

PROJECT MANAGEMENT FUNDAMENTALS

Project: -A temporary endeavor that produces a unique product, service, or result

Project management is the application of knowledge, skills, tools, and techniques to satisfy project requirements

group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually

Portfolio Management: A portfolio is a collection of projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives.

Operations Management: Deals with the ongoing production of goods and/or Services

A phase is a collection of logically related project activities that culminate in the completion of one or more deliverables.

deliverable is any unique and verifiable product, service, or result. (or) a tangible or intangible outcome of a product service or result which is accepted by the customers

Stakeholders: Stakeholders are those who have an influence or get impacted by the project

Project teams actively engage other stakeholders throughout the project to minimize potential negative impacts and maximize positive impacts.

project life cycle representation of the phases that a project typically goes through from start to finish

Can be either predictive or adaptive

Milestone: A milestone is a significant event or achievement in a project that marks a key point or completion of a major deliverable.

Milestones have a zero duration because they represent a significant point or event on the project

Task Duration: Task duration refers to the amount of time it takes to complete a specific task or activity within a project.

Organizational Structures Chart

	Functional	Weak Matrix	Balance Matrix	Strong Matrix	Projectized
PM	Little/No	Low	Low to Moderate	Moderate to High	High/Total
Resource Avail.	Little/No	Low	Low to Moderate	Moderate to High	High/Total
Budget controls	Functional Manger	Functional Manger	Mixed	PM	PM
Pm Role	PT	PT	PT/FT	FT	FT
PM Staff	PT	PT	PT/FT	FT	FT

Functional Organizations: a structure that groups staff members according to their area of expertise (sales, organization: structure, etc.). Functional structures require the project team members to report directly to the functional manager

Matrix Organizations: -There are three matrix structures: weak, balanced, and strong. The different structures are reflective of the project manager's authority in relation to the functional manager's authority.

Project-Oriented Organizations: Structure where the PM has the greatest amount of authority. The project team is assigned to the project on a full-time basis. When the project is complete, the project team members moves on to other assignments within the organization.

Hybrid-blended type

Project Governance is the Framework within which project decisions are made

Three pillars:

- Structure
 - People
 - Information
-

Project Management Office Organizational Structure that standardizes processes and facilitates the sharing of resources, methodologies, tools, and techniques

types

Supportive: Supports the project manager, such as providing templates, training, or lessons learned from other projects.

Controlling: Determines the framework, methodology, and use of specific forms

Directive: controls the project. PM will be assigned and report to the PMO

project management approaches

There are two primary approaches: predictive (also known as traditional or waterfall) and adaptive (also known as agile or iterative).

The adaptive approach focuses on flexibility, collaboration, and iterative development. It embraces change throughout the project and emphasizes continuous feedback and improvement

Predictive Approach: The predictive approach follows a linear and sequential process

It involves detailed planning and documentation upfront, with a focus on predicting and defining the project scope, objectives, timeline, and deliverables.

Extensive upfront planning

Sequential execution

Emphasis on control and documentation:

Limited flexibility, limited changes with a well define change control process

Risks are potential events or situations that may occur in the future and have an impact on the project's success. Risks can be positive (opportunities) or negative (threats)

Issues refer to problems or challenges that arise during the course of a project. They are typically negative events or circumstances that can hinder progress or impact project objectives.

Assumptions are statements or beliefs that are considered to be true or valid for the purpose of planning and decision-making.

Procurements: Acquiring resources from outside the project team

Constraints are limitations or restrictions that affect project planning and execution.

Leadership vs. Management

Table 3-1. Team Management and Team Leadership Compared

Management	Leadership
Direct using positional power	Guide, influence, and collaborate using relational power
Maintain	Develop
Administrate	Innovate
Focus on systems and structure	Focus on relationships with people
Rely on control	Inspire trust
Focus on near-term goals	Focus on long-range vision
Ask how and when	Ask what and why
Focus on bottom line	Focus on the horizon
Accept status quo	Challenge status quo
Do things right	Do the right things
Focus on operational issues and problem solving	Focus on vision, alignment, motivation, and inspiration

Management: Management focuses on tasks, processes, and operations to ensure efficient execution

It involves planning, organizing, coordinating, and controlling resources

Managers have formal authority and responsibility within the organization

Leadership: Focuses on inspiring and influencing others

It involves setting direction, motivating and empowering individuals

Emotional intelligence (EQ) refers to the ability to recognize, understand, and manage emotions, both in oneself and in others

STEWARDSHIP: The act of taking care of or managing something, includes integrity, trustworthiness, care, and compliance

Authority: the order of having the right, within a given context, to make relevant decisions, establish or improve procedures, apply project resources, expend funds, or give approvals.

Accountability: the condition of being answerable for an outcome. Accountability is not shared.

Responsibility is the condition of being obligated to do or fulfill something. Responsibility can be shared

Value: continuously evaluate and adjust project alignment to business objectives and intended benefits, and value. Value is the ultimate indicator of project success.

SYSTEMS THINKING: A system is a set of interacting and interdependent components that function as a unified whole.

Adaptability is the ability to respond to changing conditions.

Resiliency is the ability to absorb impacts and recover quickly from a setback or failure.

Quality is about meeting the acceptance criteria for deliverables

Project Management Performance Domains

Domains are a group of related activities that are critical for the effective delivery of project outcomes

Stakeholder performance domain -addresses activities and functions associated with stakeholders.

Team Performance Domain: Deals with activities and functions associated with the people who are responsible for creating project deliverables that realize business outcomes.

Outcomes includes:

- Shared ownership
- A high-performing team
- Appropriate leadership and other interpersonal skills

Terms used in this domain made of:

Project Manager: Assigned by the business to lead the team and is responsible for accomplishing the project objectives

Project Management team: People who are directly involved in project management activities

Project Team: A group of individuals performing the work of the project to achieve its purposes

Servant leadership is a method of leadership that is based on understanding and addressing the needs and development of project team members

servant leadership behaviour includes:-

Obstacle removal, Diversion shield, Encouragement and development opportunities

Development Approach and Life Cycle Performance Domain: Deals with activities and functions associated with the development approach, cadence, and life cycle phases of the project.

Delivery cadence refers to the timing and frequency of project deliverables.

Planning Performance Domain: Deals with activities and functions associated with the initial, ongoing, and evolving organization and coordination necessary for delivering project deliverables and outcomes

The purpose of planning is to proactively develop an approach to creating project deliverables

Outcomes include:

- The project moves in an organized, coordinated, and deliberate manner.
- There is a holistic approach to providing the project outcomes.
- Evolving information is elaborated.

- Time spent planning is appropriate. ◦ Planning is sufficient to manage stakeholder expectations.
- There is a process for the adaptation of plans.

Project Work Performance Domain: Deals with activities and functions associated with establishing project processes, managing physical resources, and fostering a learning environment.

Project work is connected with establishing the processes and performing the work done by the project team to deliver the expected deliverables and outcomes.

Project Delivery Performance Domain: Deals with activities and functions associated with delivering the scope and quality that the project was undertaken to achieve

Project delivery is about meeting requirements, scope, and quality expectations to produce the expected deliverable

Measurement Performance Domain: Deals with activities and functions associated with assessing project performance and taking appropriate actions to maintain acceptable performance.

It involves measuring project performance and implementing appropriate responses to keep the project on track

Key Performance Indicators (KPI) - two types of KPIs:

leading indicators - Leading indicators predict changes or trends in the project

Lagging indicators measure project deliverables or events. They provide information after the fact.

Effective Metrics

Use of SMART (Specific, Meaningful, Achievable, Relevant, Timely) criteria.

Uncertainty Performance Domain: -Deals with activities and functions associated with risk and uncertainty

Such As

Risk associated not knowing future events

Ambiguity associated with not being aware of current or future conditions

Complexity associated with dynamic systems having unpredictable outcomes

Initiating

1. **Develop Project Charter:** This is the process of developing a document that formally authorizes the project or a phase and provides the project manager with the authority to apply organizational resources to project activities.

Business Documents contain specific information as to why a project should be initiated. There are two main documents the business case and the benefits management plan

Business Case: Necessary information that determines whether or not the project is worth it or not

Project Charter-Formally authorizes the existence of the project and it assigns the Project Manager and their authority-level

Assumption Log: A list of things that you perceive to be true (assumptions) and things that might constrain the project

Agreements - Service Level Agreements (SLA), Letters of intent, Contract between internal and external customer, Work required to be performed for Payment

2. **Identify Stakeholders:** This involves identifying all people or organizations impacted by the project and documenting relevant information regarding their interests, involvement, and impact on project success.

Salience model: Power: Level of authority Urgency: Immediate attention Legitimacy: How appropriate is their involvement

Directions of Influence:

Upward: Senior management **Downward:** Team members **Outward:** Vendors, government, public, end-users Sideward: peers such as other project managers **Prioritization**

Stakeholder Register Should contain: Contact information, Role on the project, such as sponsor or functional manager, Communication requirements, Expectations of the project How are they affected by the project, Power influence level on the project

PLANNING

1. **Develop Project Management Plan:** Process of defining, preparing, and coordinating all plan components and consolidating them into an integrated project management plan
Provides Guidance on project execution

Only changed when a change request is generated and approved by the **change control board**

Project Management Plan:-Outlines how the project is executed, monitored and controlled, and closed.

Baselines - Scope, Schedule, Cost, Performance Measurement

2. **Plan Scope Management:** The process of creating a scope management plan that documents how the project scope will be defined, validated, and controlled.

Scope Management Plan:- How the scope will be defined, developed, monitored, controlled, and verified

Requirement Management Plan

* How the requirements will be analyzed, documented, and managed.

* Traceability structure to reflect which requirements need to be captured on the traceability matrix

3. **Collect Requirements:** Process of determining, documenting, and managing stakeholder needs and requirements to meet objectives.

Requirement Documentation How individual requirements are to be performed and why each requirement is important to the project

Tools:-

- **Data gathering-** benchmarking
- **Data Analysis:** Analysing documents, agreements, policies, proposals, or business plans

Idea / Mind Mapping - Ideas gathered through brainstorming are mapped together to discover new considerations and conception variations

Affinity Diagrams-large ideas that are grouped and sorted together for further review and analysis

Requirement Traceability Matrix: is a document that helps ensure all project requirements are traced throughout the project lifecycle. Once a requirement is created, a table is created that will link the requirement back to its source. This is used to help manage changes to the project scope

The table is created to track, but is not limited to:

- Who is the original stakeholder that provided the requirement?
- Why was the requirement added?
- Description of the requirement

- Current status of the requirement: completed, in progress, delayed, canceled,
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4. **Define Scope:** This is the process of developing a detailed description of the project and product.

Project Scope Statement: This statement describes in detail the project deliverables and the work that is required to produce those deliverables.

- The greater the level of the scope allows the team the better understanding on how to reach the end state of the project successfully.
- The less detail of the scope statement creates a great chance of project risk, as well as offering the possibility of greater scope creep.

Details should include, but not limited to:

- Product Description, Goals of the project
 - identified risks
 - Project/Product acceptance criteria
 - Project constraints/exclusions
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5. **Create WBS:** This involves subdividing project deliverables and project work into smaller, more manageable components.

WBS Dictionary -A document that details the contents of the WBS

- It provides detailed information on each node of the WBS
- It captures additional qualities about each Work Package in a separate document
- It should include the team member assigned to it, time estimate, cost estimate, account information, work package ID, quality requirements, contract information, Scheduled Milestone, plus detail overall of the task at

WBS Dictionary

Project Name: Phone System Upgrade	Work Package ID: 1.3.1
Work Package Name: Configure Server Software	
Work Package Description: Install a new virtual server. Install the phone server software. Configure the software to support 100 phones and voice mail to email. Ensure all updates are applied to the operating system before installing the phone system software.	
Assigned to: Bob Peterson	Duration: 5 days
Date Assigned: 12/30/2017	Due Date: 1/30/2018
Estimated Cost: \$5,000	Account Code: PSU-882.3

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6. **Plan Schedule Management:** Establishes the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.(Provides guidance and direction on how the project schedule will be managed throughout the project.)

Schedule Management Plan: -how the project schedule will be planned, developed, managed, executed, and controlled throughout the phase or project

Data analysis is a tool that is used in plan schedule management which is used to create the schedule management plan

7. **Define Activities:** process of Identifying and documenting the specific actions to be performed to produce the project deliverables.

Rolling wave planning is a planning technique in which the work to be accomplish in the future is decomposed as the work gets closer

Activity List: A complete list of all scheduled activities that is required to be performed on the project.

Activity Attributes: Any additional information required to execute the Activity list

- Point of contact, location of work being performed
 - Used for scheduling development
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8. **Sequence Activities:** This is the process of identifying and documenting relationships among the project activities(go for start-to-finish)

Precedence Diagramming Method, (PDM)(activities are represented by nodes and are graphically linked):-Graphical representation of all the work that is needed to be perform on the project. This represents the flow of the project. What work packages tie into other work packages, in order as well as durations Simply stated it is work packages relationships to each other

Dependency determination

Mandatory Dependencies (Hard Logic): They are tangible limitations of work packages that are tied together. One work package **MUST** be completed prior to the subsequent work package beginning.

Discretionary Dependencies (Soft Logic) work packages that are tied together but do not have physical limitations. Work packages may work in unison or in tandem. (Discretionary dependencies are when the sequence of activities does not necessarily have to be done in that particular order.)

External Dependencies: Work package relationship between project and non-project activities. Non-project Activities are usually outside the control of the project team

Internal Dependencies: Project Activities are within the control of the team

Tools

A lead is the amount of time a successor activity can be advanced with respect to a predecessor activity. ,in other words, A lead is an overlap between activities, in which case one activity can start before the other activity is done.

A lag directs the delay in the successor work package or activity

Project Schedule Network Diagrams:-(sequence of work) These are system wide drawings which shows the entire project work packages/activities from start to finish. It shows logical relationships as well

- **Relationships**
 - **Finish to Start (The most commonly used)**
 - The start of the successor's work package depends upon the completion of its predecessor work package
 - **Finish to Finish**
 - The completion of the successor work package depends on the completion of the predecessor work package
 - **Start to Start**
 - The start of the successor's work package depends upon the start of its predecessor work package
 - **Start to Finish**
 - The completion of the successor work package depends upon the start of its predecessor work package

9. **Estimate Activity Durations:** The process of estimating the number of work periods needed to complete individual activities with estimated resources.

Tools and Techniques:

- **Expert Judgment:** Input from subject matter experts or those with experience in similar activities can provide valuable insights into how long each activity might take.
- **Analogous Estimating(Top-down Estimating):** Using historical data from similar projects as a basis for estimating durations for current activities. but it gives the least accuracy when it comes to estimating.
- **Parametric Estimating:** Applying statistical relationships between historical data and other variables (like size, weight, or complexity) to estimate activity durations.
- **Three-Point Estimating:** Using optimistic, pessimistic, and most likely estimates to calculate a weighted average, often represented as: $\text{Expected Duration} = (\text{Optimistic} + 4 \times \text{Most Likely} + \text{Pessimistic}) / 6$
- **Group Decision-Making Techniques:** Methods such as brainstorming or Delphi technique to gather and consolidate input from multiple stakeholders.
- **Bottom-Up Estimating** The work has to be very detailed for this type of estimation to take place,takes a very long time to complete, but is highly accurate
- **Duration Estimates** The likely number of work periods required to completed an activity or a work package. It does not have any leads or lags assigned to it. It is just a number
- **Basis of Estimates** How the estimates were developed and their ranges(**Ranges of possible estimate**)
The basis of estimates will have an indication of the confidence level of the final estimate
Cost aggregation is when you aggregate the individual costs of the work packages to find the entire project budget.

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10. **Develop Schedule:** This involves analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model.

Tools

Critical Path Method: Calculate the early start (ES), early finish (EF), late start (LS), and late finish (LF) dates, without requiring any resource limitations. It is used to help determine Lags, Leads, activity relationships, schedule constraints

Critical Chain Method A method of planning and managing projects that puts more emphasis on the resources required to execute project tasks developed

Resource Optimization Techniques A method to flatten the schedule when resources are over-allocated or allocated unevenly

Monte Carlo Simulation (what if scenarios): A method that uses repeated random sampling to obtain numerical results and predict the probability of different outcomes in a process
Crashing (adding resources to a project activity)

- Always adds cost
- May add additional Risk

Fast Tracking(Activates performed in parallel)

- May not always add a cost
- May increase risk due to project rework

Fast tracking is a compression technique in which activities are done in parallel. This technique generally increases the risk on a project but may not increase costs. Crashing is adding more resources to the project to finish it faster and will increase the costs.

Schedule Baseline Original Schedule baseline with any approved changes to the schedule

Schedule data Schedule templates that the team used to calculate durations, assumptions, constraints, or resource requirements

Milestone Chart A list of only key dates in the project. A very high level detail of the status of the project.

Project Calendars identify Project shifts and work days

11. **Plan Cost Management:** Establishing the policies, procedures, and documentation for planning, managing, expanding, and controlling project costs.

Cost Management Plan How costs will be planned, structured and controlled

Value Engineering Aka, **value analysis** is finding a less costly way of doing work. It will look at how to achieve a goal/scope in a less costly way

Cost Type	Explanation
Fixed	Costs that stay same throughout the life of a project . I.E. bulldozer
Variable	Costs that vary on a project. I.E. hourly labor, fuel for bulldozer
Direct	Expenses billed directly to the project. I.E. materials used to construct bldg
Indirect	Costs that are shared & allocated among several or all projects. i.e. mgr's salary.
Sunk	Costs that have been invested into or expended upon the project. Sunk costs are like spilt milk.

12. **Estimate Costs** Developing an approximation of the cost of resources needed to complete project work

types:-

Definitive Estimates: –5% to +10%

Budget Estimates: –10% to +25%

Rough Order of Magnitude Estimates: – 25% to +75

Tools:-

Expert Judgment

- **Analogous Estimating**- Top-down, Past projects, Not very detailed
- **Parametric Estimating** - Statistical relationships between historical data and variables eg:- 8 hour work period, lay 50 cubic feet of concrete, 1 hour work period, paint 32 square feet of drywall
- **Bottom-up Estimating** -Separate estimate for each activity and aggregated up to summary nodes on WBS Greatest Level of specified detail Highly accurate, labor-intensive
- **Pert**, Three point Estimating (Covered in Schedule Management)

Contingency Reserves

Definition: funds set aside for identified and analyzed risks within the project scope.

Purpose: To cover the costs of known risks.

Management: controlled by the project manager.

Budget Inclusion: Included in the project cost baseline.

Management Reserves

Definition: funds set aside for unforeseen risks and unexpected changes outside the project scope.

Purpose: To cover the costs of unknown risks.

Management: controlled by higher-level management.

Budget Inclusion: Not included in the project cost baseline but part of the overall project budget.

13. **Determine Budget:** process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.

Contingency Reserves: The PM determines, manages, and controls the contingency reserves, which will address the cost impact of the remaining or known/unknown risks

Management Reserve: The management determines the funds to cover unknown/ unknown risks to the project

Cost Baseline Includes the cost of all the activities, that are aggregated to work packages. The work packages and the contingency reserves are aggregated into control account. The sum of all control account is the cost baseline

- cost baseline includes all activities + contingency reserves,
- project budget includes cost baseline + management reserves
- typically displayed in S-Curve graph, where x=cost, y=time compares CB with actual cost

14. **Plan Quality Management:** Identifying quality requirements and/or standards for the project and its deliverables, and documenting how the project will demonstrate compliance.

quality metrics -Specifications on how quality will be measure during the control quality process. Such as, error per line of code

Manage quality is a process that ensures the project's deliverables and work processes are meeting the project's quality standards and requirements

Plan Quality Management - Tools

Data Representation

- **Logical Data Model:** A visual representation of the data and you can then use it to identify the best methods to sort and organize it
- **Matrix Diagram** The relationship between two or more groups within the project
Mind Mapping Visually organize data
- **Flowcharts:** A graphical representation of the process and any room for improvements
- **Cost Benefit Analysis** Does the activities, work packages performed cost more then the expected results
- **Cost of Quality, (COQ)** All costs incurred over the life of the product, ensuring it meets quality of the product

Mind mapping is a method used to visually organize information. **A flowchart** can display the sequence of steps the process will follow. **The critical path** method is used to find the minimum duration on a network diagram. An **Ishikawa diagram**, also known as a cause and effect diagram, show reasons for potential flaws.

Conformance or cost of conformance which usually includes prevention costs such as training, equipment, appraisal costs, testing and inspections.

Non-Conformance- Internal and external failure costs, which usuallyincludes prevention costs such as training, equipment, appraisal costs, testing, and inspections.

15. **Plan Resource Management:** The process of defining how to estimate, acquire, manage, and utilize physical and team resources.

Team Charter

- A document that outlines what will be acceptable behavior within the project.
 - Should include things like the general rules of conduct for meetings, decision-making, and one-on-one conversations
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16. **Estimate Activity Resources:** Where you look at each individual activity and determine what and how many resources are needed to accomplish that activity.

Resource Requirements will document the number and types of resources needed to complete each activity. This should be very detailed.

Bottom-Up Estimating Break down the activities in more detail until you can assign the resources. You can then aggregate them back up to the full activity

Resource Breakdown Structure Hierarchical breakdown of resources by their categories and types.

Basis of Estimates How the estimates were created.

17. **Plan Communications Management:** Developing an appropriate approach and plan for project communications based on stakeholder needs and requirements.

Channels = $n(n-1)/2$

N=The number of people on the project

4 Team Members= 6 lines of communication $4(4-1)/2=x$ $6=x$

There are 10 stakeholders on a project, how many channels will the project manager need to analyze? $10(10-1)/2 = 4$

Tools

Informal Written-Email, Memorandums

Formal Written Contracts, Project Documents, Legal Notices

formal verbal-presentations,speeches

Push-mail Blast

Pull-Download information

interactive-Joint Discussions

18. **Plan Risk Management:** Defining how to conduct risk management activities for a project.
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19. **Identify Risks:** The process of identifying individual project risks as well as sources of overall project risk.and documenting them in the risk register and risk report

Should be done throughout the project. Risk changes daily

- **Risk Register - (Individual Project Risks)**-A document used in project management to record identified risks, their characteristics (like likelihood and impact),and planned responses and what categories the risks fall into
- SWOT ANALYSIS
- **Prompt Lists** A predetermined list of risk categories. RBS can be used to used to identity both individual and overall risk

Centralized Information: Consolidates all risk-related information in one place.

Risk Report Sources of overall project risk and summary information on identified individual risk

20. **Perform Qualitative Risk Analysis:** that involves assessing and prioritizing risks based on their probability of occurrence , potential impact and other characteristics.

Done in order to determine which risks are the highest priority on the project.
Creates a ranking

21. **Perform Quantitative Risk Analysis:** Numerically analyzing the effect of identified risks on overall project objectives.

Assigns a value to the risk that have been ranked by qualitative risk analysis

22. **Plan Risk Responses:** Develop options and actions to enhance opportunities and reduce threats to project objectives.

Plan Risk Responses: Tools Strategies for Negative Risk or threats

Escalate-Outside the Project Team Level

Avoid-eliminate the risk entirely

Transfer-transfer ownership to a 3rd party

Mitigate- reduce the probability of the risk event

Accept- Deal with the Risk at hand

Types of contracts

Fixed price-When the buyer pays one flat price (lump sum) for all work in the contract

Use when the scope is well-defined and understood

All risk is with the seller

Firm Fixed Price (FFP): This contract is when the price is fixed and cannot be changed. Fixed Price

Incentive Fee (FPIF): This contract is when the fixed price includes an additional fee for meeting a target set forth in the contract.

Fixed Price Economic Price Adjustment (FP-EPA): This contract is used to adjust the fixed cost over the life of the contract because of economic conditions.

Cost reimbursable-When the buyer pays for the work expenses and then pays the seller a fee for his profit. The risk is with the buyer because the cost overrun of work expense is covered by the buyer

3 Types

- **Cost plus fixed fee (CPFF):** This contract is when the buyer pays the work expense and then a fixed fee to the seller for profit.
- **Cost plus incentive fee (CPIF):** This contract is when the buyer pays the work expense and an additional fee if a target is met, such as finishing two weeks earlier.
- **Cost plus award fee (CPAF):** This contract is when the buyer pays the work expense and pays an award fee that is based on satisfaction of work.

Time and materials-Time and material contract is when the buyer pays for both labor and material. The buyer takes all the risk of cost overrun for both the labor and materials

23. **Plan Procurement Management:** Documenting project procurement decisions, specifying the approach, and identifying potential sellers. (Determines whether to obtain goods and services from outside the project and, if so, what to acquire as well as how and when to acquire it.)

Procurement Management Plan Outlines the activities to be undertaken during the procurement processes

Make contain a prequalified sellers list

Procurement Strategy

Determine how to deliver the deliverables, types of contracts to use, and what phases will be used to complete procurements

Bid Documents

Used to Solicit Proposals from potential sellers

RFI, Request for information

IFB, Invitation for bid

RFP, Request for proposal

RFQ, Request for quote

Procurement Statement of Work

Developed from the Scope Baseline, Lists the needs of the buyer

Allows prospective sellers to determine if they can meet the requirements set forth by the Buyer

24. **Plan Stakeholder Engagement:** Develop approaches to involve project stakeholders based on their needs, expectations, interests, and potential impact on the project.

Stakeholder Engagement Plan How will the team keep the stakeholders engaged on the project What type of communication will be needed to engage them on the project.

Executing

1. **Direct and Manage Project Work:** Performing the work defined in the project management plan It involves managing people and keeping them engaged, improving the processes, requesting changes, and implementing approved changes

Issue Log A record of all the issues/problems you have encountered on the project All issues are described, assigned, prioritized, and addressed.

2. **Manage Project Knowledge:** Using existing knowledge and creating new knowledge to achieve the project's objectives and contribute to organizational learning.

Explicit knowledge can be formally documented and shared, i.e Data ,Documents , Records

Tacit knowledge exists inside the heads of your employees i.e Experience ,thinking

The **sharing of knowledge between stakeholders** on a project. Used to foster project interaction. Sure as: **Networking Workshops Meetings**

Lessons Learned Register Gathered throughout the project, not just at the end

3. **Manage Quality:** Translating the quality management plan into executable quality activities that incorporate the organization's quality policies into the project.

Tools Data Representation

- **Affinity Diagrams** Used to group ideas together
 - **Audits-** Identify all best practices are being executed
Identify all short comings and gaps in the process
 - **Matrix Diagrams** Show the relationship between processes
 - **Cause and Effect Diagrams** Also known as Ishikawa or Fishbone diagrams, it will tell you the causes of defects
- Quality Reports** Report generally includes information about quality issues on the project and recommendations on how to improve the processes being used
- Test and Evaluation Documents** Documents generally take the form of a checklist that can be used when checking the quality of the deliverables
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4. **Acquire Resources:** Obtaining team members, facilities, equipment, materials, supplies, and other resources necessary to complete project work.
Done continuously throughout the project or phase
- Resource Calendars** Shows working shifts for resources. Shows availability.
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5. **Develop Team:** Process of improving abilities, team member communication, and the overall team atmosphere
- Co-Location (Tight Matrix)** Moving the entire team into one physical location, War room
Maybe temporary or long term

Forms of Power

Reward Power - Ability to give rewards

Expert Power - SME (subject matter of experts)

Legitimate(formal power)

Referent- Respect /Personality of the Manager

Punishment- Punish associates when they fail (least desirable)

Herzberg's Two-Factor Theory of Motivation- it focuses on factors that motivate employees and factors that cause dissatisfaction.

Herzberg's Two-Factor Theory of Motivationp-it focuses on factors that motivate employees and factors that cause dissatisfaction.

Theory Z Increased Loyalty at the workplace. Theory emphasizes the well-being of the employees, both at work and outside of work, it encourages steady employment

McClelland 3 need theory-Achievement,Power, Affiliation

6. **Manage Team:** Tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance.
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7. **Manage Communications:** Ensuring timely and appropriate collection, creation, distribution, storage, retrieval, management, monitoring, and the ultimate disposition of project information.
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8. **Implement Risk Responses:** Implementing agreed-upon risk response plans.
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9. **Conduct Procurements:** Obtaining seller responses, selecting a seller, and awarding a contract.
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10. **Manage Stakeholder Engagement:** Communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder involvement.
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Monitoring & Controlling

in almost all monitoring and controlling processes The project manager compares the project management plan with work performance data to determine if the project is in control

1. **Monitor and Control Project Work:** Process of tracking, reviewing, and recording the progress to meet the performance defined in the PM Plan

Takes all the Work Performance Information and creates the Work Performance Reports.

2. **Perform Integrated Change Control:** Reviewing all change requests, approving changes, and managing changes to deliverables, organizational process assets, project documents, and the project management plan.
 - A process where you assess the change's impact on the project
 - Any stakeholder may request a change
 - Should be submitted in written form
 - **Change Control Board** – Group responsible for reviewing, evaluating, approving, deferring, or rejecting changes to the project and for recording and communicating such decisions

Process for making change

1. A stakeholder needs to identify a need for a Change request
2. A written change request is submitted it to the Project Manager
3. The Project Manager assesses the change and looks for any other options for the Change Request. Looks at the impact of the change request
4. The Change request is submitted to the Change Control Board

5. The Change request is either approved or rejected by the Change Control Board
6. If approved, The PM will adjust the Project Management Plan Then manage the project to the new plan
7. If it is not approved, the team goes back to the issue and develops a new change request, repeating step 1

Project Document updates Once a change has been approved or rejected, the project manager should update the change log to reflect the status of the change.

3. **Validate Scope:** Formalizing acceptance of the completed project deliverables.
tools

inspection: Ensures deliverables meet requirements.

Decision Making: Involves selecting actions for project success.

Validate Scope -: Accepted deliverables, change requests, and work performance information are key outcomes affecting project progress and management decisions.

4. **Control Scope:** Process of monitoring the status of the project and product scope and managing changes to the scope baseline.
-

5. **Control Schedule:** Monitoring the status of the project to update project progress and manage changes to the schedule baseline.
-

6. **Control Costs:** Monitoring the status of the project to update the project costs and manage changes to the cost baseline.
-

7. **Control Quality:** Assess performance and ensure the project outputs are complete, correct, and meet customer expectations.

Data Gathering

- **Checklists** ensure that all components of the deliverables are checked correctly
 - **Check sheets** - used to keep a running total or tally
 - **Statistical Sampling**
 - **Questionnaires and Surveys**
 - **Inspection** Inspections are often referred to as audits, walkthroughs or peer reviews. Used to validate defect repairs
-

8. **Control Resources:** How to correctly manage the physical resources on the project as the project is progressing

9. **Monitor Communications:** Ensuring that the information needs of the project and its stakeholders are met.

10. **Monitor Risks:** monitoring the implementation of agreed-upon risk response plans, tracking identified risks, identifying and analyzing new risks, and evaluating risk process effectiveness.

11. **Control Procurements:** Managing procurement relationships, monitoring contract performance, and making changes and corrections as appropriate.

12. **Monitor Stakeholder Engagement:** Monitoring overall project stakeholder relationships and adjusting strategies and plans for engaging stakeholders.

Closing

1. **Close Project or Phase:** Finalizing all activities across all Project Management Process Groups to formally complete the project or phase.

Enterprise Environmental Factors (EEF): Things that impact the project but are not part of the project itself Influence the organization, the project, and its outcome

Organization Process Assets (OPA) Organizations have assets such as information, policies, procedures, documents, or knowledge bases which are called Organizational Process Assets (OPA) to help them achieve their objectives

Kept in some central repository so that they can be used whenever required

Change Request A Proposal to change a document, deliverable, or baseline Can include a request to add or remove work from the scope, finish the project faster, or complete the project more cheaply

Work Performance Data Work performance data is simply raw data It is the status of the work that was done but does not have any analysis applied to it.

Work Performance Report overall status report of the actual project It takes all the work performance information and puts it together into one comprehensive document

BAC = Total Budget Cost for the project

PV = Planned % Complete X BAC

EV = Actual % X BAC

AC = Sum of the cost for the given period

CV = EV - AC

CPI = EV / AC

SV = EV - PV

SPI = EV / PV

EAC = BAC / CPI

ETC = EAC - AC

VAC = BAC - EAC

TCPI = (BAC - EV) / (BAC - AC) for remaining funds

SCHEDULE (SPI)

1=ON THE SCHEDULE

>1=AHEAD

<1=BEHIND

COST(CPI)

1=ON THE BUDGET

>1=UNDER BUDGET

<1=OVER BUDGET

AGILE PRINCIPLES AND MINDSET

Characteristics				
Approach	Requirements	Activities	Delivery	Goal
Predictive	Fixed	Performed once for the entire project	Single delivery	Manage cost
Iterative	Dynamic	Repeated until correct	Single delivery	Correctness of solution
Incremental	Dynamic	Performed once for a given increment	Frequent smaller deliveries	Speed

Agile leverages both aspects of Iterative and incremental

In Agile, **incremental development** delivers small, usable parts of the product in stages, while **iterative development** involves refining and improving the same part of the product through repeated cycles.

Increment: The finished, usable part of the project, such as a new login screen.

Iteration: The time spent working to create that part, such as the two weeks spent developing the login screen.

Agile vs. Traditional Project Management

- Agile builds in increments vs. as a whole
- Agile does planning throughout vs. done all at once
- Agile delivers products over time vs. all at once
- Customers see value faster vs. at the end
- Agile wants changes vs. discouraging change

Agile Mindset

Welcoming change, Working in small value increments, Using build and feedback loops, Learning through discovery, Value-driven development, Failing fast with learning, Continuous delivery, Continuous improvement

The Agile Manifesto Values

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

Individuals & Interactions	over	Processes & tools
Working software	over	Comprehensive documentation
Customer collaboration	over	Contract negotiation
Responding to change	over	Following a plan

CREATED IN 2001 CONTAINS 4 VALUES AND 12 GUIDING PRINCIPLES

Agile Methods

Many agile methodologies

Scrum Extreme Programming (XP)

Kanban Development

Lean Software Development

Scaled Agile (SAFe)

AGILE SCRUM TEAMS

Product Owner - Designated person that represents the customer on the project

Agile Project Manager/Scrum Master – Manages the agile project

Product Backlog - Project requirements from the stakeholders

Sprint Planning Meeting- Meeting done by the agile team to determine what features will be done in the next sprint

Sprint Backlog – Work the team selects to get done in the next sprint

Sprint - A short iteration where the project teams work to complete the work in the sprint backlog, (1-4 weeks typical)

Daily Stand Up Meeting - A quick meeting each day to discuss project statuses, led by the Scrum Master. Usually 15 minutes

Sprint Review – An inspection done at the end of the sprint by the customers

Retrospective – Meeting done to determine what went wrong during the sprint and what when right. Lesson learned for the sprint.

Partial Completed Product - Customers Demo the product and provides feedback. This feedback adjust the next Sprint priorities

Release - Several Sprints worth of work directed to operations for possible rollout and testing

Sprint = Iteration

Scrum -Set of team guidance practices, roles, events, artifacts, and rules

Based on three pillars of **Transparency, Inspection, and adaptation,**

Transparency -Visibility to those responsible for the outcome

Adaptation - Adjusting a process to minimize further issues if an inspection shows a problem or undesirable trend

Inspection -Timely checks on how well a project is progressing toward goals

Looks for problematic deviations or differences from goals

Product Owner -Owns Product vision

Prioritizes features according to market value

Can change features and priorities every Sprint

ScrumMaster -Responsible for facilitating process

Focuses Team and protects them from external interruption

Looks for ways to enhance productivity

Assists Product Owner in leveraging Scrum

Development Team - Small group containing all necessary project skills

Scrum Activities

The Scrum methodology refers to several different types of activities:

1. sprint planning meeting
 2. sprints ◦ Daily stand-up meeting
 3. sprint review meeting
 4. sprint retrospectives.
-

Sprint Planning Meeting

- Used to determine what work will be done in that sprint and how the work will be achieved
 - The **development team** then determines how this functionality will be built and how the team will organize to deliver the sprint goal.
 - Output of this will be the **sprint backlog**. The work to get done in the next sprint
-

Sprints

- A sprint is a timeboxed (time-limited) iteration of 1-4 weeks to build a potentially releasable product
 - Each sprint includes a sprint planning meeting, daily Scrum, the actual work, a sprint review meeting, and the sprint retrospective
 - During the sprint, no changes are made that would affect the sprint
 - The development team members are kept the same throughout the sprint
-

Daily Scrum (or Standup) A 15-minute time-boxed activity for the Development Team to synchronize activities and create a plan for the next 24 hours

Should be held at the same time and place each day

Each team member should answer 3 questions:

1. What did you do yesterday?
2. What will you do today?
3. Are there any impediments in your way?

Sprint Review

- Takes place at the end of the Sprint
 - Designed to gather feedback from stakeholders on what the Team has completed in the sprint
 - team demonstrates work that was completed during the sprint
 - should be time boxed to no more than an hour per week of Sprint
-

Sprint Retrospective Opportunity for the Team to inspect and create a plan for improvements to be done during the next Sprint

Team discusses:

What went well

What went wrong

What to do more

of What to do less of

Scrum Artifacts

- **Product increment** -Part of the product that is complete after each sprint.
The product owner and team needs to agree upon the “**definition of done**” before the team starts working on the product
 - **Product Backlog**-Prioritized list of valuable items to deliver OR Prioritized list of all work that needs to be done to complete the product,
Team and product owner will “groom the backlog”
 - **Sprint Backlog** -List of committed items to be addressed within Sprint OR The sprint backlog is the set of items from the product backlog that were selected for a specific sprint.
It is a highly visible view of the work being undertaken and may only be updated by the development team
-

Definition of Done (DoD) - is a shared understanding of what it means when work is considered done, it should be defined at the beginning of the project, and it applies globally to the project

EXTREME PROGRAMMING(XP)-Software development centric agile method

XP-Core values-simplicity,communication,feedback,courage,respect

XP-Roles-Coach,Customer,Programmers,Testers

XP Practices

Planning Activities (Games):

Collective Code Ownership: Any pair of developers can improve or amend any code

Sustainable Pace: ◦ While periods of overtime might be necessary, repeated long hours of work are unsustainable and counterproductive

The practice of maintaining a sustainable pace of development optimizes the delivery of longterm value

Test-Driven Development (TDD): The team writes tests prior to developing the new code.

Pair Programming: In XP, production code is written by two developers working as a pair to write and provide real-time reviews of the software as it emerges

Refactoring: Remove redundancy, eliminate unused functionality, and rejuvenate obsolete designs

Release Planning: -

- Push of new functionality all the way to the production user
- Customer outlines the functionality required
- Developers estimate difficult build

Iteration Planning:

- Short development cycles within a release (Scrum calls "sprints")
- Conducted at the start of every iteration, or every two weeks
- Customer explains functionality they would like in iteration

Some Basic Terminology Review

Scrum	Extreme Programming (XP)	Definition
Sprint	Iteration	Fixed-length period of time (timebox)
Release	Small Release	Release to production
Sprint/Release Planning	Planning Game	Agile planning meetings
Product Owner	Customer	Business representative to project
Retrospective	Reflection	"Lessons learned"-style meeting
ScrumMaster	Coach	Agile project manager
Development Team	Team	Empowered Cross-Functional team
Daily Scrum	Daily Standup	Brief daily status meeting

Lean Software Development



Seven Wastes of Lean

1. Partially done work
2. Extra Processes
3. Extra features
4. Task switching
5. Waiting
6. Motion
7. Defects

OTHER AGILE METHODS

"Kanban" is a Japanese word meaning "signboard."

Feature-Driven Development -The team will first develop an overall model for the product, then build a list, and plan the work.

Limit WIP- Keeping the amount of work in progress low increases the visibility of issues and bottlenecks

Crystal

It's a customized methodology that are coded by color names.

Crystal Clear is for small teams working on non-critical projects

Crystal magenta is used for larger teams working on more critical work

Scalable Agile Framework (SAFe®) - A framework that implements Scrum at an enterprise level, Deals with big global teams

VALUE-DRIVEN DELIVERY

Valued based prioritization is the one of core practices in agile planning

Features are prioritized on the basis of business value, risk and dependencies

Some of prioritization techniques used:

- Simple Scheme
 - MoSCoW prioritization
 - Monopoly Money
 - 100-point method
 - Dot Voting or Multi-voting
 - Kano Analysis
 - Requirements Prioritization Mode
-

Prioritization Techniques

Simple Scheme

- Priority 1, Priority 2, Priority 3, etc.
- Could be problematic as many items might become the first priority.

MoSCoW prioritization

- Must have
- Should have
- Could have
- Would like to have, but not this time

Dot Voting or Multi-voting

- Each person gets a certain number of dots to distribute to the requirements

Monopoly Money

- Give everyone equal monopoly money
- They then distribute the funds to what they value the most

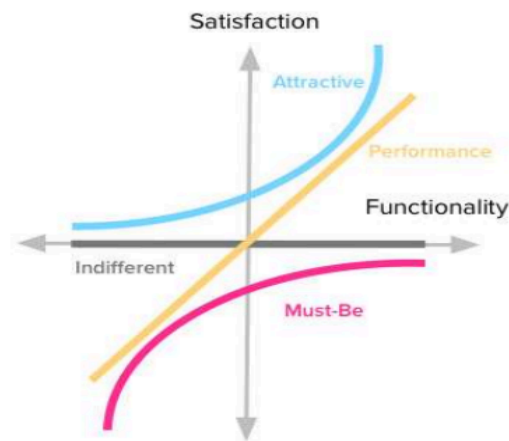
100-point method

- Each person is given 100 points
- They then use that to distribute to individual requirements

Prioritization/Ranking is relative

Kano Analysis

- Helps to understand the customers satisfaction
 - Delighters/Exciters
 - Satisfiers
 - Dissatisfiers
 - Indifferent



Delivering Value Incrementally

Incremental delivery is about deploying working parts of a product over the life of the project

In software development, its first delivered to a testing environment then to production

This will reduce the amount of rework by discovering issues early and fixing them

Minimal Viable Product (MVP)- refers to a set of functionalities that is complete to be useful, but small enough not to be an entire project
Usually a module in a software

Tools for Agile Projects

Low-tech, high-touch over computer models

When using computer models problems could arise such as:

- Data accuracy perception increases
- No stakeholder interaction. Only a few people would update them

Low-Tech, High-Touch Tools

Use card, charts, whiteboards, and walls

Promotes communication and collaboration

Skip using a computer Gantt chart to a Kanban board

Kanban/Task Board

An "information radiator" - ensures efficient diffusion of information

Can be drawn on a whiteboard or even a section of wall

Makes iteration backlog visible

Serves as a focal point for the daily meeting



Educating People about Agile

Teach all the stakeholders about the benefits of agile

Concerns about agile can include:

- Senior management and sponsor: They are worried about the risk of failing
- Managers: fear the loss of control
- Project team: resist agile methods
- Users: will not get all features

Engaging Stakeholders- Short iterations and releases keep them engaged

Keeping them engaged can lead to stakeholders being more involved and getting more change request

if some **stakeholders** are causing **problems**, the agile **PM** will need to use their **interpersonal skills** to **resolve issue**

Set a Shared Vision-Important to ensure customers and agile project team has the same vision

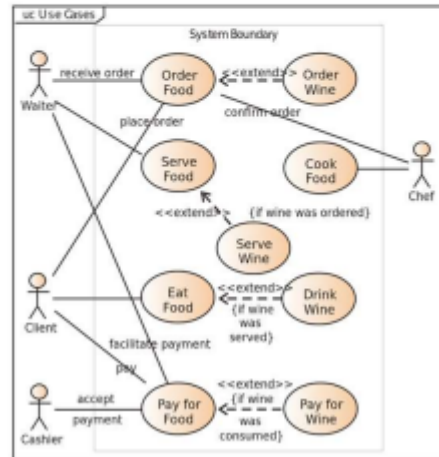
Methods include: - Agile Charter , Definition of "Done"

Agile Modeling- ◦ Use case diagram ,Data models , Screen design , Wireframes , Personas

Agile Modeling

Use case diagrams

- Visually shows how users would use an application



Definition of “Done”

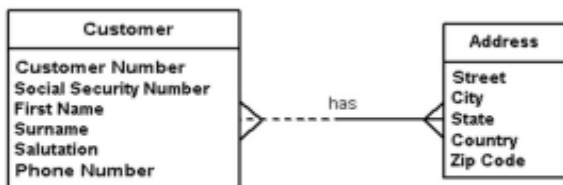
Creating a shared vision of what done looks like

Should be done for:

- User stories
- Releases
- Final project deliverables

Agile Modeling

- Data models
 - How the data are structured in tables and their relationships



Copyright 2002-2006 Scott W. Ambler

Agile Modeling

- Screen designs
 - Simple screen shots



Personas

Wireframes

Wireframes

- Quick mock-up of product
- “low-fidelity prototyping”
- Clarify what “done” looks like
- Validate approach prior to execution

Name: Andrew Jones— Certified Accountant



Description:

Andrew has been an Accountant for over 10 years and has worked at many large accounting firms.

He likes to be organized and get his work done on time.

Value:

Andrew would like to ensure all company bills are paid on time while using online auto payments.

He would like to ensure customers are reminded automatically of outstanding balances.

He is looking to print the receivables and payable reports on a weekly basis to check on bills and invoices.

Personas

Personas

- Quick guides or reminders of key stakeholders and interests
 - Provide description of users
 - Be grounded in reality
 - Be goal-oriented, specific, and relevant
 - Be tangible and actionable
 - Generate focus
- Help team focus on valuable features to users

User personas - a fictional character representing a user type

Communicating with Stakeholders

Two-way communication

- Just don't ask for confirmation or concerns, but actually listen to what they have to say

Knowledge sharing

- Agile teams work closely with each other such as with pair-programming.
- Using Kanban boards or wireframes are ways to share information
- Use of low-tech tools like a whiteboard will allow all to see the work and understand it
- We must encourage it

Communicating with Stakeholders

Information Radiators

- Things that are highly visible
- Used to display information
- Usually includes chats, graphs and boards

Social Media

- Use to communicate
- Can include twitter or Instagram

Conflict Resolution

All projects will have conflicts

While some level of conflicts are good, we need to ensure they don't become a "world war" where people are trying to destroy each other

Levels of conflict(1-5):

- Level 1: Problem to solve – sharing info
- Level 2: Disagreement – Personal Protection
- Level 3: Contest – Must win
- Level 4: Crusade – Protecting one's group
- Level 5: World War – Must destroy the other

What is the primary purpose of an **Information Radiator** in Agile?

To provide real-time information about the project's progress

Participatory Decision Models

Engage stakeholder in decision making process

- Simple voting
 - Vote "for" or "against" it
- Thumbs up/down/sideways
 - People hold their thumbs in a way of if they support it or not. Sideway is if they cannot make up their mind
- Fist of five
 - People how up finger based on they support the idea
 - 1 finger: total support – 5 finger: Stop against it

Team Performance

High-Performance Agile Teams

Have a shared vision

Realist goals

Fewer than 12 members

Have a sense of team identity

Provide strong leadership

Experiments (Have a safe place)

Establish safe environment for
disagreement

Allows team members to build strong
commitment to decisions

Encourage people to experiments with
new methods

Leads to more engagement

Product Owner/Customer Prioritizing the product features

Manage the product backlog ensuring its accurate and up to date

Defines the acceptance criteria

Agile Project Manager (ScrumMaster/Coach) Act as a servant leader

Help the team self-organize and direct themselves Be a facilitator

Building Teams Self-Organizing

Self-Directing

Small teams with fewer than 12 members

Experiments (Have a safe place) -Establish a **safe environment** for disagreement

Allows team members to build strong commitment to decisions

Encourage people to experiments with new methods

Leads to more engagement

Tuckman's Five Stages of Team Development

Models of team development

Shu-Ha-Ri Model of Skill Mastery

- Shu- Obey,
- Ha – Moving away,
- Ri – finding individual paths

Dreyfus Model of Adult Skill Acquisition

- Novice, Advanced Beginner, Competent, Proficient, Expert

1. **Forming:** team comes together and starts to get to know each other. There is not much conflict or communication.
2. **Storming:** team members start to have conflicts with each other. They start to learn of each other's ideas and may not agree with them. Most conflicts takes place in this stage.
3. **Norming:** the team members begin to agree with each other on the best methods to build the deliverables. Generally, everyone is coming to a consensus.
4. **Performing:** the team is performing well and is working without conflict.
5. **Adjourning:** In this stage, the project is completed and the team is reassigned.

Team Spaces

Co-located Teams-All team member work together in the same location Allows for face-to-face time and interaction, should be within 33 feet of each other, , sometimes virtual co-location

Global and Cultural Diversity-Time Zones Cultures Native Languages Styles of communication

Value-Base Analysis and Decomposition

Assessing and prioritizing the business value of work items, and then plan accordingly.

Value-Based Decomposition

Breaks down requirements and prioritized them

Design the product box

Team Space

Lots of low-tech, high touch

- Whiteboards and task boards
- Sticky notes, flip charts
- Round table
- No barriers to face-to-face communication

Caves and Common

- Caves → space team members can retreat to individually
- Common → space team members can work as group

Osmotic Communication

- Information flows that occur as part of everyday conversations and questions
- 33 feet or 10 meters

Tacit Knowledge

- Information that is not written down; supported through collective group knowledge

Distributed Teams

At least one team member working off-site

Need to find ways to replicate co-location team benefits

Agile Tools

- Low-Tech, High-Touch Tools
- Digital Tools for distribute teams
 - Video conferencing
 - Interactive whiteboards
 - IM / VoIP
 - Virtual card walls
 - Web cams
 - Digital cams

Timeboxing

Short, fixed-duration periods of time in which activities or work are undertaken

- If work is not completed within time period, move it to another timebox

Daily Stand-up – 15 minutes

Retrospectives – 2 hours

Sprints – 1-4 weeks

Beware of Parkinson's Law

- Work tends to expand to fill the time given

Three C's of Stories

Have users write the stories on index cards

No details, it's used to help converse

3 Cs:

- Card
- Conversation
- Confirmation

user stories in Agile are brief descriptions of a feature from the end user's perspective, highlighting the value and purpose of the feature. They help ensure that the development team understands the user's needs and context.

User Stories - INVEST

Effective user stories should be "INVEST"

Independent

- Should be independent so it can reprioritize

Negotiable

- Should allow for trade-off's based on cost and function

Valuable

- Should clearly state the value of it

Estimatable

- Should be able to estimate how long to complete

Small

- Stories should be between 4-40 hours of work

Testable

- Should be testable to ensure it will be accepted once completed

Affinity Estimating and T-Shirt Sizing

Affinity Estimating

- Group estimates into categories or collections

T-Shirt Sizing

- Place stories in sizes of t-shirts

Wideband Delphi

Wideband Delphi

- Group-based estimation approach
- Panel of experts, anonymously

It's used to prevent:

- Bandwagon effect
- HIPPO decision making (Highest-Paid Person's Opinion)
- Groupthink

User Story Example

"As an payroll clerk, I want to be able to view a report of all payroll taxes, so that I can pay them on time"

"As a sales person, I want to be able to see a current list of leads, so that I can call them back quickly"

"As student of this course, I want to be able to understand the requirements of the exam, so that I know if I qualify for it or not"

Tracking Team Performance

Planning Poker

Advantages of Wideband Delphi

Fast, collaborative process

Uses cards with Fibonacci sequence

Burn Charts

- Burnup
- Burndown

Velocity Charts

User Story Backlog (Product Backlog)

Prioritize Requirements

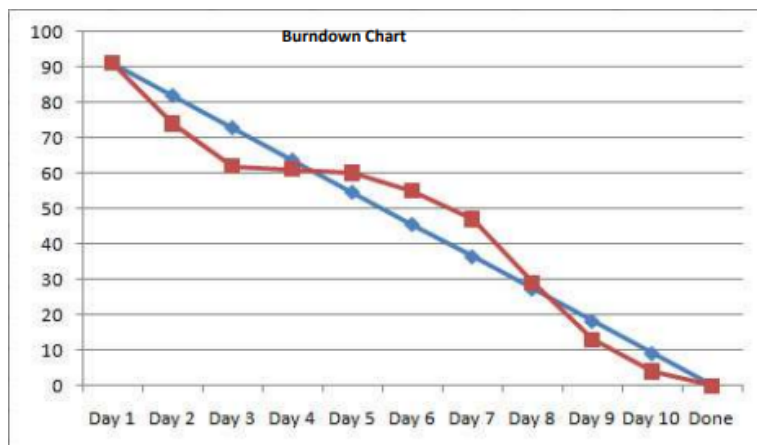
Refining (Grooming) Backlog

- Keeping the backlog updated and accurately prioritized

Planning Poker is used in Agile to estimate the effort or relative size of user stories or tasks. It helps teams gauge how much work is involved in completing each item in their backlog.

Product Roadmap Shows when features will be delivered and what is included in each release

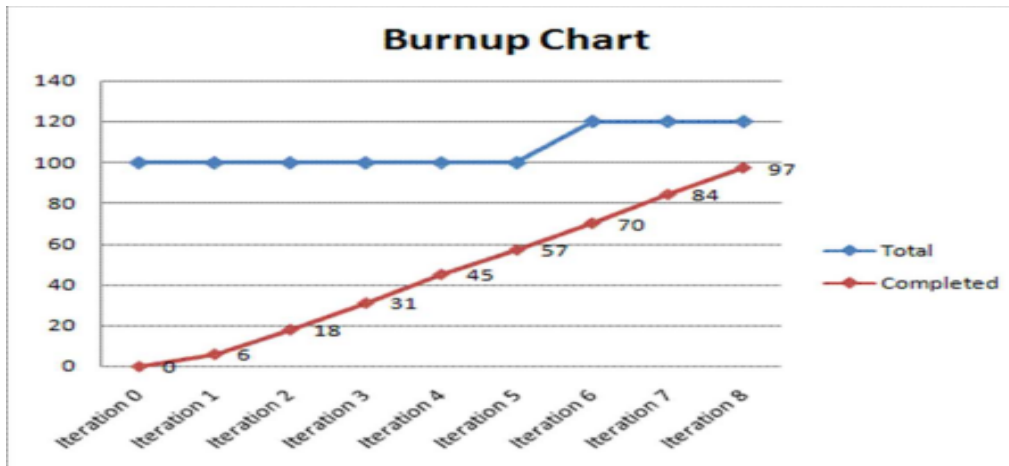
Burn-Down Chart(Work that remains to be done)



A burn-down- chart shows the amount of work remaining to be done versus time

Burn-Up Chart(Work that has been done)

A burn-up chart shows the amount of work completed versus time, as well as the total amount of work. It provides a clearer picture of scope changes over time. Here's what it typically includes:



Velocity chart -shows how teams are performing

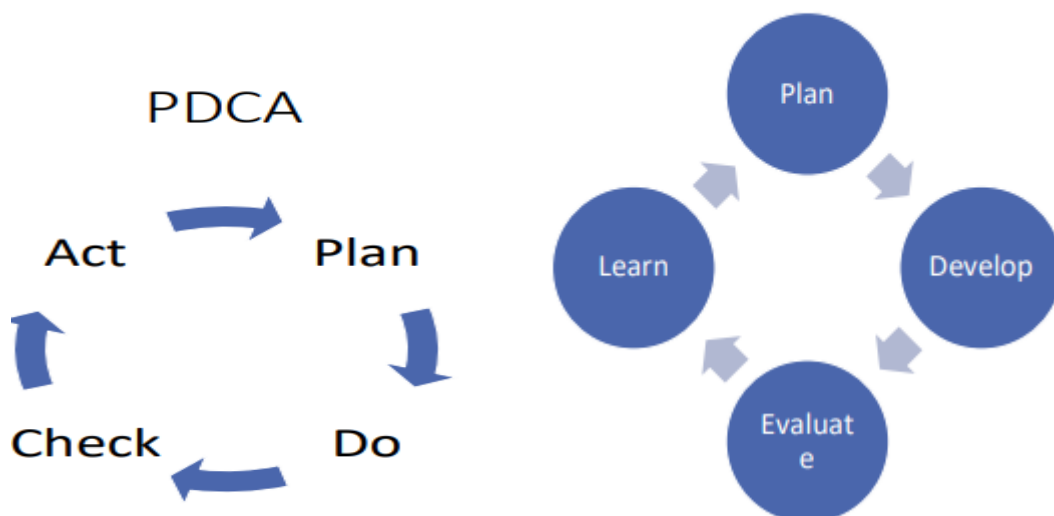
Velocity Charts

If a team has complete 3 iterations with the average velocity of 18 points per iteration, how many iterations would it take to complete 250 points of work?

= $250/18$ = About 14 more iterations.

CONTINUOUS IMPROVEMENT

Agile Cycle



Value Stream Map

Process Analysis

Review and diagnose issues
Look for tailoring possibilities

Optimize the flow of information or materials to complete a process

Reduce waste (waiting times) or unnecessary work

Value Stream Map Example



SMART Goals

Team sets goals that are SMART:

- **S**pecific
- **M**easurable
- **A**ttainable
- **R**elevant
- **T**imely

Characteristics of four life cycles

Characteristics				
Approach	Requirements	Activities	Delivery	Goal
Predictive	Fixed	Performed once for the entire project	Single delivery	Manage cost
Iterative	Dynamic	Repeated until correct	Single delivery	Correctness of solution
Incremental	Dynamic	Performed once for a given increment	Frequent smaller deliveries	Speed
Agile	Dynamic	Repeated until correct	Frequent small deliveries	Customer value via frequent deliveries and feedback

Agile leverage both aspect of Iterative and incremental

Hybrid Method

Hybrid Projects

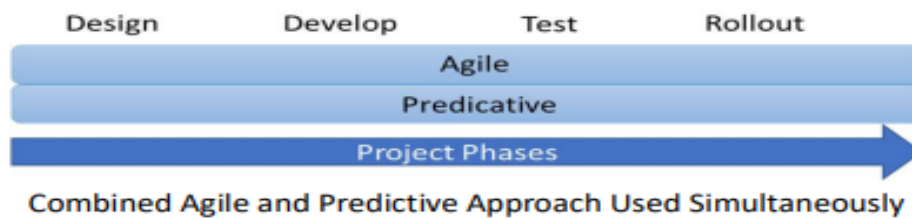
- Uses a combination of traditional (waterfall) methods with agile.
- Can be implemented in a number of different ways.

Hybrid Method 1

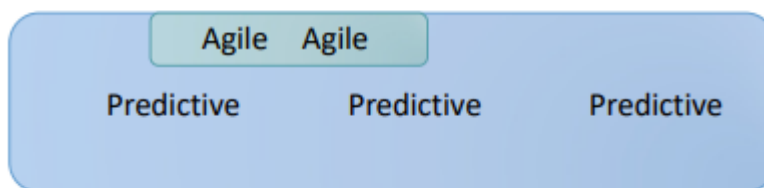


Agile Development followed by a predictive rollout

Hybrid Method 2

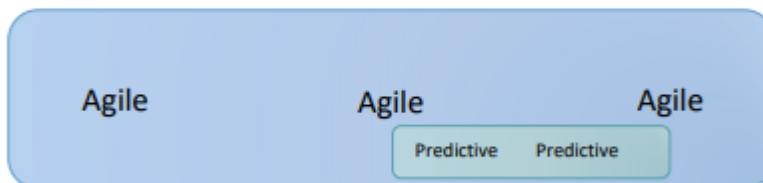


Hybrid Method 3



Predominantly Predictive Approach with some agile

Hybrid Method 4



Predominantly Agile Approach with some Predictive

BUSINESS ANALYSIS

Business analysis is the application of knowledge, skills, tools, and techniques to:

- determine problems and opportunities
- Identify business needs and recommend viable solutions to meet those needs and support strategic decision-making
- Business analysis is conducted in support of solution development, through portfolios, programs, and projects, as well as ongoing operational activities, such as monitoring, modeling, and forecasting
- Business analysis focuses on products, whereas project management focuses on delivering projects to create or evolve products

Business Value -Net quantifiable benefit derived from a business endeavor

A requirement is defined as a condition or capability that is necessary to be present in a product, service, or result to satisfy a business need

Requirements

Types of Product Requirements:

Here are the requirements categories in short:

Business Requirements: High-level needs of the organization, including business issues, opportunities, and goals.

Stakeholder Requirements: Needs of individuals or groups affected by the project.

Solution Requirements: Features and functions of a product to meet business and stakeholder needs.

Transition Requirements: Temporary capabilities needed for moving from the current state to the future state, such as training and data conversion.

Product Lifecycle

- The stages a product goes through from its introduction to its eventual withdrawal from the market.
- Business analysis focuses on products, whereas project management focuses on delivering projects to create or evolve products

BA Process Groups

6 Process Groups

Helps with understanding how business analysis processes are performed

Here are the process groups summarized:

Defining and Aligning Process Group: Assess feasibility, determine scope, and align products and projects with the organization's strategy.

Initiating Process Group: Establish objectives and allocate resources for a portfolio, program, project, or project phase.

Planning Process Group: Identify the best approach for business analysis tasks, adapt to the project life cycle, and assess stakeholder impact.

Executing Process Group: Elicit, analyze, model, define, verify, validate, prioritize, and approve product information like backlogs and requirements.

Monitoring and Controlling Process Group: Evaluate proposed changes, measure performance, and maintain communication with stakeholders.

Releasing Process Group: Decide on and secure approval for the release of a complete or partial solution to an operational team.

BA Knowledge Areas

Six Knowledge Areas:

Here are the six knowledge areas summarized:

Needs Assessment: Determine the need for change by identifying and clarifying problems or opportunities.

Stakeholder Engagement: Identify stakeholders, develop an engagement plan, and understand their needs and constraints.

Elicitation: Gather requirements from stakeholders using various techniques like interviews, surveys, and workshops.

Analysis: Analyze, refine, prioritize, and validate requirements to ensure they are clear and aligned with business needs.

Traceability and Monitoring: Document, trace, and track requirements throughout the project lifecycle to ensure they are met and changes are managed.

Solution Evaluation: Evaluate the solution against requirements to ensure it meets needs, and assess its performance for areas of improvement.

Needs Assessment Processes

- Identify Problem or Opportunity

Tools:

- Benchmarking • Competitive analysis • Interviews • Market analysis • Prototyping

Results:

- Business Need

Assess Current State

Tools:

Elicitation Techniques

• Document Analysis • Interviews • Observations • Questions And Surveys • Process Flows • SWOT Analysis

Results

• Current State Assessment

Determine Future State -Identifying shortcomings in current capabilities and proposing necessary changes to achieve a desired future state that addresses the problem or opportunity being analyzed.

Tools:

• Affinity diagram • Benchmarking; • Capability table • Elicitation techniques • Gap Analysis

Results: • Business goals and objectives

Determine Viable Options and Provide Recommendation -The primary advantages of this process is that it confirms the feasibility of suggested solutions

Tools:

• Benchmarking • Cost-benefit analysis • Elicitation techniques • Group decision-making technique

Results: • Feasibility study results • Recommended solution option

Facilitate Product Roadmap Development -Assist in creating a roadmap that outlines and schedules product features or components for delivery.

Product Roadmap: A perspective of the features and functions to be incorporated into a product, together with the order in which they will be constructed or provided.

Tools: • Facilitated workshops • Product visioning • Story mapping

Results: • Product roadmap •Assemble Business Case •Support Charter Development

Assemble Business Case-This process helps organizations uniformly evaluate programs and projects, enabling decision-makers to determine if a program or project justifies the necessary investment.

Tools: • Facilitated workshops • Document analysis • Product visioning • Story mapping

Results: • Business case • Product scope

Identify Stakeholders- The main advantage of this process is that it aids in determining whose interests need to be considered during business analysis-related activities.

Tools: • Brainstorming • Interviews • Organizational charts • Process flows • Questionnaires and Surveys

Results: • Stakeholder register

Determine Stakeholder Engagement and Communication Approach-Creating suitable strategies for engaging and communicating with stakeholders throughout the product life cycle, based on their needs, interests, and roles in the business analysis process

Tools: • Elicitation techniques • Persona analysis • RACI model • Retrospectives and lessons learned

Results: • Stakeholder engagement and communication approach

Conduct Business Analysis Planning-Conducted to reach consensus on the business analysis activities to be performed and the allocation of roles, responsibilities, and skill sets needed for successful completion

Tools: • Burndown charts • Decomposition model • Estimation techniques • Planning techniques

Results: • Business analysis plan

User stories are utilized by business analysts to capture functional requirements from the user's perspective

Job shadowing allows business analysts to directly observe and understand actual work processes and user needs.

The business case presents the justification for the project, including high-level objectives and anticipated benefits.

While the **business analyst elicits and documents requirements**, it is the **stakeholders who validate them to ensure they meet business needs**.

Competitive is not a recognized type of requirement in the context of business analysis.

Workshops, often referred to as requirement workshops, involve collaborative sessions to gather collective knowledge.

Gap analysis primarily aims to identify discrepancies between the current state (as-is) and the desired future state (to-be).

The Business Analyst is mainly in charge of eliciting, documenting, and validating stakeholder requirements.

While SWOT analysis is a strategic tool used to analyze Strengths, Weaknesses, Opportunities, and Threats, it's **not typically used for gathering requirements**.

Context Diagrams Used to visually show how a business process, other systems, and people interact.

Traceability and Monitoring: Involves creating connections between requirements and other product information to ensure requirements are approved, managed, and that the impact of any changes is evaluated.

Evaluate Solution Performance -Assessing a solution to verify if it delivers the intended business value.

Points to Remember

Once a deliverable has been accepted, the project manager should then **conduct the close project or phase process**. In that process, the project manager will conduct the lessons learned and release or reassign the project team. A project manager should never leave a project without formally closing it.

In Scrum, the **Definition of Done (DoD)** is used to ensure that work meets the required quality standards before it is considered complete. It provides a clear and shared understanding of what it means for work to be done, ensuring consistency and quality across the team.

A **Story Point** in Agile is a way to estimate how much work is needed to complete a task. It's a measure of the task's complexity and effort, not time.

This helps teams plan and understand how much they can do in a certain period.

Sprint Goal is an objective set for the Sprint that can be met through the implementation of Product Backlog

A **Spike** in Agile is a short time for the team to research or explore something unknown to gain knowledge or confidence, make better decisions and reduce risks.

What is the purpose of a **Retrospective Prime Directive**?

the purpose of the Retrospective Prime Directive is to set the tone for open and honest discussion, ensuring a safe and blame-free environment for team reflection.

What is the primary purpose of a **Release Burndown chart**?

To show progress towards completing the release scope

What is a **Sprint 0** in some Agile implementations? An initial Sprint for project setup and planning

Definition of Ready is To set criteria for when a backlog item is ready to be worked on

Three Amigos concept in Agile is a collaborative approach involving perspectives from business (represented by the product owner or business analyst), development (represented by developers), and testing (represented by testers or QA engineers).

What is a **walking skeleton** in Agile development?

A minimal end-to-end implementation of the system

What is the concept of **Fail Fast** in Agile?

Quickly identifying and addressing issues or mistakes

plan schedule management- Decide how you will manage the schedule (rules) by policies and guidelines

schedule management plan-write down those rules (the guidebook)

develop schedule-create the schedule by using time order,resources and controls

Plan scope management -decide how you handle or manage the scope

Scope management plan writes down the rules or documenting the guidelines

Define scope- create a detailed description of what project will deliver/ clearly describe what project will include

validate scope- confirm project deliverable meets the agreed upon criteria

control scope- Monitor and manage the changes to the project scope to ensure it stays on track

School Baseline- approved version of project and it defined the scope of the project

Project Plan	Process Where Made
Scope Management Plan	Plan Scope Management
Requirement Management Plan	Plan Scope Management
Schedule Management Plan	Plan Schedule Management
Cost Management Plan	Plan Cost Management
Quality Management Plan	Plan Quality Management
Resource Management Plan	Plan Resource Management
Communication Management Plan	Plan Communications Management
Risk Management Plan	Plan Risk Management
Procurement Management Plan	Plan Procurement Management
Stakeholder Management Plan	Plan Stakeholder Management
Change Management Plan	Develop Project Management Plan
Configuration Management Plan	Develop Project Management Plan
Scope Baseline	Create WBS
Schedule Baseline	Develop Schedule
Cost Baseline	Determine Budget
Performance Measurement Baseline	Develop Project Management Plan
Project Life Cycle Description	Develop Project Management Plan
Development Approach	Develop Project Management Plan

Data Gathering

brainstroming,interviews, checklists, questionnaires, and surveys,

Focus groups: A focus group is when you bring together subject matter experts to understand their perspectives and how they would go about solving the problem

Data analysis

Alternative analysis: Alternative analysis involves looking at different options or ways to accomplish

something.

Root cause analysis (RCA): A root cause analysis is used to identify the main underlining reason for a particular event.

Variance analysis: Variance analysis is used quite often to find the exact differences between different things.

Trend analysis: Trend analysis involves looking at data over a period of time to see if a particular trend is forming.

Decision Making

voting, multicriteria decision analysis, autocratic decision making

Change Request Proposal to change a document,

The **requirements documentation** includes the project and the product quality requirements. The requirements management plan documents how to manage the project requirements and the **traceability matrix** will show the origin of where the requirements came from.

Quality is a measure of how well a product or service meets the specified standards and satisfies the customer's requirements. High quality is achieved when a product or service is free from defects, deficiencies, and significant variations. Grade does not imply quality but instead distinguishes between items with the same functional use but different technical characteristics or features. All project deliverables should be high quality but not necessarily high grade. The scenario in the question does not call for a high-grade product

Quality is about prevention. The more a defect is prevented, the less inspection will be needed. For example, hiring well-trained programmers would require less inspections of the code

Benchmarking is a systematic process used by organizations to evaluate various aspects of their processes, products, or services in comparison to those of other companies or industry standards

Project Document	Project Document Description	Process Were Created
1. Activity attributes	Detailed information about each individual activity	Define activities
2. Activity list	List of all the activities on the project.	Define activities
3. Assumption log	List of all project assumptions and constraints.	Develop project charter
4. Basis of estimates	Describes how schedule, cost, and resource estimates were developed. Also includes their confidence level and ranges.	Estimate activity duration, estimate costs, estimate activity resources
5. Change log	Lists and describes the status of the change requests that is being processed or have been processed through the perform integrated change control process	Perform integrated change control
6. Cost estimates	Cost of each individual activity	Estimate costs
7. Cost forecasts	A prediction of how much the project will cost when it completes based on the current work.	Control costs
8. Duration estimates	Amount of time needed to complete each activity on the project.	Estimate activity durations
9. Issue log	List of all issues on the project. Could include history type, description, priority, status, and resolution	Direct and manage project work
10. Lessons learned register	List of all lessons learned throughout the project	Manage project knowledge
11. Milestone list	Description of milestones on a project.	Define activities
12. Physical resource assignments	Assignments of the physical resources to the activities or work packages	Acquire resources
13. Project calendars	A calendar view of what takes place on a day-to-day basis on the project.	Develop schedule
14. Project communications	Communicate in on the project by following the communications management plan	Manage communications

15. Project schedule	A detailed breakdown of the work that needs to be done in order to complete the project. Will include a bar chart, milestone chart, and the project schedule network diagram.	Develop schedule
16. Project schedule network diagram	A sequencing diagram that shows the relationships amongst the activities and the sequence they will be performed. But also show the critical path.	Sequence activities
17. Project scope statement	A detailed description of the project or phase deliverables	Define scope
18. Project team assignments	Assignment of the project team members to the work packages or activities	Acquire resources
19. Quality control measurements	Results of the activities done in the “control quality” processes to determine if the quality standards or policies were met.	Control quality

20. Quality metrics	An attribute that will be used to measure the project or to deliverable to verify that it has met the quality requirements and/or standards	Plan quality management
21. Quality report	A report which generally includes information about quality issues on the project and recommendations on how to improve the processes on the project	Manage quality
22. Requirements documentation	Description of all requirements from project stakeholders	Collect requirements
23. Requirements traceability matrix	A table that traces the origin of the requirements.	Collect requirements
24. Resource breakdown structure	Categorization and type of the project resources.	Estimate activity resources
25. Resource calendars	Shows the availability of resources on the project both physical and HR.	Acquire resources
26. Resource requirements	Description of the number and type of resources needed to complete each work package or activity.	Estimate activity resources
27. Risk register	A list of all positive and negative risks on a project, along with responses.	Identify risks
28. Risk report	A description of the overall project risks.	Identify risks
29. Schedule data	The information that is used to create the schedule such as who made it, assumptions, and constraints.	Develop schedule
30. Schedule forecasts	A prediction of when the project may be completed based on the current progress of the work.	Control schedule
31. Stakeholder register	A list of all stakeholders, which can include categorization, impact, and communication requirements	Identify stakeholders
32. Team charter	Guidelines team should follow on a project. Includes values, decision-making process, acceptable behavior, code of conduct, and etiquette.	Plan resource management
33. Test and evaluation documents	Used to help evaluate the project deliverables when completed.	Manage quality

