Software and its Engineering

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Contents

- Introduction
- Software Project Management
  - Estimation
- Development Approaches
  - Traditional
  - OO
  - CO

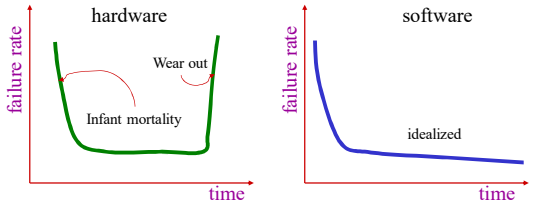
Reference Books

- Software Engineering: A practitioners approach, Roger S. Pressman - McGraw Hill
- The Unified Modeling Language User Guide, Grady Booch, James Rumbaugh, Ivar Jacobson, Addison-Wesley, 1999
- Component Oriented Software Engineering, Ali Dogru, The Atlas Publications, Dallas, Texas, 2006, ISBN: 0-9778129-0-1.
- http://theatlas.org/index.php?option=com_content&task=view&id=108 / OR http://www.ceng.metu.edu.tr/~dogru/b.pdf

Software Characteristics

- Software is developed, not manufactured
- Software does not wear out
- Software problems are wicked
- Mostly custom built, should benefit from being assembled from existing components

Failure Curves



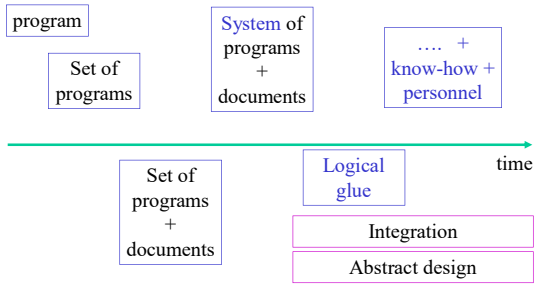
Software Types

- System software
- Real-time software
  - Hard real-time
- Business software
- Engineering and scientific software
- Embedded software
- Fault tolerant
- Safety critical

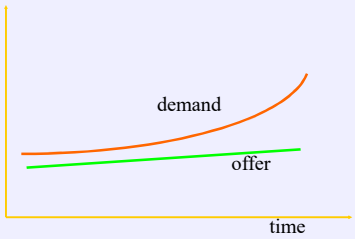
Myths

- Management myths
  - Standards and procedures are there, that is everything our people needs
  - development tools = newest computers
  - behind schedule? Hire more people
- Customer Myths
  - Begin with a general statement, details will be filled in later
  - Change can be accommodated easily because software is flexible
- Practitioners Myths
  - program works -> job is done
  - before the program runs, quality cannot be assessed
  - the only deliverable is a working program

What is Software?

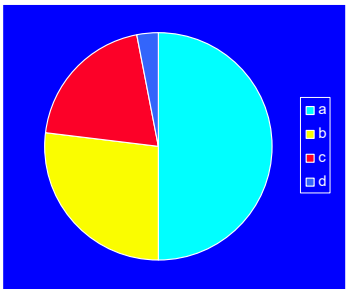


Software Crisis



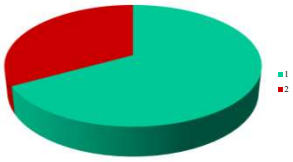
Success ?

- Failure
- Big repair
- Some repair
- Success



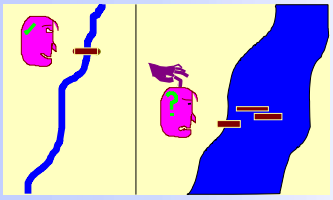
’70-’90s

Success: 2010 +



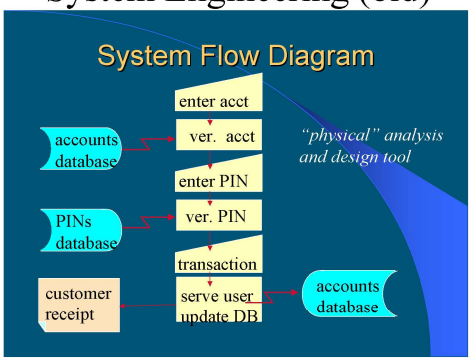
Source: Standish

Engineering Problem



- Wicked problems
- Elevating abstraction
- Automation
- Software !!!

System Engineering (old)



SysML

- ~UML Profile
- Some added diagrams (Requirements D.!)
- Some modified diagrams
- Some UML diagrams are excluded

- Influenced UML 2.0 on.