

The Evolution of the Software Professional:

Changes to the practice and culture of software engineering over the last 35 years

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Computer Science: Who Cares?

Computer Graphics (1970's):

- One department, at one university
- Several faculty, a few more students
- \$5,000,000 grant from ARPA



Computer Science: It Matters

Computer Graphics (2000's):

- Animated Content: \$59b revenues
- Medical Imaging: \$11b revenues
- Video Games: \$46b revenues



Software Engineering

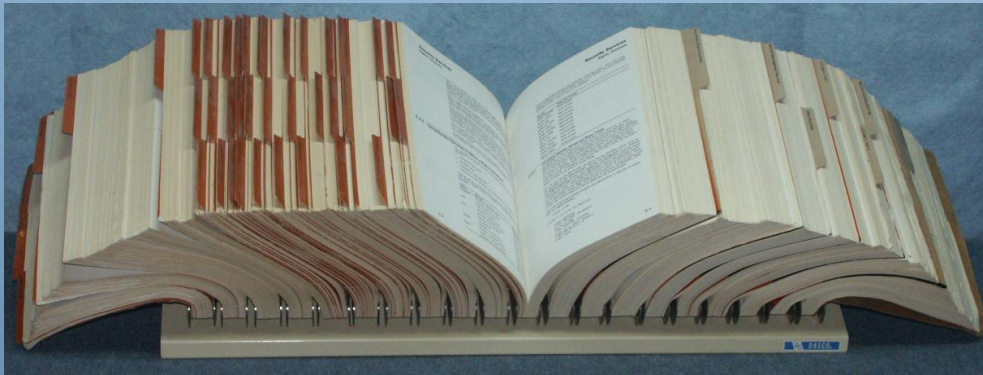
IEEE Computer Society Definition:

“**Software engineering** is the application of a **systematic, disciplined, quantifiable** approach to the development, operation, and maintenance of software, and the study of these approaches; that is, the application of engineering to software.”

Game Changers in Our Profession

#1) The fast and ubiquitous access to the accumulated knowledge of humanity:

- Internet Infrastructure, Internet Content
- Cisco thinks 8.7 billion in 2012

A screenshot of a Stack Overflow question page. The page title is "implements Runnable" vs. "extends Thread". The question asks for the best way to write threads in Java. The answer shows two code snippets: one using Runnable and one using Thread. The page also features a Microsoft Azure advertisement and a "CAREERS 2.0" sidebar with various job listings.

Stack Overflow is a question and answer site for professional and enthusiast programmers. It's 100% free, no registration required. [Take the 2-minute tour](#)

"implements Runnable" vs. "extends Thread"

Microsoft **Not all clouds are created equal.** Backup and storage you can count on. [Microsoft Azure](#) **FREE TRIAL**

asked 5 years ago
viewed 223285 times
active 8 days ago

CAREERS 2.0

Senior Front End Developer
Pellicci Analytics
Boulder, CO

Drupal Developer
Galam
Louisville, CO

Sr. Technical Writer
Wowza Media Systems
Evergreen, CO / remote

Full Stack Web Developer
Second Phase
Boulder, CO

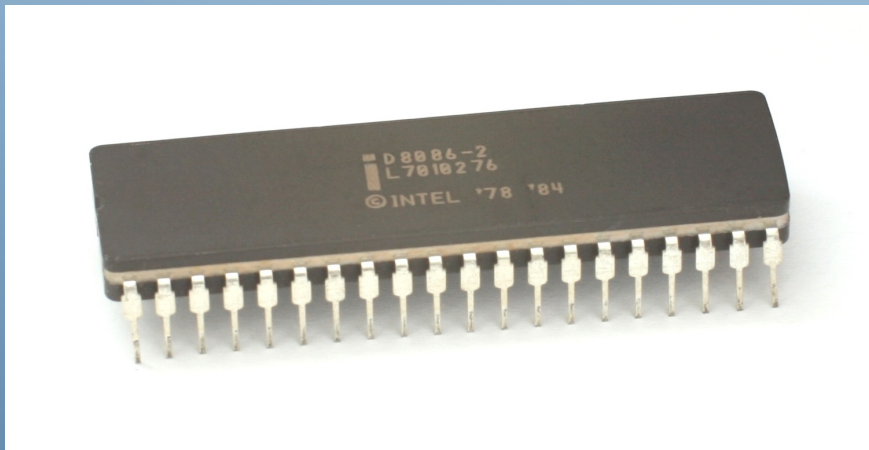
Rails Developer
TeamSnap

```
537 public class ThreadA implements Runnable {  
    public void run() {  
        //Code  
    }  
    264 //with a "new Thread(threadA).start()" call  
  
    public class ThreadB extends Thread {  
        public ThreadB() {  
            super("ThreadB");  
        }  
        public void run() {  
            //Code  
        }  
    }  
}
```

Game Changers in Our Profession

#2) The evolution of fast, powerful, inexpensive, yet reliable hardware and software systems.

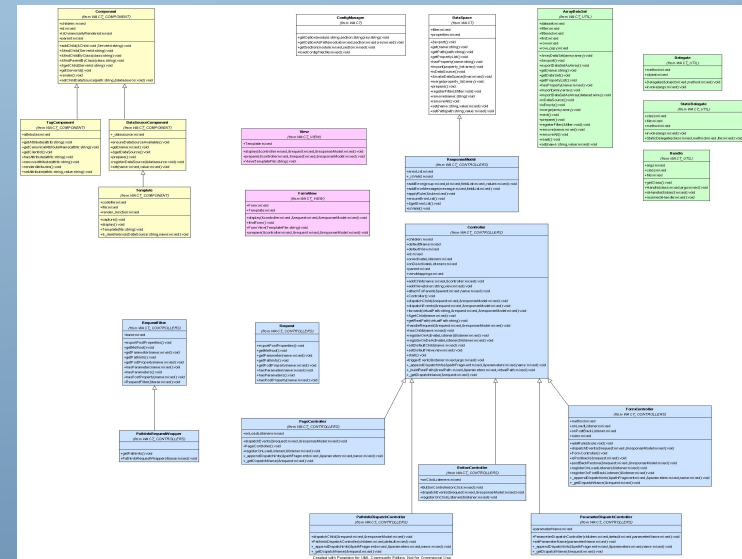
- 1978: Intel, 8086, 16-bit, 10 Mhz, 29K transistors
- 2014: nVidia Tegra, 64-bit, 2.5 Ghz, 1G transistors



Game Changers in Our Profession

#3) Object Oriented Programming

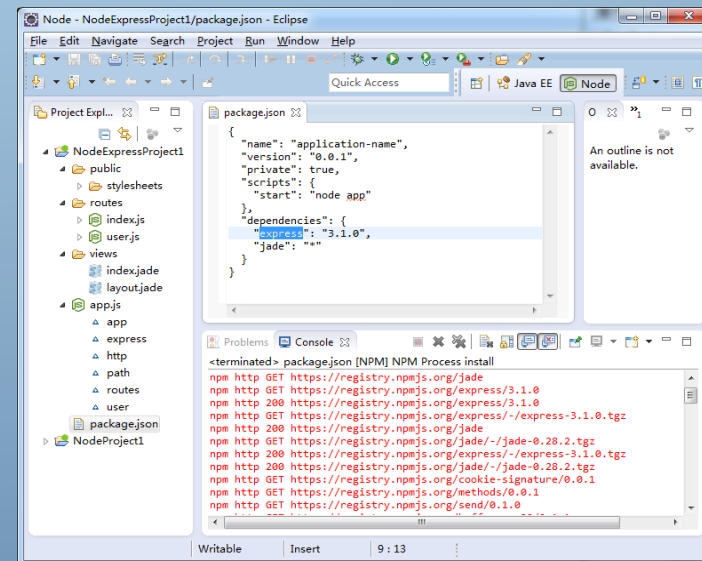
- 1978: Fortran, Pascal, Cobol, C becoming popular
- 2014: Ada, C++, Java, Python, Perl, etc.



Game Changers in Our Profession

#4) Evolving Development Environments

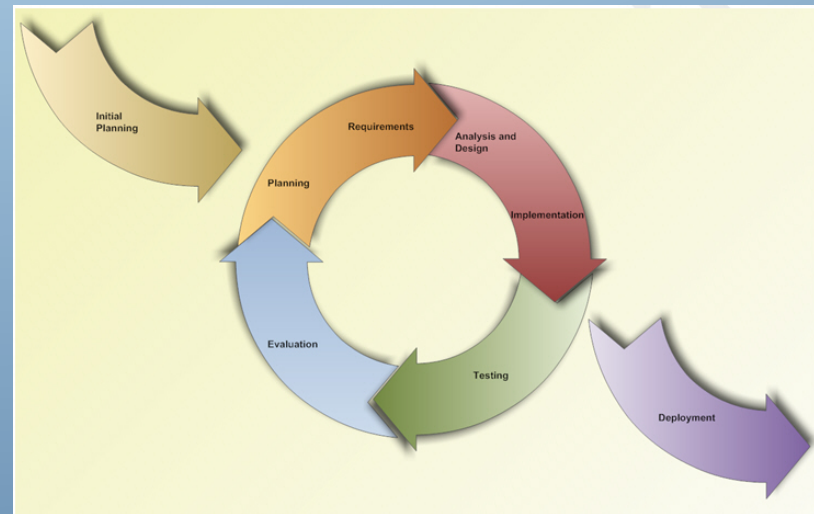
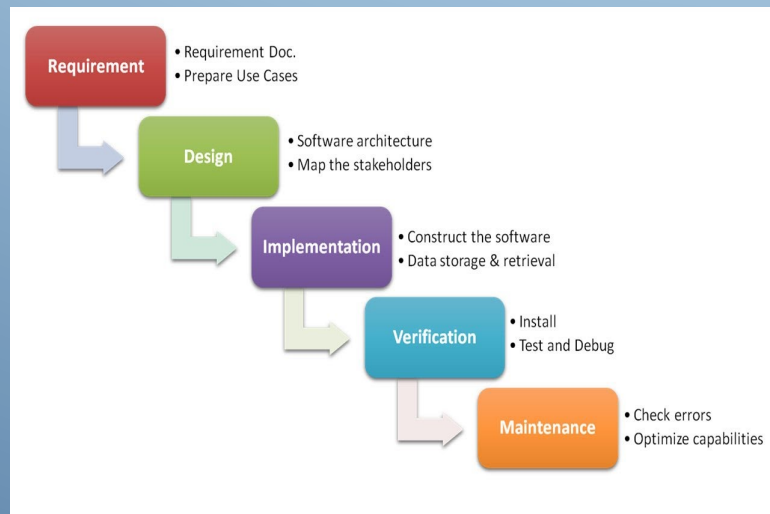
- 1978: Card Reader, VT100 Terminal, Vi or Emacs
- 2014: DevStudio, Eclipse, GitHub, Amazon Cloud



Game Changers in Our Profession

#5) Software Engineering Advances

- 1978: Waterfall Model, Source Control (maybe!)
- 2014: Agile Practices, Test Driven Development



Success Factors in this Profession

- You must know programming, operating systems, software engineering, etc.
- In addition, you must develop expertise that is specific to the domain in which you work
- You must be able to communicate your own ideas and understand those of others.
- You must have the ability to change and evolve along with technology.



Inevitability of Change

