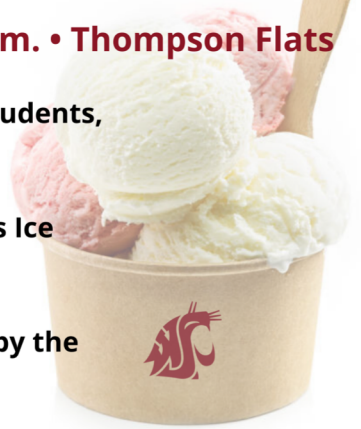
WASHINGTON STATE UNIVERSITY
Voiland College of Engineering and Architecture

Please join us for the

2022 VCEA ICE CREAM SOCIAL

August 25th, 2-4 p.m. • Thompson Flats

- **Meet VCEA clubs, students, staff, and faculty!**
- **Eat free Ferdinand's Ice Cream!**
- **Toppings provided by the clubs.**



This event is sponsored by Microsoft Devices Microsoft

ACM Presents
Meet and Greet!

AUGUST 29TH

05:30

Join us in Spark 227 to kick off our first meeting of the year!

WASHINGTON STATE UNIVERSITY
Voiland College Student Success

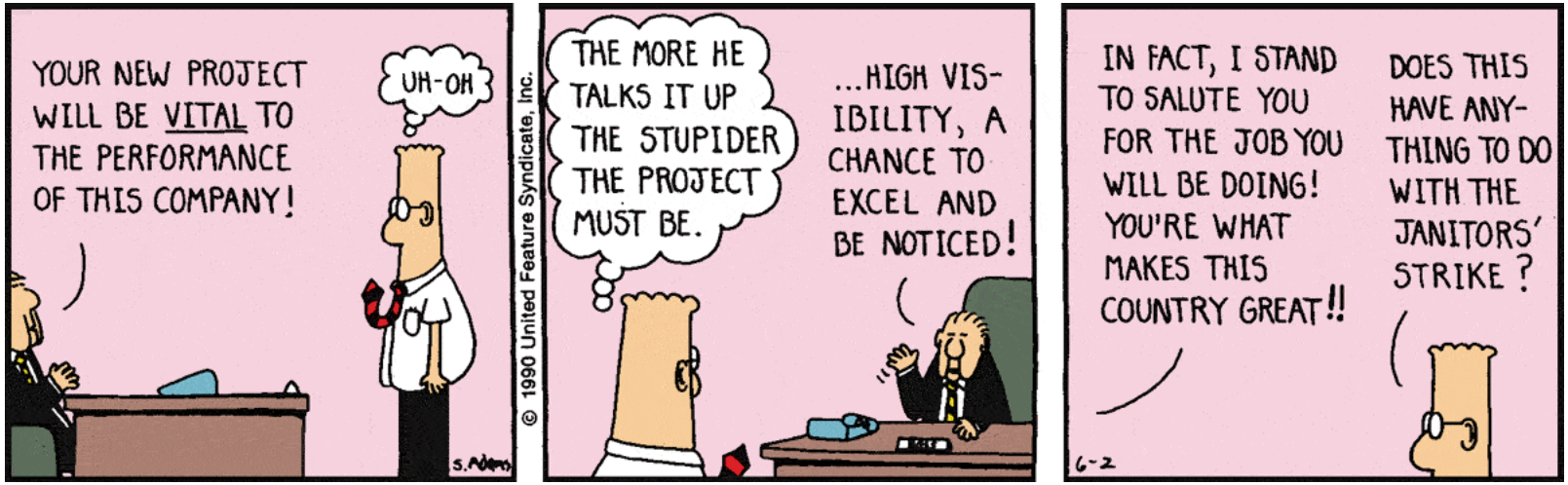
Thursday, Sept.1
@12:10 pm
Paccar Lecture Hall SPARK G45
Jimmy John's Refreshments Provided

"Building the Future of Aerospace Together"
Greg Hyslop
Chief Engineer & Executive Vice President of Engineering Test & Technology

From servicing the next International Space Station to its goal of Zero Carbon Emissions from Commercial Aviation to Flying Taxi Drones, come hear about the opportunities and challenges facing the future of the aerospace industry from the man who leads The Boeing Company's 50,000+ engineers worldwide and oversees its technology vision, strategy and investment.

BOEING

Lect. #2: Project Management Introduction and Project Scope 1



dilbert.com/strip/1990-06-02

Agenda for Today

1. Introduction to Project Management: Definition, Attributes, Two Models, …

2. Project Scope 1: Requirements, SOW, Deliverables, and Acceptance Criteria

PM: Project Definition and Attributes

"A project is an endeavor to accomplish a specific objective through a unique set of interrelated activities and the effective utilization of resources."– Gido et al.

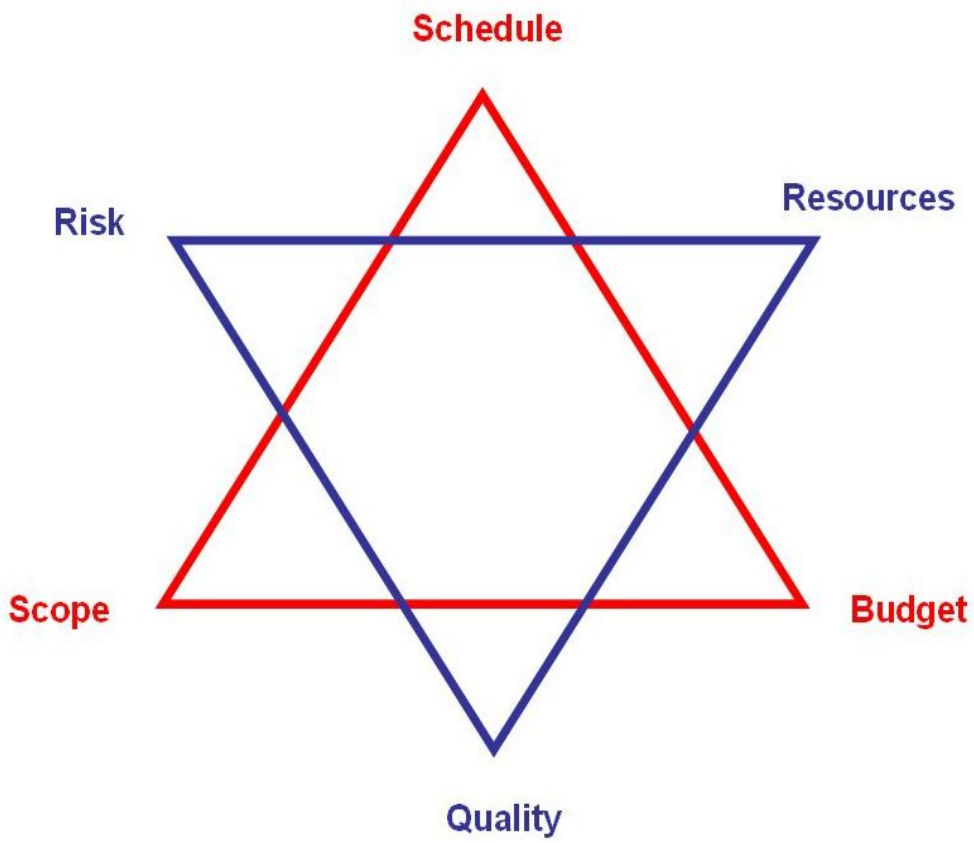
- A project has a well-defined objective
- A project is executed by completing tasks in a certain sequence
- A project requires resources
- A project is completed within a certain timeframe and requires a schedule

PM: Project Definition and Attributes (cont.)

- A project can be relatively simple and be completed within a short time, e.g., remodeling a bathroom, or very complex and take many years, e.g., Mars Perseverance mission
- A project might be unique because it's the first time it's been done, e.g., Mars Perseverance mission, or because of the customization required, e.g., a wedding
- A project is funded by a customer or a sponsor, although the sponsor is often the company for which one works
- A project involves a degree of uncertainty and/or risk

PM: Six-Point Star (SPS) Constraint Model

Two triangles of SPS have competing constraints



PM: Triangles of SPS Model of Project Constraints

Scope-Schedule-Budget Triangle

- Scope: What needs to be done to complete project
- Schedule: Timetable for the project plan
- Budget: Cost within which project must be completed

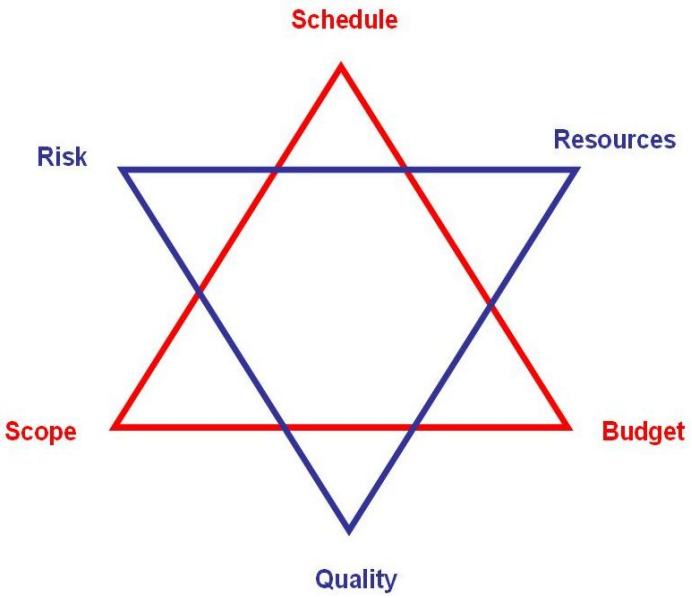
Risk-Resources-Quality Triangle

- Risk: Any event that can jeopardize the project plan
- Resources: Anything required to complete a project (people, materials, equipment, facilities, and so on)
- Quality: Expectations defined at the beginning relating to project deliverables

Breakout Discussion (5 min)

David English, [is] CFO for Ryan LLC, a Dallas-based global tax firm…His fast-growing company has been using software that's 15 years old and operates in a rudimentary manner. A project is needed to help the $150 million company with 750 employees in 45 cities in Canada and the United States to integrate finance, customer relationship, and human resource management systems.

- For the scenario above, which triangle, if either, do you think is more important and why?
- Choose someone from your table to present your ideas



PM: Three-Legged Stool Model

Balance three legs of stool:

- Time (Schedule)
- Quality (Scope)
- Cost (Budget)

while managing risk

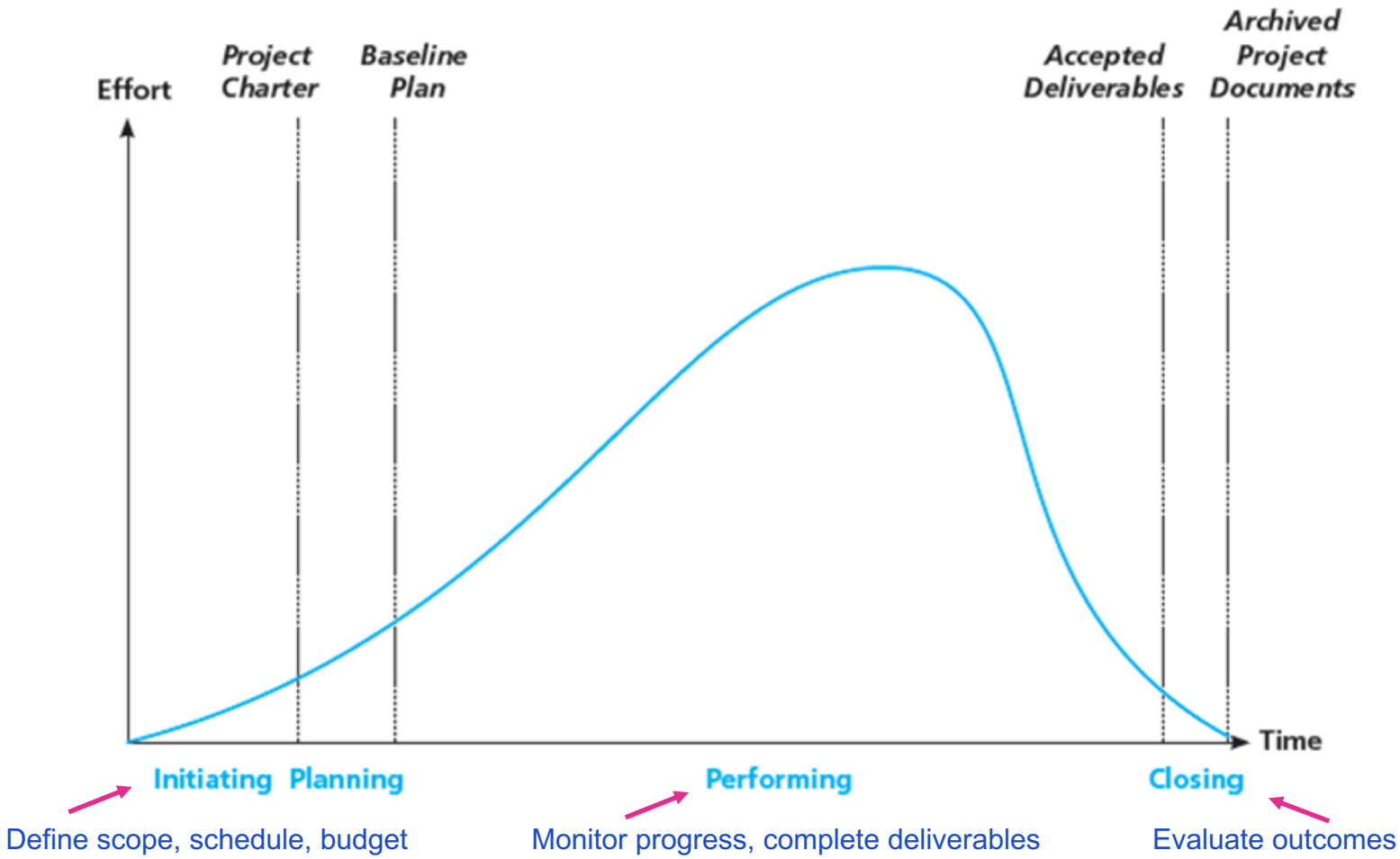
practicalprojectmanager.blogspot.com/2010/02/three-legged-stool.html

PM: Generic Project Life Cycle

There are four phases to a project life cycle:

1. Initiating phase. Projects are identified and selected. They're often authorized by a project charter.
2. Planning phase. This phase includes defining the project scope, identifying resources, developing a schedule and budget, and identifying risks. It results in a baseline plan for doing the project.
3. Performing phase. This one is the longest phase. It involves executing the baseline plan, monitoring the progress of the project, making adjustments, and producing all the deliverables. It may require updating the baseline plan and documenting all changes. Plan the work then work the plan!
4. Closing phase. In the last phase, project evaluations are conducted, lessons learned are documented, and all documents are organized and archived. Celebrations may also occur.

PM: Generic Project Life Cycle



PM: Project vs Program vs Product Management

- Project management involves coordinating and prioritizing resources for a given project and managing its costs and risks
- Program management involves coordinating and prioritizing resources across projects, managing links between the projects, and the overall costs and risks of the program
- Product management involves managing a product or one part of a product; this varies considerably by product

PM: Project Scope

- Define project objective
- Define project scope
  - Requirements
  - Statement of work (SOW)
  - Deliverables
  - Acceptance criteria
  - Work breakdown structure (WBS)
- Also associated with scope are:
  - Responsibility assignment matrix (RAM)
  - Activity sequence diagram (ASD), i.e., a network diagram

PM: Project Example
Speedgolf

- Install real-time speedgolf tournament scoring system
- Score = golf strokes + minutes
- Par = 72 + 54 = 126
- Competitors tee off every 5-6 minutes; play alone
- Must determine time for competitor to complete each hole and number of strokes used for each hole, e.g.,

Name	1		2		3	
Rob Hogan	4	1:44	3	1:21	4	2:08

SPEEDGOLF™ INTERNATIONAL

PM: Speedgolf Example
1. Project Objective

Create and install a scoring system at Palouse Ridge Golf Club that enables a speedgolf tournament to be automatically scored, with real-time (hole-by-hole) results displayed on a website. The project requires delivery of a wireless hardware infrastructure and a software application. It must be started on Jan. 2, 2023, and be completed by Jun. 30, 2023.

PM: Speedgolf Example
2. Project Requirements

1. Tournament set-up (tournament director)
   a. Entry of name, date, and other tournament details
   b. Entry of competitor names and tee times
2. Tournament scoring
   a. Competitor's round clock must start automatically at designated tee times with the ability for manual override
   b. Competitor's time for each hole must be automatically logged when the ball is holed
   c. Competitor's score for each hole must be automatically recorded
   d. Scoring system must determine when a player has passed another player
   e. Tournament director must be able to correct scoring manually
3. Tournament reporting
   a. Real-time tournament results must be displayed on a live leaderboard which automatically refreshes while tournament is in progress
   b. Leaderboard results must be searchable and readable

Note 1. Because the scoring is web-based, some latency is expected. However, this latency should be minimized using a clock synchronization scheme.

Note 2. The system should be able to function in windy and rainy weather conditions.

Breakout Discussion (5 min)
Speedgolf Example

- Brainstorm how to design a system that addresses the following project requirements:
  - Competitor's time for each hole must be automatically logged when the ball is holed to know the time it took for player to reach next hole
  - Competitor's score (both # of strokes and run time) for each hole must be automatically recorded, and system must know when a player has passed another player
- Choose someone else from your table to present your ideas

PM: Speedgolf Example
3. Statement of Work (SOW)

A. Build prototype(s) to explore feasibility of different automatic scoring methods
B. Present prototype(s) to customer to make final decision
C. Purchase hardware to implement chosen method
D. Develop and test software application that interfaces with hardware
E. Assemble hardware
F. Interface hardware with software
G. Install hardware on golf course
H. Test software/hardware integration
I. Develop user manual for installing and using the system
J. Conduct final acceptance testing with customer

PM: Speedgolf Example
3. Project Deliverables

- Hardware needed for automatic, real-time scoring system which can be temporarily installed on golf courses for speedgolf tournaments
- Software needed for automatic, real-time scoring system
- User manual

PM: Speedgolf Example
4. Project Acceptance Criteria

Hardware:

- Must automatically record when a player has finished a hole
- Must be capable of recording a player's golf score at end of each hole
- Must be able to operate in golf weather conditions: 20-120 ^{o}F, rain, and 0-50 mph wind
- Must not obstruct or delay play on golf course
- Must be able to communicate with software wirelessly

PM: Speedgolf Example
4. Project Acceptance Criteria (cont.)

Software:

- Tournament director must be able to set up a new tournament in 2n minutes where n = number of players in tournament
- Tournament official must be able to input player start time if not time originally entered by director
- Competitor's score and time must be recorded by the system within 10 seconds after ball holed
- System must determine when a player has passed another player
- Tournament officials must be able to edit scores and times if corrections are needed
- Tournament leaderboard must update every 30 seconds
- Tournament leaderboard must be accessible via web browser

PM: Speedgolf Example
4. Project Acceptance Criteria (cont.)

User manual:

- Must clearly document how to install hardware
- Must clearly document steps needed to ensure hardware and software are communicating
- Must clearly document how to install software on a web server
- Must clearly document all system features organized for specific interface: tournament director, tournament officials, tournament spectators