

# Planning Projects

COMP6204: Software Project  
Management and Secure Development

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# Learning Objectives

- Describe the importance of creating plans to guide project execution
- List several **planning processes** and **outputs** for **project integration and scope management** when using a predictive approach to project management
- Discuss the project integration management planning process and explain the purpose and contents of a project management plan
- Describe the project **scope management planning** processes.

# Learning Objectives

- Explain the purpose and contents of a scope management plan and requirements management plan.
- Discuss different ways to collect project requirements, create a scope statement to define project scope,
- Develop a work breakdown structure (WBS) and a WBS dictionary to clearly describe all the work required for a project
- Discuss integration management planning for an agile/hybrid project
- Describe scope planning for an agile/hybrid project, understand the concepts of themes and epics, and be able to create story cards.

# Introduction

- Many people have heard the following sayings:
  - *If you fail to plan, you plan to fail.*
  - *If you don't know where you're going, any road will take you there.*
  - *What gets measured gets managed.*
- Successful project managers know how important it is to develop, refine, and **follow plans** to meet project goals
- People are more likely to perform well if they know what they are supposed to do and when

# Project Planning Should Guide Project Execution

- Planning is often the most difficult and unappreciated process in project management
- Often, people do not want to take the time to plan well, but **theory and practice** show that good planning is crucial to good execution
- *The main purpose of project planning is to guide project execution*, so project plans must be realistic and useful

# Planning Processes and Outputs for Project Integration and Scope Management

Knowledge area	Planning process	Outputs
Project integration management	Develop project management plan	Project management plan
Project scope management	Plan scope management Collect requirements Define scope Create WBS	Scope management plan Requirements management plan Requirements documentation Requirements traceability matrix Project scope statement Project documents updates Scope baseline Project documents updates

# Project Integration Management

- Project integration management involves coordinating all the project management knowledge areas throughout a project's life span
- The main planning output is a project management plan

# Project Management Plans

- A **project management plan** is a document used to **integrate** and **coordinate** all project planning documents and to help guide a project's **execution, monitoring** and **control**, and closure
- Plans created in the other knowledge areas are subsidiary parts of the overall project management plan and provide more detailed information about that knowledge area
- **Project management plans** facilitate **communication** among stakeholders and provide a baseline for **progress measurement** and project control
  - A **baseline** is a starting point, a measurement, or an observation that is documented so that it can be used for future comparison

# Project Management Plan and Project Documents

Project Management Plan		Project Documents			
1.	Scope management plan	1.	Activity attributes	1.	Quality report
2.	Requirements management plan	2.	Activity list	2.	Requirements documentation
3.	Schedule management plan	3.	Assumption log	3.	Requirements traceability matrix
4.	Cost management plan	4.	Basis of estimates	4.	Resource assignments
5.	Quality management plan	5.	Change log	5.	Resource breakdown structure
6.	Resource management plan	6.	Cost estimates	6.	Resource calendars
7.	Communications management plan	7.	Cost forecasts	7.	Resource requirements
8.	Risk management plan	8.	Duration estimates	8.	Risk register
9.	Procurement management plan	9.	Issue log	9.	Risk report
10.	Stakeholder engagement plan	10.	Lessons learned register	10.	Schedule data
11.	Change management plan	11.	Milestone list	11.	Schedule forecasts
12.	Configuration management plan	12.	Physical resource assignments	12.	Stakeholder register
13.	Scope baseline	13.	Project calendars	13.	Team charter
14.	Schedule baseline	14.	Project communications	14.	Team resource assignments
15.	Cost baseline	15.	Project schedule	15.	Test and evaluation documents
16.	Performance measurement baseline	16.	Project schedule network diagram		
17.	Project life cycle description	17.	Project scope statement		
18.	Development approach	18.	Quality control measurements		
		19.	Quality metrics		

Source: Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)* – Sixth Edition (2017).

# Attributes of Project Management Plans

- Project management plans should be **dynamic, flexible, and receptive to change** when the environment or project changes
- Just as projects are unique, so are project plans.
  - For a small project involving a few people over a couple of months, a **project charter, team contract, scope statement**, and **Gantt chart** might be the only project planning documents needed; *there would not be a need for a separate project management plan*
  - A large project involving 100 people over three years would benefit from having a **detailed project management plan** and **separate plans** for each knowledge area
- It is important to tailor *all* planning documentation to fit the needs of specific projects

# Common Elements in Project Management Plans

- Introduction/overview of the project
- Project organisation
- Management and technical processes (including project lifecycle description and development approach, as applicable)
- Work to be performed (scope)
- Schedule information
- Budget information
- References to other project planning documents

# Sample Project Management Plan (Partial)

## Management Processes

- **Management Review Process:** The project steering committee will meet at least monthly to provide inputs and review progress on this project.
- **Progress Measurement Process:** The project steering committee will review project progress during project review meetings, and they can also review information as needed by viewing reports on the enterprise project management software. Post project progress will also be measured to see if the project met its goals. These goals include reducing the training cost per employee by \$100/person/year and receiving positive results from survey participants on the effectiveness of the training.
- **Change Approval Process:** See Attachment 1 based on corporate standards.
- **Supplier Management Process:** See Attachment 2 based on corporate standards.

# Sample Project Management Plan (Partial)

## Technical Processes

- **Enterprise Project Management Software:** All tasks, costs, resources, issues, and risks will be tracked for this project using our enterprise project management software. Data must be entered on a weekly basis, at a minimum, to provide timely information.
- **Supplier Evaluation:** The project team will coordinate with the purchasing department to follow our standard procedures for selecting and working with suppliers. See Attachment 2 for corporate standards.
- **Productivity Improvement:** The project team will work with the finance and quality assurance departments to develop and implement a system to measure improvements in employee productivity that result from this new training program. The finance department will report on this information annually beginning one year after the first new training course is offered.

# Project Scope Management

- Project scope management involves defining and controlling what work is or is not included in a project
- The main planning tasks include planning scope management, collecting requirements, defining scope, and creating the WBS
- The main documents produced are requirements documents, a requirements management plan, a requirements traceability matrix, and a scope baseline, which is composed of an approved scope statement, a WBS, and a WBS dictionary

# Planning Scope Management

- The purpose of the process of **planning scope management** is to determine how the project scope will be **defined**, **validated**, and **controlled**.
  - **Validation** means formal acceptance of deliverables by the customer and other identified stakeholders
  - In contrast, **verification** (done as part of controlling quality) means the deliverable complies with a **regulation**, **requirement**, **specification**, or imposed condition
- Project teams usually have several meetings with key stakeholders and experts to help them develop a scope management plan and requirements management plan.

# Processes Described in a Scope Management Plan

- Preparing a detailed project scope statement
- Creating, maintaining, and approving the WBS
- Obtaining acceptance of the completed project deliverables
- Controlling how requests for changes to the project scope statement will be processed

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# Collecting Requirements

- The *PMBOK® Guide – Seventh Edition*, defines a **requirement** as “a condition or capability that is necessary to be present in a product, service, or result to satisfy a business need.”
- A **requirements management plan** describes how project requirements will be **analysed, documented, and managed**.

# Sample Requirements Management Plan (partial)

## Requirements Management Plan Version 1.0

### September 30

**Project Name:** Just-In-Time Training Project

#### **Planning, tracking, and reporting requirements**

Information from the Phase I project, the business case, and the project charter will provide valuable information in determining requirements for this project, as will many existing corporate standards and processes. A survey will also be used to gather requirements. All requirements will be documented where appropriate. For example, requirements related to course prerequisites will be documented in course descriptions. Requirements related to facilities, class size, etc. will be documented in the scope statement. Requirements will be tracked by the person in charge of each related deliverable and reported as part of our normal reporting processes (i.e., weekly status reports, monthly review meetings, etc.)

#### **Performing configuration management activities**

Requirements can be introduced by several means, such as existing written requirements, suggestions provided from our survey, or direct suggestions from stakeholders. Appropriate project stakeholders will analyze, authorize, track, and report changes to requirements. The project manager must be informed in advance of potential changes to requirements and be involved in the decision process to approve those changes. Any change that will impact the project's cost or schedule significantly must be approved by the project steering committee.

#### **Prioritizing requirements**

All requirements will be designated as 1, 2 or 3, for mandatory, desirable, or nice-to-have, respectively. Emphasis will be placed on meeting all mandatory requirements, followed by desirable and then nice-to-have requirements.

#### **Using product metrics**

#### **Tracing requirements**

# Requirements Management – A success case

- Emerging Health started using a tool by IBM called Rational *DOORS* to help manage requirements.
- As a result, they saw a 69 percent reduction in the cost of test preparation, testing, and rework in the software development process
- and a 25 percent reduction in the time it took to customise their Clinical Looking Glass application for unique client requirements.

# Tools reduce time to market

- According to McCroskey, “Time to market is always a critical benchmark, but especially so in the fast-paced healthcare industry.
- Because our industry is so competitive, being able to deliver the product faster enhances our reputation and the confidence our customers have in us.
- Faster time to market is vital to our success, and we’ve now achieved that with the more responsive environment Rational *DOORS* has allowed us to establish.”

# Outputs of Collecting Requirements

- *Requirements documents*: text, diagrams, images, tables etc.
- A *requirements traceability matrix (RTM)*, which is a table that lists requirements, various attributes of each requirement, and the status of the requirements to ensure that all of them are addressed

# Sample Requirements Traceability Matrix

Requirement no.	Name	Category	Source	Status
R26	Survey questions	Survey	Project steering committee minutes	Complete. The survey questions were reviewed and approved by the steering committee.
R31	Course evaluations	Assessment	Corporate training standards	In process. The course evaluations have not been created yet.

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# Defining Scope

- Good scope definition is crucial to project success because it
  - Helps improve the accuracy of time, cost, and resource estimates
  - Defines a baseline for performance measurement and project control
  - Aids in communicating clear work responsibilities
- A project **scope statement** describes product **characteristics** and **requirements**, user **acceptance criteria**, and **deliverables**.
- Work that is not included in the scope statement should not be done, and you can explicitly state what is out of scope for the project under a section called ***project exclusions***.

# Sample Scope Statement

## Scope Statement, Version 1.0

August 1

### Project Title: Just-In-Time Training Project

### Product Characteristics and Requirements

This project will produce three levels of courses, executive, introductory, and advanced, in the following subject areas: supplier management, negotiating skills, project management, and software applications (spreadsheets and Web development). Details on each course are provided below:

1. Supplier management training: The Supplier Management Director estimates the need to train at least 200 employees each year. There should be three levels of courses: an executive course, an introductory course, and an advanced course. Course materials should be developed as a joint effort with internal experts, outside training experts, if needed, and key suppliers.

A partnership might be developed to maximize the effectiveness of the training and minimize development costs. Different delivery methods should be explored, including instructor-led, DVD, and Web-based training. About half of employees would prefer an instructor-led approach, and about half would prefer a self-paced course they could take at their convenience.

### Product User Acceptance Criteria

The courses produced as part of this project will be considered successful if they are all available within one year and the average course evaluations for each course are at least 3.0 on a 5.0 scale.

### Project Exclusions

Training related to Six Sigma is not part of this project.

Providing new facilities is not part of this project.

# Sample Scope Statement (continued)

## Deliverables

### ***Project Management-Related Deliverables***

Project charter, project management plan, scope statement, WBS, etc.

### ***Product-Related Deliverables:***

1. Supplier management training:

    1.1. Needs assessment: A survey will be conducted to determine the learning objectives for the executive, introductory, and advanced courses. The corporate online survey software will be used and coordinated with IT and HR. Results will be documented in a detailed report (8-10 pages) and presentation (15-20 minutes long).

    1.2 Research of existing training: A study will be done to identify current training courses and materials available. Results will be documented in a detailed report and presentation.

    1.3. Partnerships: Partnership agreements will be explored to get outside training organizations and suppliers to work on developing and providing training.

    1.4. Course development: Appropriate materials will be developed for each course. Materials could take various formats, including written, video, DVD, or Web-based. Materials should include interactivity to keep learners engaged.

    1.5. Pilot course: A pilot course will be provided for the introductory supplier management course. Feedback from the pilot course will be incorporated into following courses.

# Planning Processes and Outputs for Project Integration and Scope Management

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# Creating the Work Breakdown Structure

- A **work breakdown structure (WBS)** is a deliverable-oriented **grouping** of the work involved in a project that defines the total scope of the project
- The WBS is a document that breaks all the work required for the project into **discrete deliverables**, and groups them into a **logical hierarchy**
- Often shown in two different forms:
  - *Graphical* or chart form
  - *Tabular* or list form

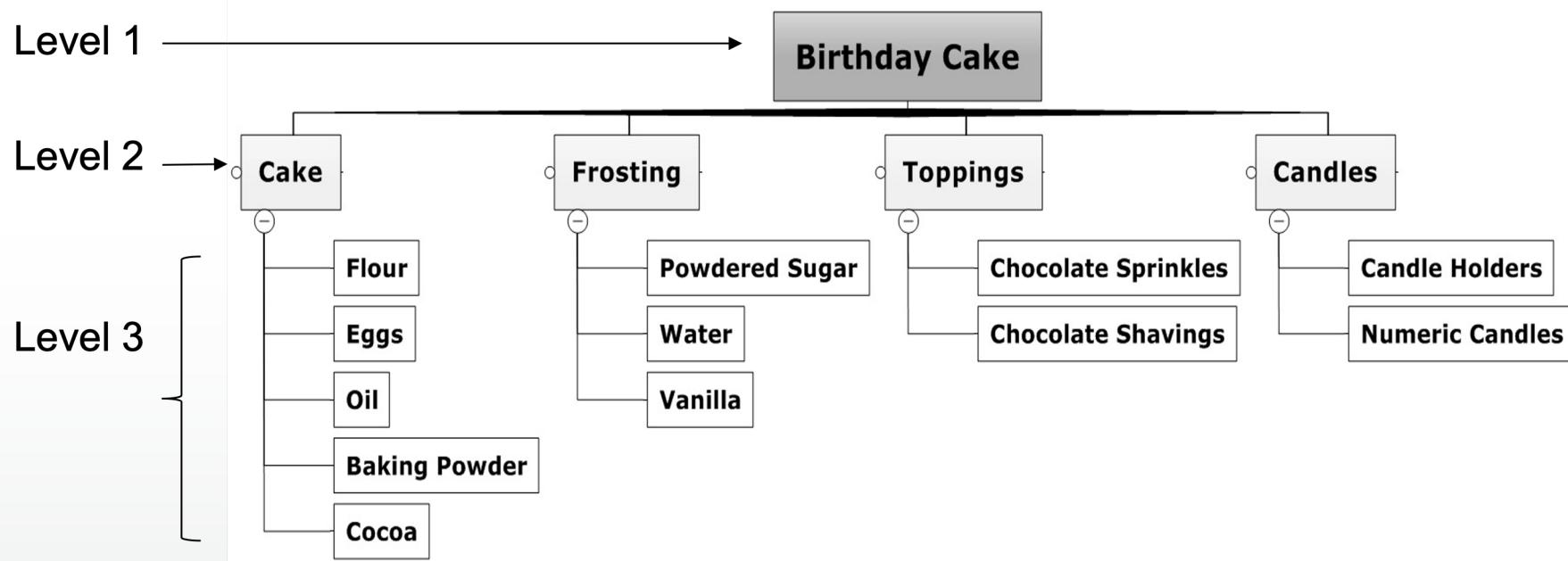
# Work Packages

- A **work package** is a **deliverable** at the lowest level of the WBS
  - it can be appropriately assigned to and managed by a single accountable person
- Each work package should be defined in **enough detail** to estimate what it would **cost** and **how long** it would take to create
- Each work package is part of a **control account**, a management control point for **performance** measurement where **scope**, **budget**, and **schedule** are integrated and compared to the earned value (see Chapter 8 for detailed on earned value)

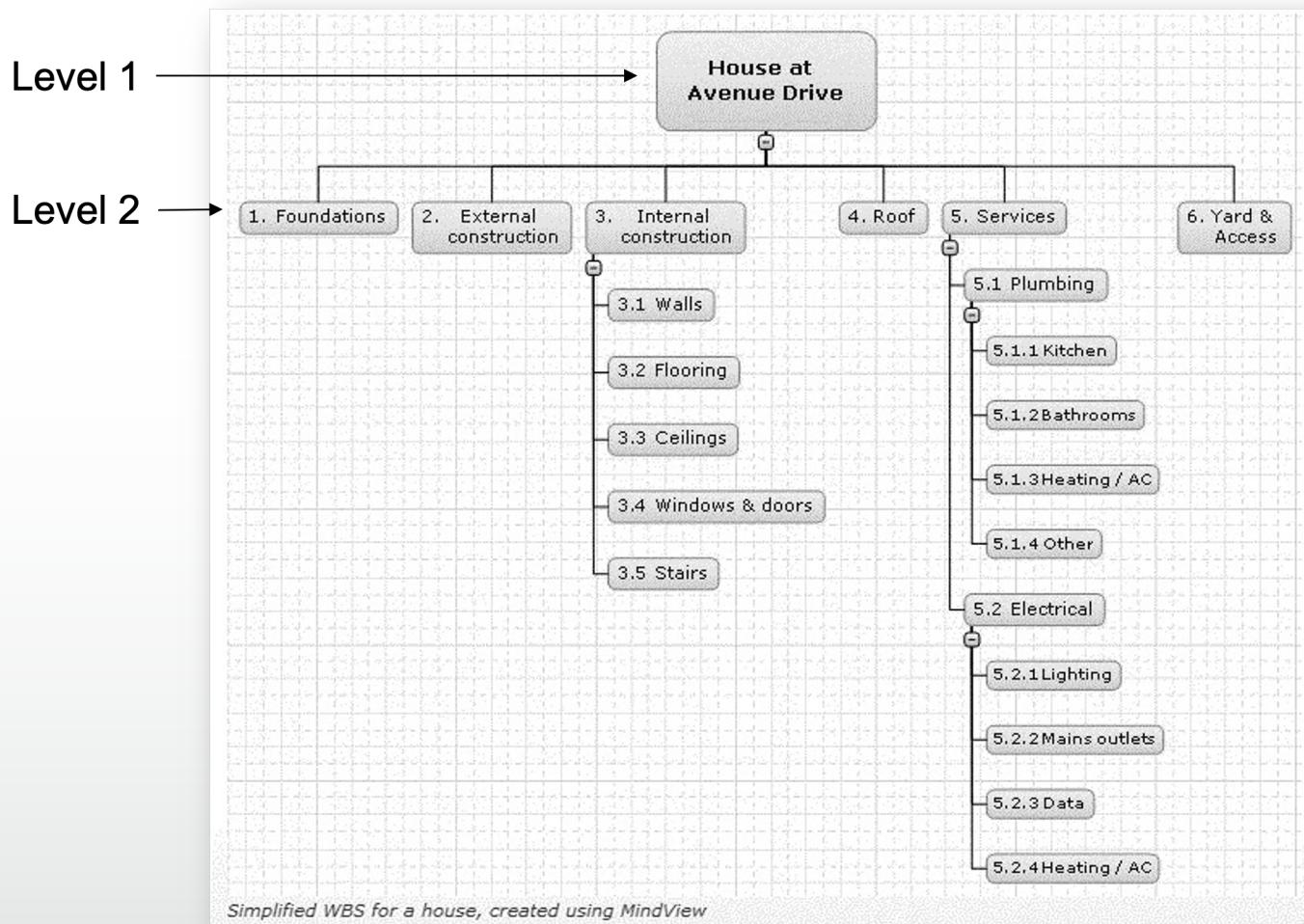
# Importance of a Good WBS

- Foundation document in project management because it provides the **basis** for **planning** and **managing** project **schedules, costs, resources, and changes**
- The WBS contains **100%** of the deliverables (often called “work”) of the project—not **95%**, not **102%**, but **100%**
- Often depicted in a **graphical format**, similar to an organisational chart; can also be shown in **tabular** form as an **indented list** of elements

# WBS for a Birthday Cake



# WBS for a House Showing 6 Main Deliverables ([www.matchware.com](http://www.matchware.com))



## 1.0 Initiating

- 1.1 Stakeholder identification
- 1.2 Project charter
- 1.3 Kick-off meeting

## 2.0 Planning

- 2.1 Team planning meeting
- 2.2 Team charter
- 2.3 Scope statement
- 2.4 WBS
- 2.5 Schedule and cost baseline
  - 2.5.1 Task resources
  - 2.5.2 Task durations
  - 2.5.3 Task dependencies
  - 2.5.4 Draft Gantt chart
  - 2.5.5 Final Gantt chart
- 2.6 Risk prioritization



## 3.0 Executing

- 3.1 Survey
- 3.2 User inputs
- 3.3 Intranet site content
  - 3.3.1 Templates and tools
  - 3.3.2 Articles
  - 3.3.3 Links
  - 3.3.4 Ask the Expert
  - 3.3.5 User Requests feature

- 3.4 Intranet site design
- 3.5 Intranet site construction
- 3.6 Intranet site testing
- 3.7 Intranet site promotion
- 3.8 Intranet site roll-out
- 3.9 Project benefits measurement

## 4.0 Monitoring and Controlling

- 4.1 Progress reports
- 4.2 Change requests

## 5.0 Closing

- 5.1 Final project report
- 5.2 Final project presentation
- 5.3 Lessons learned

JWD Consulting intranet project work breakdown structure  
(WBS)

# WBS - Best Practice

- If you look closely at the WBS examples shown you will notice that there are no **verbs**, as verbs represent **action**, and a *WBS is not about action*, but rather about **deliverables**.
  - As the definition of a WBS has fluctuated over the decades, sometimes you may still come across a definition that shows **activities** on the WBS.
- However, it is **incorrect** to show **activities** on the WBS, according to PMI, so try to consistently use **deliverables** on your WBS.
  - Activities should be shown on the **schedule** and not on the WBS itself.

# WBS - Best Practice

- Several project management software packages use the WBS to create the **activities**, which may also cause some confusion.
- Use your judgment to decide the best way to create a WBS and the wording on it.

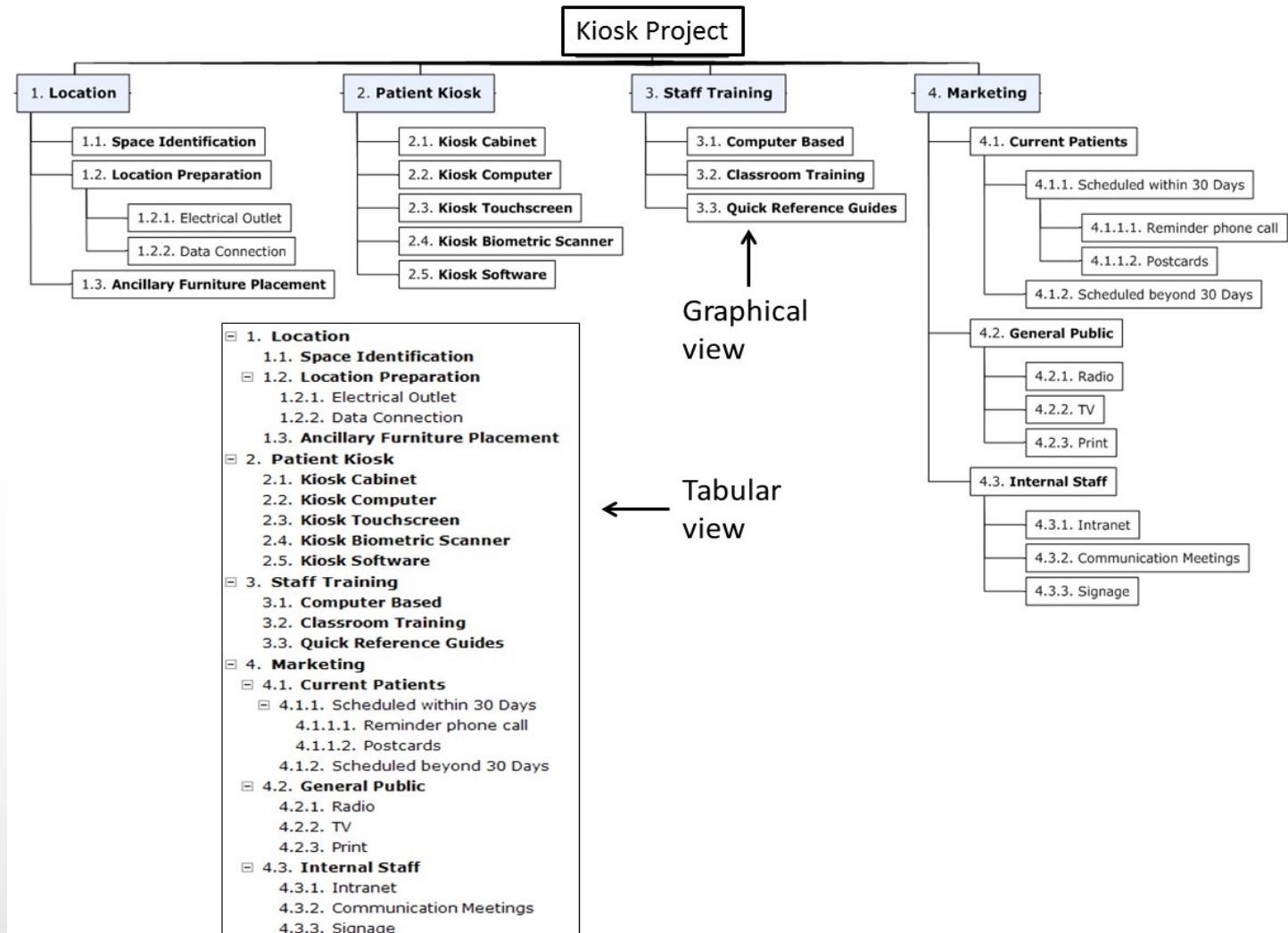
# Creating a Good WBS

- It is difficult to create a good WBS
- The project manager and the project team must decide as a group how to **organise** the work and **how many levels** to include in the WBS
- It is often better to focus on getting the **top levels** of the WBS done well to avoid being distracted by too much detail
- Many people confuse **tasks** on a WBS with **specifications** or think it must reflect **a sequential list** of steps
- You should focus on ***what work needs to be delivered***, not ***when*** or exactly ***how*** it will be done

# WBS for a Kiosk Project

- The next figure shows a WBS in both graphical and tabular views for a project to create a new patient sign-in kiosk for a small physician practice.
- The title of the project is *Kiosk Project*, shown in the top box or **level 1** of the WBS, and the **level 2** deliverables are **location, patient kiosk, staff training, and marketing**.
  - Level 3 deliverables are also included

# WBS for a Kiosk Project - Graphical & Tabular Formats



# Approaches to Developing Work Breakdown Structures

- Because it is so important to create a good WBS, this section describes several approaches you can use to develop them. These approaches include:
  - Using guidelines or templates
  - The analogy approach
  - The top-down approach
  - The bottom-up approach
  - The mind-mapping approach

# Approaches to Developing WBSs – Cont.

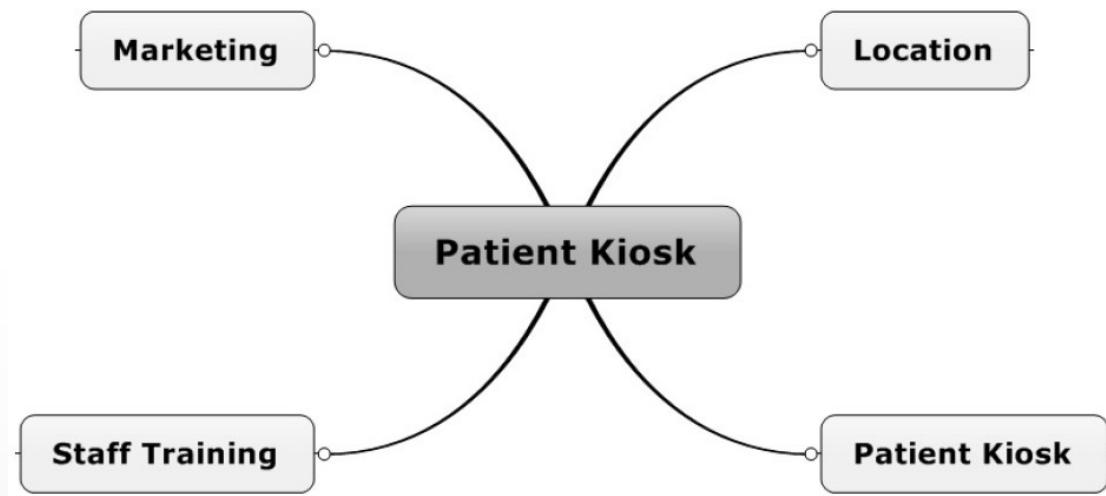
- Using guidelines or templates: Some organisations, like the DOD, provide *guidelines* or *templates* for preparing WBSs
- The *analogy* approach: Review WBSs of similar projects and tailor to your project
- The *top-down* approach: Start with the largest items of the project and break them down
- The *bottom-up* approach: Start with the specific tasks and roll them up

# Mind Mapping

- Some project managers like to use mind mapping to help develop a WBS
- *Mind mapping* is a technique that uses branches radiating out from a core idea to structure thoughts and ideas.
- This more visual, less structured approach to defining and then grouping activities can unlock creativity among individuals and increase participation and morale among teams.
- You can create mind maps by hand, by using sticky notes, using presentation software like PowerPoint, or by using mind-mapping software.

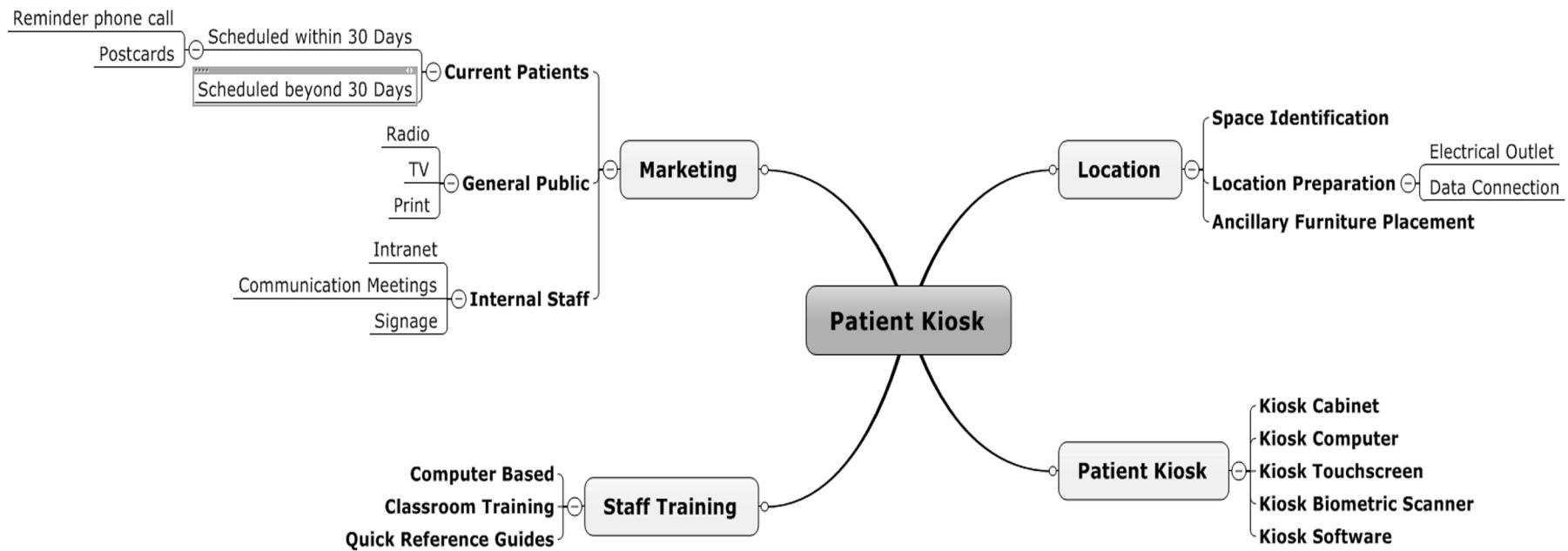
# Mind-mapping diagram for the Kiosk Project

initial mind map

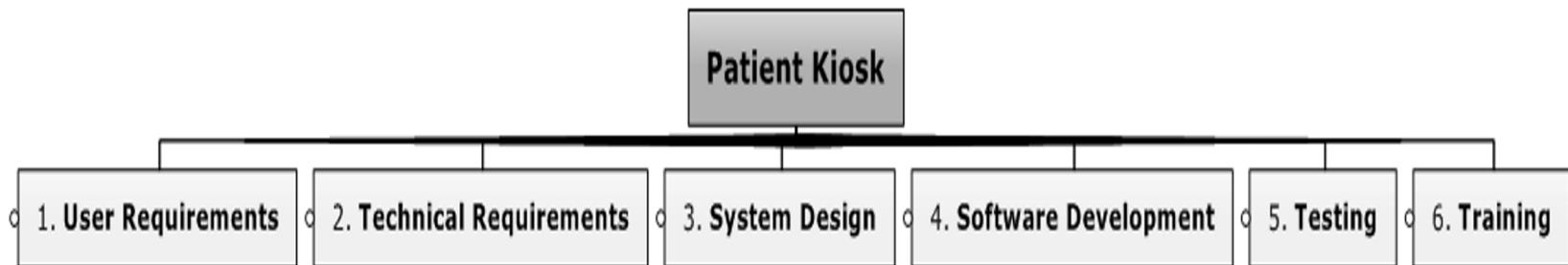


detailed mind map

# Patient Kiosk WBS – Detailed Mind Map



# WBS Showing Workflow or Chronological Order (Somewhat)



# Sample WBS

## Work Breakdown Structure (WBS) for the Just-In-Time Training Project, August 1

1. Initiating
  - 1.1. Stakeholder register
  - 1.2. Project charter
  - 1.3. Assumption log
  - 1.4. Project kickoff meeting
2. Planning
  - 2.1. Project integration management
    - 2.1.1. Project management plan
  - 2.2. Project scope management
    - 2.2.1. Scope management plan
    - 2.2.2. Requirements management plan
    - 2.2.3. Requirements documentation
    - 2.2.4. Requirements traceability matrix
    - 2.2.5. Project scope statement
    - 2.2.6. Scope baseline
  - 2.3. Project schedule management
  - 2.4. Project cost management
  - 2.5. Project quality management
  - 2.6. Project resource management
  - 2.7. Project communications management
  - 2.8. Project risk management
  - 2.9. Project procurement management
  - 2.10. Project stakeholder management

# Sample WBS (continued)

3. Executing
  - 3.1. Course design and development
    - 3.1.1. Supplier management training
      - 3.1.1.1. Needs assessment
      - 3.1.1.1.1. Survey development
      - 3.1.1.1.2. Survey administration
      - 3.1.1.1.3. Survey results analysis
    - 3.1.1.2. Research of existing training
    - 3.1.1.3. Partnerships
      - 3.1.1.3.1. Research on potential partners for providing training
      - 3.1.1.3.2. Meetings with potential partners
      - 3.1.1.3.3. Partnership agreements
    - 3.1.1.4. Course development
      - 3.1.1.4.1. Executive course
      - 3.1.1.4.2. Introductory course
      - 3.1.1.4.3. Advanced course
    - 3.1.1.5. Pilot course evaluation
      - 3.1.1.5.1. Plans for pilot course
      - 3.1.1.5.2. Pilot course
      - 3.1.1.5.3. Report on pilot course
      - 3.1.1.5.4. Presentation on pilot course
    - 3.1.2. Negotiating skills training
    - 3.1.3. Project management training
    - 3.1.4. Software applications training
  - 3.2. Course administration
  - 3.3. Course evaluation
  - 3.4. Stakeholder communications
    - 3.4.1. Communications regarding project and changes to training
      - 3.4.1.1. Documents (Emails, posters, memos, etc.)
      - 3.4.1.2. Meetings
      - 3.4.1.3. Information for the corporate intranet
    - 3.4.2. Communications regarding productivity improvements
4. Monitoring and controlling
5. Closing

# Creating the WBS Dictionary

- A **WBS dictionary** is a document that describes the deliverables on the WBS in more detail
- The format can vary based on project needs
- It may also include **who owns** the work package, **estimated cost** and **schedule** information, **contract** information if outsourced, specific **quality requirements**, **technical** and **performance** requirements, etc.

# Sample WBS Dictionary Entry

**WBS Item Number:** 3.1.1.1.2

**WBS Item Name:** Survey administration

**Requirement Trace:** R12 – Follow corporate policies on surveys

**Responsible person:** TBD

**Estimated Cost:** TBD

**Estimated duration:** TBD

**Resource requirements:** Mike Sundby, department heads, survey expert

**Description:** The purpose of the survey for the supplier management training is to determine the learning objectives for the executive, introductory, and advanced supplier management courses (see WBS item 3.1.1.1.1 for additional information on the survey itself). The survey will be administered online using the standard corporate survey software. After the project steering committee approves the survey, the IT department will send it to all employees of grade level 52 or higher in the purchasing, accounting, engineering, information technology, sales, marketing, manufacturing, and human resource departments. The project champion, Mike Sundby, VP of Human Resources, will write an introductory paragraph for the survey.

Department heads will mention the importance of responding to this survey in their department meetings and will send an e-mail to all affected employees to encourage their inputs. If the response rate is less than 30% one week after the survey is sent out, additional work may be required.

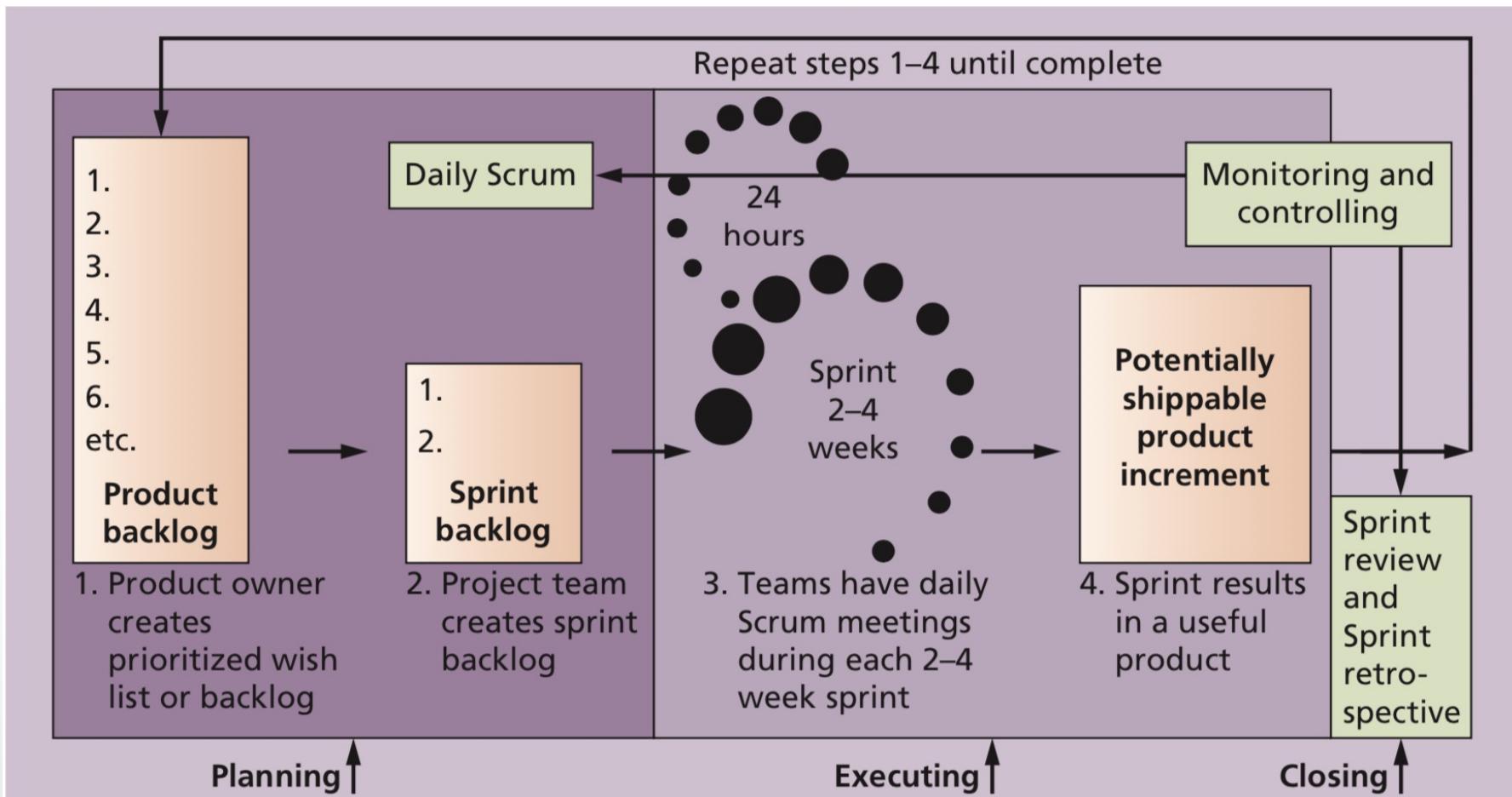
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# Integration Planning for an Agile/Hybrid Project

- Planning for agile projects remains at a high-level for the long-term, but more detailed plans are created for the short-term.
  - Why? Because change is expected, and requirements can change after every iteration.
- Instead of putting detailed plans in writing, agile teams write down only what is **necessary** and have **discussions** to make sure everyone understands what is happening.
  - The **daily Scrum meetings**, the **sprint planning meeting**, the **sprint review**, and **sprint retrospectives** allow for necessary discussions and interactions.

# Scrum framework and the process group



# Scope Planning for an Agile/Hybrid Project

- For **predictive** projects, the scope is defined at the beginning of the project.
- For **agile** projects, the scope is not completely known until the end of the project because the **customer** can **add** and **remove features** from the overall scope **at the start of every iteration**.
- During **backlog refinement** teams *progressively* elaborate and **reprioritise** the work to determine what can be accomplished during that iteration.
- New **features** can be **added** at any time to ensure that projects deliver the most value.

# Themes, Initiatives, Epics and Story Cards

- In agile projects, instead of WBS we can have:
  - *Themes* are *large focus areas* that span the organisation.
  - *Initiatives* are collections of *epics* that drive toward a common goal.
  - *Epics* are large bodies of work that can be broken down into a number of smaller tasks (called *stories*).
  - *Stories*, also called ‘user stories,’ are short requirements or requests written from the *perspective* of an *end user*.

# MoSCoW Prioritisation Method

In Agile, it is important to prioritise requirements as well.



Must have: Non-negotiable product needs that are mandatory for the team.



Should have: Important items that add significant value.



Could have: Nice to have items that will have a small impact if not provided.



Will not have: Items that are not a priority for this specific time frame.

# Story Cards

- *Story cards* contain information about **user stories** written on an **index card** or typed in software to facilitate planning and discussion.
- Stories should use the INVEST rule and be:
  - **Independent**: Can be completed on its own
  - **Negotiable**: One or two sentences long. Details can be worked out through discussion
  - **Valuable**: Provide value to the customer
  - **Estimable**: A good approximation
  - **Small**: Can be completed within one iteration
  - **Testable**: Know when it is complete

# Story Cards

- Story cards should include the following:
  1. **Title:** A concise name for the task that the team can see and understand.
  2. **Value statement:** The user story, emphasizing the stakeholder and benefit of the task.
  3. **Basic requirements:** A sentence or two describing expectations.
  4. **Size or estimation.** The size could be small, medium, large, etc., or use another estimating approach, described in more detail in Chapter 5.
  5. **Acceptance criteria.** A benchmark that must be met to consider the user story complete.

# Sample epic broken down into user stories

**Epic:** As a hiring manager, I want to hold a “hiring days” event both face-to-face and virtual, so that I can meet, review, and hire people quickly.

**User story 1:** As a hiring manager, I want to hold a 2-day face-to-face hiring event at Global Construction Headquarters within the next two months, so that I can meet, review, and hire people quickly for meeting staffing needs at the HQ.

**User story 2:** As a hiring manager, I want to hold a 2-day virtual hiring days event every month starting in two months, so that I can meet, review, and hire people quickly to meet various staffing needs throughout the company.

**User story 3:** As a potential employee, I want to filter open positions online by various requirements, so that I can decide which ones to apply for.

# Sample Story Cards

<p><b>Front of Card User Story 1</b></p> <p><b>Title:</b> Physical hiring event</p> <p><b>Value statement:</b> As a hiring manager, I want to hold a 2-day face-to-face hiring event at Global Construction Headquarters within the next two months, so that I can meet, review, and hire people quickly for meet staffing needs at the HQ.</p> <p><b>Requirements:</b> Event will be from 8-5 on Friday and Saturday and have capacity for 100 people per hour.</p>	<p><b>Back of Card User Story 1</b></p> <p><b>Acceptance Criteria:</b></p> <p>I know I am done when:</p> <p>The dates are set.</p> <p>The facilities are booked.</p> <p>Data is communicated to other teams.</p> <p>Hiring managers are scheduled.</p> <p>Refreshments are ordered.</p> <p>Signage is provided onsite.</p> <p><b>Estimate:</b> L</p>
<p><b>Front of Card for User Story 3</b></p> <p><b>Title:</b> Filter positions</p> <p><b>Value statement:</b> As a potential employee, I want to filter open positions online by various requirements, so that I can decide which ones to apply for.</p> <p><b>Requirements:</b> Provide several categories such as education requirements, years of experience, specific skills needed, location, etc.</p>	<p><b>Back of Card User Story 3</b></p> <p><b>Acceptance Criteria:</b></p> <p>I know I am done when:</p> <p>Open positions are posted.</p> <p>Categories for filters are completed.</p> <p>Testing is completed.</p> <p><b>Estimate:</b> M</p>

# Chapter Summary

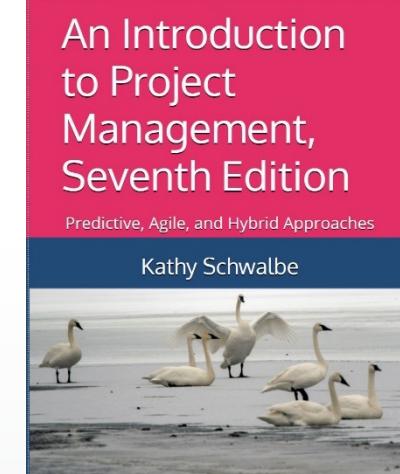
- Planning for **integration management** for predictive projects includes developing a *project management plan*.
  - Plans in the other knowledge areas are considered to be subsidiary parts of the project management plan.
- Planning processes for **scope management** include planning **scope management**, **collecting requirements**, **defining scope**, and creating a WBS
- Approaches for developing a WBS include:
  - using guidelines or templates, an analogy approach, a top-down approach, a bottom-up approach, and mind mapping.

# Chapter Summary

- A **WBS dictionary** provides more detail on WBS items
- When using an **agile** approach to project management, planning remains at a high-level for the long-term, but more detailed plans are created for the short-term.
- Teams refine the product backlog during sprint planning for each iteration and often break *epics* into ***user stories***.
  - Teams can use story cards to document requirements.

# Reference

Chapter 4:  
Planning Projects,  
Part 1 (Integration and Scope  
Management)



# Project Planning – An Example

# Opening case

- Erica Bell is in charge of the Project Management Office (PMO) for her consulting firm, JWD Consulting, which has grown to include more than 200 full-time consultants and even more part-time consultants. JWD Consulting provides a variety of consulting services to assist organizations in selecting and managing IT projects. The firm focuses on finding and managing high-payoff projects and developing strong metrics to measure project performance and benefits to the organization after the project is implemented. The firm's emphasis on metrics and working collaboratively with its customers gives it an edge over many competitors.
- Joe Fleming, the CEO, wanted his company to continue to grow and become a world-class consulting organization. Because the core of the business is helping other organizations with project management, he felt it was crucial for JWD Consulting to have an exemplary process for managing its own projects. He asked Erica to work with her team and other consultants in the firm to develop several intranet site applications that would allow them to share their project management knowledge. He also thought that the firm should make some of the information available to the firm's clients. For example, the firm could provide project management templates, tools, articles, links to other sites, and an Ask the Expert feature to help build relationships with current and future clients. Because JWD Consulting emphasizes the importance of high-payoff projects, Joe also wanted to see a business case for this project before proceeding.

# Project Planning

- The main purpose of project planning is to guide execution
  - Every knowledge area includes planning information (see Table below)
- Key outputs included in the JWD project
  - Team contract
  - Project scope statement
  - Work breakdown structure (WBS)
  - Project schedule, in the form of a Gantt chart with all dependencies and resources entered
  - List of prioritized risks (part of a risk register)
- See sample documents

# Planning processes and outputs

Knowledge Area	Planning Process	Outputs
<b>Project Integration Management</b>	Develop project management plan	Project management plan
<b>Project Scope Management</b>	Plan scope management	Scope management plan Requirements management plan
	Collect requirements	Requirements documentation Requirements traceability matrix
	Define scope	Project scope statement Project documents updates
	Create WBS	Scope baseline Project documents updates
<b>Project Schedule Management</b>	Plan schedule management	Schedule management plan

# Planning processes and outputs – Cont.

Knowledge Area	Planning Process	Outputs
	Define activities	Activity list Activity attributes Milestone list Change requests Project management plan updates
	Sequence activities	Project schedule network diagrams Project documents updates
	Estimate activity durations	Activity duration estimates Basis of estimates Project documents updates
	Develop schedule	Schedule baseline Project schedule Schedule data Project calendars Project management plan updates Project documents updates
<b><i>Project Cost Management</i></b>	Plan cost management	Cost management plan

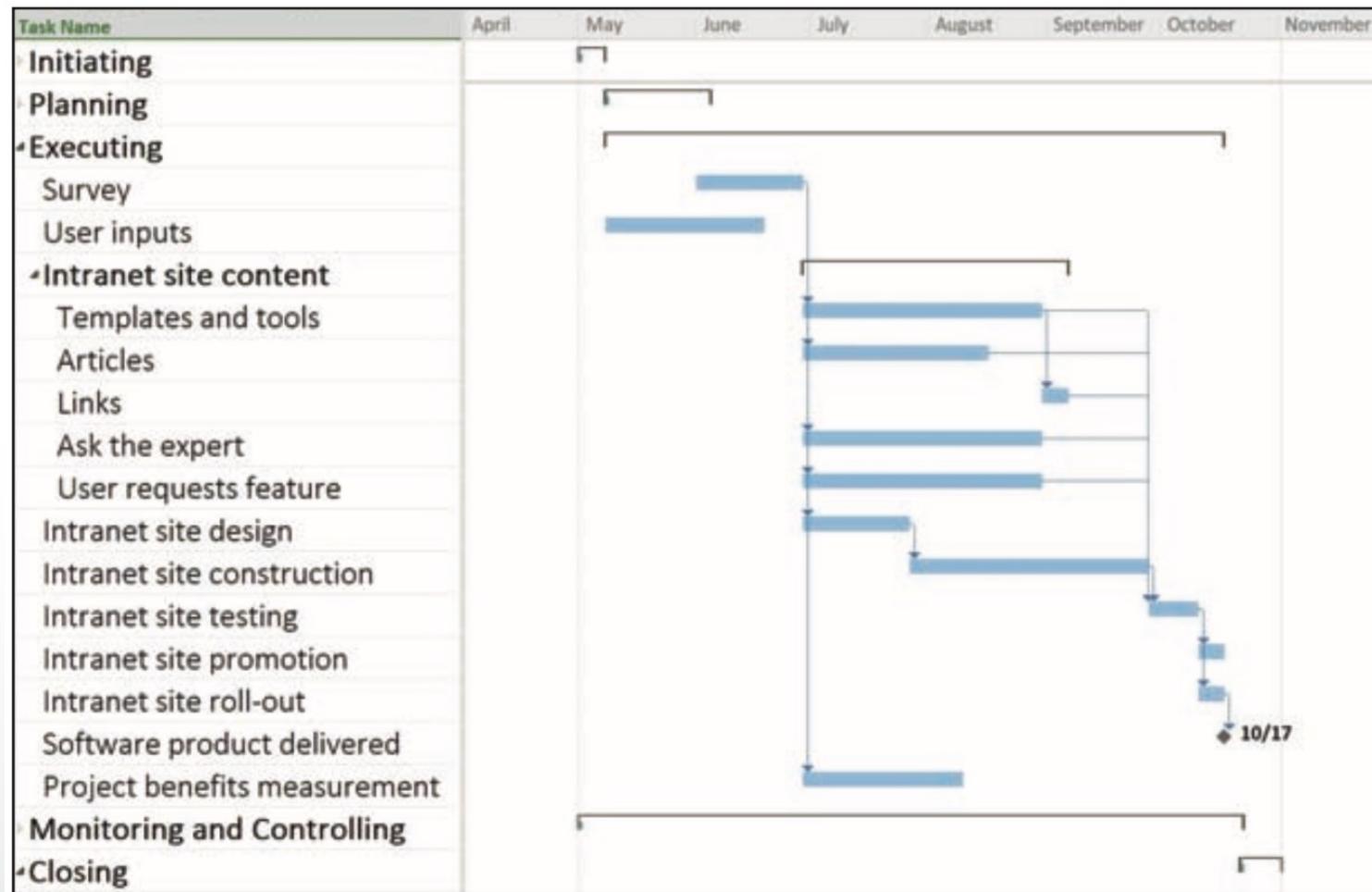
# Planning processes and outputs – Cont.

Knowledge Area	Planning Process	Outputs
<b><i>Project Cost Management</i></b>	Plan cost management	Cost management plan
	Estimate costs	Cost estimates Basis of estimates Project documents updates
	Determine budget	Cost baseline Project funding requirements Project documents updates
<b><i>Project Quality Management</i></b>	Plan quality management	Quality management plan Quality metrics Project management plan updates Project documents updates
<b><i>Project Resource Management</i></b>	Plan resource management	Resource management plan Team charter
	Estimate activity resources	Project document updates Resource requirements Basis of estimates Resource breakdown structure Project documents updates
<b><i>Project Communications Management</i></b>	Plan communications management	Communications management plan Project management plan updates Project documents updates

# Planning processes and outputs – Cont.

Knowledge Area	Planning Process	Outputs
<b><i>Project Risk Management</i></b>	Plan risk management	Risk management plan
	Identify risks	Risk register Risk report
	Perform qualitative risk analysis	Project documents updates Project documents updates
	Perform quantitative risk analysis	Change requests Project management plan updates
	Plan risk responses	Project documents updates
<b><i>Project Procurement Management</i></b>	Plan procurement management	Procurement management plan Procurement strategy Bid documents
		Procurement statement of work Source selection criteria
		Make or buy decisions Independent cost estimates
		Change requests Project documents updates
		Organizational process assets updates
<b><i>Project Stakeholder Management</i></b>	Plan stakeholder engagement	Stakeholder engagement plan

# Project Planning



JWD Consulting intranet site project baseline Gantt chart

# Project Planning - List of prioritised risks

Ranking	Potential Risk
1	Lack of inputs from internal consultants
2	Lack of inputs from client representatives
3	Security of new system
4	Outsourcing/purchasing for the article retrieval and Ask the Expert features
5	Outsourcing/purchasing for processing online payment transactions
6	Organizing the templates and examples in a useful fashion
7	Providing an efficient search feature
8	Getting good feedback from Michael Chen and other senior consultants
9	Effectively promoting the new system
10	Realizing the benefits of the new system within one year

# Project Execution

- Usually takes the most resources to perform
  - Project managers must use their leadership skills to handle the many challenges that occur during project execution
- Table 3 -11 lists the knowledge areas, executing processes, and outputs of project execution
  - Many project sponsors and customers focus on deliverables related to providing the products, services, or results desired from the project
  - It is equally important to document change requests and update planning documents
- A milestone report can help focus on completing major milestones

# Best Practice

- One way to learn about best practices in project management is by studying recipients of PMI's Project of the Year award
  - The Quartier international de Montreal (QIM), Montreal's international district, was a 66 -acre urban revitalisation project in the heart of downtown Montreal
  - This \$90 million, five-year project turned a once unpopular area into a thriving section of the city with a booming real estate market and has generated \$770 million in related construction

# Project Monitoring and Controlling

- Involves measuring progress toward project objectives, monitoring deviation from the plan, and taking correction actions
  - Affects all other process groups and occurs during all phases of the project life cycle
- Outputs include performance reports, change requests, and updates to various plans
- See Table Below

Knowledge Area	Monitoring and Controlling Process	Outputs
<i>Project Integration Management</i>	Monitor and control project work	Work performance reports Change requests Project management plan updates Project documents updates
	Perform integrated change control	Approved change requests Project management plan updates Project documents updates
<i>Project Scope Management</i>	Validate scope	Accepted deliverables Work performance information Change requests Project documents updates
	Control scope	Work performance information Change requests Project management plan updates Project documents updates
<i>Project Schedule Management</i>	Control schedule	Work performance information Schedule forecasts Change requests Project management plan updates Project documents updates
<i>Project Cost Management</i>	Control cost	Work performance information Cost forecasts Change requests Project management plan updates Project documents updates
<i>Project Quality Management</i>	Control quality	Quality control measurements Verified deliverables Work performance information Change requests Project management plan updates Project documents updates
<i>Project Resource Management</i>	Control resources	Work performance information Change requests Project management plan updates Project documents updates

# Project Closing

- Involves gaining stakeholder and customer acceptance of the final products and services
  - Even if projects are not completed, they should be closed out to learn from the past
- Outputs may include project files and lessons-learned reports
  - Also may include a final report and presentation

# A Case Study

- JWD Consulting's Project Management Intranet Site (Agile Approach)
- An agile project team typically uses several iterations or deliveries of software instead of waiting until the end of the project to provide one product
  - Teams do not normally make a snap decision about whether to manage a project using an agile approach or not

# Scrum – Roles

- **Product owner:** person responsible for the business value of the project and for deciding what work to do and in what order, as documented in the product backlog
- **Scrum Master:** person who ensures that the team is productive, facilitates the daily Scrum, enables close cooperation across all roles and functions, and removes barriers that prevent the team from being effective
- **Scrum team or development team:** cross-functional team of five to nine people who organise themselves and the work to produce the desired results for each sprint, which normally lasts two to four weeks

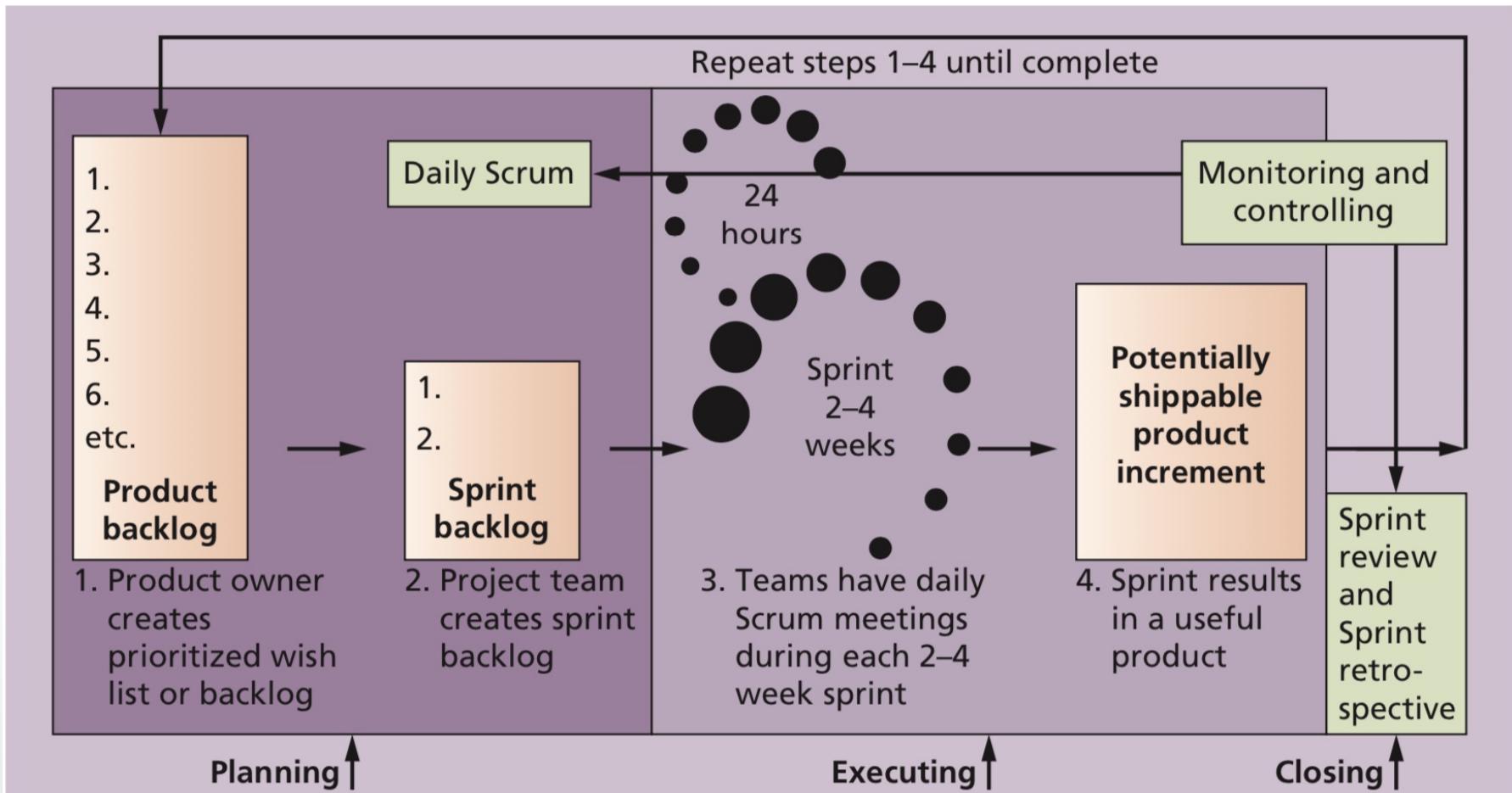
# Scrum – Artifacts

- An **artifact** is a useful object created by people
- Scrum artifacts
  - **Product backlog**: list of features prioritised by business value
  - **Sprint backlog**: highest-priority items from the product backlog to be completed within a sprint
  - **Burndown chart**: shows the cumulative work remaining in a sprint on a day-by-day basis

# Scrum – Ceremonies

- **Sprint planning session:** meeting with the team to select a set of work from the product backlog to deliver during a sprint
- **Daily Scrum:** short meeting for the development team to share progress and challenges and plan work for the day
- **Sprint reviews:** meeting in which the team demonstrates to the product owner what it has completed during the sprint
- **Sprint retrospectives:** meeting in which the team looks for ways to improve the product and the process based on a review of the actual performance of the development team

# Scrum framework and the process group



# Unique Scrum activities by process group

## Initiating:

- Determine roles.
- Decide how many sprints will compose each release and the scope of software to deliver.

## Planning:

- Create product backlog.
- Create sprint backlog.
- Create release backlog.
- Plan work each day in the daily Scrum.
- Document stumbling blocks in a list.

## Executing:

- Complete tasks each day during sprints.
- Produce a shippable product at the end of each sprint.

## Monitoring and Controlling:

- Resolve issues and blockers.
- Create and update burndown chart.
- Demonstrate the completed product during the sprint review meeting.

## Closing:

- Reflect on how to improve the product and process during the sprint retrospective meeting.

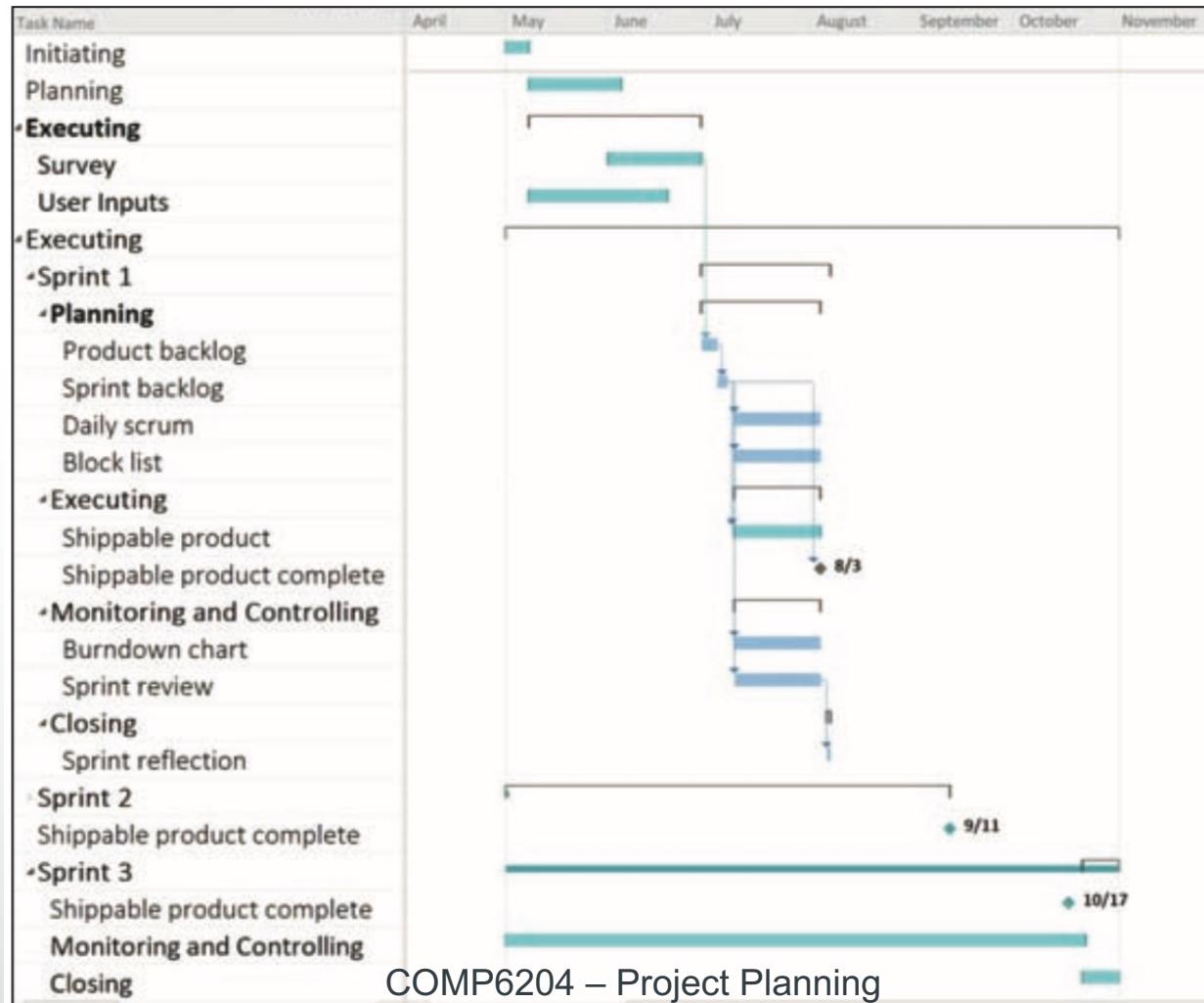
# Project Pre-Initiation and Initiation

- Main differences between pre-initiation in this case and the first case
  - Determining roles and deciding what functionality would be delivered as part of each release
  - How many sprints will be required to complete a release
  - How many releases of software to deliver

# Planning

- Because Scrum implies that team members work as a self-directed group, coached by the ScrumMaster, a team charter should not be necessary
- Descriptions of work are identified in the product and sprint backlogs
- More detailed work is documented in technical stories
- Team must estimate a velocity or capacity for each sprint

# Intranet site project baseline Gantt chart using Scrum approach



# Product and Sprint Backlogs

Product Backlog	Sprint Backlog
<ol style="list-style-type: none"><li>1. User story templates, samples, and point person</li><li>2. WBS templates, samples, and point person</li><li>3. Project schedule templates, samples, and point person</li><li>4. Ability to charge customers for some intranet products and services</li><li>5. Ability to collect user suggestions</li><li>6. Business case templates, samples, and point person</li><li>7. Ask the Expert feature</li><li>8. Stakeholder management strategy templates, samples, and point person</li><li>9. Risk register templates, samples, and point person</li><li>10. Etc.</li></ol>	<ol style="list-style-type: none"><li>1. User story templates, samples, and point person</li><li>2. WBS templates, samples, and point person</li><li>3. Project schedule templates, samples, and point person</li><li>4. Ability to charge customers for some intranet products and services</li><li>5. Ability to collect user suggestions</li></ol>

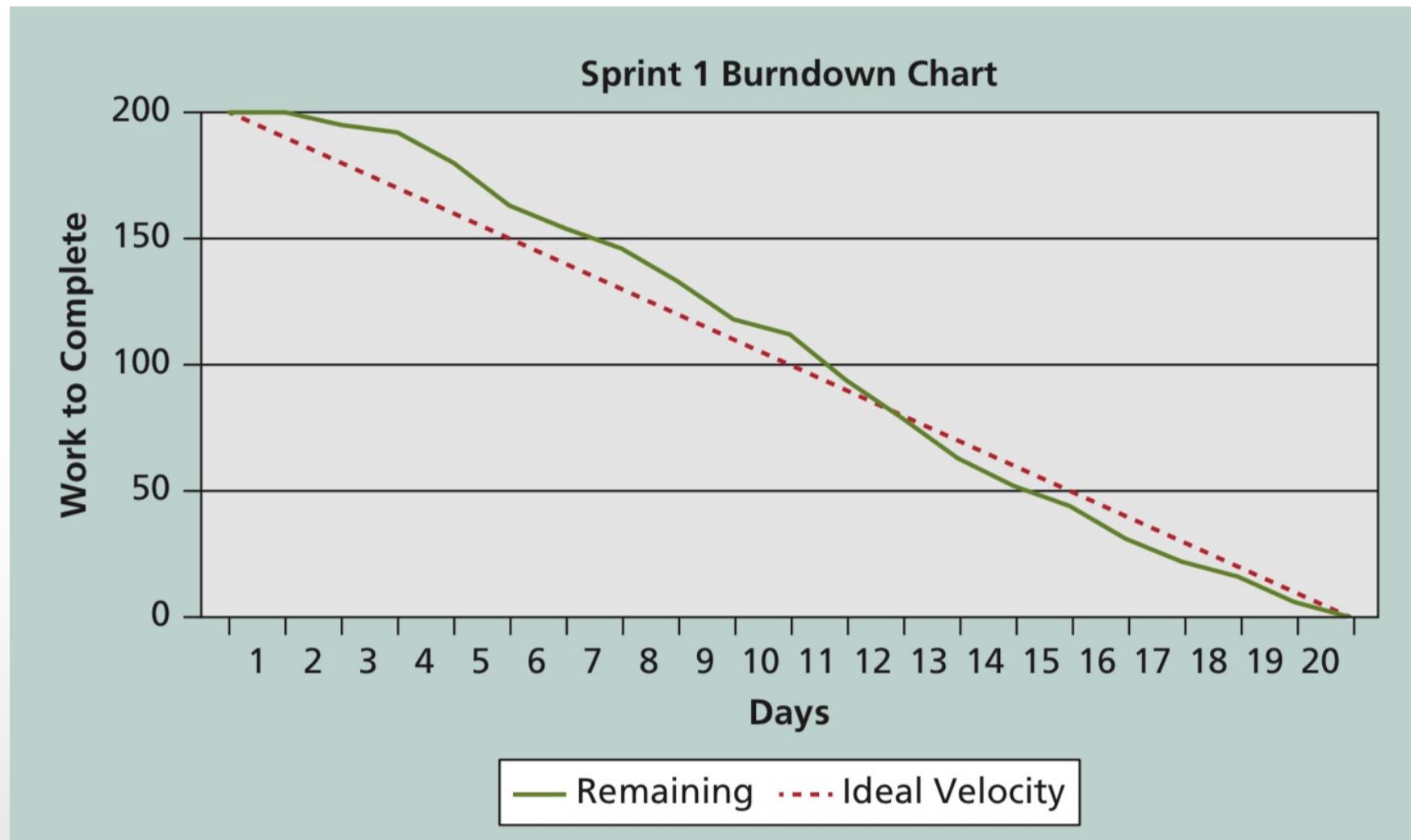
# Executing

- The most time and money should be spent on executing
  - Plans are implemented to create the desired product
- Agile approach: team produces several iterations of a potentially shippable product
  - Users can access and make suggestions
- Communications are different
  - Project team meets every morning, physically or virtually

# Monitoring and Controlling

- The two main tools for monitoring and controlling in the Scrum framework
  - Daily Scrum: held each morning to plan and communicate work for the day and discuss any risks, issues, or blockers
  - Sprint review: work progress within a sprint can be represented on a sprint board maintained by the Scrum Master
  - Burndown chart: an important artifact used to graphically display progress on each sprint

# Burndown chart



# Closing

- After the sprint review, the Scrum Master leads a sprint retrospective
  - Team reflects on what happened during the sprint
- Sprint retrospective is intended to answer two fundamental questions
  - What went well during the last sprint that we should continue doing?
  - What could we do differently to improve the product or process?

# Templates by Process Group

- The next table lists several **templates** used to prepare the documents shown in this chapter and later chapters

# Templates by process group

Template Name	Process Group	Chapter(s) Where Used	Application Software	File Name
Business Case	Pre-initiating	3	Word	business case.doc
Business Case Financials	Pre-initiating	3, 4	Excel	business case financials.xls
Stakeholder Register	Initiating	3, 13	Word	stakeholder register.doc
Stakeholder Management Strategy	Initiating	3, 13	Word	stakeholder management strategy.doc
Kick-off Meeting Agenda	Initiating	3	Word	kick-off meeting agenda.doc
Payback Period Chart	Initiating	4	Excel	payback period chart.xls
Weighted Scoring Model	Initiating	4, 12	Excel	weighted scoring model.xls

# Chapter Summary

- The *five* project management *process groups* are *initiating*, *planning*, *executing*, *monitoring* and *controlling*, and *closing*
- You can map the *main activities* of each *process group* to the *ten knowledge areas*
- Some organizations develop their own information technology *project management methodologies*
- The JWD Consulting case study provides an example of using the *process groups* and shows several *important project documents*
- The second version of the same case study illustrates how to use *Scrum*, the *leading agile method*, to manage the project