Fundamentals of Software Engineering

Introduction

Fundamentals

Course Web Site

* Central communication:

    * https://piazza.com/class#spring2015/cmpe352

* Course Management: In progress. Will be announced.

* <u>You are responsible for regularly checking this page</u>.

Instructor and Assistants

Instructor:

    Suzan Üsküdarlı (suzan.uskudarli@boun.edu.tr)

    Room: ETA 35

    Office Hours: Mondays 14:00-15:00

Teaching Assistants:

    Alp Kındıroğlu (alpkindiroglu@gmail.com) / PILAB (ETA 27)

    Can Tunca (can.tunca@boun.edu.tr) /NETLAB (ETA 46)

    Office Hours: TBA

Professional Organizations

* Project Reference
    http://www.projectreference.com/ (table of references)

* Software Engineering Institute (SEI)
    http://www.sei.cmu.edu/

* Project Management Institute (PMI)
    http://www.pmi.org

* The International Association of Project and Program Management
    http://www.iappm.org

What is Software?

* Sofware
    * Computer programs
    * Associated documentation
        * requirements
        * design models
        * user manuals

Software Engineering

* All aspects of developing a software product

* Processes and methods

* Tools and technologies

* Team work

CS vs SWE

* CS – Computer Science
  * Fundamentals of how computers and programs work

* SWE – Software Engineering
  * design and build software in teams

A project is a **temporary** endeavor undertaken to **create** a unique **product** or **service**
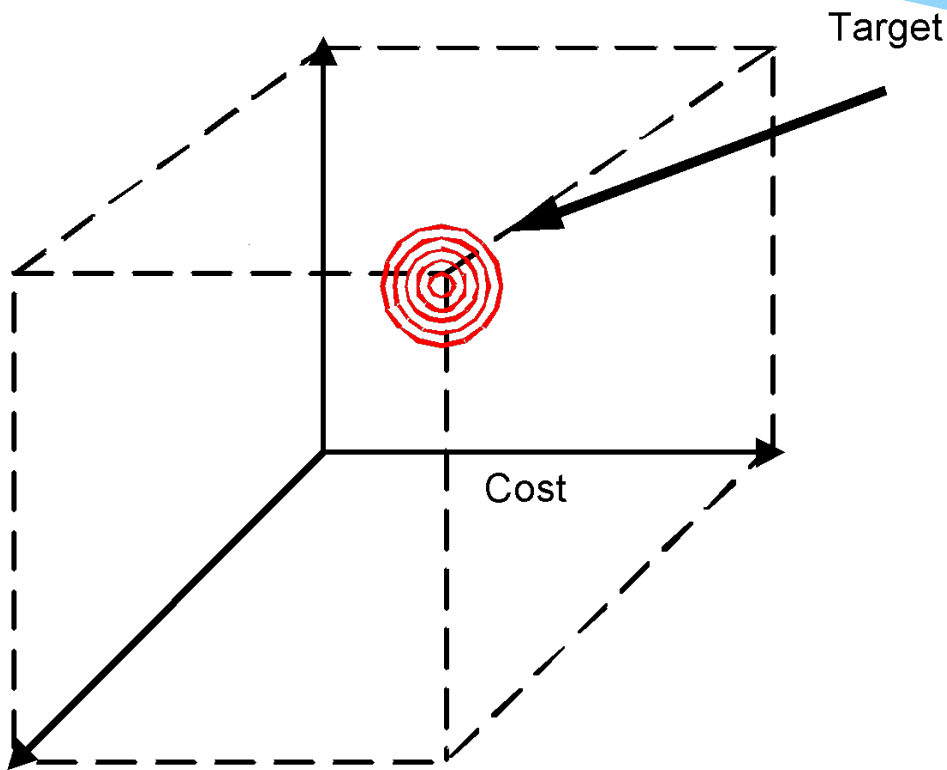
PMI: Project Management Institute

Properties

* Unique purpose

* Temporary

* Requires **resources**

* Has a sponsor and/or customer

* Has stakeholders

Project Management

The application of knowledge, skills, tools, and techniques to project activities in order to meet project requirements.

PMI*, Project Management Body of Knowledge

Target of Project Management

The project manager aims to meet 3 goals

* Time
* Cost
* Scope

Thus, satisfy customer.

Four Project Dimensions

* People

* Process

* Product

* Technology

People Issues

* Matching people to tasks

* Balance
  * individual and team

* Clear communication
  * Expectations

* Authority with responsibility

* Career development

Process

* Development fundamentals
* Quality assurance
* Risk management
* Lifecycle planning
* Customer orientation
* Process maturity improvement
* Rework avoidance

Product

* Size management
* Product
    * characteristics
    * requirements
* Feature creep management
    * What is it?
    * Why does it happen?
    * How and when to stop it?

Technology

* Language

* Tool selection

Planning

* Determine
  * requirements
  * resources
  * product features

* Select lifecycle model

Value of Planning

Plans are nothing; planning is everything.

Dwight D. Eisenhower

Tracking

* Track
  * Cost
  * Effort
  * Schedule
* Tracking is comparing
  * Planned vs. Actual
* How to handle when things go off plan?

Software Failures

Cost of software failure ~ 50 to 80 billion dollar/year

Standish Chaos Report Findings By Year

	1994	1996	1998	2000	2002	2004	2009
Succeeded	16%	27%	26%	28%	34%	29%	32%
Failed	31%	40%	28%	23%	15%	18%	24%
Challenged	53%	33%	46%	49%	51%	53%	44%

http://www.galorath.com/wp/software-project-failure-costs-billions-better-estimation-planning-can-help.php

* Software Hall of Shame

* http://spectrum.ieee.org/computing/software/why-software-fails

Project Failure

* Why do projects Fail?

Major Causes Of Project Failure

Cause	Percentage
Bad communications between relevant parties	57%
Lack of planning of scheduling, resources and activities	39%
No quality control	35%
Milestones not being met	34%
Inadequate co-ordination of resources	29%
Costs getting out of hand	26%
Mismanagement of progress	20%
Overall poor management	17%
Supplier skills overstretched	13%
Supplier under-resourced	12%
Insufficient measurable outputs	11%
Supplier people not consistent	4%