Structured Systems Analysis and Design & Project (ICS 261)

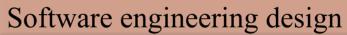(Week 1, Session 1) Monsoon 2015

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 creating reasonably large, maintainable software using
  - Software engineering principles, processes and more…

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.
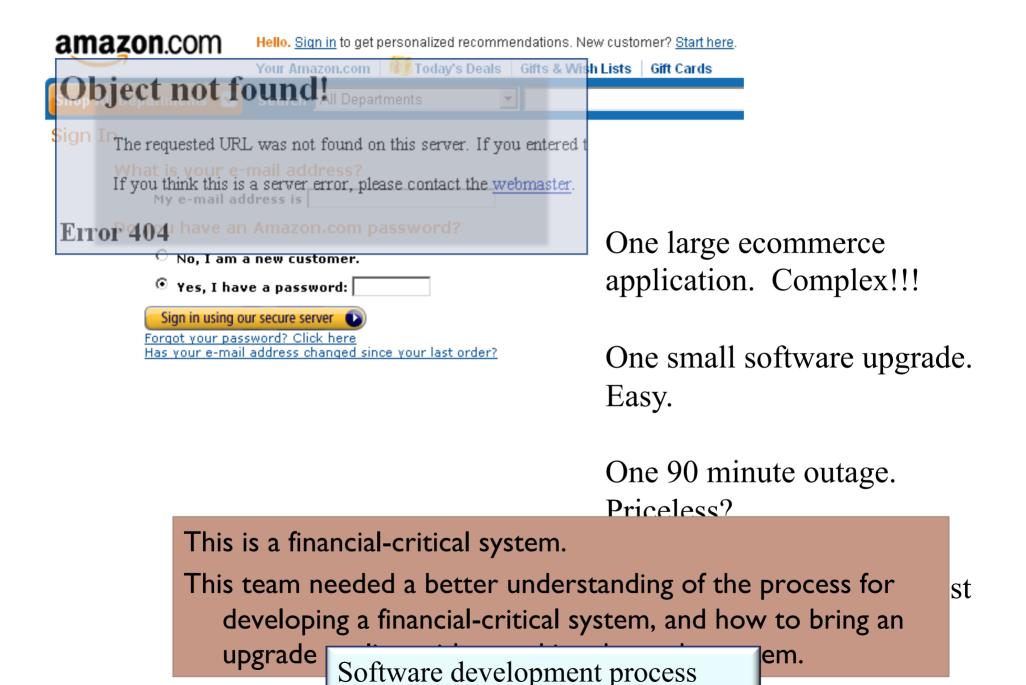

Software engineering design

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

amazon.com Hello. Sign in to get personalized recommendations. New customer? Start here.

Your Amazon.com | Today's Deals | Gifts & Wish Lists | Gift Cards

Shop by Departments   Search All Departments

Object not found!

Sign In

The requested URL was not found on this server. If you entered t

What is your e-mail address?
If you think this is a server error, please contact the webmaster.
My e-mail address is

Error 404 Do you have an Amazon.com password?

○ No, I am a new customer.

◉ Yes, I have a password:

Sign in using our secure server ▶

Forgot your password? Click here
Has your e-mail address changed since your last order?

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 online with something less than em.

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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.

Maintenance

Agile, SCRUM

Interaction

Desktop, embedded, mobile, web-based

Networks

Open source

Extreme programming

Concurrency

Teams

Data flow

Accessibility

Testing

SVN, CVS

Computer games

Graphics

Functions, Methods

Security

Websites

Ruby, PHP

Webservers

Hardware

GUI

User-centered

Linux, .NET, OS X

AJAX

Software architecture

Meetings

SQL

UML

Financial systems

Requirements scenarios

Databases

Design patterns

Java, C++, Python

Objects, classes

Software models

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.

Important link

http://faculty.iiit.ac.in/~raghu.reddy/SSAD/CourseDetails.htm

Keep checking at least once every day… Alternatively,

moodle.iiit.ac.in