

Software Engineering: What and Why?

CS 2720

Lecture 1.2

Many software projects fail.

- Consider some [statistics](#) summarized from the Standish Group: 29% are successful, 22% are failures, 49% are “challenged”.
- It is not hard to find numerous instances of software failures (see, for instance, [1](#), [2](#), [3](#), [4](#), [5](#))

Why So Many Failures?

It is unlikely that the numerous failures are strictly caused by employees who can't "code".

- According to [proprietary data from QSM](#), the "typical" software project today involves 11,414 effort hours from 6.9 FTE staff creating 29.6 KESLOC.
- "Coding" by itself does not include all the skills necessary to handle projects like these!

Defining Software Engineering

Define *software engineering*.

According to [ISO/IEC/IEEE 24765-2010](#):

Software Engineering: 1. the systematic application of scientific and technological knowledge, methods, and experience to the design, implementation, testing, and documentation of software.

2. the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software

Breaking Down the Definition

Note some of the items in the ISO/IEC/IEEE definition:

- application of scientific and technological knowledge, methods, and experience
- systematic, disciplined, quantifiable approach
- development, operation, and maintenance
- design, implementation, testing, and documentation

Software Engineering Objectives

Kung, in *Object-Oriented Software Engineering* (p. 3), lists the objectives of software engineering as:

- “...significantly increasing software productivity (P) ...”
- “...and quality (Q) ...”
- “...while reducing software production and operating costs (C) ...”
- “...and time to market (T).”

How?

How can *software engineering* help us manage the differences between “personal” and “professional” software development in terms of PQCT?

If we treat a professional software project like a personal project, we can't succeed.