

Cairo University  
Faculty of Engineering  
Chemical Engineering Department

## Plant Design Course

# Introduction to Project Management

AG, December 2018

# Project Management Statistics

- The world as a whole spends nearly \$10 trillion of its \$40.7 trillion gross product on projects of all kinds.
- More than sixteen million people regard project management as their profession; on average, a project manager earns more than \$82,000 per year.\*

\*PMI, The PMI Project Management Fact Book, Second Edition, 2001

# What Is a Project?

- **A project is “a temporary endeavor undertaken to accomplish a unique ( non-repetitive) product or service”**
- **Attributes of projects:**
  - unique purpose
  - temporary
  - require resources, often from various areas
  - should have a primary sponsor and/or customer
  - involve uncertainty

# Defining the Project

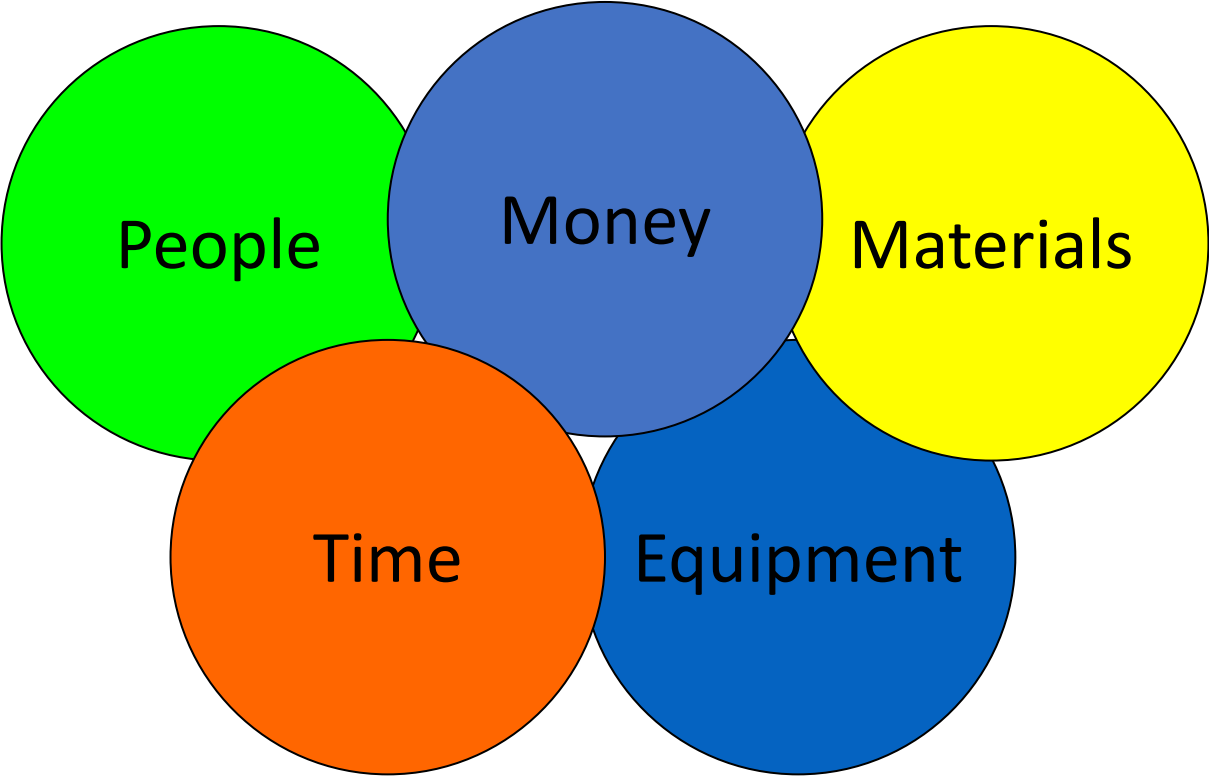
## Statement of Work

- Project Purpose
- Project Scope
- Deliverables
- Cost & Time Schedule Estimates
- Ownership and Authority



SCOPE

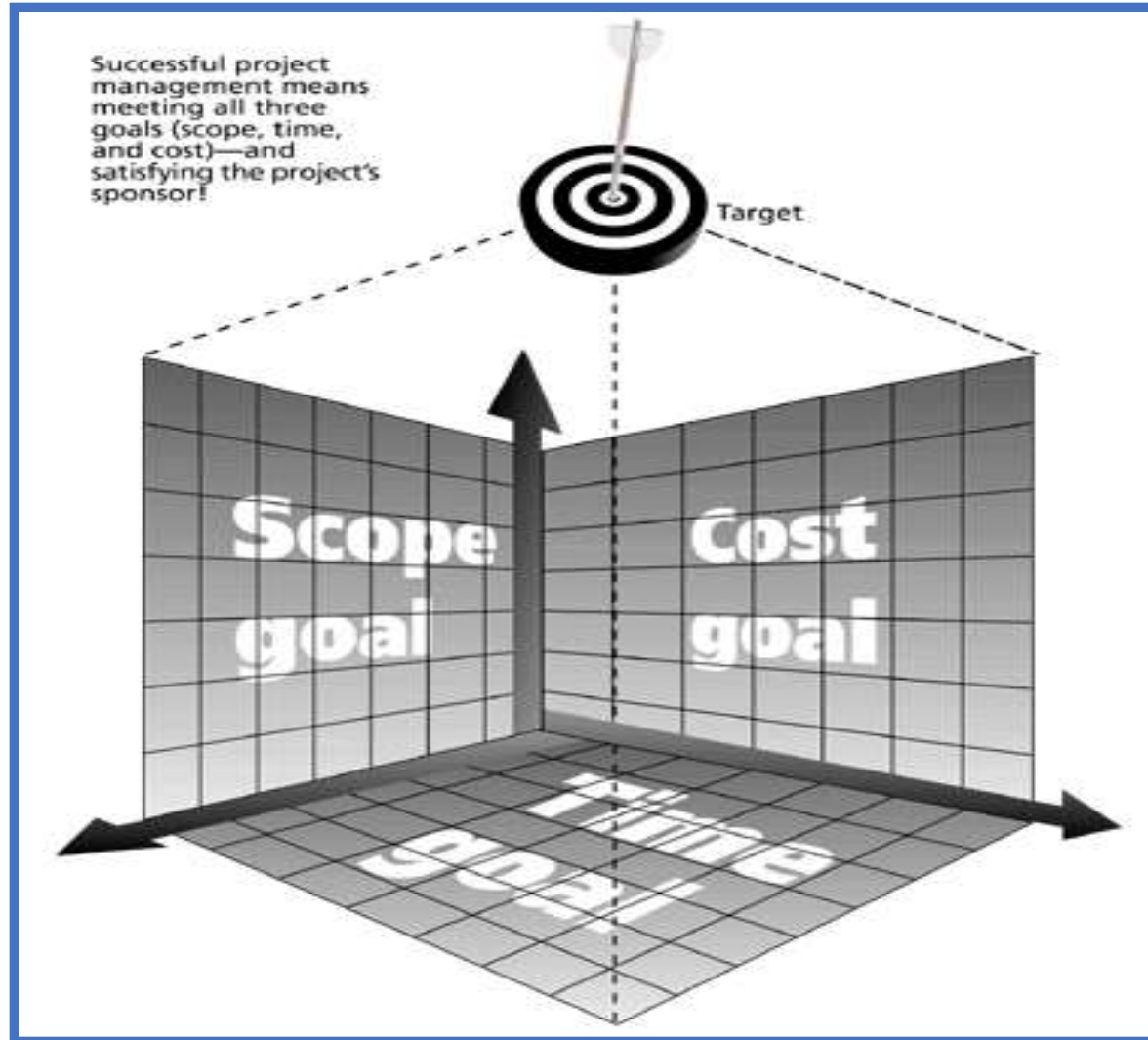
# What are the Resources to Manage?



# The Triple Constraint

- Every project is constrained in different ways by its goals related to:
  - **Scope**: What is the project trying to accomplish?
  - **Time**: How long should it take to complete?
  - **Cost**: What should it cost?
- It is the project manager's duty to balance these three often competing goals

# The Triple Constraint of Project Management



# What is Project Management?

**Project management is “the application of knowledge, skills, tools, and techniques to project activities in order to meet project requirements”**

\*The Project Management Institute (PMI) is an international professional society. Their web site is [www.pmi.org](http://www.pmi.org).



# Advantages of Using Formal Project Management

- Better control of financial, physical, and human resources
- Improved customer relations
- Shorter development times
- Higher quality
- Higher profit margins
- Improved productivity
- Better internal coordination
- Higher worker morale

Read more about PM:

1. KLM Technology Group: project management, engineering design guidelines
2. PMI background material



**Technical Note**

# Project Management Framework

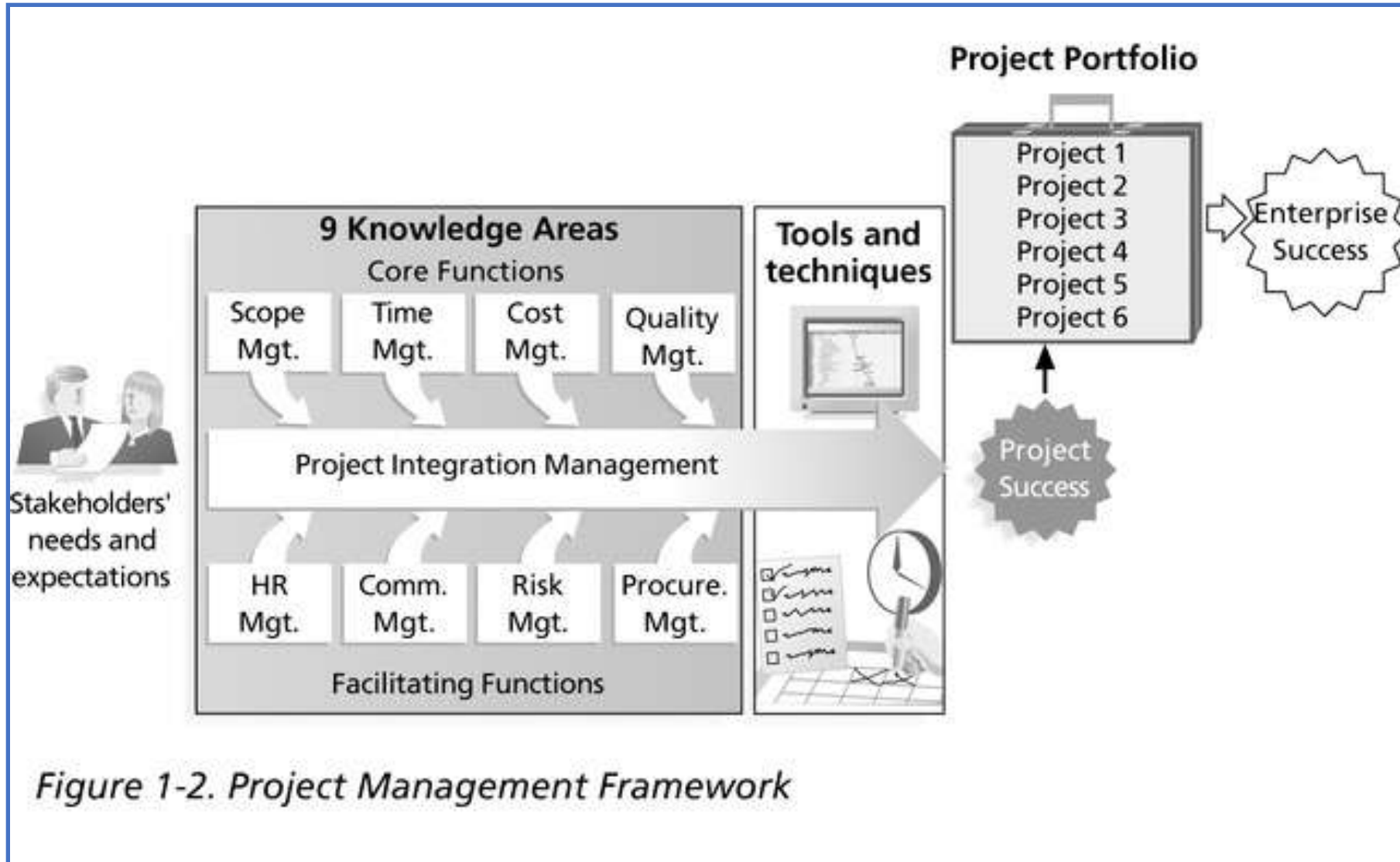


Figure 1-2. Project Management Framework

# Key Disciplines for Successful Projects

- Contract Management
- Scope Management
- Schedule Management
- Procurement Management
- Cost Management
- Dispute Management

# 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 management, and procurement management)
- 1 knowledge area (project integration management) affects and is affected by all of the other knowledge areas

# Integration Management

- Project Plan Development
- Project Plan Execution
- Change Control
- Information System
- Project Office

# Scope Management

- Requirements Definition : Business
- Requirements Definition : Technical
- Deliverables Identification
- Scope Definition
- Work Breakdown Structure (WBS) \*
- Scope Change Control

\* See : [http://www.hyperhot.com/pm\\_wbs.htm](http://www.hyperhot.com/pm_wbs.htm)

# Time Management

- Activity Definition
- Activity Sequencing
- Schedule Development
- Schedule Control
- Schedule Integration



# Cost Management

- Resource Planning
- Estimating
- Budgeting
- Performance Measurement
- Cost Control

Reality vs.  
Project Management  
Cost Estimate → Budget

Timeliness and Availability  
Measurement & Monitoring  
Integration with Scope  
& Schedule

# Quality Management

- Quality Planning
- Quality Assurance (QA)
- Quality Control (QC)
- Management Oversight

# Human Resource Management

- Organizational Planning
- Staff Acquisition
- Team Development
- Professional Development

# Communication Management

- Communication Planning
- Information Distribution
- Performance Reporting
- Subject Tracking

# Risk Management

- Risk Identification
- Risk Quantification
- Risk Response Development
- Risk Mitigation/Risk Control
- Risk Documentation

# Procurement Management

- Specifications
- Shipping
- Inspection
- Acceptance
- Global Standard

- Whose Standard?
- Inspection Protocol
- Testing Protocol
- Spare Parts
- Warranty

# Change Management

- Increased Design Complexity Leads to More Changes that Create Significant Impacts to Projects
- Build Recognition Systems into Contract
- Recognize that Change is Occurring
- Minimize Negatives and Maximize Positives of Change on the Overall Project

# 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 (scope)
  - Gantt charts, network diagrams, critical path analysis, critical chain scheduling (time)
  - Cost estimates and earned value management (cost)



# How Project Management Relates to Other Disciplines

- Much of the knowledge needed to manage projects is unique to the discipline of project management
- Project managers must also have knowledge and experience in
  - general management
  - the application area of the project

# Project Management Software

- There are hundreds of different products to assist in performing project management
- Three main categories of tools exist:
  - Low-end tools: Handle single or smaller projects well, cost under \$200 per user
  - Midrange tools: Handle multiple projects and users, cost \$200-500 per user, Project 2000 most popular
  - High-end tools: Also called enterprise project management software, often licensed on a per-user basis