Chapter One

Software Project Management

Introduction

- The job pattern of an IT company engaged in software development can be seen split in two parts:
- Software Creation
- Software Project Management
  - **What is Project?**

✓ A project is well-defined task, which is a collection of several operations done in order to achieve a goal (for example, software development and delivery).

✓ A project is “a temporary endeavor undertaken to create a unique product, service, or result” (PMBOK® Guide, Fourth Edition, 2008, p. 5)

What is Project Management?

- **Project management** is "the application of knowledge, skills, tools, and techniques to project activities in order to meet project requirements" (PMI*, Project Management Body of Knowledge (PMBOK® Guide), 2000, p. 6)

*The Project Management Institute (PMI) is an international professional society. Their web site is www.pmi.org.

Characteristics of Project

- **A Project can be characterized as:**
- Every project may has a unique and distinct goal.
- Project is not routine activity or day-to-day operations.
- Project comes with a start time and end time.
- Project ends when its goal is achieved hence it is a temporary phase in the lifetime of an organization.
- Project needs adequate resources in terms of time, manpower, finance, material and knowledge-bank.

Software Project

- A **Software Project** is the complete procedure of software development from requirement gathering to testing and maintenance, carried out according to the execution methodologies, in a specified period of time to achieve intended software product.

Importance of software project management.

- Software is said to be an **intangible product**.
- Software development is a kind of all new stream in world business and there's very little experience in building software products.
- Most software products are tailor made to fit client's requirements. The most important is that the underlying technology changes and advances so frequently and rapidly that experience of one product may not be applied to the other one.

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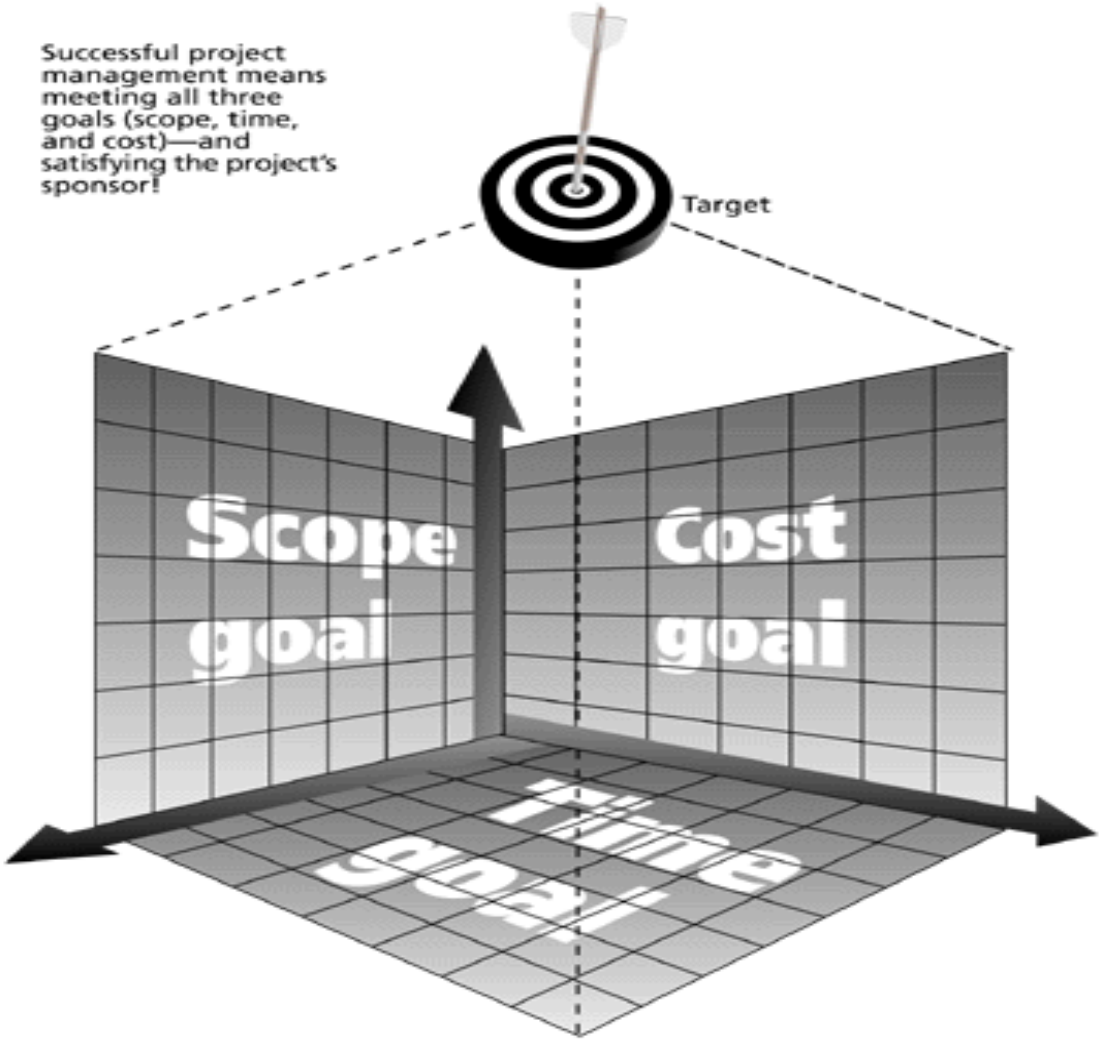
- All such business and environmental constraints bring risk in software development hence it is essential to manage software projects efficiently. **Blow** triple constraints for software projects

- It is an essential part of software organization to deliver quality product, keeping the cost within client's budget constrain and deliver the project as per scheduled.

Figure 1-1 The Triple Constraint of Project Management

Successful project management means meeting all three goals (scope, time, and cost) – and satisfying the project's sponsor!

The fourth constraint: quality



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- There are **several factors**, both **internal and external**, which may impact this triple constrain triangle. Any of three factor can severely impact the other two.
- Therefore, software project management is essential to **incorporate user requirements** along with budget and time constraints.

Project Success

- There are several ways to define project success:
  - The project met scope, time, and cost goals
  - The project satisfied the customer/sponsor
  - The results of the project met its main objective, such as making or saving a certain amount of money, providing a good return on investment, or simply making the sponsors happy

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1. Executive support
2. User involvement
3. Experienced project manager
4. Clear business objectives
5. Minimized scope
6. Standard software infrastructure
7. Firm basic requirements
8. Formal methodology
9. Reliable estimates
10. Other criteria, such as small milestones, proper planning, competent staff, and ownership

*The Standish Group, "Extreme CHAOS," (2001).

Software Project Manager

- A **software project manager** is a person who undertakes the responsibility of executing the software project.
- Software project manager is thoroughly aware of all the **phases of SDLC** that the software would go through.
- Project manager may never directly involve in producing the end product but he controls and manages the activities involved in production

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- **Managing People**
- Act as project leader
- Liaison with stakeholders
- Managing human resources
- Setting up reporting hierarchy etc.

- **Managing Project**

- Defining and setting up project scope
- Managing project management activities
- Monitoring progress and performance
- Risk analysis at every phase
- Take necessary step to avoid or come out of problems
- Act as project spokesperson

Problems with Software Projects

- poor estimates and plans;
- lack of quality standards and measures;
- lack of guidance about making organizational decisions;
- lack of techniques to make progress visible;
- poor role definition - who does what?
- incorrect success criteria.

Project Stakeholders

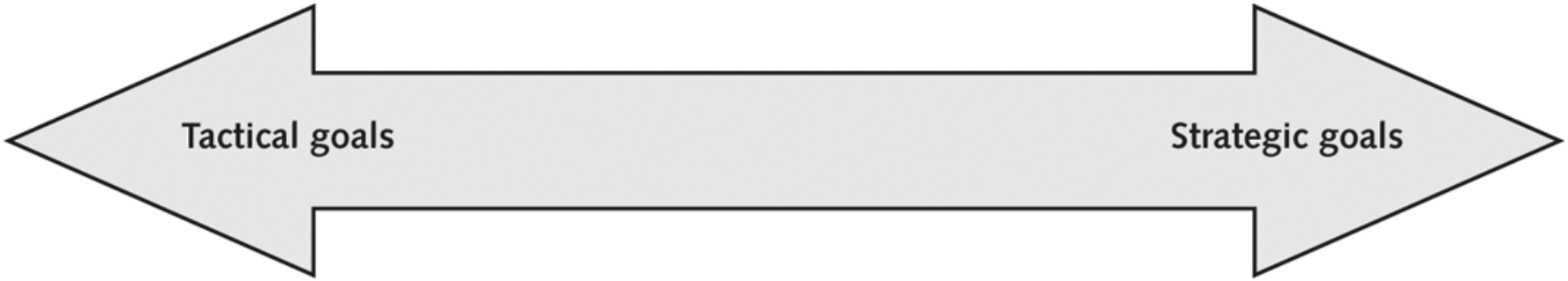
- ✓**Stakeholders** are the people involved in or affected by project activities
- ✓Stakeholders include:
  - The project sponsor
  - The project manager
  - The project team
  - Support staff
  - Customers
  - Users
  - Suppliers
  - Opponents to the project

Project Portfolio Management

- **Portfolio:** is a group of programs (investments)
- **Project Portfolio Management:** is grouping and managing groups and programs as a portfolio of investments that contribute to the entire enterprise's success.
- As part of **project portfolio management,** organizations group and manage projects and programs as a portfolio of investments that contribute to the entire enterprise's success

- Portfolio managers help their organizations make wise investment decisions by helping to select and analyze projects from a strategic perspective

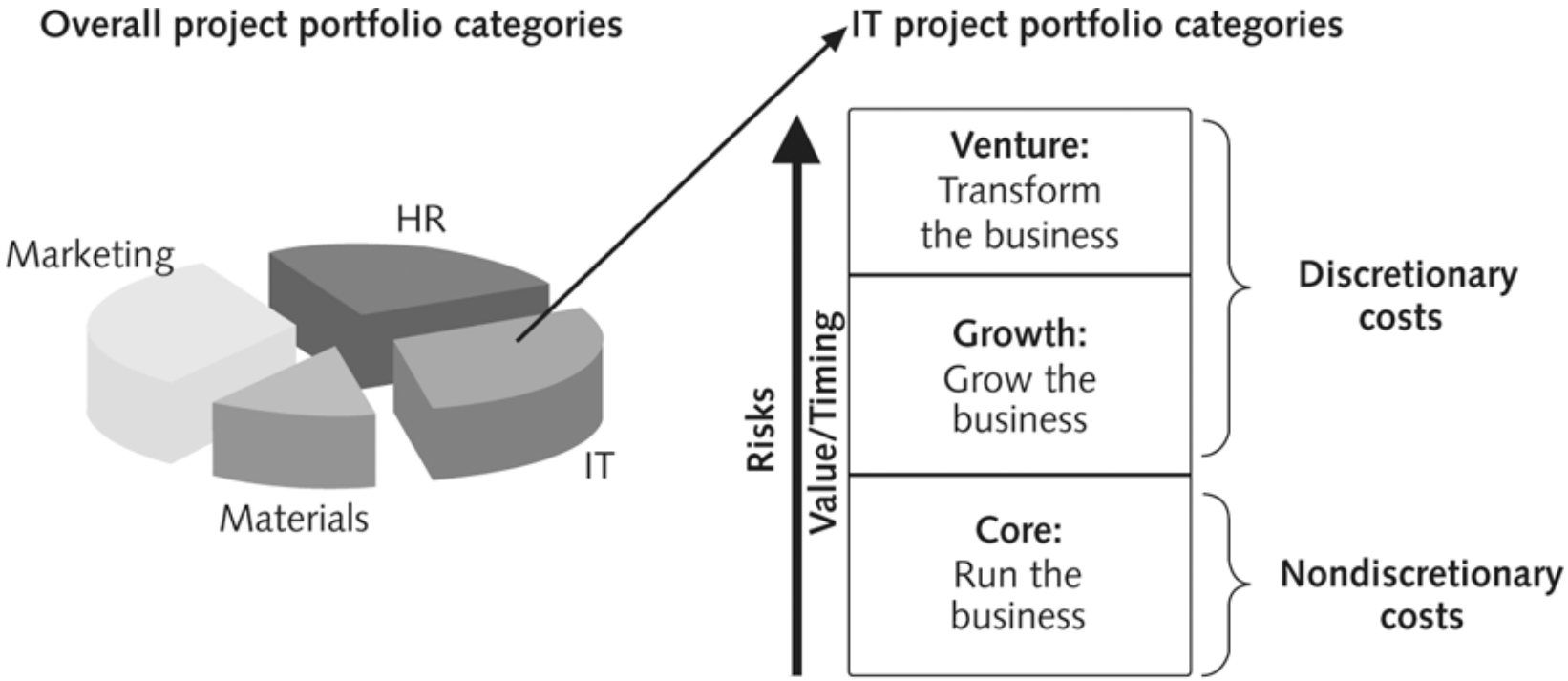
Project Management Compared to Project Portfolio Management



Project management
- Are we carrying out projects well?
- Are projects on time and on budget?
- Do project stakeholders know what they should be doing?

Project portfolio management
- Are we working on the right projects?
- Are we investing in the right areas?
- Do we have the right resources to be competitive?

Sample Project Portfolio Approach



Project Management Framework

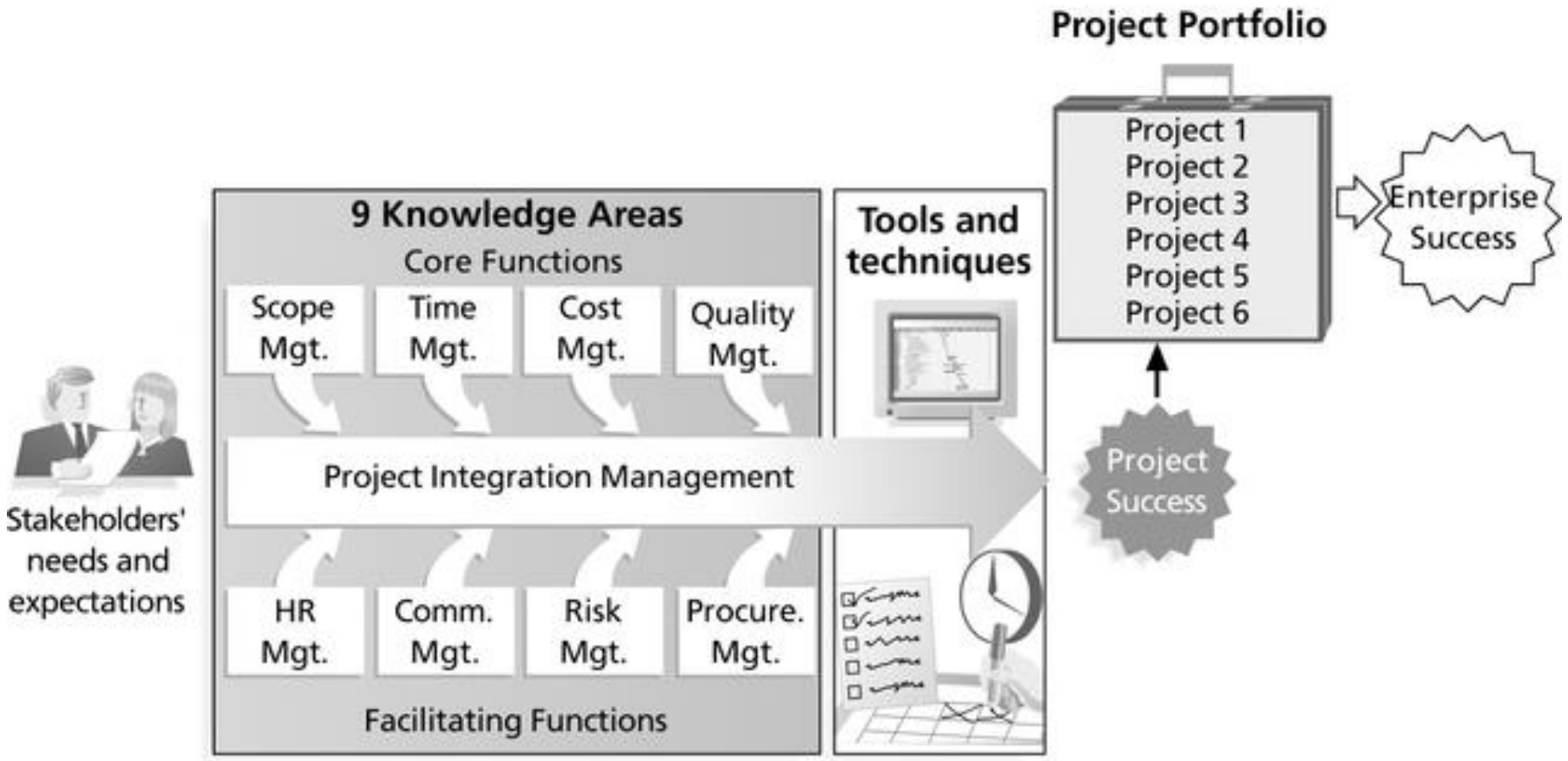


Figure 1-2. Project Management Framework

9 Project Management Knowledge Areas

- Knowledge areas describe the key competencies that project managers must develop
  - 4 core knowledge areas lead to specific project objectives (scope, time, cost, and quality)
  - 4 facilitating knowledge areas are the means through which the project objectives are achieved (human resources, communication, risk, and procurement management)
  - 1 knowledge area (project integration management) affects and is affected by all of the other knowledge areas

Feasibility Study

✓What is a Feasibility Study in Project Management?

- It determines whether the project is likely to succeed in the first place.
- It is typically conducted before any initial steps are taken with a project, including planning. It is one of — if not the— most important factors in determining whether the project can move forward.
- The study identifies the project market (if applicable); highlights the project's key goals; maps out potential roadblocks and offers alternative solutions; and factors in time, budget, legal, and manpower requirements to determine whether the project is not only possible but advantageous for the company to undertake.

Key points of a feasibility study

- A feasibility study in project management usually assesses the following areas:
- **Technical capability:** Does the organization have the technical resources to undertake the project?
- **Budget:** Does the organization have the financial resources to undertake the project, and is the cost/benefit analysis sufficient to warrant moving forward?
- **Legality:** What are the legal requirements of the project, and can the business meet them?
- **Risk:** What is the risk associated with undertaking this project? Is the risk worthwhile to the company based on perceived benefits?
- **Operational feasibility:** Does the project, in its proposed scope, meet the organization's needs by solving problems and/or taking advantage of identified opportunities?
- **Time:** Can the project be completed in a reasonable timeline?

Cost-Benefit Analysis

- A cost-benefit analysis (CBA) is a process that is used to estimate the costs and benefits of decisions in order to find the most cost-effective alternative.
- A CBA is a versatile method that is often used for the business, project and public policy decisions.
- **In project management,** a cost-benefit analysis is used to evaluate the cost versus the benefits in your project proposal and business case. It begins with a list, as so many processes do.

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- A formal CBA lists all project expenses and tangible benefits, then calculates the return on investment (ROI), internal rate of return (IRR), net present value (NPV), and payback period.
- **required rate of return/IRR —** the minimum acceptable rate of return on an investment
  return on investment (ROI) — (benefits minus costs) divided by costs
- Then, the difference between the costs and the benefits from taking action is calculated.
- A general rule of thumb is the costs should be less than 50% of the benefits, and the payback period shouldn't **exceed a year.**
- Some people also refer to cost-benefit analysis as benefit-cost analysis (BCA).

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- An effective CBA evaluates the following costs and benefits:

✓Costs

- **Direct costs:** These are all the costs that are directly related to the manufacturing of the product. Such as materials, equipment, labor, etc.
- **Indirect costs:** Other expenses that are not directly related to the product such as rent, utilities, or transportation costs.
- **Intangible costs:** Any other costs that can't be quantified, such as the brand damage if the market doesn't respond positively to the product.
- **Opportunity costs:** The loss of opportunities that occurs when a decision is made instead of another. For example, you could have chosen to manufacture a product that could have been more profitable than the one you chose to make.
- **Costs of potential risks:** Any project is susceptible to a variety of risks. You should always consider that you might have unexpected costs at some point.

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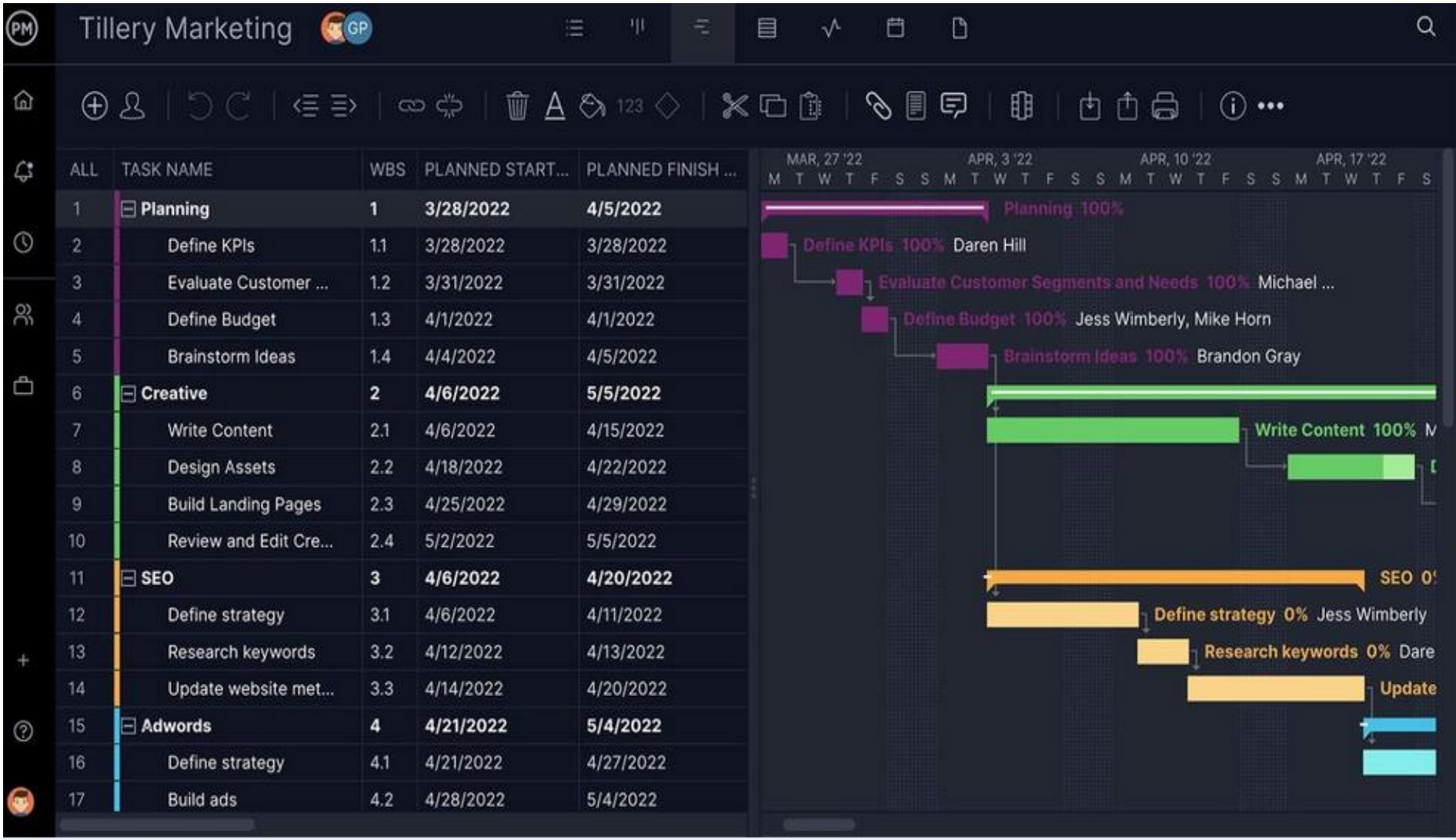
✓Benefits

- **Direct Benefits:** The measurable benefits in monetary value that you get from the project. In this case, the revenue, sales and profit obtained from your product.
- **Indirect Benefits:** Benefits that you can perceive but not necessarily measure such as increased brand awareness.
- **Total benefits:** costs of a project or decision and subtracting that amount from the total projected benefits of the project or decision. (Sometimes, this value is represented as a ratio.)
- **Net benefits:** is determined by summing all benefits and subtracting the sum of all costs of a project.
- Net benefit can be useful in ranking projects with similar B/C ratios.

Planning

- ✓ Our online Gantt charts have features to plan your projects and organize your tasks, so they lead to a successful final deliverable.
- ✓ If things change, and they will, the Gantt is easy to edit, so you can pivot quickly.

Example…


Tillery Marketing
GP
ALL
TASK NAME
WBS
PLANNED START...
PLANNED FINISH ...
1 Planning 1 3/28/2022 4/5/2022
2 Define KPIs 1.1 3/28/2022 3/28/2022
3 Evaluate Customer ... 1.2 3/31/2022 3/31/2022
4 Define Budget 1.3 4/1/2022 4/1/2022
5 Brainstorm Ideas 1.4 4/4/2022 4/5/2022
6 Creative 2 4/6/2022 5/5/2022
7 Write Content 2.1 4/6/2022 4/15/2022
8 Design Assets 2.2 4/18/2022 4/22/2022
9 Build Landing Pages 2.3 4/25/2022 4/29/2022
10 Review and Edit Cre... 2.4 5/2/2022 5/5/2022
11 SEO 3 4/6/2022 4/20/2022
12 Define strategy 3.1 4/6/2022 4/11/2022
13 Research keywords 3.2 4/12/2022 4/13/2022
14 Update website met... 3.3 4/14/2022 4/20/2022
15 Adwords 4 4/21/2022 5/4/2022
16 Define strategy 4.1 4/21/2022 4/27/2022
17 Build ads 4.2 4/28/2022 5/4/2022
MAR, 27 '22
APR, 3 '22
APR, 10 '22
APR, 17 '22
Planning 100%
Define KPIs 100% Daren Hill
Evaluate Customer Segments and Needs 100% Michael ...
Define Budget 100% Jess Wimberly, Mike Horn
Brainstorm Ideas 100% Brandon Gray
Write Content 100%
Define strategy 0% Jess Wimberly
Research keywords 0% Dare
Update

The phases of a project management life cycle

- Regardless of what kind of project you're planning, every project goes through the same stages.
- Although each project will require its own set of unique processes and tasks, they all follow a similar framework.
- There's always a **beginning,** a **middle,** and an **end**. This is called the project management life cycle.

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- The project management life cycle provides predictability and gives the project manager a way to tackle tasks in distinct phases.
- In this section, we'll explain what you need to know about each phase.

The initiation phase

- The initiation phase is the first phase of the entire project management life cycle. The goal of this phase is to define the project, develop a business case for it, and get it approved. During this time, the project manager may do any of the following:
- Perform a feasibility study
- Create a project charter
- Identify key stakeholders
- Select project management tools

The planning phase

- The planning phase is critical to creating a project roadmap the entire team can follow. This is where all of the details and goals are outlined in order to meet the requirements laid out by the organization.
- During this phase, project managers will typically:

- Create a project plan
- Develop a resource plan
- Define goals and performance measures
- Communicate roles and responsibilities to team members
- Build out workflows
- Anticipate risks and create contingency plans

The execution phase

- his stage is where the bulk of the project happens. Deliverables are built to make sure the project is meeting requirements. This is where most of the time, money, and people are pulled into the project.
- a kickoff meeting is held to mark the official start of the execution phase. A kickoff meeting agenda might look something like this
- **Introductions:** Who's who?
- **Project background:** Why are you doing this project? What are the goals?
- **Project scope:** What kind of work is involved?

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- **Project plan:** What does the roadmap look like?
- **Roles:** Who will be responsible for which elements of the project?
- **Communication:** What kind of communication channels will be used? What kind of meetings or status reports should your team expect?
- **Tools:** Which tools will be used to complete the project, and how will they be used?
- **Next steps:** What are the immediate action items that need to be completed?
- **Q&A:** Open the floor for any questions

The controlling and monitoring phase

- This phase happens in tandem with the execution phase. As the project moves forward, the project manager must make sure all moving parts are seamlessly headed in the right direction. If adjustments to the project plan need to be made due to unforeseen circumstances or a change in direction, they may happen here.

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- During the controlling and monitoring phase, project managers may have to do any of the following:
- Manage resources
- Monitor project performance
- Risk management
- Perform status meetings and reports
- Update project schedule
- Modify project plans
- At the end of this phase, all the agreed project deliverables should be completed and accepted by the customer.

Project closure Phase

- The closing phase is a critical step in the project management life cycle. It signals the official end of the project and provides a period for reflection, wrap-up, and organization of materials.

✓Project managers can:

- Take inventory of all deliverables
- Tie up any loose ends
- Hand the project off to the client or the team that will be managing the project's day-to-day operations

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- Perform a post-mortem to discuss and document any learnings from the project
- Organize all project documents in a centralized location
- Communicate the success of the project to stakeholders and executives
- Celebrate project completion and acknowledge team members

Project Management Tools and Techniques

- Project management tools and techniques assist project managers and their teams in various aspects of project management
- Some specific ones include
  - Project Charter, scope statement, and WBS (work breakdown structure) (scope)
  - Gantt charts, network diagrams, critical path analysis, critical chain scheduling (time)
  - Cost estimates and earned value management (cost)

Sample Gantt Chart

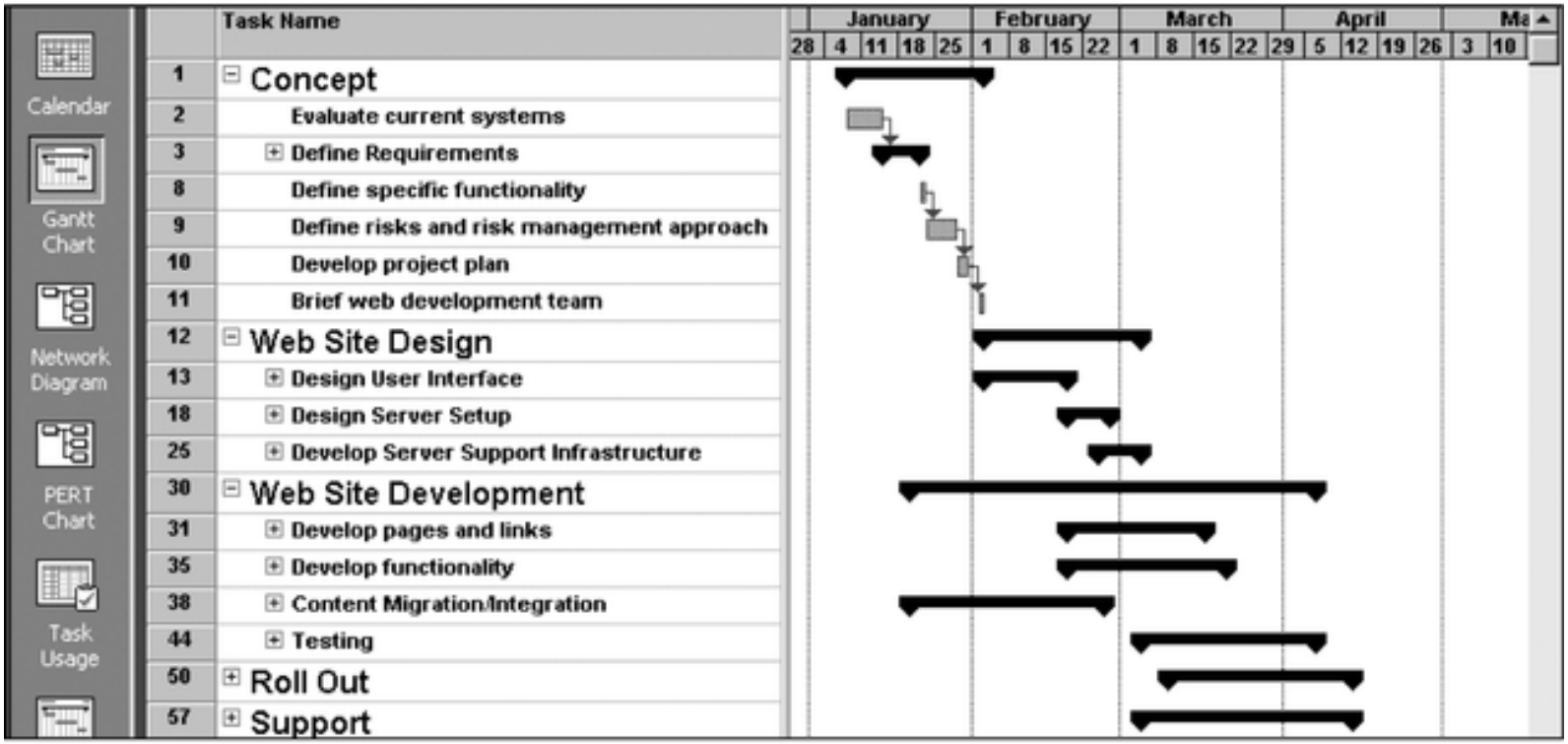

Figure 1-3. Sample Gantt Chart in Microsoft Project 2002

The WBS is on the left, and each task's start and finish date are shown on the right using a calendar timescale. Early Gantt Charts, first used in 1917, were drawn by hand.

Sample Network Diagram

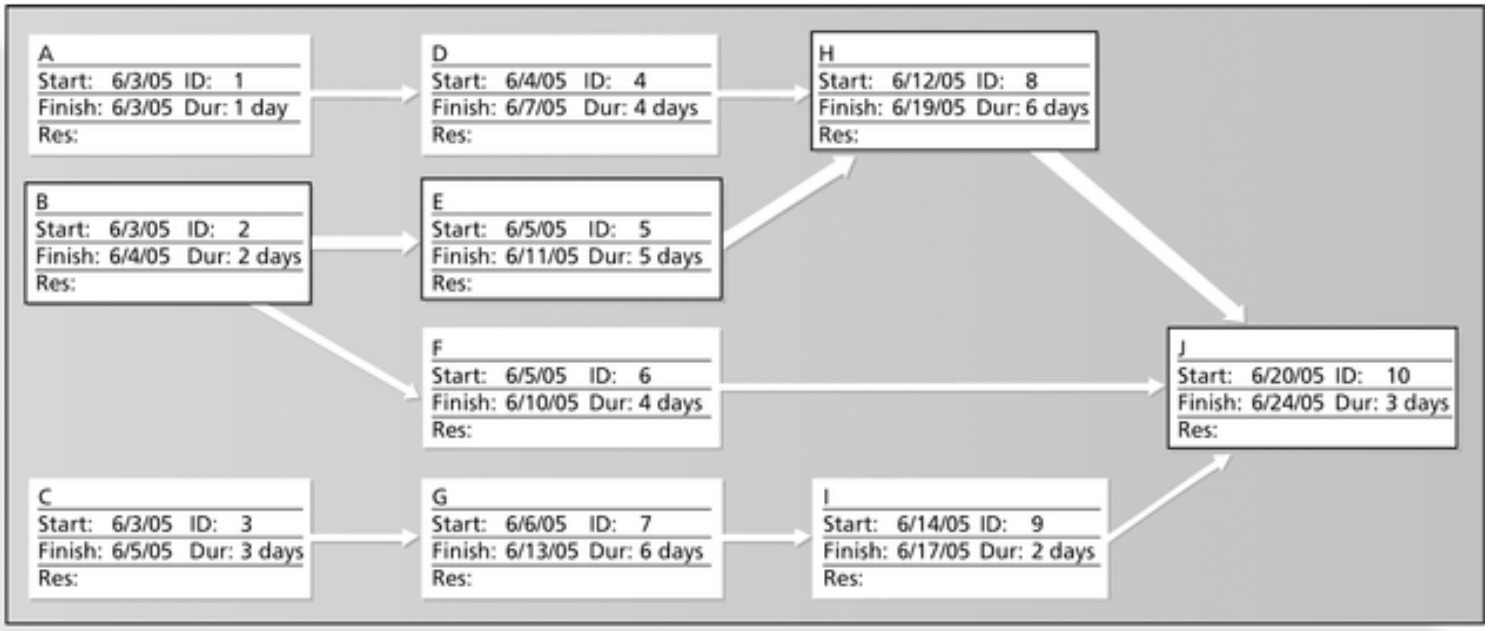

Figure 1-4. Sample Network Diagram in Microsoft Project 2002

Each box is a project task from the WBS. Arrows show dependencies between tasks. The bolded tasks are on the critical path. If any tasks on the critical path take longer than planned, the whole project will slip unless something is done. Network diagrams were first used in 1958 on the Navy Polaris project, before project management software was available.

Sample Enterprise Project Management Tool

Company ABC Project Portfolio				
Project Name	**Scope**	**Schedule**	**Budget**	**Links**
Active Projects				
Project 1	○	◉	◉	
Project 2	●	●	◉	
Project 3	○	○	○	
Project 4	○	◉	●	
Approved Projects				
Project 10	○	○	○	
Project 11	○	○	○	
Project 12	○	○	○	
Project 13	○	○	○	
Project 14	○	○	○	
Opportunities				
Project 100				
Project 200				
○	White = going well			
◉	Gray = some problems			
●	Black = major problems			

Figure 1-5. Sample Enterprise Project Management Tool

In recent years, organizations have been taking advantage of software to help manage their projects throughout the enterprise.

THANK YOU