Structured Systems Analysis and Design & Project

(Week 1, Session 1) Monsoon 2018

SSAD - What can we expect?

- Creating user-friendly software
  - Frontend: GUI / Web
  - Backend: Databases + Network

- By the end of this course you
  - should be able to create reasonably large, maintainable software using software engineering principles, processes and more…
  - Should be able to communicate with each other and others
  - Should be able to document

What do these have in common?

- They all need a *lot* of software to operate.

How much?

- The Boeing 777 flies with over 4,000,000 lines of code on-board.
- A typical top-level game has between 1 and 2 M SLOC (source lines of code)

- These are **huge** software systems that can not be thought of one line or class at a time. The software engineer needs to think about the design at different levels–from a line of code up to the entire system.

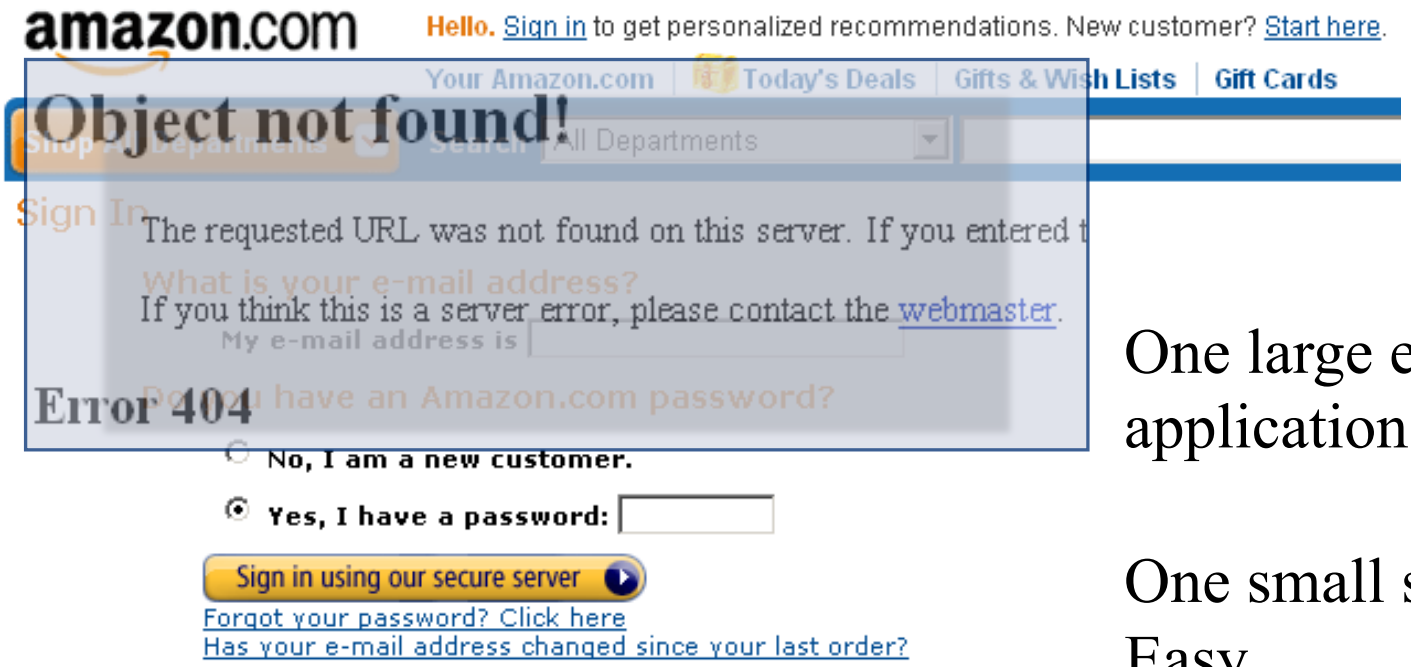
Software engineering design

1 SLOC/min/SE * 60 min/hr * 40 hrs/wk =
2,400 SLOC/wk/SE

2,400 SLOC/wk/SE * 50 wk/year =
120,000 SLOC/year/SE

2 * 10^6 SLOC / 1.2 * 10^5 SLOC/yr/SE =
~17 SEs for the year

Teamwork



One large ecommerce application. Complex!!!

One small software upgrade. Easy.

One 90 minute outage. Priceless?

This is a financial-critical system.

This team needed a better understanding of the process for developing a financial-critical system, and how to bring an upgrade

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em.

Software development process

The software engineer's daily job is to answer questions about the software system.

- How can I help the customer? What is required to solve the customer's problem?
- How will the user interact with the system?
- What operating system, language, hardware is going to be used?
- What is the overall software system structure and how do different components interact with each other?
- What code do I have to write?
- How do I organize my team so we are effective?
- Can we finish the game in time to have it on the shelves for Christmas shopping?

To answer those questions, the software engineer must work with many people.

- Customers asking for the system
- People who will use the system
- Domain experts: banking, avionics, security, medical, scientists, …
- Engineers from other engineering disciplines
- Most closely with the other software engineers on the project

Communication

Yes, software engineers get their hands dirty writing programs using the latest technologies and techniques.

Attitude

- To be confident of setting up your own computer, automate routine tasks, and be skilful with several aspect of software development (most of the time).
- You can't say – I can't do it because no one taught me how.
  - Useful links to online reading material will be provided
  - You are expected to do most of the work
    - Because *doing is learning*.
- The more you struggle now, the easier it will be later.

Keep checking regularly…

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