often embedded in a higher order project (e.g., business process redesign or development of a new product or service for sale to customers), IT professionals need to address business issues.

Project (technical) objectives define the product or the physical outcome of the project, by a given date, for a given cost. The project objective is a means to the end of the business objective. This information is being asked for in the Project Request.

Phase, Activity, or Task objectives are the specific outcome of the performance of a task within the project. These objectives are associated with specific task deliverables. They contribute cumulatively to the project objectives.
### Brainstorming: Pitfalls and Best Practices for Project Charter Development

<table>
<thead>
<tr>
<th>No.</th>
<th>Pitfalls</th>
<th>Best Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td></td>
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</tbody>
</table>

**Participant’s Notes:**

Ask participants to brainstorm both the Pitfalls and Best Practices for the Project Charter. They may capture results on a flipchart in the traditional classroom and to the whiteboard in the virtual classroom.
### Brainstorming: Pitfalls and Best Practices for Project Charter Development Debrief

<table>
<thead>
<tr>
<th>No.</th>
<th>Pitfalls</th>
<th>Best Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Putting in details that have not been confirmed or agreed upon by the whole team. Often results in “solutioning” that needs to be changed or doesn’t meet the requirements.</td>
<td>Restrict charter to the objectives and the goals of the project and not the solution.</td>
</tr>
<tr>
<td>2</td>
<td>Putting in specific time or cost details that are premature resulting in excessive updating and sign-offs</td>
<td>Use milestone approach without excessive supporting detail until planning process is further advanced</td>
</tr>
<tr>
<td>3</td>
<td>Not including the full stakeholder group in the approval process resulting in refusals to provide signoff or protracted signoff discussions</td>
<td>Take full advantage of the Communications Planning and Stakeholder Analysis processes to validate who should be providing input and signoff</td>
</tr>
<tr>
<td>4</td>
<td>Poorly communicated background and business need resulting in project team members not understanding the “why” and inadvertently delivering incompatible solutions</td>
<td>Application of a disciplined approach to interviewing sponsor and other key stakeholders at project inception</td>
</tr>
</tbody>
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**Participant’s Notes:**

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How does this compare with what the class came up with?
Defining Scope

In the project context, the term scope can refer to:

**Product Scope**
- Features and functions
- Framework for requirements.

**Project Scope**
- Work necessary to features and functions
- Part of the scope baseline for the project

**Product Scope**
- The features and functions that characterize a product, service, or result.*
- High-level product scope sets the framework for subsequent requirements development activities.

**Project Scope**
- The work performed to deliver a product, service, or result with the specified features and functions.*
- High-level project scope becomes part of the scope baseline for the project


Participant’s Notes:

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These are some of the main documents that are used in the requirements development process. The first five documents are used to define project scope and thus begin the requirements development process.

**Statement of Work (SOW)** — A narrative description of products, services, or results to be delivered by the project.

Topic:

Progressively Elaborating Project Scope. Starting the WBS and Requirements Definition

Participant’s Notes:
Simple Elaboration

The More You Go, The More You Know

Business Objective → Project Objective
                      → Scope Statement
                      → WBS
                      → Requirements
                      → Work Activities
                      → Deliverables

Participant’s Notes:

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Support from a powerful or influential person who believes in the project and can help with the definition of requirements. Whenever the project has hit a barrier and needs an advocate to speak for it, the Project Champion can assist. A project champion is the company-person who grasps the benefits of and is enthusiastic about the project. The Project Champion can be one of the most critical elements of any project team. A Project Champion can also be called a Project Sponsor.

Sponsor – A person or group who provides resources and support for the project, program, or portfolio and is accountable for enabling success.

The requirements Overview Document brings in additional information about customers as we progress in the requirements definition process. We also define key milestone dates and high-level requirements. At this stage we also begin to collect issues and risks that relate to requirements.
Once all of the stakeholders are identified, they can be further segmented into proponents, neutrals, and resistors if necessary. Inputs to stakeholder identification could include organization charts, lists of stakeholders from previous projects, and job descriptions.

For high-concern, low-power stakeholders, we should attempt to bring them up. Stakeholders that have little influence but strong impact should be given greater influence if they are to be involved in the use of the “to be” product.

**Stakeholder** – An individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project.

**Stakeholder Analysis** – A technique of systematically gathering and analyzing quantitative and qualitative information to determine whose interests should be taken into account throughout the project.
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**Stakeholder Analysis** – A technique of systematically gathering and analyzing quantitative and qualitative information to determine whose interests should be taken into account throughout the project.

Topic:

Progressively Elaborating Project Scope. More Detailed Documents

Participant’s Notes:
The Scope Statement provides more descriptive information for the product or service being developed. The scope statement lists background information and describes the approach of the project. Additionally, resource requirements that are known are documented, along with risks.

Acceptance criteria, that will be the basis upon which the completed product will be measured, begins to take form. Early top-down estimates are developed for the project schedule and cost.
The previously developed documents provide the basis for this first section of the Scope Statement. The major elements of the project are documented along with the expected benefits. Items with a tie to the business objectives of the project outcome, but not in the scope, need to be clearly excluded.

The overall approach for the project is described in this section. Constrained milestones or other key events are identified, usually provided by the customer. Relationships with other projects are documented. The project team may also assess make/buy decisions. The team’s approach to status reporting is documented and preliminary assignments listed. Procedures for dealing with scope changes are also documented and agreed to by all key stakeholders.
Any resource requirements are documented in this section. Think critically here on all potential needs.

As part of the planning process, it is important to identify and assess the risks of the project. Those outcomes are documented here and are vitally important in the definition of requirements and help to prevent impacts to requirements.
Acceptance criteria is used to measure how well the requirements have been met. Spending additional time defining good acceptance criteria will help to pin down requirements, and result in more acceptable products or services for customers.

Early estimates of the project schedule and costs provide an early indication of the amount of work and funding required to complete the project. These are derived from comparing the project to similar projects, historical databases, or using expert judgment. These are preliminary estimates and may have a wide range of accuracy.
<table>
<thead>
<tr>
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<th>Best Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Focusing exclusively on what requirements are included in the proposal or not stating what is out of scope. Result is that people make assumptions often with predictable scope creep results.</td>
<td>Application of a scope statement template that includes what is in and out of scope</td>
</tr>
<tr>
<td>2</td>
<td>Missed requirements</td>
<td>Map scope, requirements, and WBS to confirm all requirements have been accounted for</td>
</tr>
<tr>
<td>3</td>
<td>Not obtaining stakeholder signoff on scope statement</td>
<td>Application of a Communications Plan upfront which will spell out what documents are being produced in the project and who will be signing off</td>
</tr>
<tr>
<td>4</td>
<td>Not including full project context – e.g. Goals, Objectives, Constraints</td>
<td>Application of a scope statement template that includes the full array of expectations for your organization</td>
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Participant’s Notes:

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EXERCISE
Managing Project Scope

Exercise 2.1: Project Scope & Objectives Statement

Instructions

Purpose: This exercise provides you with the opportunity to practice identifying and writing project objectives and a scope statement for the case study project or for one of your own projects. Be certain that you clearly differentiate business objectives from project objectives (deliverables, schedules, and budgets). Also, take the time and effort to ensure that the objectives are feasible, measurable, and relevant. Scope is driven from the objectives.

Inputs:
- Slides from lecture
- Provided case study background (on the next page)
- Course contents regarding defining objectives
- Course contents regarding scope statements
- Your own experience in defining project objectives at any level of detail

Tools/ Templates:
- Easel paper and markers (provided by instructor in classroom)
- Project Scope Statement

Directions:
- Select a project manager for your group.
- As a team (or entire class as directed by your instructor), select a project from the project list on the next two pages.
- Using data from your selected project description, develop/document the project Scope Statement including objectives (business needs and project). Use the seven “key words” to validate the Scope Statement and the SMART criteria for the project objectives

Suggested Time:
- 20 minutes to develop and document the project Scope/Objective Statement
- 5 minutes to review the project Scope Statement with the class

Deliverables: Documented project Scope Statement and SMART project objectives
Exercise 2.2 – Develop a Scope Statement

Responses to the 7 key words:

1. Who (or for whom)?: Sales and Customer Service Group
2. What?: A new Sales and Customer Service system
3. When?: 4 - 6 months
4. Where?: Local office
5. Why?: Improve sales and customer service efficiencies
6. How?: Internal IT group, hardware and software vendors, and/or providers of software products
7. How many?: 1 system

Participant’s Notes:

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Managing Project Scope

CASE STUDY

**Project Name: EDI Project Implementation**

*The project will be utilized by your team in exercises for the duration of the course.*

**Background:**

EDI (Electronic Data Interchange) is a set of standards that enable computer-to-computer exchange of information for highly automated processes. It enables the electronic exchange of documents in bulk between multiple parties, whether they are inter or intra-organizational. The information is exchanged in a standard format that all of the parties in the loop follow. To be effective, EDI should also comply with the guidelines set by various national and international agencies.

In the US, the standard set by the American National Standards Institute (ANSI), Accredited Standards Committee (ASC) X12 is largely followed. Today, EDI is used in the majority of all business-to-business e-commerce transactions, regardless of industry, to replace conventional paper-based methods of documentation exchange.

The Steering Committee has decided to link all card vendors (Home Depot, etc.) with an EDI system to enable more timely and accurate transfer of cardholder data. The perceived benefits are:

1. **Competitive differentiation**

EDI improves speed and accuracy of the entire order-to-payment lifecycle. It aids better management of claims, invoice generation, and processing. This not only results in a better cash flow, but also ensures customer satisfaction, which can translate into a higher rate of customer retention.

2. **Economic and operational benefits**

EDI requires minimal human interaction and intervention to handle data. In fact, 48 percent of the companies surveyed that have implemented EDI report a corresponding reduction in business costs.

3. **Value for both supplier and buyer to reduce order-to-payment lifecycle and improve assortment optimization**

Over time, the value proposition has changed from being primarily hub-focused to also supporting improvements for the spoke or supplier. The initial return lay in improving payment cycles and accuracy in managing the order-to-cash lifecycle. The value continues to change over time with the automation of order-to-fulfillment and the extended support for forecasting, warranty, claims, and other non-supply chain activities support by standards-based data exchange.

The project has been approved and your team has been assigned to implement the appropriate solution as soon as possible.
Exercise 2.2: Develop Scope Statement Debrief

Scope Statement:
The Sales and Customer Service Project will improve the work group's efficiencies and reduce costs, by delivering a new system with one access control point that supports direct inquiry via the Internet and touch-tone telephone; and delivering new procedures, training, documentation and support services. The new system will be client-server based with interfaces to existing systems, and a commercial-off-the-shelf (COTS) application. The solution will be managed and developed by the internal IT group, and deployed in 6 months.

Participant’s Notes:

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Exercise 2.2: Develop Scope Statement
Reflection Questions

- What is the relationship of the scope statement and the project objectives?
- What other items are included in the scope statement?
- How does the SMART technique and the “seven key word” concept support the development of the scope statement?
- What level of detail should be in the scope statement?

Participant’s Notes:

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What is a Work Breakdown Structure (WBS)?

A hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.

The WBS can be displayed as an:
- Organizational style chart
- Tabular, indented chart

Each descending level of the WBS represents an increasingly detailed definition of the project work.

The WBS structure must be related to the objectives of the project. It is derived from the project objectives, and is used as a framework for defining project activities and tasks. It ensures that the total scope of work is defined. It defines tasks and relates them to only one specific work effort so activities are not omitted or duplicated.

Work that is outside of the WBS is outside of the scope of the project. Often, the WBS is used to develop or confirm an understanding of the project scope.

- Top-down view of how project activities fit into the overall project structure
- Each descending level increases in detailed description of project deliverables
- Lowest deliverable level often referred to as work package
- Work packages may be subdivided into activities, which can be further subdivided into tasks
Decomposition – WBS Development

- Identify the work that must be performed
  - A series of tasks are defined that together will accomplish the development of or changes to a system, system environment, and operational environment
- Describe each work component
  - The tasks need to be defined in the most effective and efficient way to achieve the business or regulatory objectives and to comply with Technology standards.

SMART objectives will help to ensure you can develop the appropriate SOW and task/requirements.

Full Development Projects – These projects provide new or enhanced system functionality, which supports the business processes.

Vendor Development Projects – Any new or enhancement projects where a vendor/third-party company is involved in providing the solution.

Minor Development Projects – These projects are trivial improvements to existing applications for which the business requirements are clearly defined in the business case or documentation without additional analysis and that do not exceed 80 man-days of CMB Technology effort.

Work Order Projects – Improvements to existing applications for which the Business requirements are clearly defined in the business case and that do not exceed 5 man-days of CMB Technology effort.

Agile Projects – A new software development methodology based on the Iterative life-cycle approach. This methodology is currently in a Pilot mode and is not available to the entire organization as a process standard; hence projects approved by the Methodology Team can only follow the CMB Technology Agility Process Standard for Project development effort.

Support Project Types:
The following are the various other work types that are called “Projects”, but are not considered to be development projects and more of a support work nature:

Development Support Projects (DS)
Production Support Projects (PS)
Program Management Projects (PgM)
Business Consultancy Projects (BC)
Once the project requirements have been defined, tasks to deliver the requirements need to be analyzed through a process called decomposition. The result of this process is called a Work Breakdown Structure (WBS).

Potential structural models:

- Phases
- Deliverables
- Product features
- Cautions
- Avoid breakdown by disciplines (e.g., sales, trading, marketing, training, etc.)
- Don’t worry about sequencing (yet)
- Make sure every WBS element has one or more deliverables
The high-level deliverables listed in the WBS are defined as part of the Scope Statement. Each of those high-level deliverables is then broken down into more detail to continue to elaborate the requirements of the project.
The construction of a new office building delivers a tangible product by using several elements. The product elements start with the Level 2 construction and flow down to the Level 4 tasks with concrete shown as an example.

The Level 2 tasks for design, procurement, and commissioning are integrating tasks; all of the elements of the construction task require input from these to be complete. Project management is shown as a separate element and has input into all of the other elements.
Lowest level of the WBS

- WBS component name and number
- Deliverables and acceptance criteria
- Dependencies
- Resource requirements
- Responsible organizations
- Estimated effort, duration, and cost
- Task numbering scheme reflects hierarchy in WBS

As the work is defined to lower levels of detail, we arrive at tasks. This unit of requirement is usually determined by the ability to assign it to one individual or a small group of individuals – usually from 40-80 hours of work.

**Work Package** – The work defined at the lowest level of the work breakdown structure for which cost and duration can be estimated and managed.

**WBS Dictionary** – document that provides detailed deliverable, activity, and scheduling information about each component in the work breakdown structure.

**Task Activity Description**

**Provides more specific information for each defined unit of work, including:**

- Task leader information
- Task functional manager information
  - WBS component name and number
  - Description
  - Deliverables
  - Assumptions
  - Dependencies
  - Resource requirements
  - Responsibility assignments

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**Participant’s Notes:**

The **Task Activity Description** provides more specific information in regard to unit of work. It facilitates the assignment of work, once the project begins. It should also provide the details of the work to be performed. This document provides the lowest level of requirement.

**Activity** – A distinct, scheduled portion of work performed during the course of a project.

Exercise 2.2: Work Breakdown Structure

| Purpose: | This exercise provides the participant the opportunity to collaboratively develop a Work Breakdown Structure and to practice use of the tool/technique. |
| Inputs: | Slides from lecture |
| Tools/ Templates: | Easel paper, Post-it® notes, and markers (provided by instructor) | WBS Document in appendices |
| Directions: | Select a project manager for your group. | Continue with the project from the case study. Using data from your selected project description develop/document the Work Breakdown Structure. Use Post-it® notes to document the activities in WBS format on easel paper. | Feel free to create additional criteria/definitions that are missing and may be required to make your WBS more complete. |
| Suggested Time: | 20 minutes to develop and document the WBS | 5 minutes to review the WBS with the class |
| Deliverables: | Documented Work Breakdown Structure |
| Debrief (5 minutes) | The exercise debrief will be led by the course leader and conducted within the large group. Each team will review their Work Breakdown Structure for comments/questions from the large group. |
| Key Insights: | This exercise provides participants with practical experience and support from team members in developing a Work Breakdown Structure. |
Exercise 2.3: Building a WBS Worksheet

Participant’s Notes:

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Exercise 2.2: Work Breakdown Structure
Reflection Questions

• Why is decomposition of the scope statement required?

• Why is a specific format required for the WBS? Why not just a listing of deliverables and work packages?

• WBS is an input for activity definition in time management and cost management. Why?

Participant’s Notes:

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The project management plan includes the requirements baseline.

- Which defines the agreed-on product scope

Changes to the requirements baseline are addressed as part of the change control process.

- Governing how the project team and other stakeholders will manage changes to requirements and scope

In effect, the project management plan provides the direct and defined link between product and project scope.

Participant’s Notes:

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With four high-level documents:

- Project work request
- Requirements overview
- Project proposal
- Project charter

Let’s look at the content and intent of each document in greater detail...

In a large complex project, it may be necessary to prepare all of the above documents. However, it is up to the project manager to decide whether to merge documents to minimize unnecessary effort, and to ensure that documentation is sufficient to avoid rework later in the project.

The contents of earlier documents should be carried forward to subsequent documents and updated as needed. There is no need to keep earlier documents up to date if subsequent documents carry updated information in a form that enables executives and others to get a high-level view of the project and product scope.
Progressive Requirements Development
(2 of 2)

With four additional documents:
- Scope statement
- Work Breakdown Structure
- Requirements definition document
- Procurement statement of work

Participant’s Notes:

Let’s look at the content and intent of each document in greater detail...
This document gets to the process of defining the specifics of the product or service that is being provided by the project.

It provides the context in which the end product will be developed or provided. It identifies how the outcome of the project will be validated and also looks at assessing the stakeholders. Another area covered is how change issues will be handled.

Specific product requirements are specified, including any technical issues that may need to be addressed.

**Requirement** – A condition or capability that is required to be present in a product, services, or result to satisfy a contract or other formally imposed specification.

**Requirements Documentation** – a description of how individual requirements meet the business need for the project.

### Introduction
- Project/product name and objectives
- Document purpose
- Document scope
- Contents
- Document structure
- Intended audience

### Context
- Source and approach
- Validation approach
- Stakeholder analysis
- Impact and change management
- Referenced documents

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**Participant’s Notes:**

The introduction section is built from many of the previous documents and provides an outline of the remainder of the document. It also identifies the intended audience.
<table>
<thead>
<tr>
<th><strong>Product requirements</strong></th>
<th><strong>Appendices</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Functions and subcomponents</td>
<td>• Detailed drawings, formula, and tables</td>
</tr>
<tr>
<td>• Features</td>
<td>• Updated business case</td>
</tr>
<tr>
<td>• Behaviors</td>
<td>• Glossary/dictionary</td>
</tr>
<tr>
<td>• Constraints</td>
<td>• Index</td>
</tr>
</tbody>
</table>

**Examples:**
1. Business Requirements Document (BRD)
2. Functional Requirement Document (FRD)

Specific product features are listed in this section. This includes any functionality that might be needed for the product or service. Also included here are the technical requirements that have been determined.

At the end of this document, include any other specific models, drawings, tables, business case, or glossary that may further explain requirements.

**Participant’s Notes:**

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### Requirements Definition Document

<table>
<thead>
<tr>
<th>No.</th>
<th>Pitfalls</th>
<th>Best Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not updating project requirement and scope documentation as refinements are agreed upon</td>
<td>Incorporate this item within Communications Plan and Responsibility Assignment Matrix (RAM) documentation</td>
</tr>
<tr>
<td>2</td>
<td>Not including and obtaining approvals from all stakeholders</td>
<td>Periodically connect back to the Stakeholder Analysis document to ensure all stakeholders are included. Work through formal Integrated Change Control Process</td>
</tr>
<tr>
<td>3</td>
<td>Ineffective translation of business need statements into technical requirements</td>
<td>Inclusion of individual where require who have proven business analysis skills</td>
</tr>
<tr>
<td>4</td>
<td>Failure to periodically validate requirements when the project spans a long period of time resulting in the users changing or upgrading their processes before the solution is delivered</td>
<td>Cultivate the user as a integral part of the stakeholder team to foster an environment where changes/directions are communicated regularly</td>
</tr>
</tbody>
</table>

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**Participant’s Notes:**

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Exercise 2.3: Requirements Definition Document

Purpose: This exercise provides the participant the opportunity to develop a Requirements Definition Document.

Inputs:
- WBS
- Scope Statement
- Course Materia

Tools/ Templates:
- Easel paper and markers (provided by instructor)
- Requirements Definition Document

Directions:
- Select a project manager for your group.
- Develop Requirements Definition Document.

Suggested Time:
- 20 minutes to develop Requirements Definition Document
- 5 minutes to review the list with class

Deliverables: Requirements Definition Document

Debrief (5 minutes)
- The exercise debrief will be led by the course leader and conducted within the larger group.

Key Insights:
- This exercise provides the participants with the practical experience of defining requirements.
Requirements Definition Document

<table>
<thead>
<tr>
<th>Project Name/Number:</th>
<th>Prepared by:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer/End User Group:</td>
<td>Contact Name:</td>
<td>Project Type (S/M/L):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Unit:</td>
<td>Project Manager:</td>
<td>Project Sponsor:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Requirements Definition Outline

The following outline represents a document that may consist of a number of electronic components, including prototypes and models, which describe the requirements and/or specifications for a project’s product or any component of the product, which may be procured externally.

1.0 Introduction
   1.1 Project/product name and objectives
   1.2 Document Purpose
   1.3 Document Scope
   1.4 Contents
   1.5 Document Structure
   1.6 Intended Audience

2.0 Context
   2.1 Source and Approach
   2.2 Validation Approach
   2.3 Stakeholder Analysis
   2.4 Impact and Change Management
   2.5 Referenced Documents

3.0 Product Requirements
   3.1 Functions/Subcomponents
   3.2 Features
   3.3 Behaviors
   3.4 Technical Requirements

4.0 Appendices
   4.1 Detailed Drawings, Formulae, and Tables
   4.2 Updated Business Case
   4.3 Glossary/Dictionary
   4.4 Index
Exercise 2.4: Developing a Requirements Definition Template (2 of 2)

3. Product Requirements
   1. Functions/Subcomponents
   2. Features
   3. Behaviors
   4. Technical Requirements

4. Appendices
   1. Detailed Drawings, Formulae, and Tables
   2. Updated Business Case
   4. Index

Participant’s Notes: 

Follow your instructor’s directions as you complete this exercise. This exercise may be completed in teams or as a group activity.
Exercise 2.4: Requirements Definition Document Reflection Questions

- The WBS is an input for activity definition for requirements definition. Why?

- What happens to the quality of the requirements if the project objective is not SMART?
Topic

Progressively Elaborating Project Scope. Contracts and Plans
**Procurement Statement of Work (SOW)**

Provides details concerning any contractual needs of the project and how they will be handled

- Introduction
- Objectives
- Deliverables
- Acceptance criteria
- Service-level agreement
- Deliverables schedule/milestones
- Cost expectations
- Communication requirements/reporting
- Standards and regulations

The Procurement SOW is intended to provide details concerning any contractual needs of the project and how they will be handled. This should provide specific information to the potential vendors as to what requirements need to be met to support the project.

**Procurement Statement of Work** – Describes the procurement item in sufficient detail to allow prospective sellers to determine if they are capable of providing the products, services, or results.


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**Participant’s Notes:**
Self Reflection: Learning Journal and Lessons Learned

- Retrieve your learning journal.
- What questions do you have that need answered? Write them down.
- Which ideas and concepts from the module were most valuable for you?
- How can these ideas and concepts be implemented in your organization?
- Journal your thoughts.

Participant’s Notes:

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