

# Software and its Engineering

Ali H. Dogru

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- Introduction
- Software Project Management
  - Estimation
- Development Approaches
  - Traditional
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## 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
- **Instant UML**: Pierre Alain Muller - Wrox Press Canada 1977
- **Component Software: Beyond Object Oriented Programming**, Clemens Szyperski, Addison-Wesley, 1998

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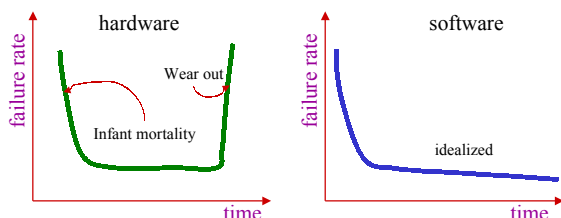
## Software Characteristics

- 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**

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## Failure Curves



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## Software Types

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

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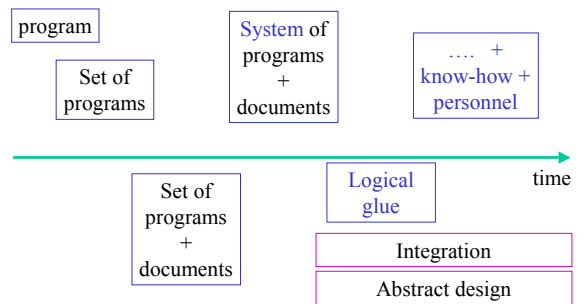
## Myths

- **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

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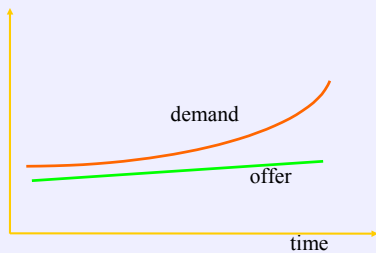
## What is Software?



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## Software Crisis

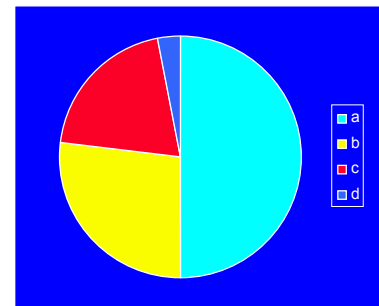


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## Success ?

- Failure
- Big repair
- Some repair
- Success

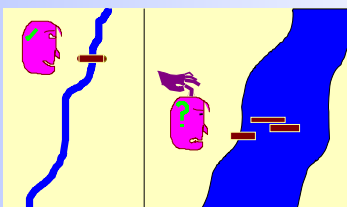


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## Engineering Problem



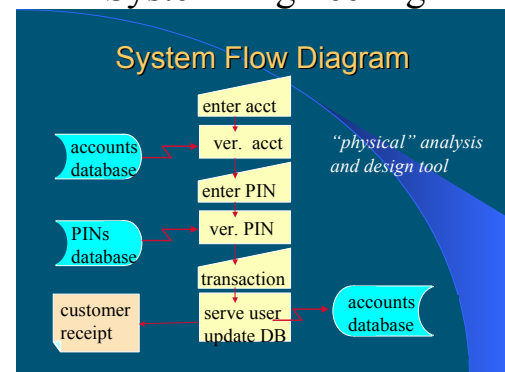
- Wicked problems
- Elevating abstraction
- Automation
- Software !!!

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## System Engineering

### System Flow Diagram



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