System Analysis and Design

Project

Department of Computer Engineering
Sharif University of Technology
Maryam Ramezani
maryam.ramezani@sharif.edu

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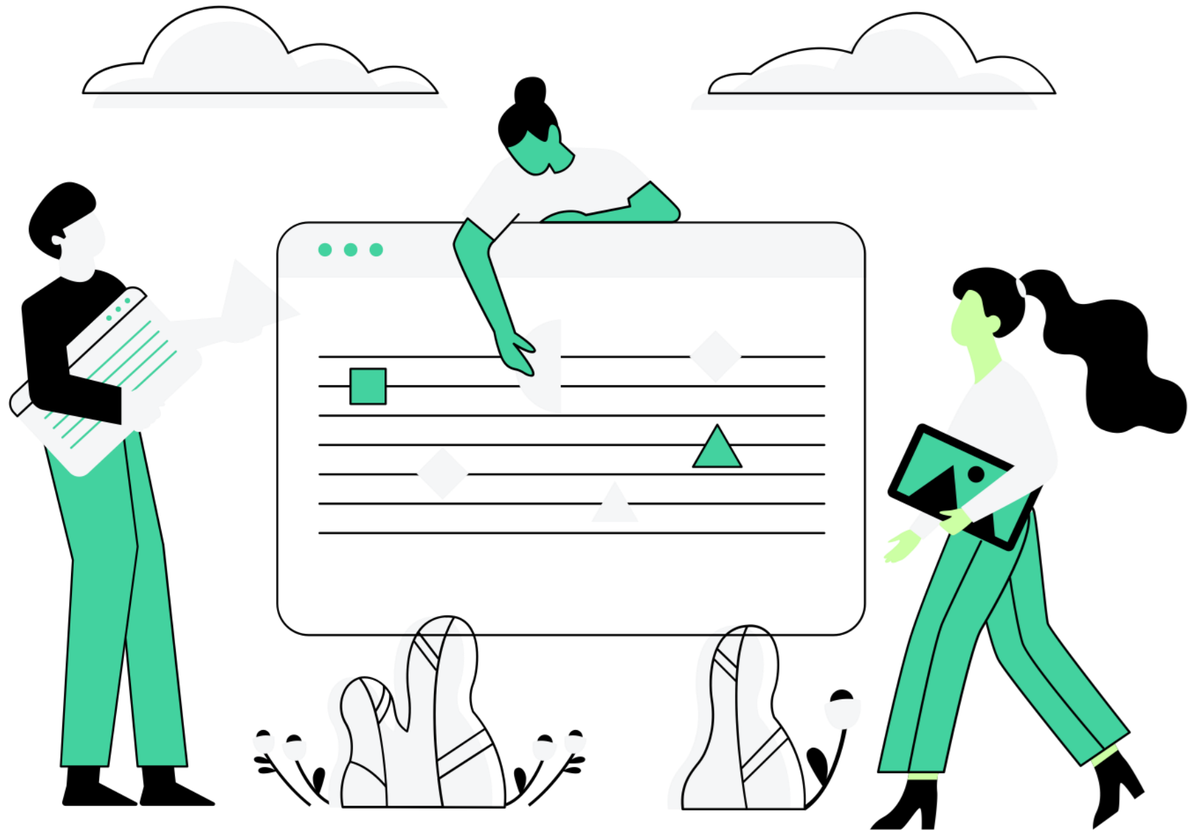

01 Concepts (RFx)

Request For Proposal (RFP)

- A formal, questionnaire-style document issued to prospective vendors from an organization that intends to buy a product or service. The RFP provides background information to potential vendors, asks key questions and invites them to submit a proposal to meet the need.
- A document issued by a business or an organization to request vendor bids for products, solutions and services.
- Rather than asking each sales representative various questions through email or over the phone, the RFP asks vendors the same questions at the same time. Then, vendors respond in a standardized format, called a proposal, making it easy for buyers to compare features, benefits, experience and value.
- A proposal is the response to an RFP. It answers questions in the RFP and formalizes a seller's bid. Naturally, the vendor writes the proposal hoping to persuade the RFP issuer to buy a product or service. Accordingly, the proposal should detail how the vendor meets the needs of the buyer.

Request For Proposal (RFP)

- Use an RFP when:
  - You're certain you want to make a purchase.
  - You have specific questions you want to address
  - You have a good idea what you want, but you need more details.
- Tip: Remember, issuing an RFP is a formal process and it requires a great deal of effort for vendors to create their proposals in response. You should know what you're trying to solve and be close to making a purchase but still open to suggestions from potential vendors.

Request For Information (RFI)

- A document that solicits general information about the solutions and/or services vendors provide. Organizations generally issue an RFI prior to the RFP process.
- The RFI is usually used in the early stages of procurement when the organization needs to understand what options are available in the market or clarify technical capabilities.
- **Use an RFI when:**
  - You're seeking general information
  - You only have broad questions
  - You're not sure what you're look for
- **Tip:** The RFI process is much less formal than issuing an RFP. If you have a challenge you want to overcome or a goal you want to achieve, but you're not 100 percent sure you're going to make a purchase, this is a much better option. It helps you quickly get the information you're looking for without asking for a major commitment from potential vendors.

Request For Quotation (RFQ)

- A document that solicits pricing and payment information. Organizations often use this type of request when they know what type of solution they want and are only evaluating vendors based on price.
- Use an RFQ when:
  - You know exactly what you want
  - All available solutions are extremely similar
  - You only want to compare vendors based on price
- Tip: Because RFQs focus solely on pricing and payment terms, you only want to use this option when you don't need additional information. If you're open to suggestions on how to achieve your goals or overcome your challenges, you're better off issuing an RFI or RFP.

Practice

بسمه تعالی

دانشگاه صنعتی شریف

آگهی فراخوان عمومی

دانشگاه صنعتی شریف در نظر دارد برای امکان‌سنجی در خصوص نحوه تدارک و خرید برخی تجهیزات آزمایشگاه‌های پژوهشی و آموزشی (ساخت داخل و خارج) با شرکت‌های دارای تجربه و سابقه مفید در جلسه‌ای عمومی هم اندیشی نماید. خرید مورد نظر از محل اعتبارتسهیلات تامین مالی (دارای مصوبه از شورای اقتصاد مقاومتی) بوده و انتظار می‌رود که پس از نهایی شدن تسهیلات، بخش عمده اقلام مورد نظر در قالب تعداد معدودی قرارداد از طریق مناقصه خریداری شود.

بدینوسیله از شرکت‌هایی که دارای تجربه و سابقه مفید در تأمین تجهیزات آموزشی و پژوهشی برای دانشگاه‌های کشور، و ارائه خدمات مؤثر بعد از فروش و تأمین قطعات و لوازم مصرفی مربوط به تجهیزات بوده دعوت می‌شود حداکثر تا تاریخ ۲۵ آبان ۱۳۹۹ تمایل خود جهت شرکت در جلسه را به دفتر روابط عمومی دانشگاه از طریق پست الکترونیک (آدرس prm@sharif.ir) ، یا دورنگار (۶۶۱۶۴۰۵۱) اطلاع دهند.

ریز اقلام مورد نظر و سایر اطلاعات در جلسه هم اندیشی اطلاع رسانی خواهد شد.

محل برگزاری جلسه با رعایت شرایط بهداشتی، فاصله گذاری فیزیکی، و تهویه مناسب هوا خواهد بود.

جلسه از ساعت ۱۰ صبح تا ۱۲ روز سه‌شنبه ۲۷ آبان ۱۳۹۹، در سالن تالارها در دانشگاه صنعتی شریف برگزار خواهد شد.

علاقمندان لازم است از درب اصلی دانشگاه واقع در خیابان آزادی به محوطه دانشگاه وارد شوند و از آنجا به محل سالن راهنمایی خواهند شد.

روابط عمومی دانشگاه صنعتی شریف

تلفن ٦٦٠١٣١٢٦ - ٦٦١٦٤٠٥١ - ٠٢١

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02 Project Definition

Project Definition

- A project is a well-planned and controlled endeavor that follows a defined set of goals, constraints, and time frames to produce a desired result.

  - It usually has a defined scope, budget, and resources.
  - A project has a start date and an end date.
  - It is not an ongoing operation but has a fixed duration.
  - There are many defining aspects to projects in project management.
  - These are defined by the output they produce which can be a product, a service, or a particular outcome.

- Project Manager: the person responsible for supervising a systems project from initiation to conclusion

Defination

- Project management: the process of scoping, planning, staffing, organizing, directing, and controlling the development of an acceptable system at a minimum cost within a specified time frame.
- Process management: the activity of documenting, managing, and continually improving the process of systems development.

Characteristics of a Project

- **Clear Goals**: Projects are one of a kind of projects with clear, quantifiable goals to meet within a defined time frame in line with an organization's strategic priorities.
- **Scope Definition**: The scope defines the scope of the project, defines the scope of work, and defines what is not included in the scope of work.
- **Temporary Nature**: Unlike ongoing operational tasks, projects have a clear beginning and end indicating their temporary nature.
- **Cross-Functional Collaboration**: Projects require cross-functional collaboration and communication between stakeholders for success.
- **Effective Project Management**: Projects need to be managed effectively in terms of money, time, people, technology, and resources within defined parameters.

Characteristics of a Project

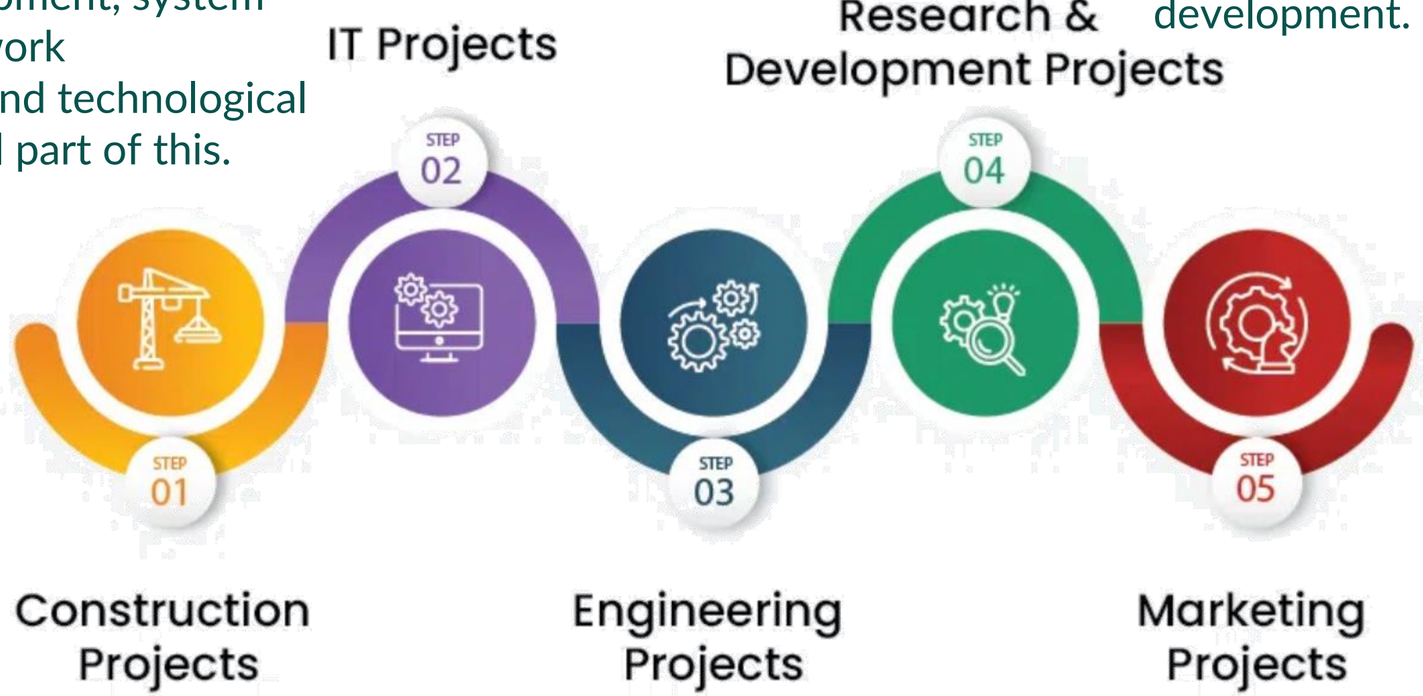
Example

- **Clear Goals**: Building a new bridge to connect two cities. The clear, measurable goal of this project is to complete the bridge in two years with a capacity to support 5,000 vehicles per day.
- **Scope Definition**: In a software development project, the scope may include building a mobile app with specific features like login, user profiles, and online payment. Tasks such as supporting multiple languages might be defined as outside the project's scope.
- **Temporary Nature**: Organizing an annual trade show. The project starts with planning and ends after the event, clearly indicating its temporary nature.
- **Cross-Functional Collaboration**: Developing a new car model, which requires collaboration between design, engineering, marketing, and production teams to successfully bring the product to market.
- **Effective Project Management**: Constructing a commercial building where effective project management includes controlling costs, scheduling activities, and coordinating between different contractors to ensure the project is completed on time and within budget.

Types of Projects

Software development, system integration, network enhancements, and technological innovation are all part of this.

Projects focused on innovation, discovery, and product, and service development.

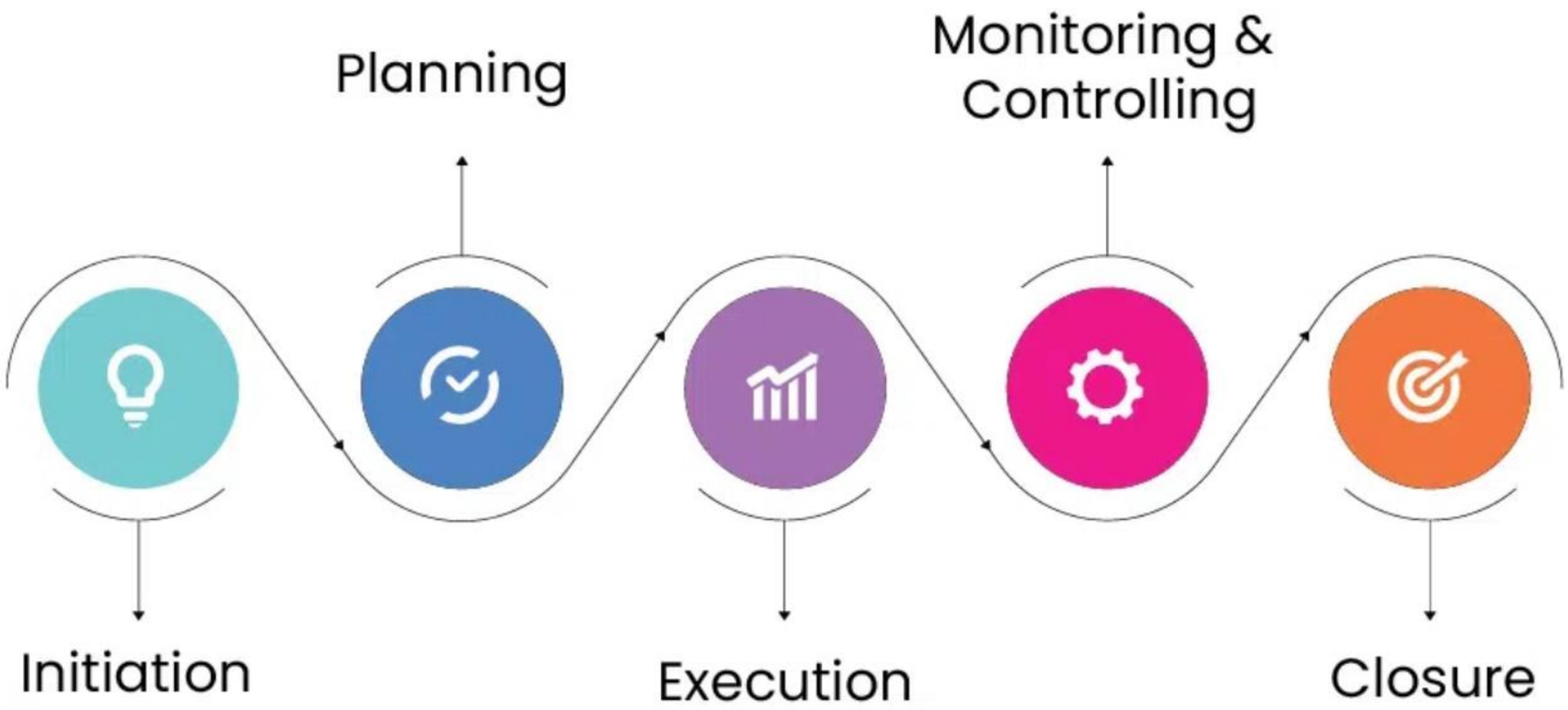


These include the construction of physical constructions projects such as buildings, roadways, bridges, and infrastructure.

This category includes projects that involve the design, development, and construction of machinery.

Promotional activities such as product or service marketing, market research, brand awareness, and advertising.

Project Life Cycle Steps

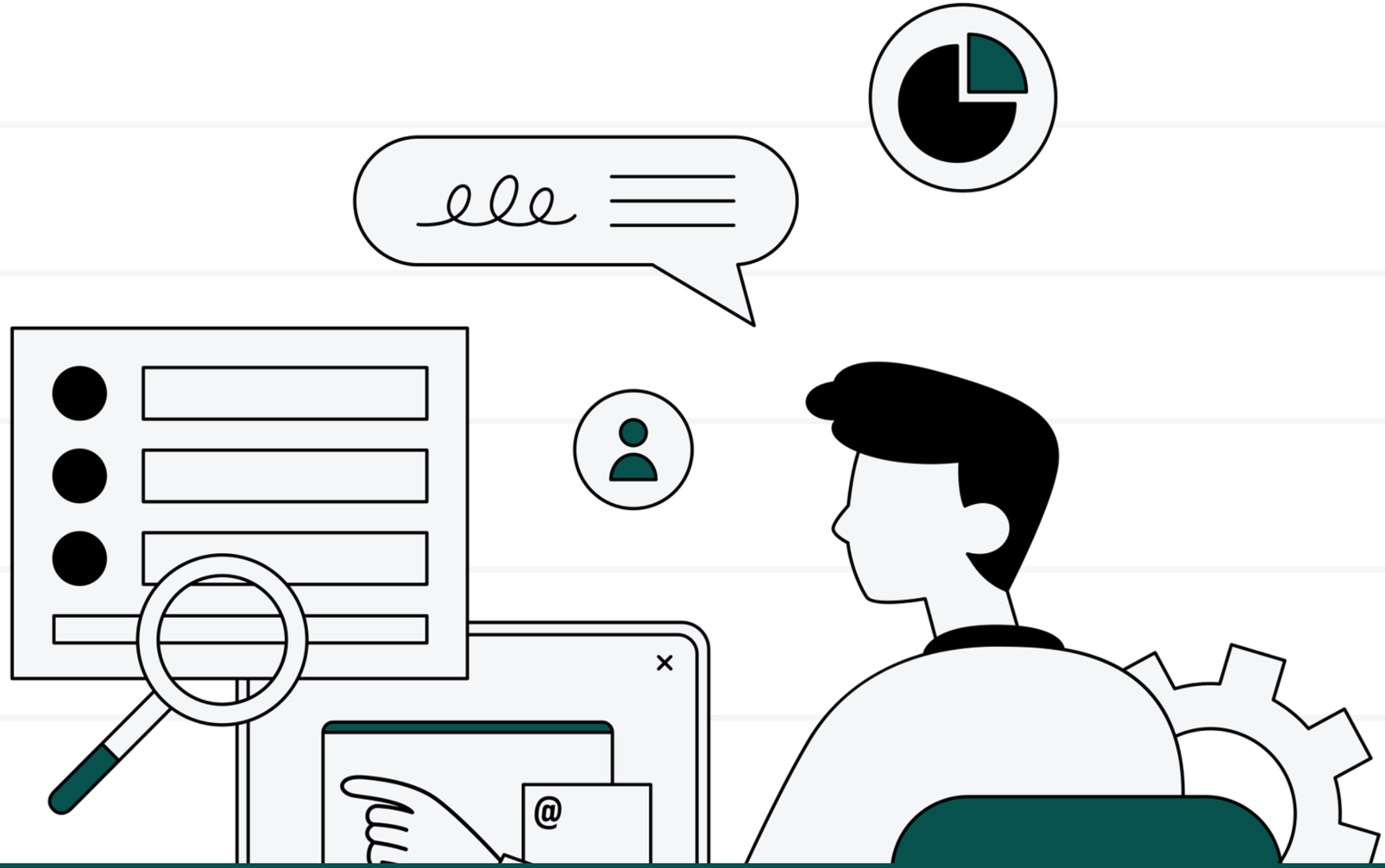


Initiation Phase

- A project officially begins when it enters the initiation phase. A project beginning is known as the commencement phase. (1) Stakeholder identification, (2) goal-setting, (3) scope definition and (4) purpose and goal definition are all part of it. Creating a project charter* which describes the goals, limitations and preliminary requirements of the project is a common step in this phase. To make sure the project fits with organizational objectives.

- In the initiation phase there are some tasks we have to follow them:
  - **Objective (Why) =Definition of project's purpose and goal:** Clear the reasons behind project existence and set the available goals.
  - **Scope (What)=Project scope definition:** Established the boundaries and deliverables of the project.
  - **Responsibilities (Who)=Stakeholder catalogue identification:** Locating and getting to know the people and organizations interested in the project.

*منشور پروژه



03 Project Charter

Definition

- A project charter is an elevator pitch of your project objectives (WHY), project scope (WHAT), and project responsibilities (WHO) in order to get approval from key project stakeholders.
- In the charter, you should provide a short, succinct explanation of the main elements of your project before you get started.
- By creating a project charter before getting started on other, more in-depth project planning documents, you can get approval or course-correct if necessary.
- The project charter defines the **goals and scope of the project on a high level** so it should be done before the project starts.

Definition

- The project charter is the **first document** you want to show your writing skills in. It **doesn't include technical information and written project requirements**. Instead, it gives a clear **summary** of what you should do after it.
- One of the things to differentiates a project charter from other plans is that it confers authority to the project manager.

Initiation Phase- Why

- You should outline why this project is important and what the key objectives are for the end of the project. Make sure your project purpose clearly explains why it's important to work on this project and how this project will support your company goals.

Difference between goal & objective?

- You should also clarify your project objectives. These are the things you plan to achieve by the end of the project, like deliverables or assets.
- **SMART** Method:

Ref: https://asana.com/resources/smart-goals

Initiation Phase- Who

- Set the roles and responsibilities in the project. List all the essential roles such as stakeholders, project team members, project sponsors, and customers.

Initiation Phase- What

- Your project scope statement defines exactly **what is and isn't part of the project**. When you draft a project scope, you're setting boundaries and, more importantly, outlining what you won't do during the project timeline.
- As you create your project charter, the most important part of explaining scope is outlining the ideal project budget.
- Remember, you will use your project charter document to pitch this project to stakeholders—so you need to clearly show what the budget is and where that money will go.
- Your project scope helps you envision the entire lifecycle of your project and make sure your end goals are achievable.
- Defining your project scope allows you to:
  - Ensure all stakeholders have a clear understanding of the boundaries of the project
  - Manage stakeholder expectations and get buy-in
  - Reduce project risk
  - Budget and resource plan appropriately
  - Align your project to its main objectives
  - Prevent scope creep
  - Establish a process for change requests (for complex projects)

Define your project's scope

- Outline your project objectives
- A sense of which resources (anything from project budget to team bandwidth) you'll have available to you
- Collect any additional project requirements
- Draft your project scope statement. Start by answering these questions:
  - Why are we working on this project? What are our ultimate goals and deliverables?
  - What restrictions do we have? How much budget, headcount, and resources are available? Which team members will be working on this?
  - When are our deliverables due? What timeline do we have to hit?
  - What is out of scope?

Example project scope statement

Let's say you're rebuilding your company website. Here's what the project scope might look like:

- **Project objectives:** Transfer website backend onto CMS platform in order to improve page speed and flexibility.
- **Resources:**
  - Web team (three people), 30 hours of work a week for 6 weeks
  - Engineering manager (one person), 10 hours of work a week for 6 weeks
  - IT & Legal review (two teams), five hours of ad hoc work a week
  - $7,000 for CMS
- **Deliverables:**
  - Training for all content writers in late May 2023
  - Entire website on new CMS by June 2023
- **Project roadmap** and timeline:
  - **April 26:** Begin scoping CMS
  - **May 10:** IT & Legal review
  - **May 17th–June 3rd:** Web team transfer
  - **May 31st:** Content writers' training
  - **June 4th:** CMS is live
- **Out of scope:**
  - New DAM system
  - Customizable web pages on new CMS

CMS= Content Management System

DAM=Digital Asset Management

Example

Q2 Brand Campaign — Project Charter

Project name: Q2 Brand Campaign

Project manager: @Avery Lomax

Last revision date: April 5, 2021

Project purpose statement: The purpose of this project is to increase brand awareness in NAMER and EMEA through a digital brand campaign in Q3.

Project objectives: Launch display and video ads in Q3 to increase brand awareness in NAMER and EMEA.

Project scope

Deliverables:

- Landing page design
- Display ads (two variations for A/B testing), sized according to display spec sheet
- Video spots (6 and 30 second spots), sized according to video spec sheet

Creative requirements:

- Display
  - Shows logo and CTA throughout animation
  - Both static and HTML5 banners are needed
- Video
  - Features branding within first 5 seconds
  - Includes voiceover
- Landing page
  - Ads and landing page should create a consistent visual experience

Out of scope:

- Translating brand campaign assets

Resources

- Brand design team (six people), 15 hours per week for four weeks
- $50,000 media spend budget

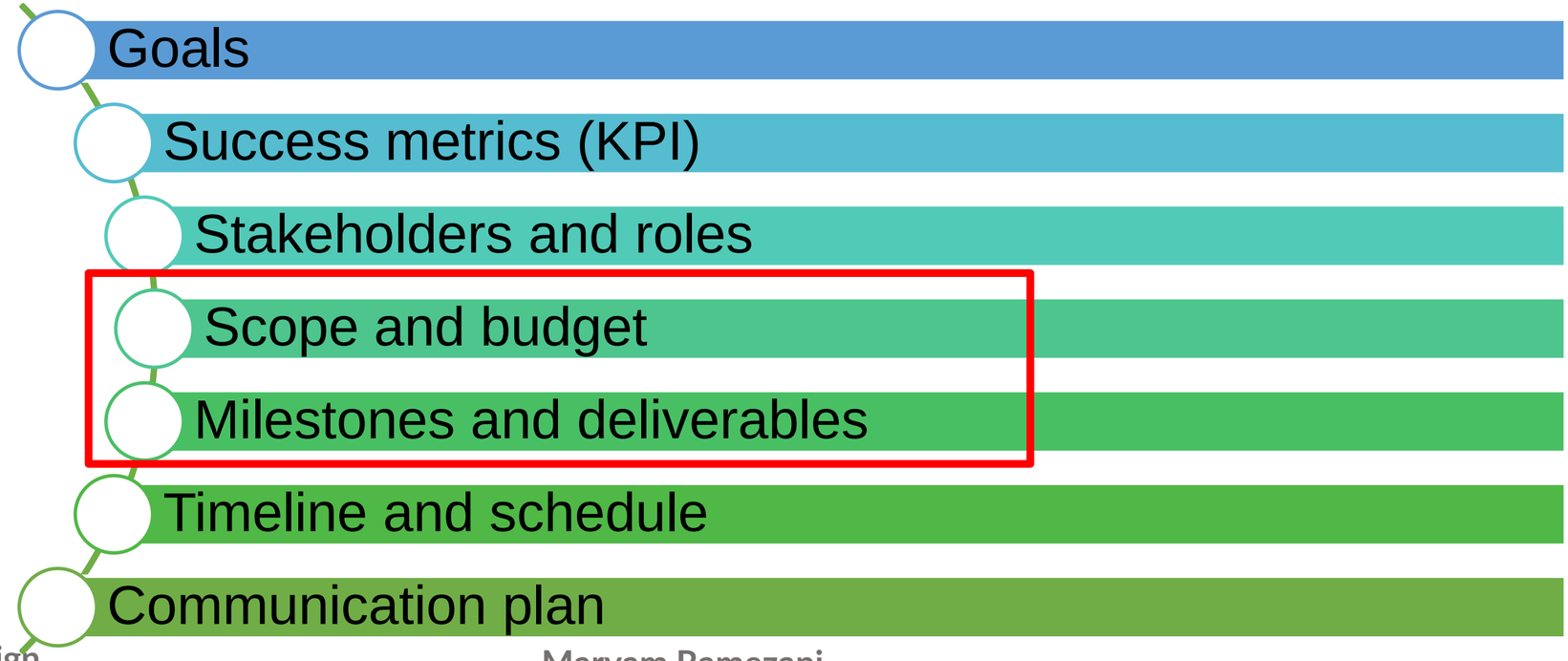
Stakeholders and approvers

- Project sponsor: @Daniela Vargas
- Approvers: @Kat Mooney, @Kabir Madan

04 Project Plans

Project Charters vs. Project Plans

- Once your charter has been approved, you should then create a project plan.
- Your project plan builds on your project charter to provide a more in-depth blueprint of the key elements of your project.
- There are seven key elements in a project plan:



Can be done with WBS

https://asana.com/resources/project-management-plan

Example

- **Annual content calendar**

  Let’s say you’re the Content Lead for your company, and it’s your responsibility to create and deliver on a content marketing calendar for all the content that will be published next year.

  Goals & success metrics
  Stakeholders and each person’s role
  Budget
  Milestones and deliverables
  Timeline and schedule
  Communication plan

Example

Goals: increase engagement by 10%.

Success metrics: the open rate and click through rate on emails, your company's social media followers, and how your pieces of content rank on search engines.

Stakeholders and each person's role:

There will be five people involved in this project.

- **You, Content Lead:** Develop and maintain the calendar
- **Brandon and Jamie, Writers:** Provide outlines and copy for each piece of content
- **Nate, Editor:** Edit and give feedback on content
- **Paula, Producer:** Publish the content once it's written and edited

Budget: Your budget for the project plan and a year's worth of content is $50,000.

تعرفه نرخ پایه خدمات
فنی – تخصصی
انفورماتیک
(سال ۱۴۰۳)

نسخه ۱.۰۲ – اردیبهشت ماه ۱۴۰۳

https://www.irannsr.org/fa/cdk/func/getFile/file_ctp_id/585/file_id/343268/file_field/news_file/file/NASR+TARIFF+1403+V1.02.pdf/

Example

Milestones and deliverables: Your first milestone is to finish the content calendar, which shows all topics for the year. The deliverable is a sharable version of the calendar. Both the milestone and the deliverables should be clearly marked on your project schedule.

Timeline and schedule:

You've determined that your schedule for your content calendar project plan will go as follows:

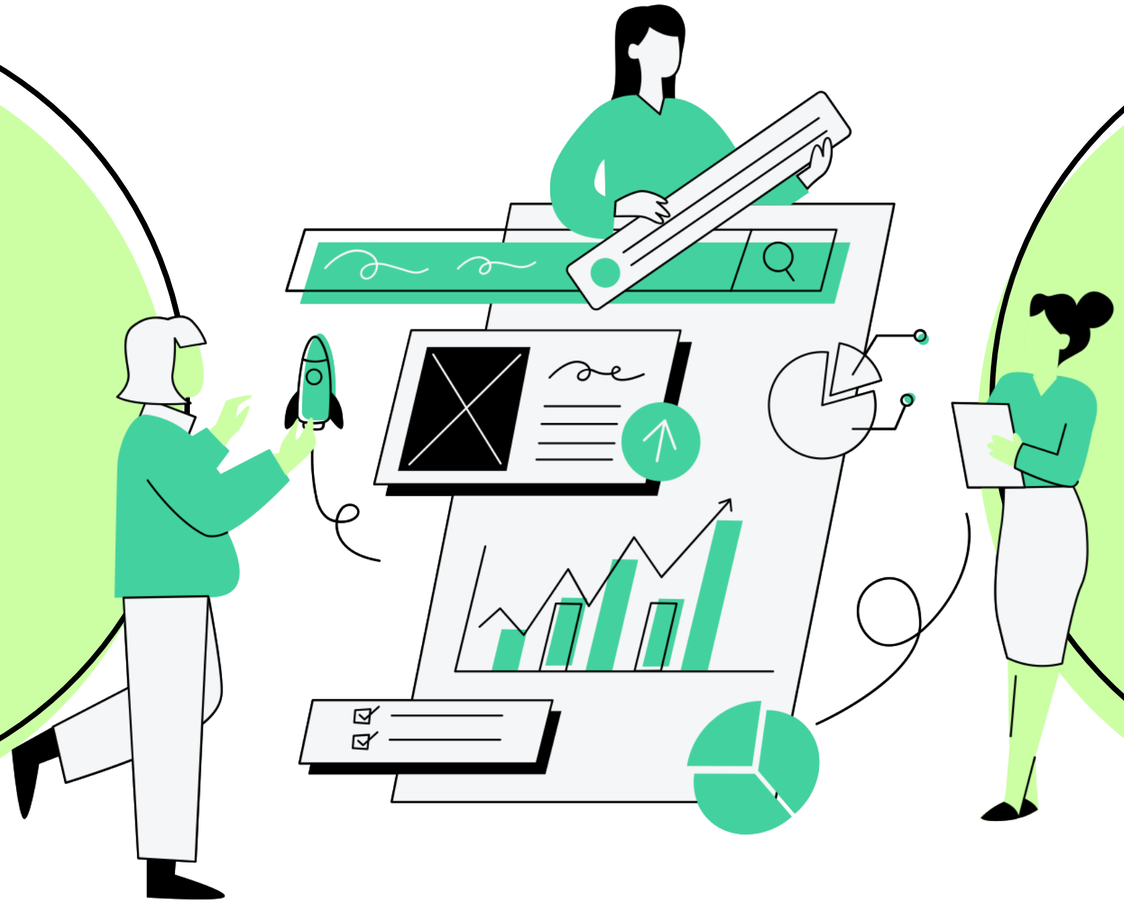
- **October 15 - November 1:** The research phase to find ideas for topics for content
- **November 2 - November 30:** Establish the topics you'll write about
- **December 1 - January 1:** Build the calendar
- **January 1 - December 31:** Content will be written by Brandon and Jamie, and edited by Nate, throughout the year
- **January 16 - December 31:** Paula will begin publishing and continue to do so on a rolling basis throughout the year.

Communication plan:

You'll have a kick-off meeting and then monthly update meetings as part of your communication plan. Weekly status updates will be sent on Friday afternoons. All project-related communication will occur within a project management tool.

Work Breakdown Structure

The core of project planning



Project managers use the **WBS** to divide the project into controllable elements. It is a visual and hierarchic representation of all work needed to complete the project.

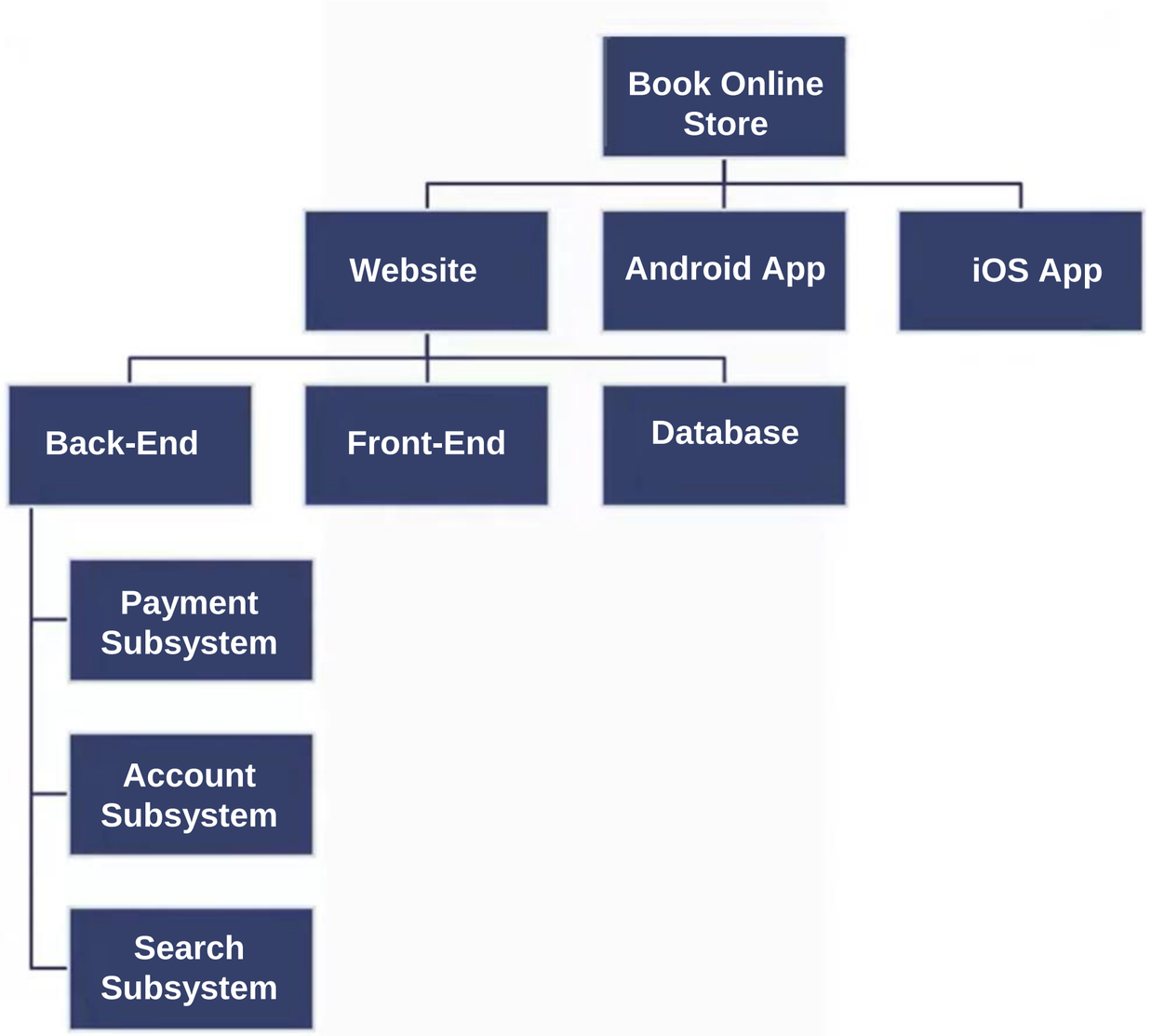
WBS

- Work breakdown structures (WBS): a hierarchy of tasks to identify:
  - Duration of each task
  - Current status of each task
  - Task dependencies (shows which tasks must be completed before others can begin)
  - We draw a WBS to ensure the estimation of: budges, human resource, timeline, and other resources.

- Gantt charts: horizontal bar chart that shows the WBS graphically

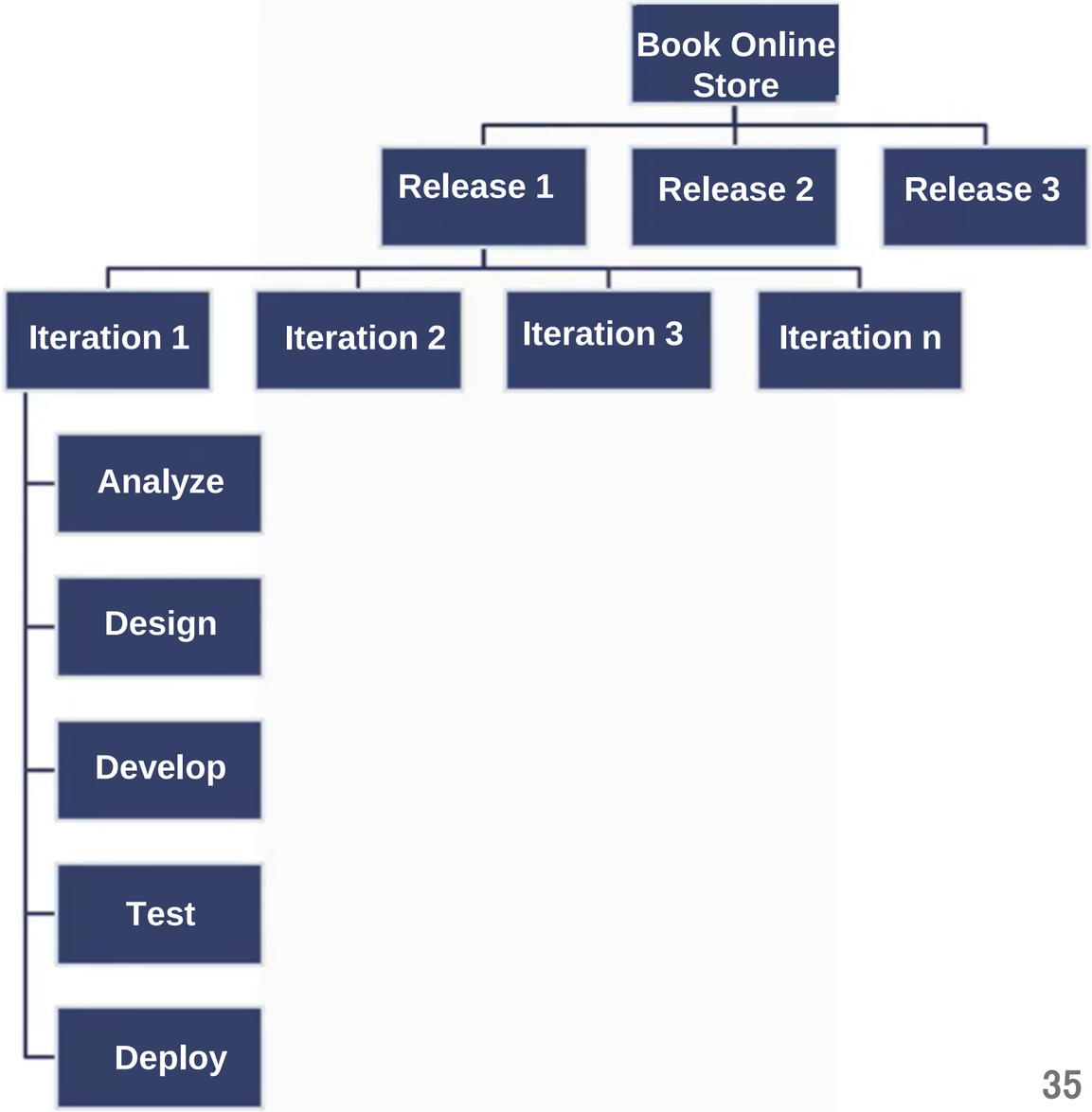
Lets think about a online book store

- Delivery based
  - Good for estimation the human resource and their capabilities



Lets think about a online book store

- Phase based
  - Good for estimation the budge and timeline



WBS Elements

WBS Levels: The WBS levels are what determines the hierarchy of a WBS element. Most work breakdown structures have 3 levels that represent the project's main deliverable, control accounts, project deliverables and work packages.

Control Accounts: Control accounts are used to group work packages and measure their status. They're used to control areas of your project scope. In our example, the execution project phase could be a control account because it has several deliverables and work packages associated with it.

Project Deliverables: Project deliverables are the desired outcome of project tasks and work packages. In our WBS example, we can observe some examples of project deliverables such as the project budget or interior work. Both of them are the result of smaller tasks and work packages.

WBS Elements

Work Packages: As defined by the project management institute (PMI) in its project management body of knowledge book (PMBOK) a work package is the "lowest level of the WBS". That's because a work package is a group of related tasks that are small enough to be assigned to a team member or department. As a project manager, you can estimate costs and duration of these work packages, which makes them an essential WBS element.

> Note: The work package should be small enough for the project team to complete within 10 days. If it takes longer, it should be broken down further.

Tasks: Your tasks make up your work packages and therefore, your project scope. A WBS will help you define each task requirements, status, description, task owner, dependencies, and duration.

WBS Elements

WBS Dictionary: A WBS dictionary is a document that defines the various WBS elements. It's an important component of a WBS because it allows the project participants and stakeholders to understand the work breakdown structure terminology with more clarity. It will be edited during the project.

WBS Dictionary Template

دیکشنری WBS	
شناسه	
توصیف کار	
فرضیات و محدودیت‌ها	
مسئول انجام	
فرسنگ‌نما	
زمان‌بندی فعالیت‌ها	
منابع مورد نیاز	
تخمین هزینه	
ملزومات کیفی	
معیارهای پذیرش	
مراجع فنی	
اطلاعات توافق	

Example

WBS Dictionary	Details
Identifier	WP-001
Work Description	Designing the user interface and user experience for the Online Bookstore website, including homepage, category pages, product details, and cart/checkout flow.
Assumptions and Constraints	Assumes all content will be provided. The design must adhere to existing brand guidelines.
Responsible Person	Lead UI/UX Designer
Milestone	Wireframes and mockups for the websites key pages, ready for approval and development handoff.
Activity Schedule	Start: October 15, 2024, End: October 25, 2024
Required Resources	Design software (Figma/Adobe XD), access to brand assets and content, UI/UX team support.
Cost Estimate	Estimated $5000 for design team efforts and software licenses.
Quality Requirements	Designs must be responsive, meet accessibility standards (WCAG 2.1), and ensure a seamless user journey.
Acceptance Criteria	Approval from project stakeholders and sign-off from the clients product team.
Technical References	Brand guidelines, content strategy document, user personas.
Agreement Information	Client and design team agreement on final deliverables and timeline.

Example: House Construction Project

- Foundation
  - Excavation
  - Pouring Concrete
- Structure
  - Wall Construction
  - Roof Installation
- Finishing
  - Door & Window Installation
  - Painting

Control Accounts

- Major sections of WBS
- Example:
  - **Foundation**
  - **Structure**
  - **Finishing**

Project Deliverables

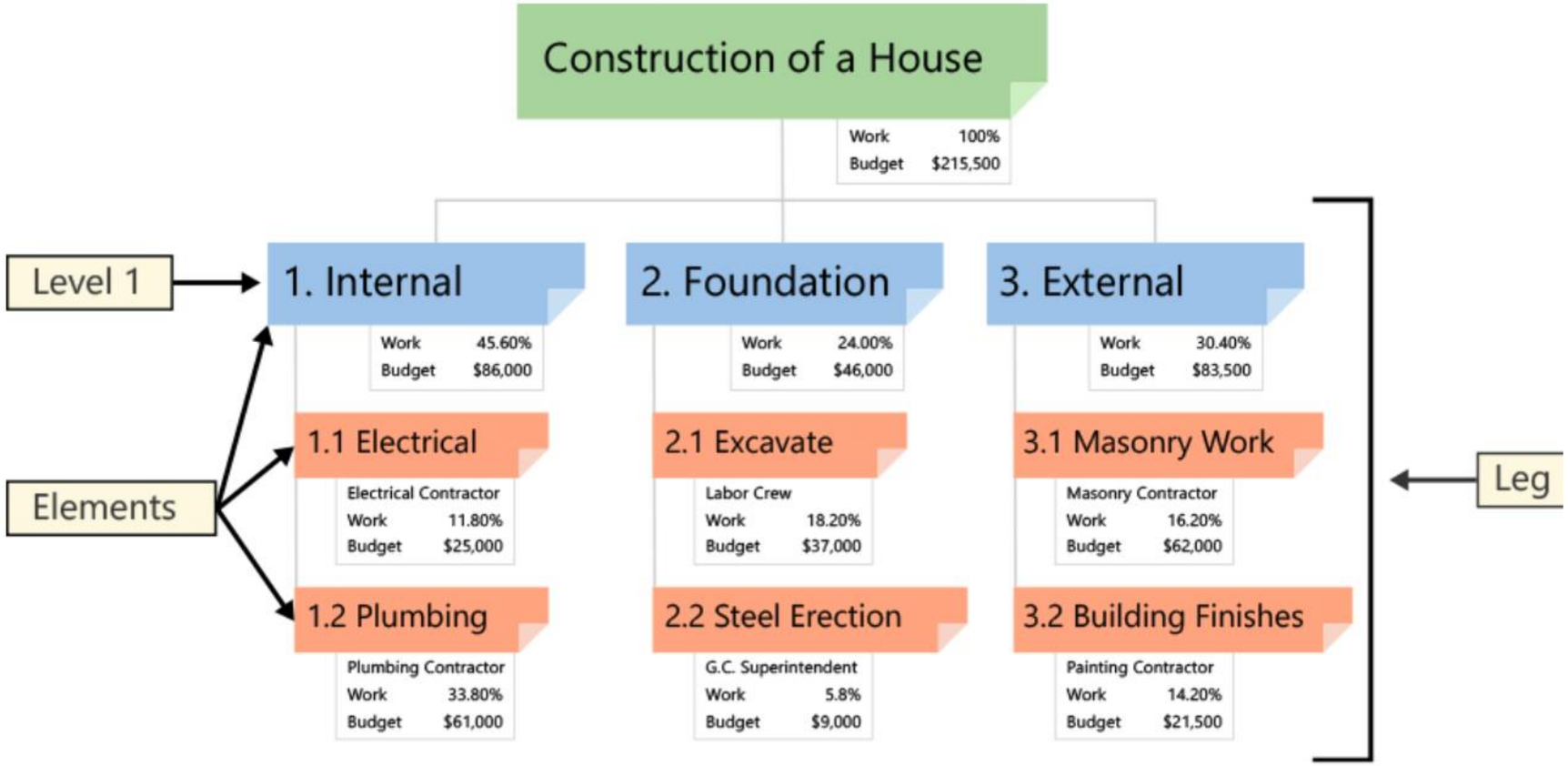
- Final outcomes of each major section
- Example:
  - Complete **Foundation**
  - Complete **Structure**
  - Complete **Finishing**

Work Packages

- Smallest, manageable tasks
- Example:
  - **Excavation** & **Pouring Concrete** (Foundation)
  - **Wall Construction** & **Roof Installation** (Structure)

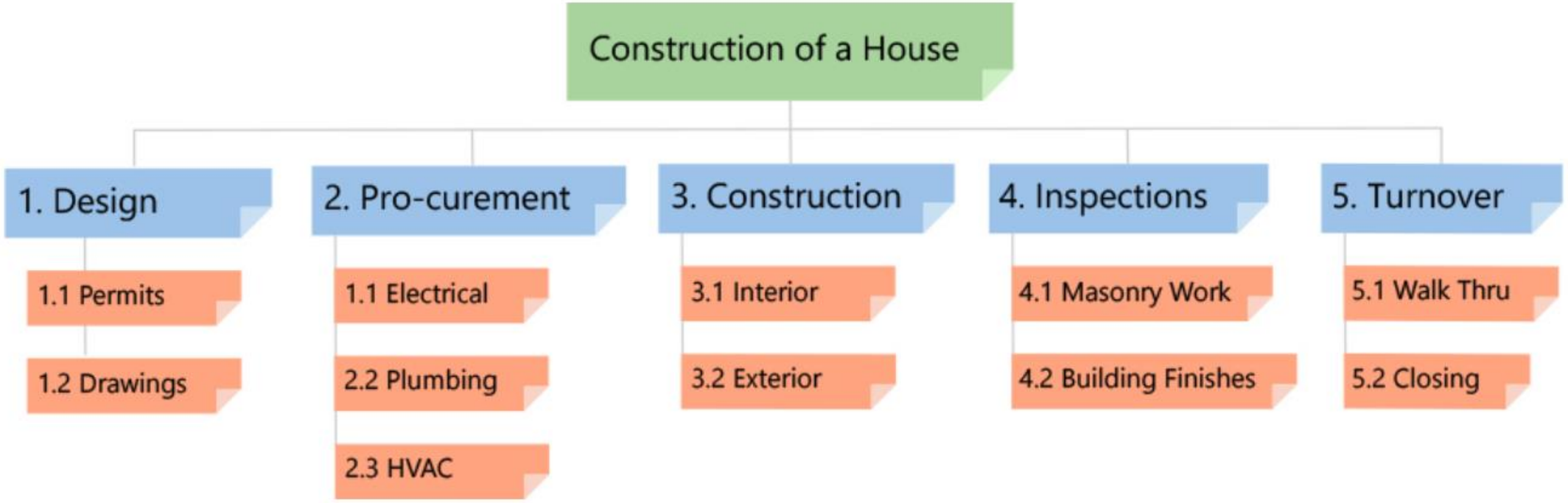
Deliverable-Based WBS

- A Deliverable-Based Work Breakdown Structure clearly demonstrates the relationship between the project deliverables (i.e., products, services or results) and the scope (i.e., work to be executed).

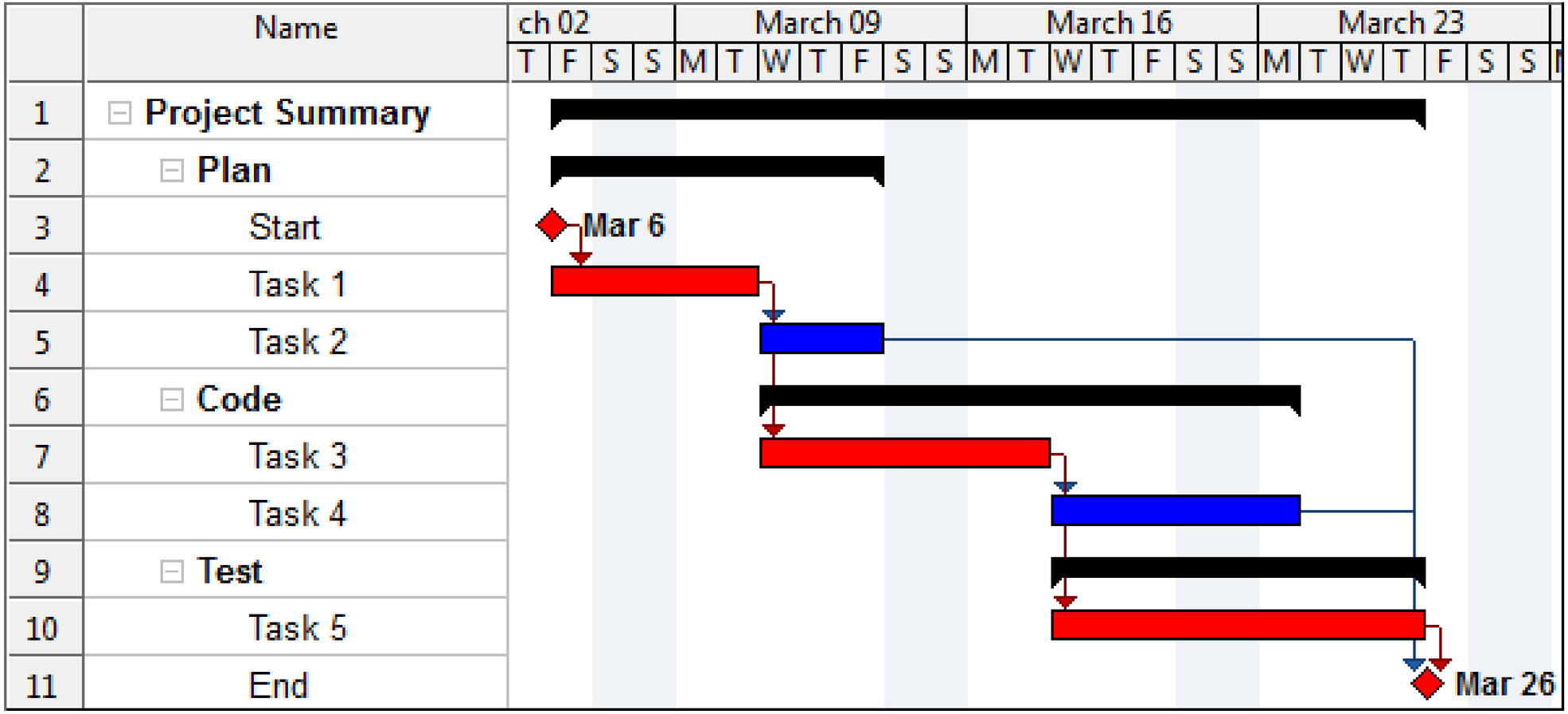


Phase-Based WBS

- Each of these Elements are typical phases of a project. The Level 2 Elements are the unique deliverables in each phase. Regardless of the type of WBS, the lower Level Elements are all deliverables. Notice that Elements in different Legs have the same name. A Phase-Based WBS requires work associated with multiple elements be divided into the work unique to each Level 1 Element.



WBS Sample


Name
ch 02
March 09
March 16
March 23
T F S S M T W T F S S M T W T F S S M T W T F S S
1 Project Summary
2 Plan
3 Start
4 Task 1
5 Task 2
6 Code
7 Task 3
8 Task 4
9 Test
10 Task 5
11 End
Mar 6
Mar 26

Example (Deliverable-Based WBS)

Level 1: Project Name

1.0 Software Project

Level 2: Major Deliverables

1.1 Requirements Gathering & Analysis
1.2 System Design
1.3 Development
1.4 Testing
1.5 Deployment
1.6 Documentation
1.7 Maintenance & Support

Level 3: Sub-deliverables

1.1 Requirements Gathering & Analysis

1.1.1 Stakeholder Interviews
1.1.2 Requirement Documentation
1.1.3 Requirement Sign-off

1.2 System Design

1.2.1 Architectural Design
1.2.2 Database Design
1.2.3 UI/UX Design
1.2.4 Technical Specification Documentation

1.3 Development

1.3.1 Backend Development
1.3.2 Frontend Development
1.3.3 Database Development
1.3.4 API Integration

1.4 Testing

1.4.1 Unit Testing
1.4.2 Integration Testing
1.4.3 System Testing
1.4.4 User Acceptance Testing (UAT)

1.5 Deployment

1.5.1 Production Environment Setup
1.5.2 Data Migration
1.5.3 Go-live

1.6 Documentation

1.6.1 User Manual
1.6.2 Technical Documentation
1.6.3 Training Materials

1.7 Maintenance & Support

1.7.1 Bug Fixes
1.7.2 Performance Optimization
1.7.3 System Updates

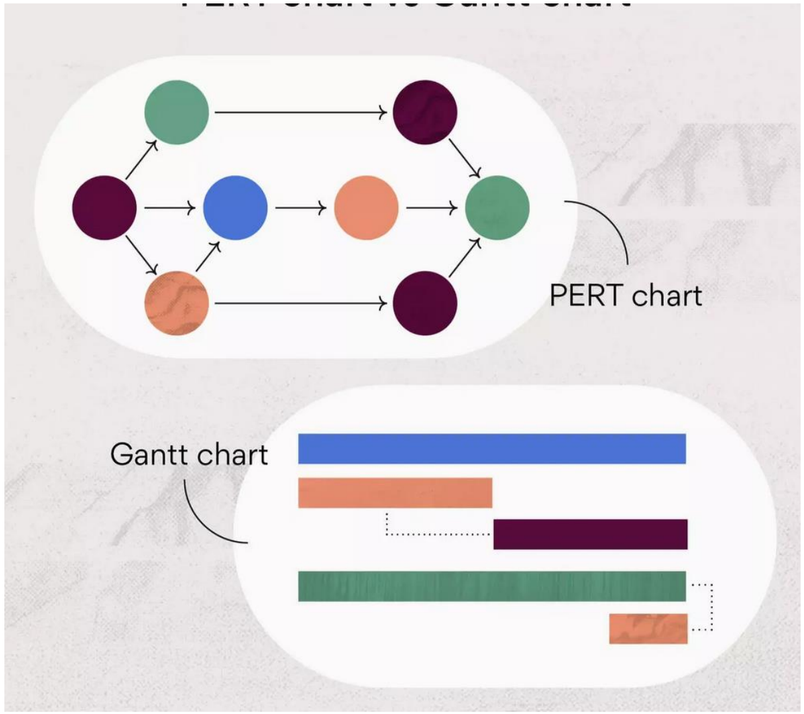
Example (Phase-Based WBS)

Level 1: Project Name
1.0 Software Project
Level 2: Project Phases
1.1 Initiation
1.2 Planning
1.3 Execution
1.4 Monitoring & Controlling
1.5 Closing
Level 3: Activities/Tasks
1.1 Initiation
1.1.1 Project Charter
1.1.2 Feasibility Study
1.1.3 Stakeholder Identification
1.2 Planning
1.2.1 Project Plan Development
1.2.2 Scope Definition
1.2.3 Schedule Creation
1.2.4 Budget Planning
1.3 Execution
1.3.1 Development of System
1.3.2 Test Execution
1.3.3 Product Deployment
1.4 Monitoring & Controlling
1.4.1 Performance Monitoring
1.4.2 Change Management
1.4.3 Risk Management
1.5 Closing
1.5.1 Project Review
1.5.2 Final Documentation
1.5.3 Post-project Support

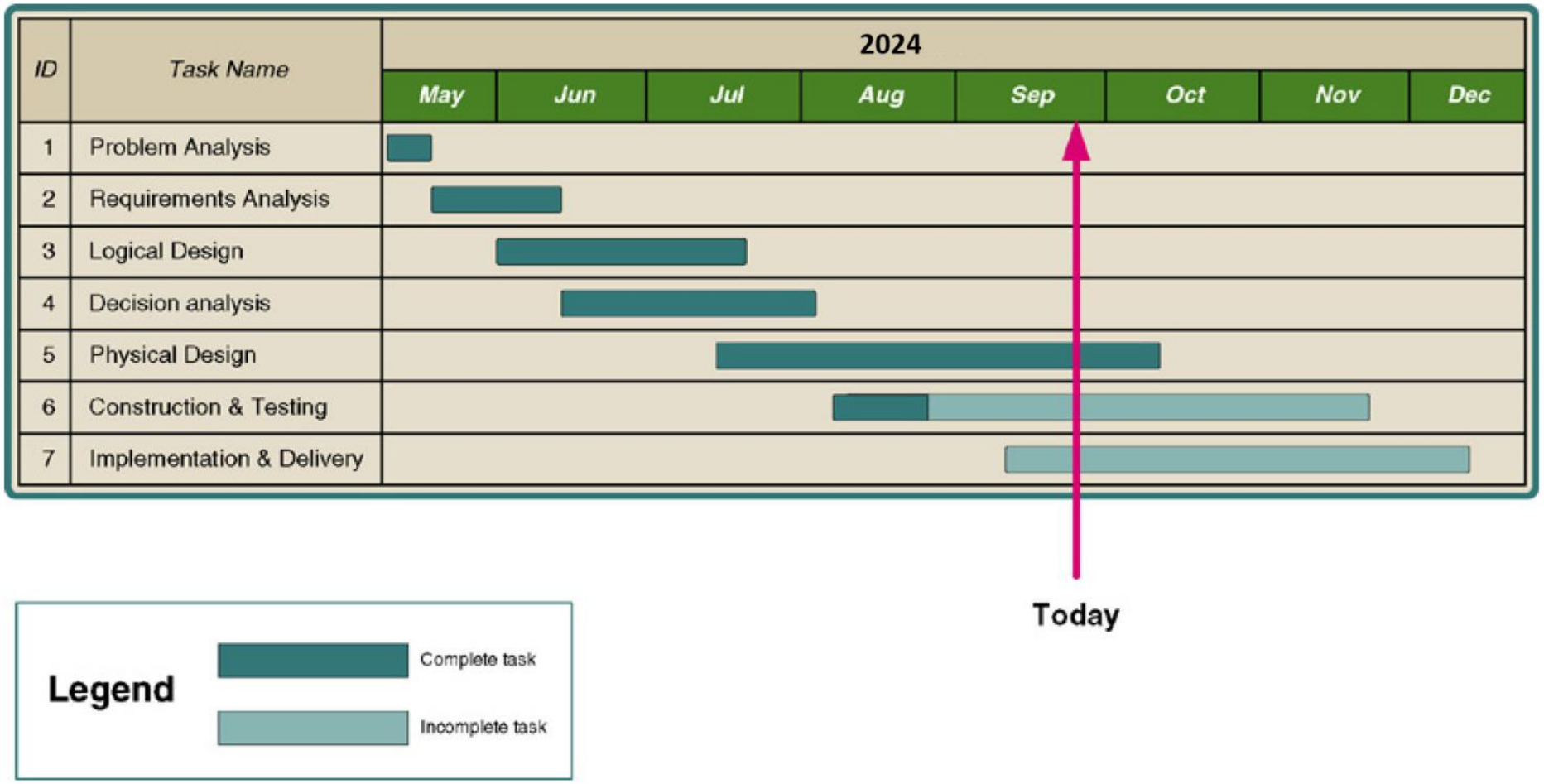
05 Project Management

Project Management Tools & Techniques

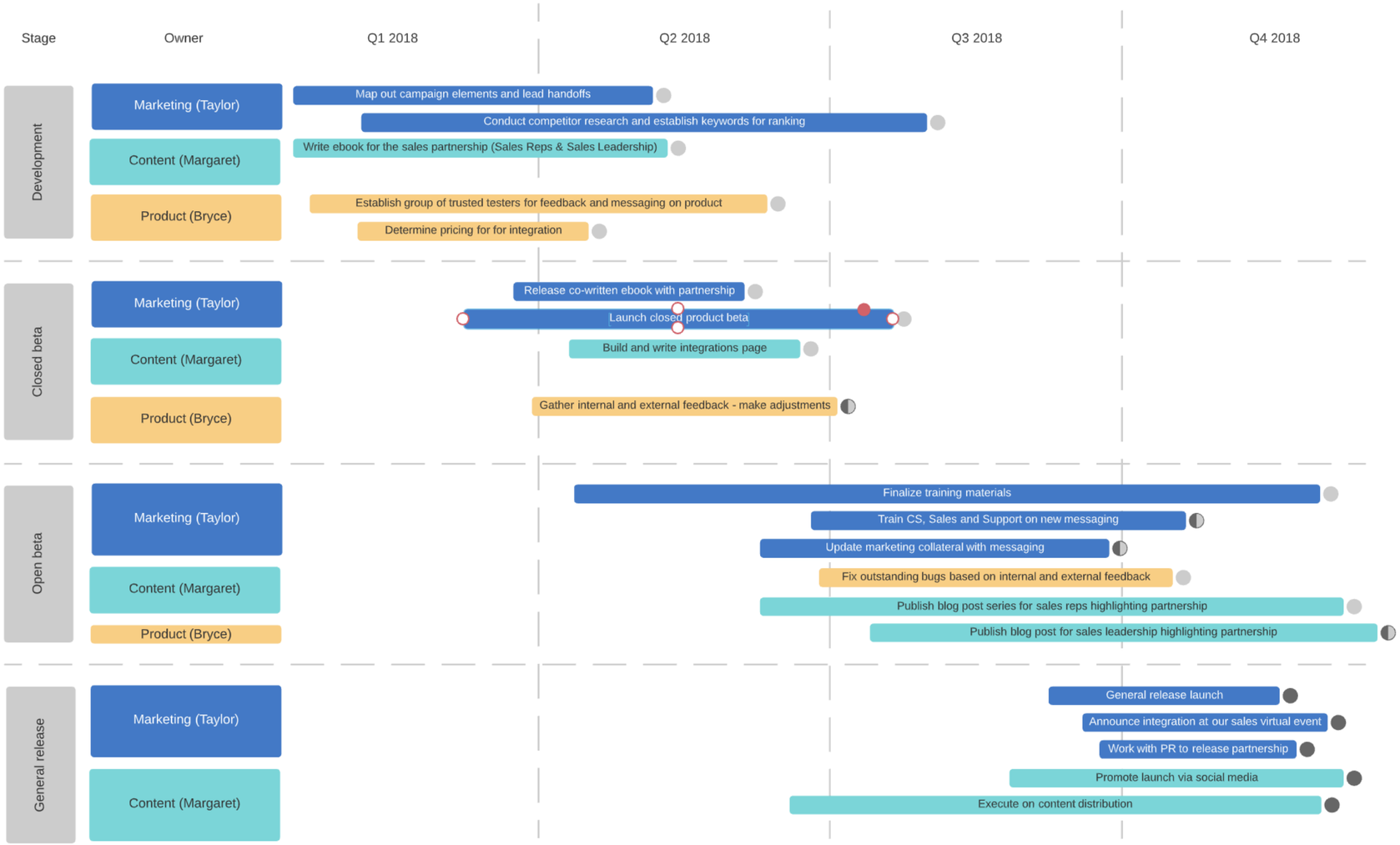
- Gantt chart: a bar chart used to depict project tasks against a calendar.
- PERT chart: a graphical network model used to depict the interdependencies between a project's tasks.



Gannt Chart

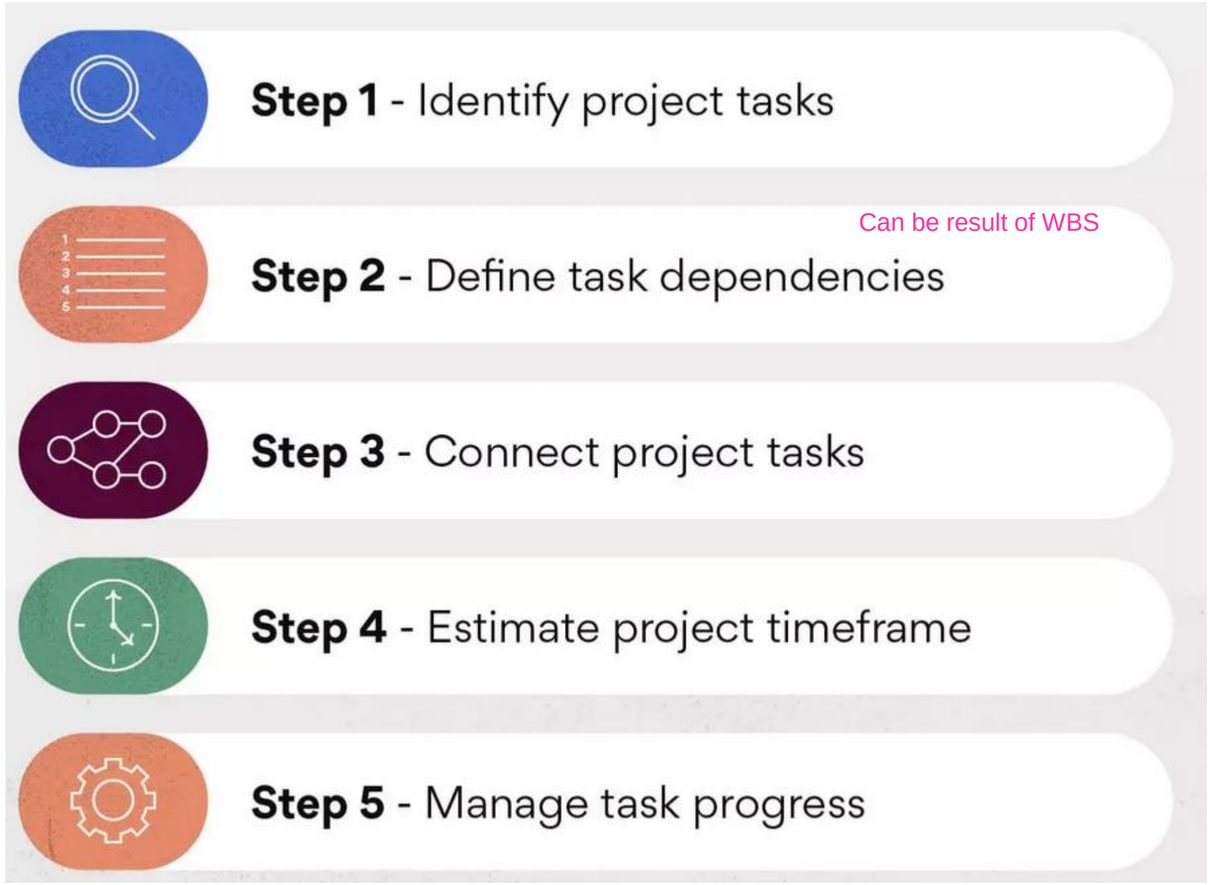

ID
Task Name
2024
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
1
Problem Analysis
2
Requirements Analysis
3
Logical Design
4
Decision analysis
5
Physical Design
6
Construction & Testing
7
Implementation & Delivery
Today
Legend
Complete task
Incomplete task

Gannt Chart


Stage
Owner
Q1 2018
Q2 2018
Q3 2018
Q4 2018
Development
Marketing (Taylor)
Content (Margaret)
Product (Bryce)
Map out campaign elements and lead handoffs
Conduct competitor research and establish keywords for ranking
Write ebook for the sales partnership (Sales Reps & Sales Leadership)
Establish group of trusted testers for feedback and messaging on product
Determine pricing for for integration
Closed beta
Marketing (Taylor)
Content (Margaret)
Product (Bryce)
Release co-written ebook with partnership
Launch closed product beta
Build and write integrations page
Gather internal and external feedback - make adjustments
Open beta
Marketing (Taylor)
Content (Margaret)
Product (Bryce)
Finalize training materials
Train CS, Sales and Support on new messaging
Update marketing collateral with messaging
Fix outstanding bugs based on internal and external feedback
Publish blog post series for sales reps highlighting partnership
Publish blog post for sales leadership highlighting partnership
General release
Marketing (Taylor)
Content (Margaret)
General release launch
Announce integration at our sales virtual event
Work with PR to release partnership
Promote launch via social media
Execute on content distribution

PERT Chart

- Program Evaluation and Review Technique

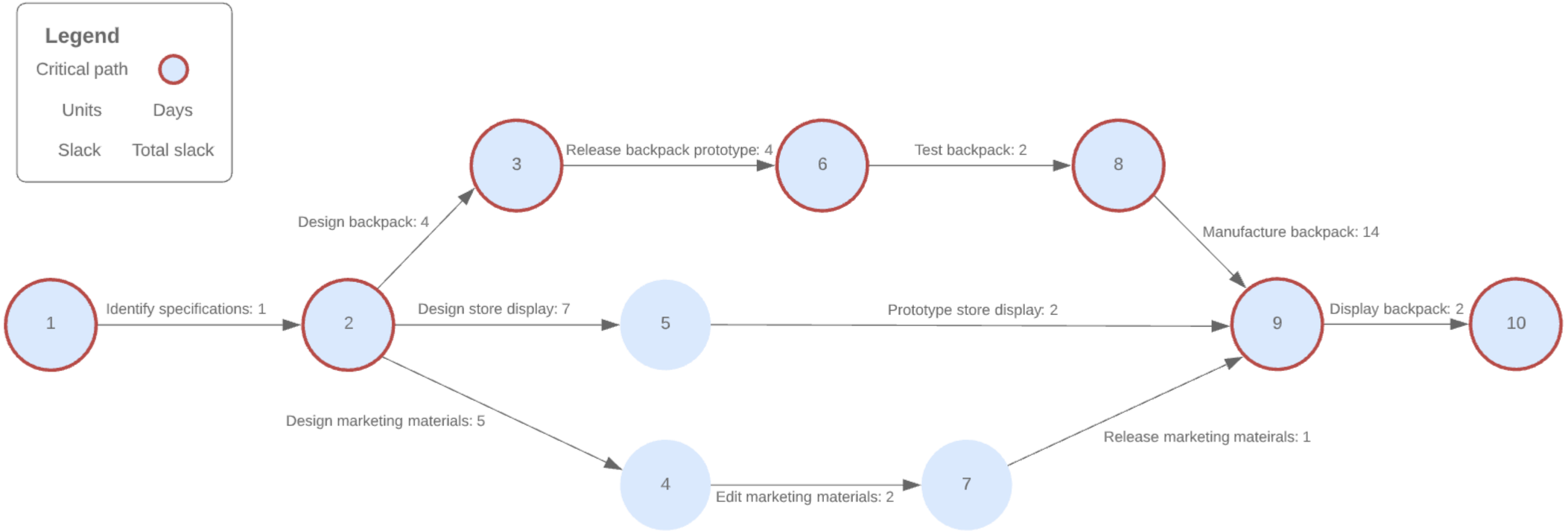


Estimated Times

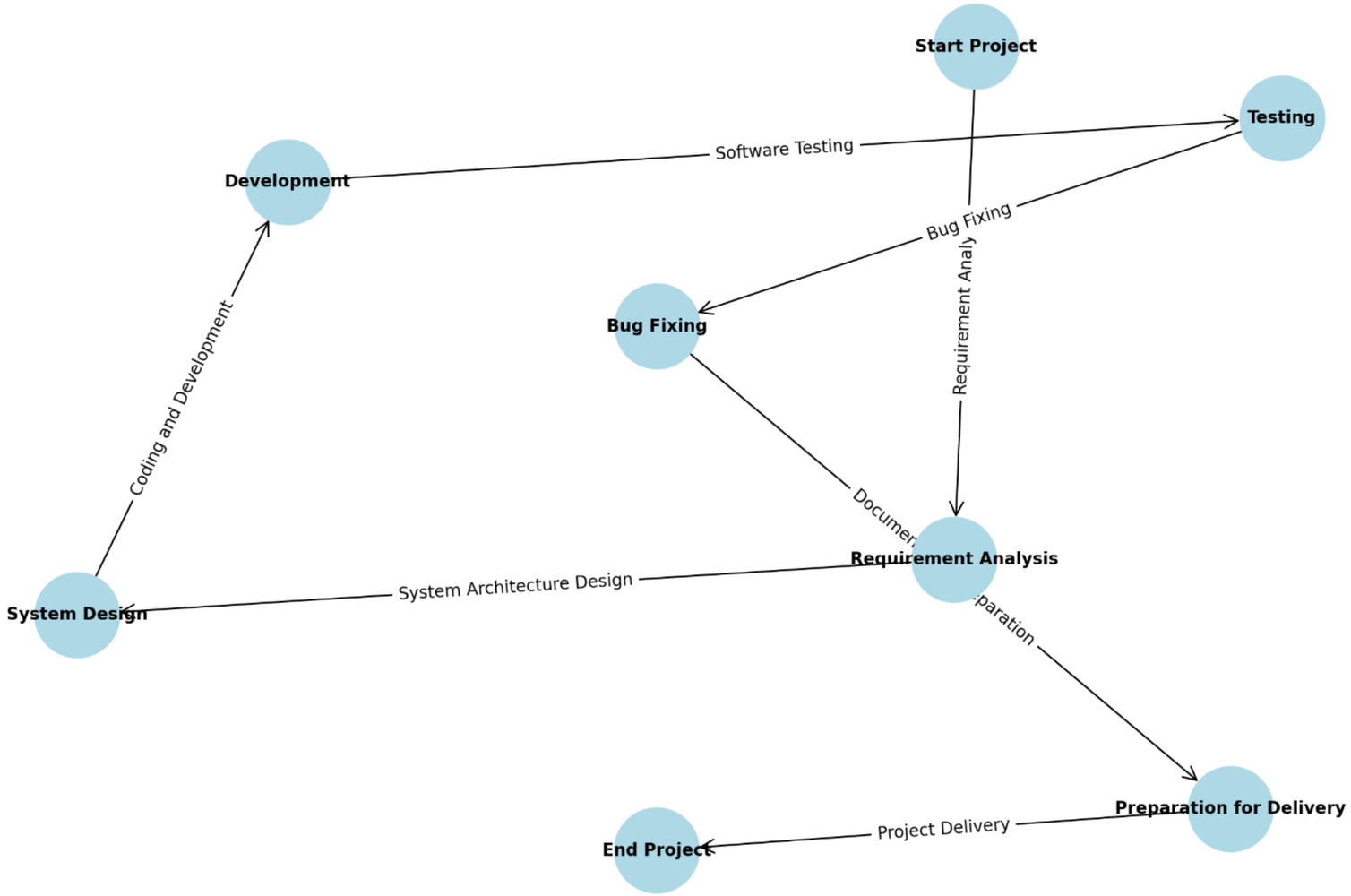
- For each activity in a PERT chart, three estimated times are considered:
- **Optimistic Time (O)**: The shortest time in which an activity is expected to be completed under ideal conditions.
- **Most Likely Time (M)**: The time that is most likely to be required for an activity to be completed under normal conditions.
- **Pessimistic Time (P)**: The longest time it might take to complete an activity under worst-case conditions.
- These times are usually written next to each arrow (activity) in the PERT chart.

E= (O + 4M + P)/6.

Estimated Times

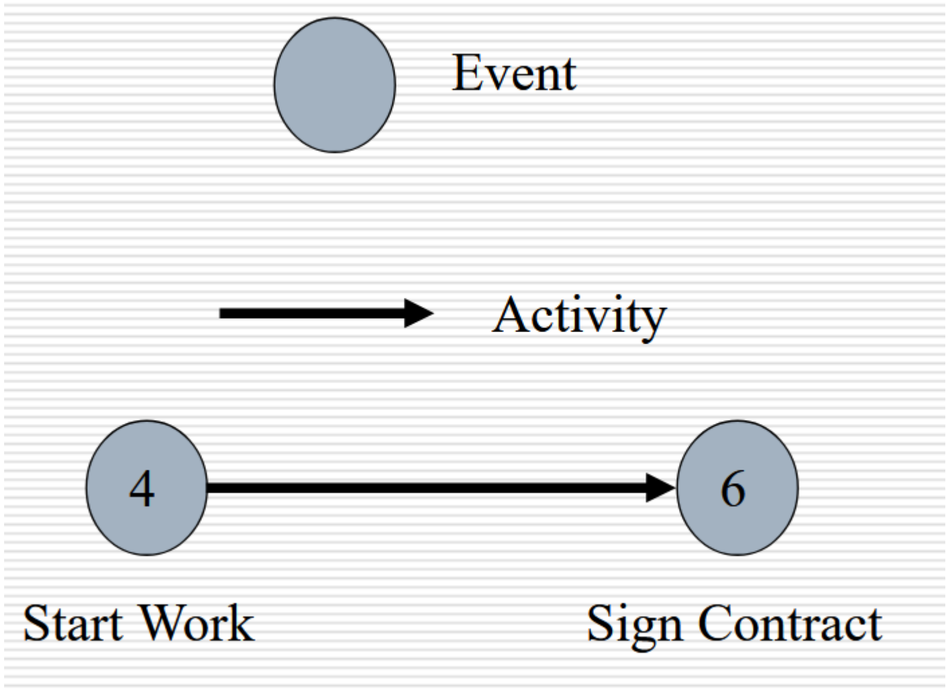


PERT Chart Example



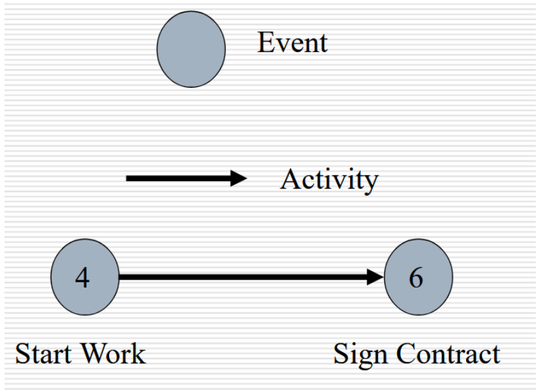
PERT Chart Symbols

- Numbered nodes: Each node represents an event or milestone in the project, completion of one stage, or a series of tasks needed to move the project forward.



PERT Chart Symbols

- Dependencies: Directional (or concurrent) arrows: The arrows on a PERT chart represent the tasks or activities that need to be completed before the team can move on to the next event or phase in the project. Project managers use directional arrows to schedule activities that have dependencies.
- Activities represent action and **consumption of resources** like time, money, and energy required to complete the project.
  - A task or a certain amount of work required in the project
  - Requires time to complete
  - Represented by an arrow



PERT Chart Symbols

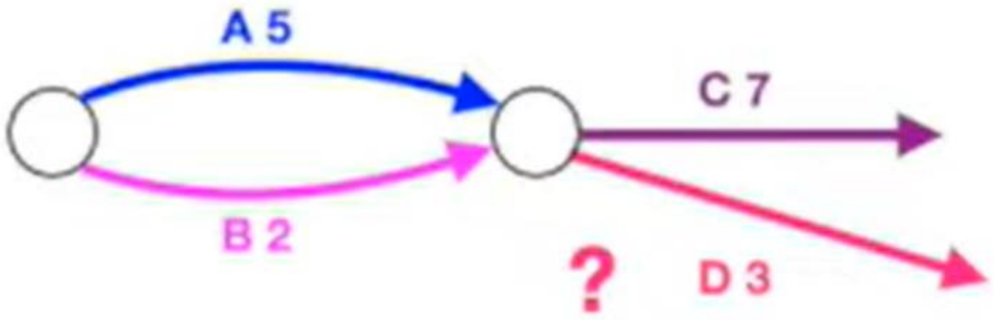
- Divergent arrows Dependencies without resources or Dashed lines!: A dependency without resources is one that, while connected to another, doesn't have tangible events that need to be completed. These arrows represent tasks that a team may work on simultaneously or in any sequence they choose because they do not have dependencies. In the mockup here, you can see an example of this after node 2, for example. The team may work first on the activities leading to node 3 or node 4, or they may choose to complete them simultaneo

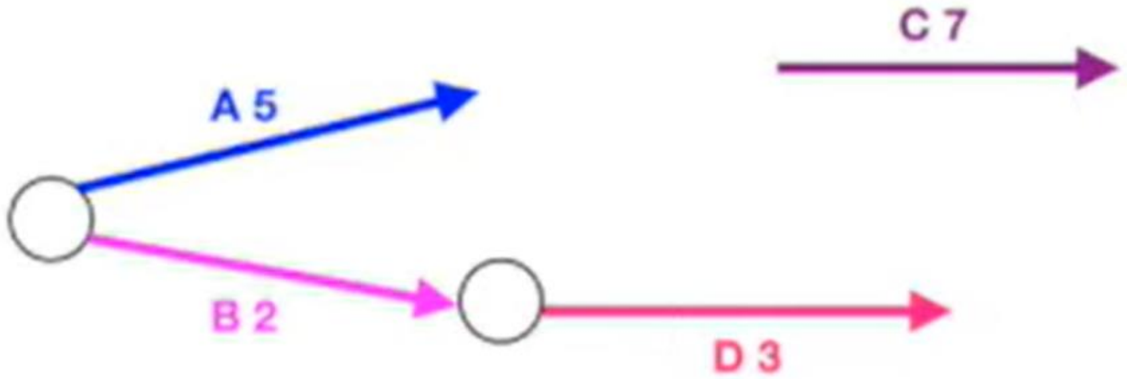
Notes

- The network should have a unique starting and ending node.
- No activity can be represented by more than a single arc (the line with an arrow connecting the events) in the network.
- No two activities can have the same starting and ending node.

Example

Activity	Time (Days)	Predecessor(s)
A	5	-
B	2	-
C	7	A, B
D	3	B
E	6	C, D

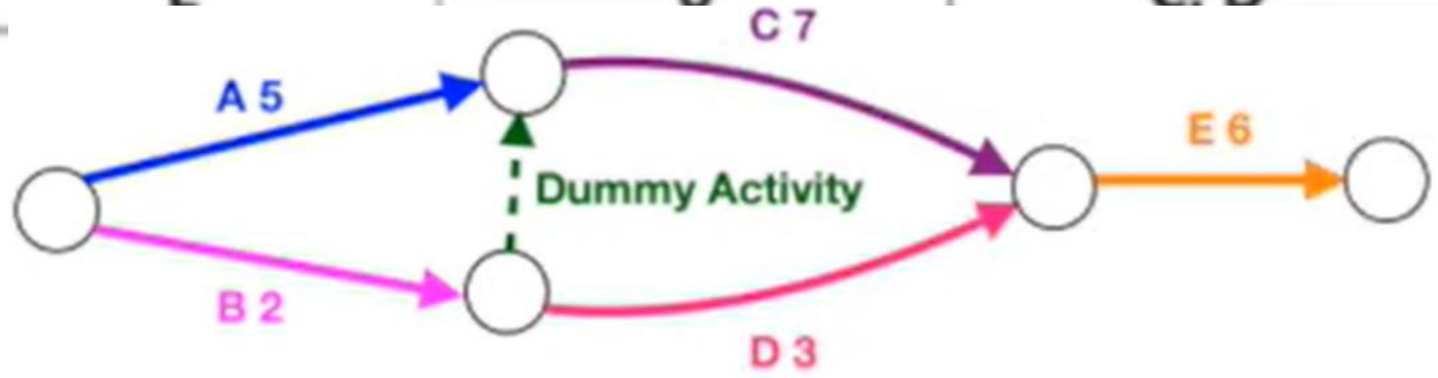




Example

With 4 phases of project.

Activity	Time (Days)	Predecessor(s)
A	5	-
B	2	-
C	7	A, B
D	3	B
E	6	C, D

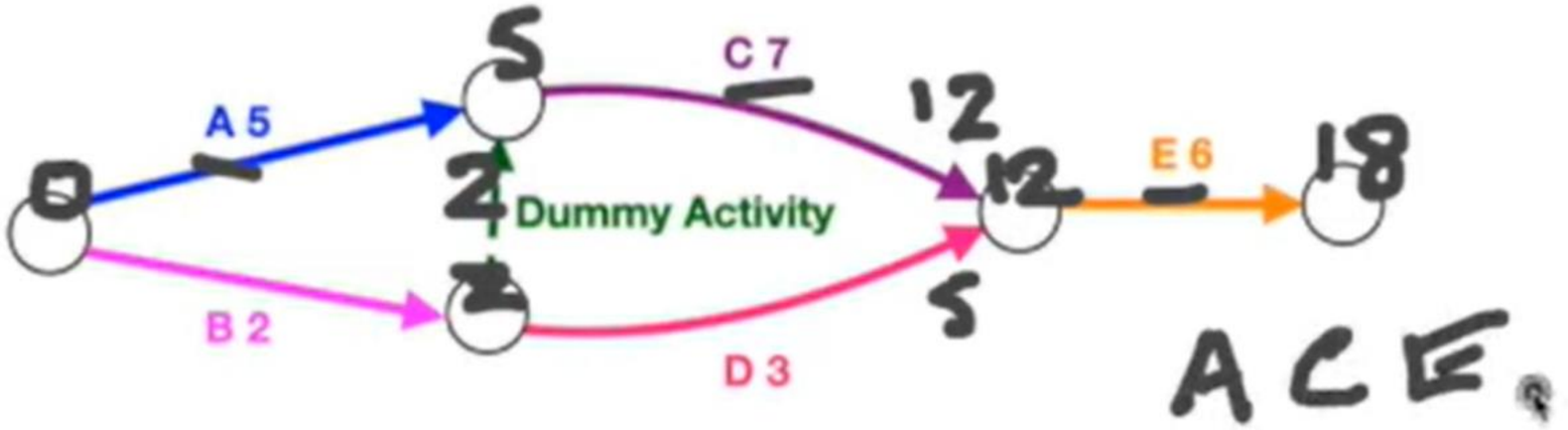


PERT Chart Symbols

- Dummy Activity:
  - Indicates only precedence relationships
  - Does not require any time of effort
  - It is a type of activity in the network which neither consumes any time nor resource.
  - It is an artificial activity.
  - It is represented by a dashed arrow and identified by the terminal node or event to which it connects.
  - It maintains the logic of the network diagram (used to identify a dependency among operations).
  - It maintains the uniqueness of the activity
  - It acts as a connecting link for control purposes.

CPM calculation

- Critical Path Method
  - Path: A connected sequence of activities leading from the starting event to the ending event
  - Critical Path: The longest path (time); determines the project duration. A path in the chart that represents the longest time required to complete the project. Any delay in this path will result in a delay for the entire project. In PERT charts, the critical path is usually highlighted with distinct colors or arrows to make it easily identifiable.
  - Critical Activities: All of the activities that make up the critical path

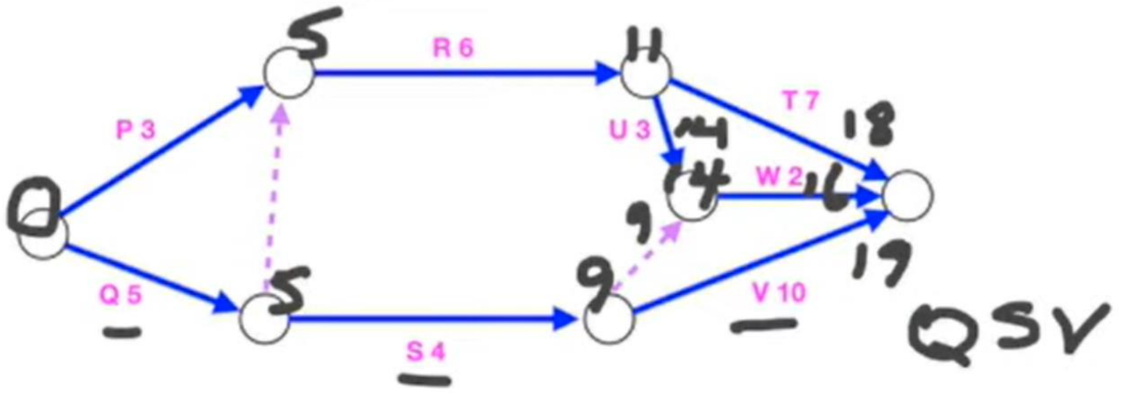


Class HW

Draw the project network and find the minimum completion time.

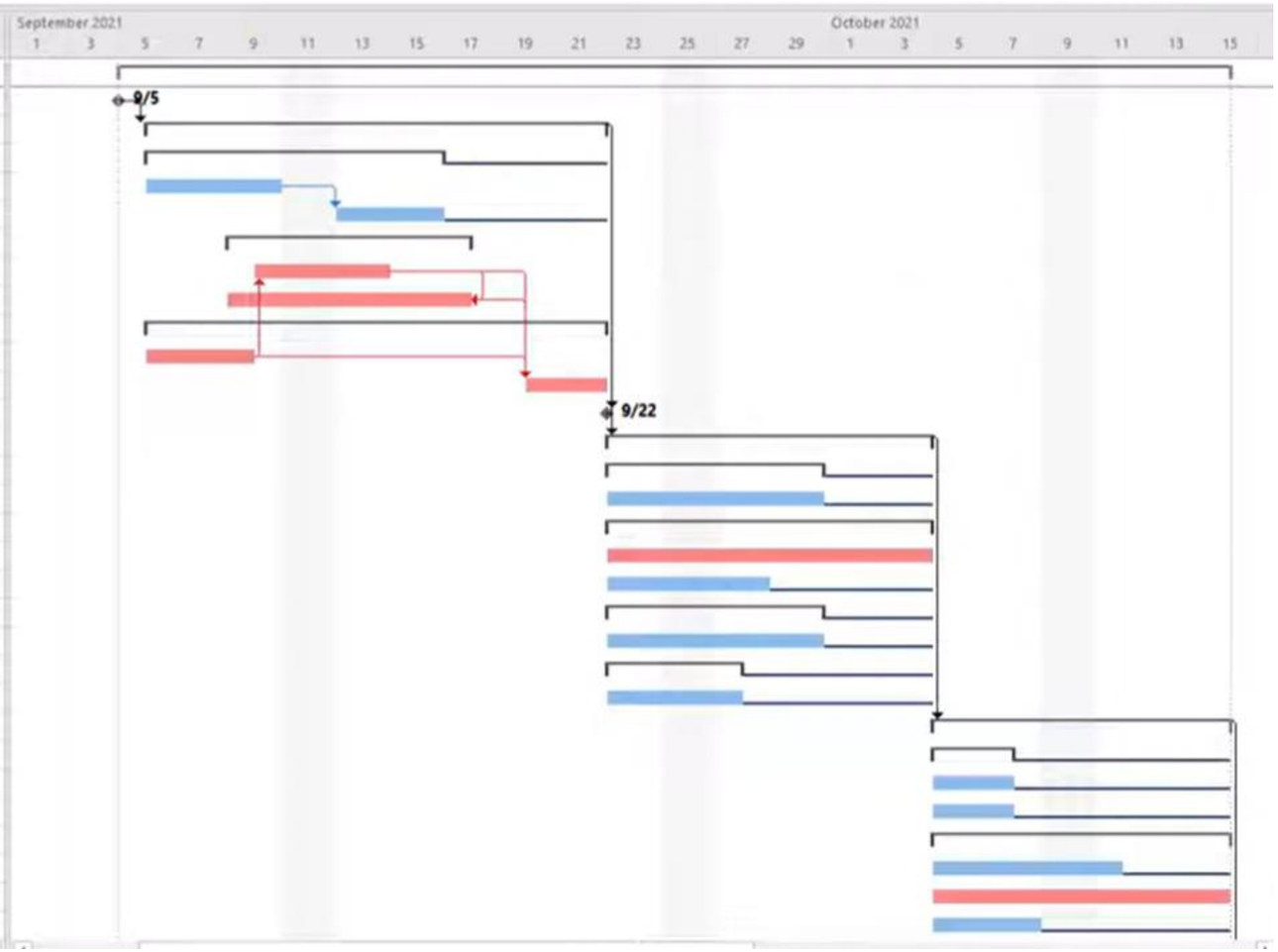
Activity	Time (Days)	Predecessor(s)
P	3	-
Q	5	-
R	6	P, Q
S	4	Q
T	7	R
U	3	R
V	10	S
W	2	S, U

If Activity W is delayed by 4 days, what effect will this have on the minimum completion time and critical path?



WBS with Critical Path

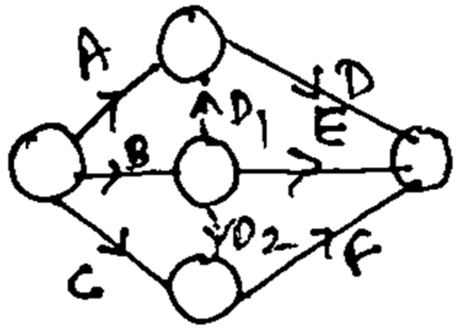
WBS	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
OS-1		**فروشگاه آنلاین کتاب**	**30 days**	**Sun 9/5/21**	**Fri 10/15/21**		
OS-1.1		امضای قرارداد	0 days	Sun 9/5/21	Sun 9/5/21		
OS-1.2		**انتشار یک**	**13 days**	**Mon 9/6/21**	**Wed 9/22/21**	2	
OS-1.2.1		**حساب کاربری**	**9 days**	**Mon 9/6/21**	**Thu 9/16/21**		
OS-1.2.1.1		ثبت نام	5 days	Mon 9/6/21	Fri 9/10/21		
OS-1.2.1.2		ورود	4 days	Mon 9/13/21	Thu 9/16/21	5	
OS-1.2.2		**سفارش**	**7 days**	**Thu 9/9/21**	**Fri 9/17/21**		
OS-1.2.2.1		افزودن به سبد خرید	3 days	Fri 9/10/21	Tue 9/14/21	11	
OS-1.2.2.2		پرداخت	7 days	Thu 9/9/21	Fri 9/17/21	8FF+3 days	
OS-1.2.3		**مدیریت**	**13 days**	**Mon 9/6/21**	**Wed 9/22/21**		
OS-1.2.3.1		افزودن کتاب	4 days	Mon 9/6/21	Thu 9/9/21		
OS-1.2.3.2		تغییر وضعیت سفارش	3 days	Mon 9/20/21	Wed 9/22/21	11,9,8	
OS-1.3		دریافت تبهی از مبلغ	0 days	Wed 9/22/21	Wed 9/22/21	3	
OS-1.4		**انتشار دو**	**8 days**	**Thu 9/23/21**	**Mon 10/4/21**	3,13	
OS-1.4.1		**حساب کاربری**	**6 days**	**Thu 9/23/21**	**Thu 9/30/21**		
OS-1.4.1.1		ویرایش حساب	6 days	Thu 9/23/21	Thu 9/30/21		
OS-1.4.2		**خدمات**	**8 days**	**Thu 9/23/21**	**Mon 10/4/21**		
OS-1.4.2.1		جست و جو	8 days	Thu 9/23/21	Mon 10/4/21		
OS-1.4.2.2		مرتب کردن	4 days	Thu 9/23/21	Tue 9/28/21		
OS-1.4.3		**نظرات**	**6 days**	**Thu 9/23/21**	**Thu 9/30/21**		
OS-1.4.3.1		ثبت نظر	6 days	Thu 9/23/21	Thu 9/30/21		
OS-1.4.4		**مدیریت**	**3 days**	**Thu 9/23/21**	**Mon 9/27/21**		
OS-1.4.4.1		وضعیت موجودی	3 days	Thu 9/23/21	Mon 9/27/21		
OS-1.5		**انتشار سه**	**9 days**	**Tue 10/5/21**	**Fri 10/15/21**	14	
OS-1.5.1		**نظرات**	**3 days**	**Tue 10/5/21**	**Thu 10/7/21**		
OS-1.5.1.1		ویرایش نظر	3 days	Tue 10/5/21	Thu 10/7/21		
OS-1.5.1.2		حذف نظر	3 days	Tue 10/5/21	Thu 10/7/21		
OS-1.5.2		**مدیریت**	**9 days**	**Tue 10/5/21**	**Fri 10/15/21**		
OS-1.5.2.1		مدیریت دسته‌ها	5 days	Tue 10/5/21	Mon 10/11/21		
OS-1.5.2.2		گزارش گیری	9 days	Tue 10/5/21	Fri 10/15/21		
OS-1.5.2.3		ویرایش کتاب	4 days	Tue 10/5/21	Fri 10/8/21		



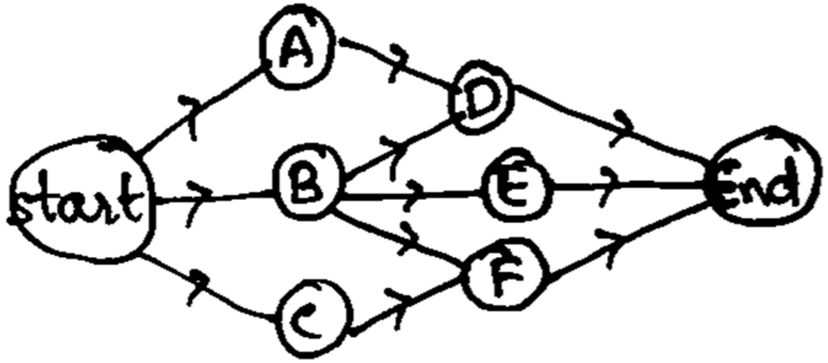
Activity on node (AoN) and Activity on Arrow (AoA)

Activity	Predecessor Activity
A	–
B	–
C	–
D	A, B
E	B
F	B, C

[AOA]

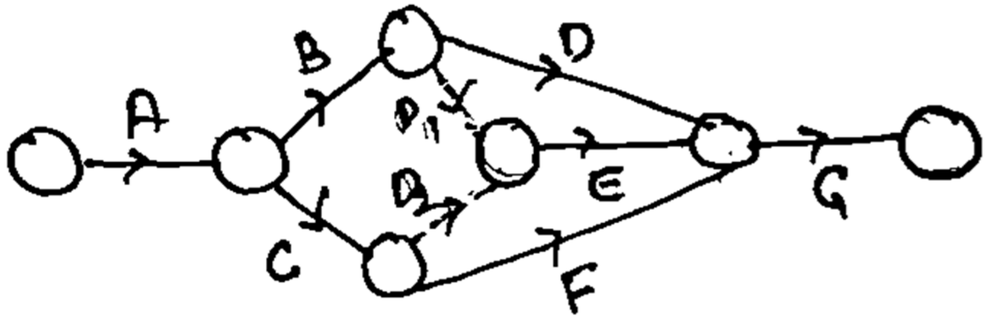


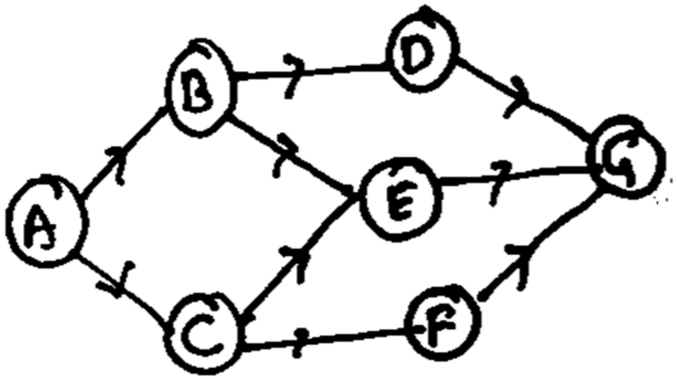
[AON]



Activity on node (AoN) and Activity on Arrow (AoA)

Activity	Predecessor Activity
A	—
B	A
C	A
D	B
E	B,C
F	C
G	D,E,F





PERT & CPM

- **PERT (Program Evaluation and Review Technique)**
  - Focuses on time management.
  - Used for projects with uncertain activity durations.
  - Utilizes probabilistic time estimates (Optimistic, Pessimistic, Most likely).
  - Best for research and development (R&D) or complex projects.
- **CPM (Critical Path Method)**
  - Focuses on both **time and cost management**.
  - Used for projects with **deterministic** activity durations.
  - Employs **fixed** time estimates.
  - Best for construction, manufacturing, or well-defined projects.
- **Similarities**
  - Both identify the **critical path** in a project.
  - Both are used for **project scheduling** and management.
- **Differences**
  - **PERT**: Probabilistic, ideal for uncertain timelines.
  - **CPM**: Deterministic, focuses on both time and cost.

06 SUCCESS & FAILURE

Measures of Project Success

- The resulting information system is acceptable to the customer.
- The system was delivered “on time.”
- The system was delivered “within budget.”
- The system development process had a minimal impact on ongoing business operations.

Cause of Project Failure

- Failure to establish upper management commitment to the project.
- Lack of organization's commitment to the methodology
- Taking shortcuts through or around the methodology
- Poor expectations management
  - Feature creep: uncontrolled addition of technical features to a system.
  - **Scope creep**: unexpected and gradual growth of requirements during an information systems project.

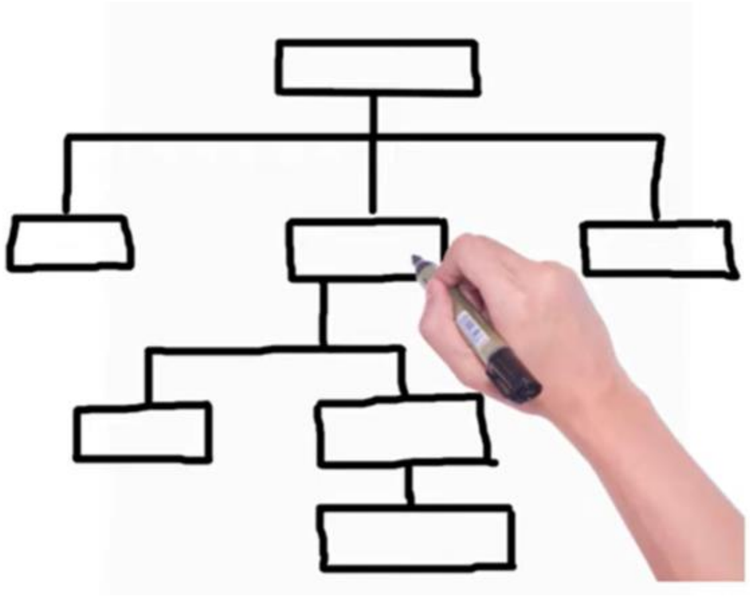
How to prevent Scope Creep

- Before accepting any changes or new features look at:

WBS Dictionary

دیکشنری WBS	
	شناسه
	توصیف کار
	فرضیات و محدودیت‌ها
	مسئول انجام
	فرسنگ‌نما
	زمان‌بندی فعالیت‌ها
	منابع مورد نیاز
	تخمین هزینه
	ملزومات کیفی
	معیارهای پذیرش
	مراجع فنی
	اطلاعات توافق

WBS



Project Scope

How to Manage & Prevent Scope Creep

- Clear requirements: Ensure that project goals, deliverables, and requirements are clearly defined and agreed upon before the project begins.
- Change control process: Implement a formal process for requesting, evaluating, and approving changes to the project scope.
- Stakeholder communication: Keep stakeholders informed about how changes will impact the project in terms of time, cost, and resources.
- Project documentation: Regularly document any changes, and update project plans and timelines accordingly.
- Prioritization: Work with stakeholders to prioritize any additional requests to ensure they align with the project's core objectives.

Cause of Project Failure (CONT)

- Premature commitment to a fixed budget and schedule
- Poor estimating techniques
- Overoptimism
- People management skills
- Failure to adapt to business change
- Insufficient resources
- Failure to “manage to the plan”