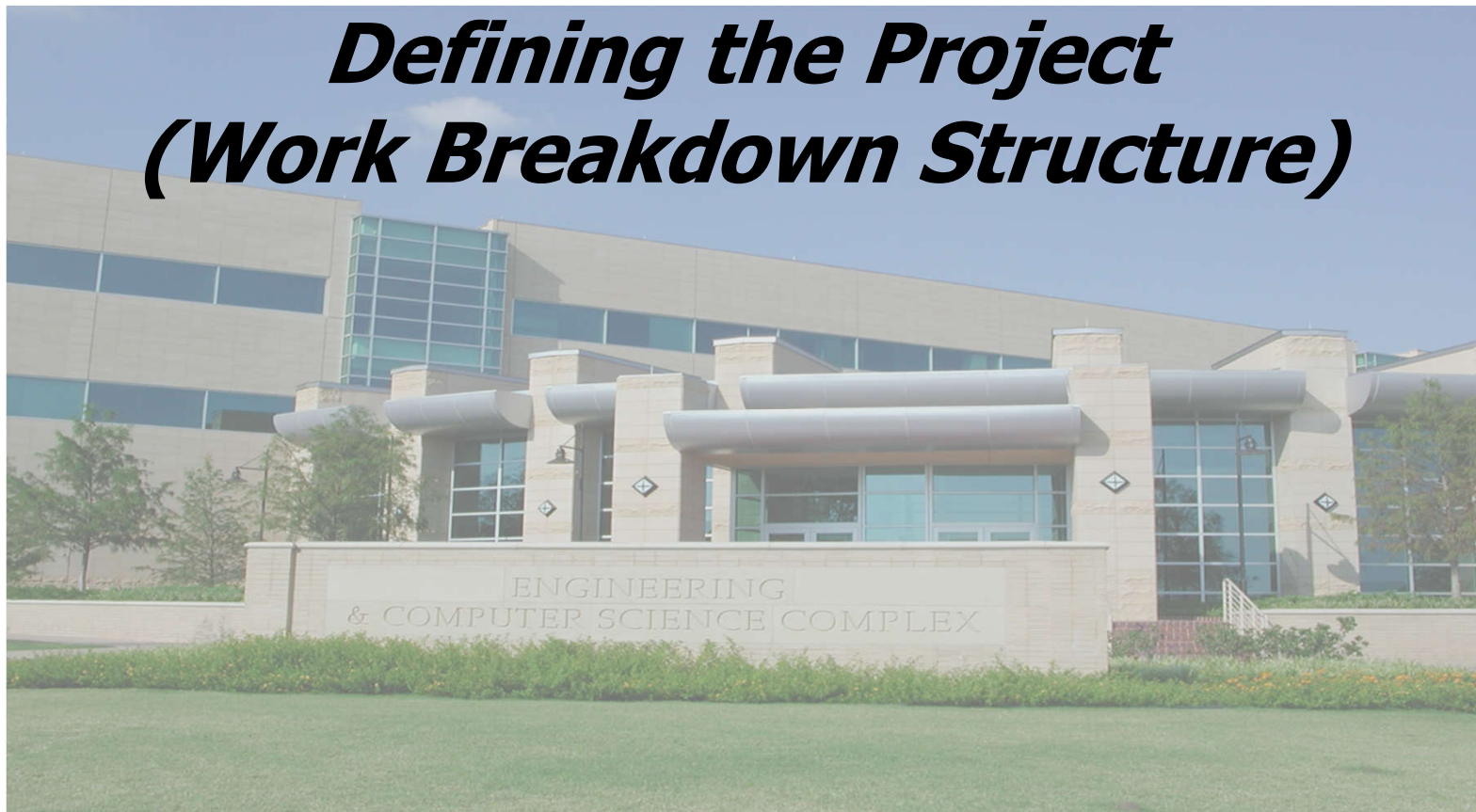


Defining the Project (Work Breakdown Structure)



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SE 4381, Software Project Planning and Management

Management Topics

1. Modern project management

PMBOK

2. Organization strategy and project selection

3. Organization: structure and culture

 **4. Defining the project**

5. Estimating times and costs

6. Developing a project plan

7. Managing risk

8. Scheduling resources and cost

9. Reducing project duration

10. Leadership

11. Teams

12. Outsourcing

13. Monitoring progress

14. Project closure

15. International projects

16. Oversight

17. Agile PM

Critical chain project management

Project Scope Management (PMBOK)

Includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully.

- **plan scope management**
- **collect requirements**
- **define scope**
- **create WBS**
- **validate scope**
- **control scope**

Project Scope

A definition of the end result or mission of your project

Primary purpose – define as clearly as possible the deliverable(s) for the end user and focus project plans

A poorly defined scope or mission is the most frequently mentioned barrier to project success

- approximately 50% of planning problems relate to unclear definition of scope and goals (Gobeli and Larson)
- what is the relationship to requirements volatility?

Project Scope Checklist

Project objective

- describe the customer's needs / problem and how the system meets those needs
- describe the project's objective in less than a paragraph

Deliverables

- major deliverables – the expected project outputs
- for example, describe the form / how the system is to be delivered.

Milestones

- significant events in a project that occur at a point in time
- important deliveries from both the process (artifacts) and the system's development (implemented features)
- needed to track team's progress throughout the lifecycle

Technical requirements

- functional requirements – what the product will do
- non-functional requirements – define needed performance, delivery platform, etc.

Limits and exclusions

- what the project will not deliver
- needed to manage customer expectations
- prevent scope (requirements) creep
- avoid expending resources on the wrong problem

Internal and external customer review

- is the customer getting what they desire from the system?
- does the project definition identify deliveries, budgets, timing, and non-functional requirements?
- are questions of limits and exclusions covered?

Project Charter

Scope statement

- **aka statement of work (SOW)**
- **aka project charter**

Special meaning of “project charter”

- **a document that authorizes the project manager to initiate and lead the project**
- **often includes a brief project description, risk limits, customer needs, spending limits, sometimes team composition**

Basis for avoiding scope creep → added costs and project delays

Priority Matrix

Which project criteria are constrained?

- features or requirements that are fixed, i.e., must be provided or met

Which project criteria can be enhanced / optimized if opportunity arises?

- add features / value, reduce costs, shorten schedule, ...
- added value means to take on additional work if schedule permits, e.g., add operational reports to the delivery

Which project criteria can be sacrificed?

- things to be sacrificed in a trade-off against other criteria
- features that can be dropped to meet a proposed schedule

There are likely to be natural limits to the extent managers can constrain, optimize, or accept any one criterion.

Project Priority Matrix For a Cable Modem Product

	Time	Performance	Cost
Constrain		✓	
Enhance	✓		
Accept			✓

What are the priorities and constraints?

- The customer is willing to increase costs if the product can be delivered earlier.
- The modem's performance specification cannot be reduced.

Defined before the project begins.

Work Breakdown Structure (WBS)

An enumeration of all work activities in hierarchy

- may be task- or product-oriented; likely hybrid

Organizes work short, manageable tasks

- typically 8-80 person-hours of effort (1-10 days)

Used to assign responsibility for tasks

Each item in the WBS needs a time and cost estimate

- for software projects, effort and cost are largely the same

R.C. Tausworthe, "The Work Breakdown Structure in Software Project Management," Journal of Systems and Software, 1980.

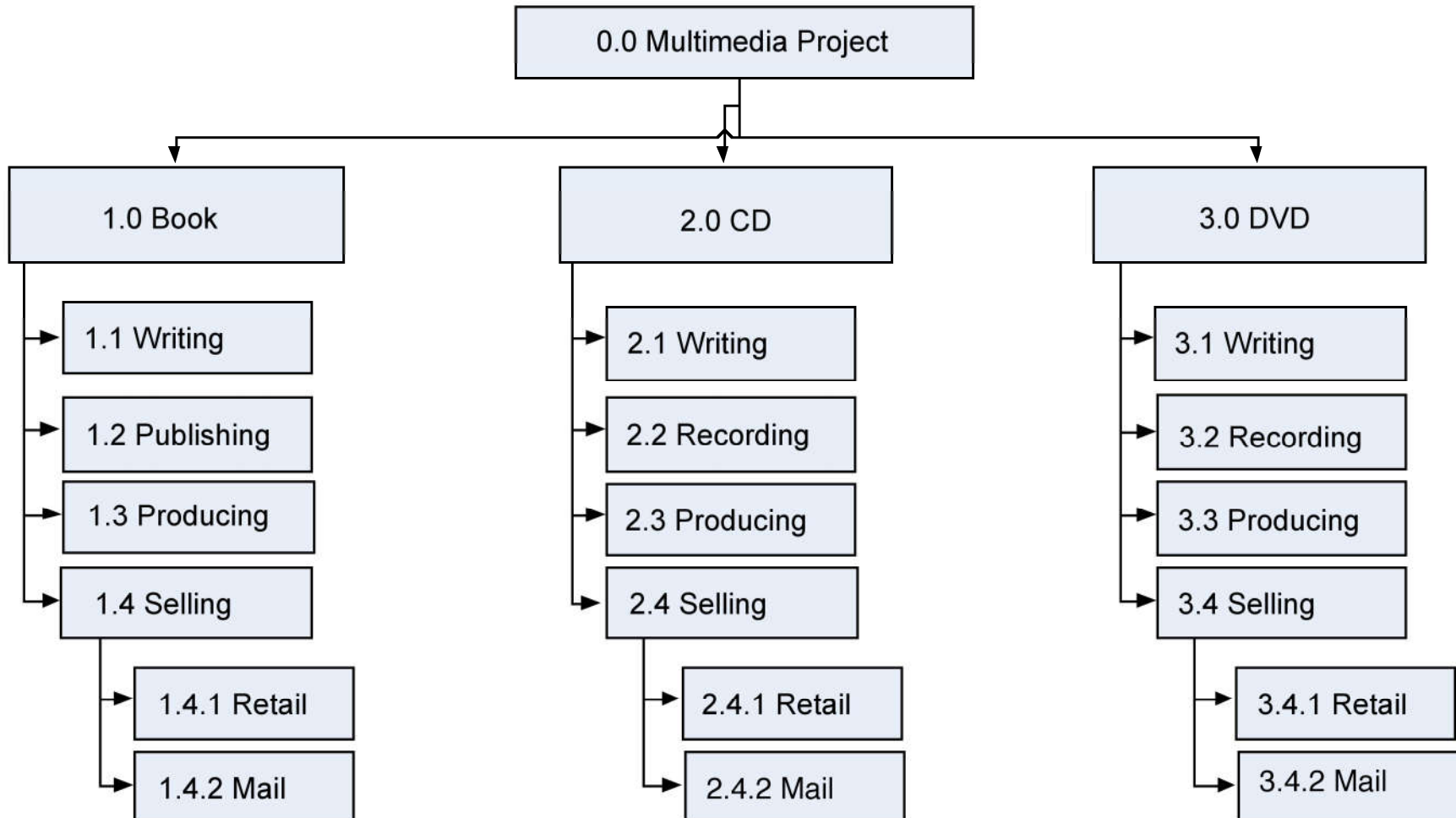
WBS Examples

herdingcats.typepad.com

- 1 WBS for Software Implementation Project
 - 1.1 Project Management
 - 1.2 Product Requirements
 - 1.2.1 Software Requirements
 - 1.2.1.1 Draft Software Requirements
 - 1.2.1.2 Final Software Requirements
 - 1.2.1.3 Software Requirements Approval
 - 1.2.2 User Documentation
 - 1.2.2.1 Draft User Documentation
 - 1.2.2.2 Final User Documentation
 - 1.2.2.3 User Documentation Approval
 - 1.2.3 Training Program Materials
 - 1.2.3.1 Initial Training Requirements
 - 1.2.3.2 Initial Training Materials
 - 1.2.3.3 Trial Course Delivery
 - 1.2.4 Hardware
 - 1.2.4.1 Draft Hardware Requirements
 - 1.2.4.2 Final Hardware Requirements
 - 1.2.4.3 Hardware Requirements Approval
 - 1.2.5 Implementation & Future Support
 - 1.3 Detail Software Design
 - 1.3.1 Initial Software Design
 - 1.3.2 Final Software Design
 - 1.3.3 Software Design Approval
 - 1.4 System Construction
 - 1.4.1 Configured Software
 - 1.4.2 Customized User Documentation
 - 1.4.3 Customized Training Program Materials
 - 1.4.4 Installed Hardware
 - 1.4.5 Implementation & Future Support

WBS Examples

cnx.org



WBS Examples

docstoc.com

Annexure C Work Breakdown Structure – Construction Activities EXAMPLE ONLY

WORK BREAKDOWN STRUCTURE – CONSTRUCTION ACTIVITIES					
Level 1		Level 2		Level 3	
1001	SITE ESTABLISHMENT	1100	CONTRACTOR'S SITE FACILITIES AND CAMP	1101	Contractor's site facilities
				1102	Contractor's camp
1002	PROVISION FOR TRAFFIC	1200	TRAFFIC MANAGEMENT	1201	Provision for traffic
				1202	Preparation of Traffic Management Plan
				1211	Construction of side track
				1221	Supply of Portable Concrete Barrier, 1050 mm high
				1222	Supply of Portable Concrete Barrier, 500 mm high
				1223	Installation of Portable Concrete Barrier, 1050 mm high
				1224	Installation of Portable Concrete Barrier, 500 mm high
				1225	Supply of temporary barrier end treatments
				1226	Installation of temporary barrier end treatments
				1227	Supply of anti-gawking screens, if ordered (Provisional Quantity)
				1228	Installation of anti-gawking screens, if ordered (Provisional Quantity)
				1231	Supply and installation of temporary road lighting including connection to Electricity Supply Authority's network, if ordered (Provisional Quantity)
1003	ENVIRONMENTAL MANAGEMENT	1301	MANAGEMENT PLAN (S)	1311	Preparation of the Environmental Management Plan (Construction)
				1312	Implementation and monitoring of the Environmental Management Plan (Construction)
				1313	Erosion and sediment control management plan

Work Packages

Work package – bottom-level of WBS

- assignable unit of work
- 8-80 hours of effort per work package (within reporting period)

Short duration tasks

Definite start and stop point

Consume resources and represent cost

- resources are typically personnel
- cost is typically salary, overhead, benefits

Should be as independent of other work packages as possible

Tasks (aka Work Packages)

A cohesive unit of work on a project

- not too big or too small to be tracked
- progress is binary – done or not done

Used to communicate the work that needs to be done

Put the work of the project in the most logical sequence for completion

- see activity network
- ensures that all work sequences are identified and understood

Can be used to determine needed skills and quantify the number of people needed to do the work

Rolling Time Horizon

Aka rolling plans and forecasts

Ineffective to plan in detail long periods in advance

Plan in detail for the near term

- 2-3 months, one or two increments

Plan in medium detail, further out in time

- enough detail to estimate and make commitments with reasonable confidence

Recognizing that things change, plan roughly for the long term

- planning in detail for three years from now is wasted effort since things change

OBS

The organization breakdown structure (OBS) assigns the lowest organizational unit the responsibility for work packages within a cost account

WBS Codes

Codes define levels and elements in the WBS

- organization elements
- work packages
- budget and cost information

Most common is numeric indention

- 1.2.3.4

Coding system can be used to identify

- work package numbers
- site locations
- special accounts
- materials
- engineers
- ...

Responsibility Matrix

AKA linear responsibility chart (LRC)

Summarize the tasks to be performed

Identify who is responsible for what

- **Responsible**
- **Supports / assists**
- **Consult**
- **Notification**
- **Approval**

Responsibility Matrix Example

Task	Adam Z.	Betty Y.	Charles X.
Task 1	R		S
Task 2		R	
Task 3			R

Project Communications Management (PMBOK)

Includes the processes that are required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and the ultimate disposition of project information.

- **plan communications management**
- **manage communications**
- **control communications**

Project Communication Plan

Purpose: express what, who, how, and when information will be transmitted to project stakeholders so schedules, issues, and action items can be tracked

- **What information needs to be collected and when?**
- **Who will receive the information?**
- **What methods will be used to gather and store the information?**
- **What are the limits, if any, on who has access to certain kinds of information?**
- **When will the information be communicated?**
- **How will it be communicated?**

Developing a Communication Plan

Stakeholder analysis

- identify the target groups

Information needs

- what information is pertinent to the stakeholders?

Sources of information

- who will produce information?
- how will information be collected (and aggregated)?
- where is the information stored?

Dissemination modes

- face to face, email, teleconferencing, archival
hardcopy (agenda, minutes)

Responsibility and timing

Project Stakeholder Management

(PMBOK)

Includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution.

- identify stakeholders**
- plan stakeholder management**
- manage stakeholder engagement**
- control stakeholder engagement**

Project Communication Plan Template

What information?	Target audience	When?	Method of communication	Provider
Milestone report	Senior management, Project manager	Monthly	Email, hardcopy	Project office
Project status reports	Staff, Customer	Weekly	Email, hardcopy	Project manager
Team status reports	Project manager, Project office	Weekly	Email	Team recorder
...				

Questions and Answers

