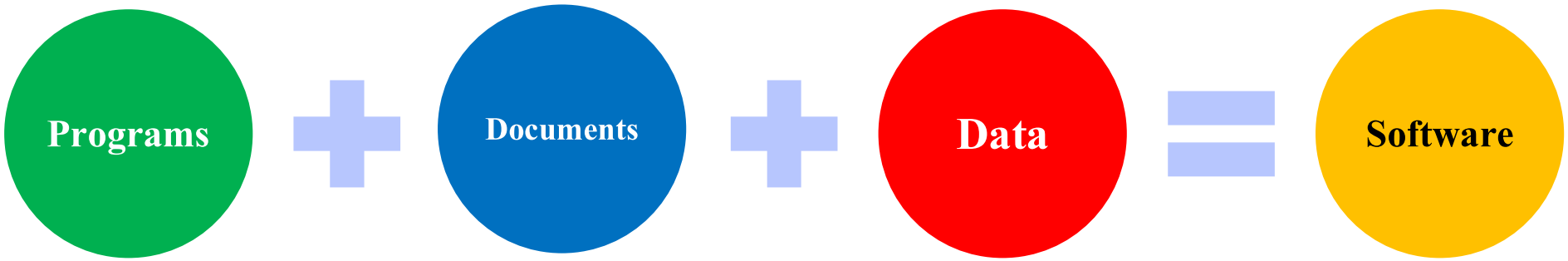
The Product

Modified from Roger S. Pressman, Software Engineering:

A Practitioner's Approach 8th Edition, McGraw Hill, 2014

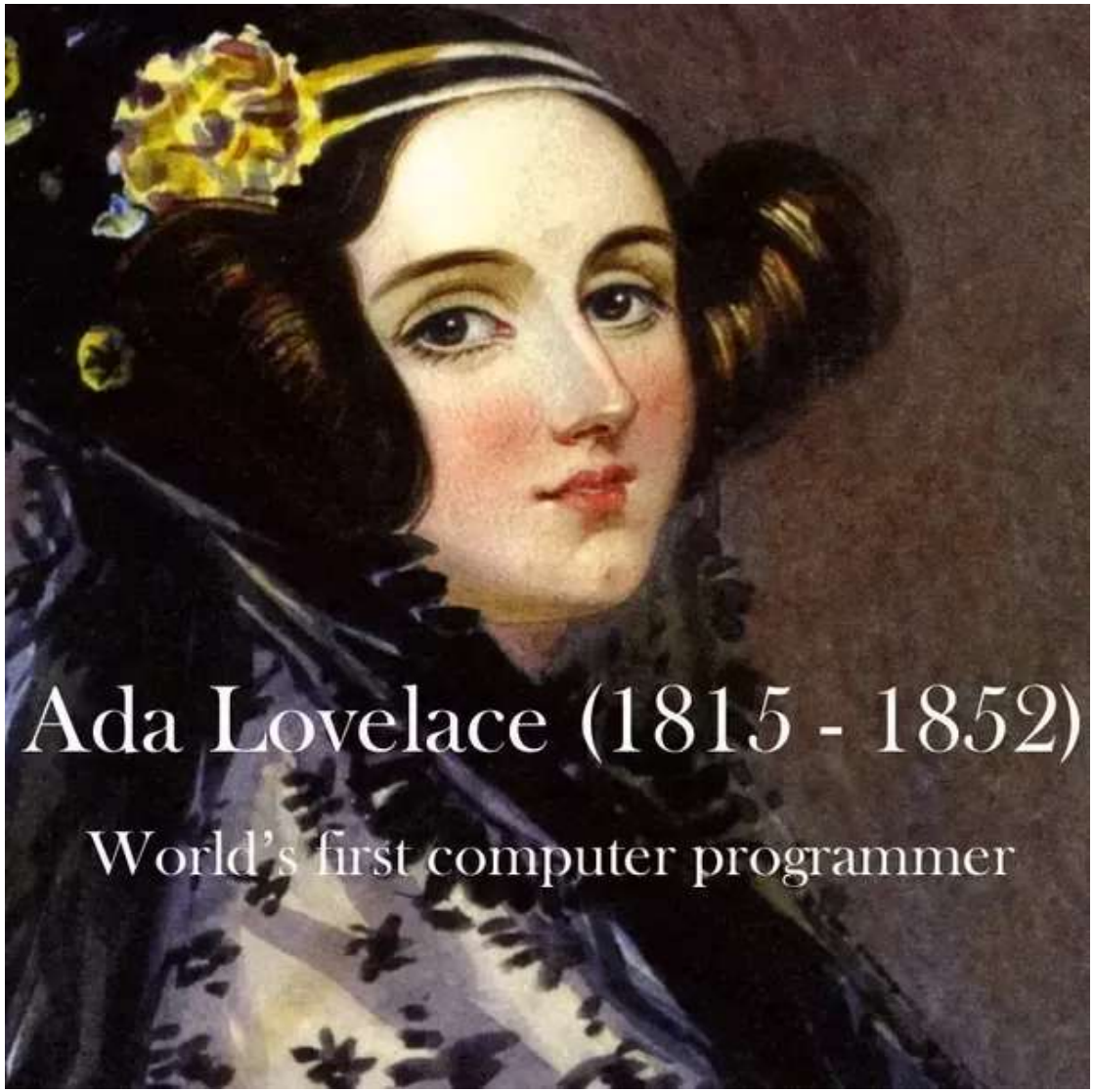
What is Software?

- Software is a set of items or objects that form a "configuration" that includes
  - programs
  - documents
  - data



First Programmer in the World

- **Ada Lovelace** was the first programmer

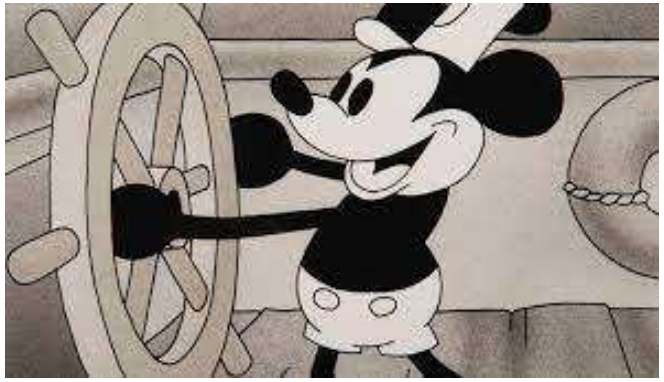


https://www.quora.com/Who-was-the-first-programmer-1

Software Characteristics

- Software is developed or engineered
  - it is not manufactured like hardware
  - both activities is achieved through good design
  - manufacturing hardware can introduce quality problems
  - both activities depend on people
  - construction approaches of both activities are different

- Software เทียบเคียงกับ วรรณกรรม บทนิพนธ์
- ลิขสิทธิ์เป็นของผู้เขียน ยกเว้นยกให้คนอื่น



- พรบ.ลิขสิทธิ์ กำหนดให้โปรแกรมคอมพิวเตอร์หรือที่เรียกกันว่าซอฟต์แวร์นั้นอยู่ในประเภทเดียวกันกับวรรณกรรม
- กฎหมายได้ให้ความคุ้มครอง source code โดยถือว่าเป็นงานเขียนชนิดหนึ่ง ทำให้ได้รับความคุ้มครองทันทีโดยไม่จำเป็นต้องจดทะเบียน
- แต่ก็สามารถแจ้งข้อมูลลิขสิทธิ์ไปยังกรมทรัพย์สินทางปัญญาได้โดยไม่มีค่าใช้จ่ายใดๆ เหมือนกับงานวรรณกรรมประเภทอื่น
- อายุการคุ้มครองตลอดชีวิตของผู้สร้างสรรค์ และหลังจากผู้สร้างสรรค์ตายไปอีก 50 ปี

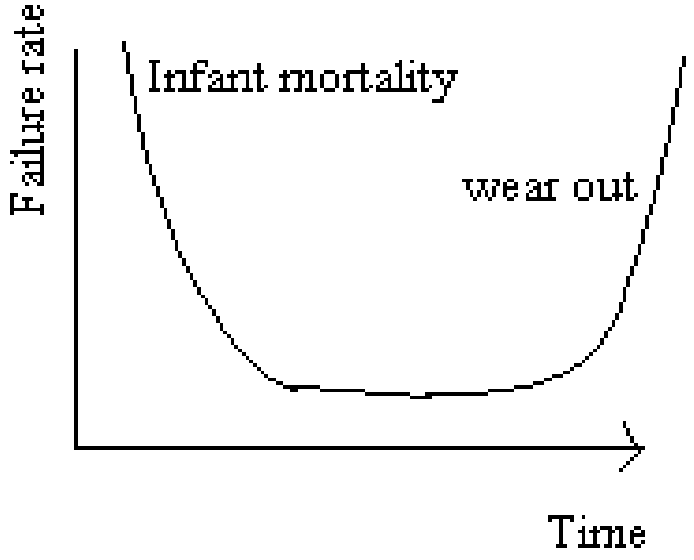
Custom

Built

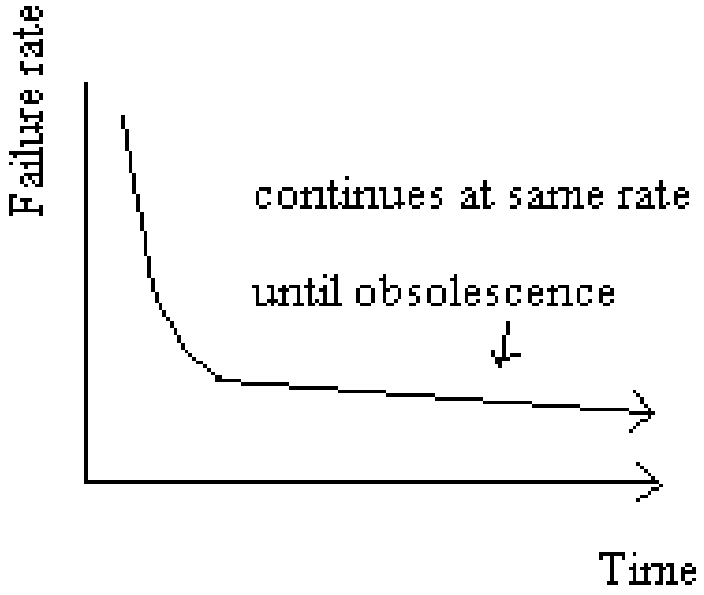
Software Characteristics (cont.)

- Software doesn't wear out
  - hardware has high failure rate early in its life time
  - then the failure drops to the steady level
  - the failure rate rises again as time pass
  - software has high failure rate early in its life time
  - it continues at same rate until obsolescence
  - if there are changes, the failure rates will spike
  - when a hardware component wears out, it may be replaced, but there are no software spare parts
- Most software is custom-built, rather than being assembled from existing components

Failure Curve for Hardware and Software

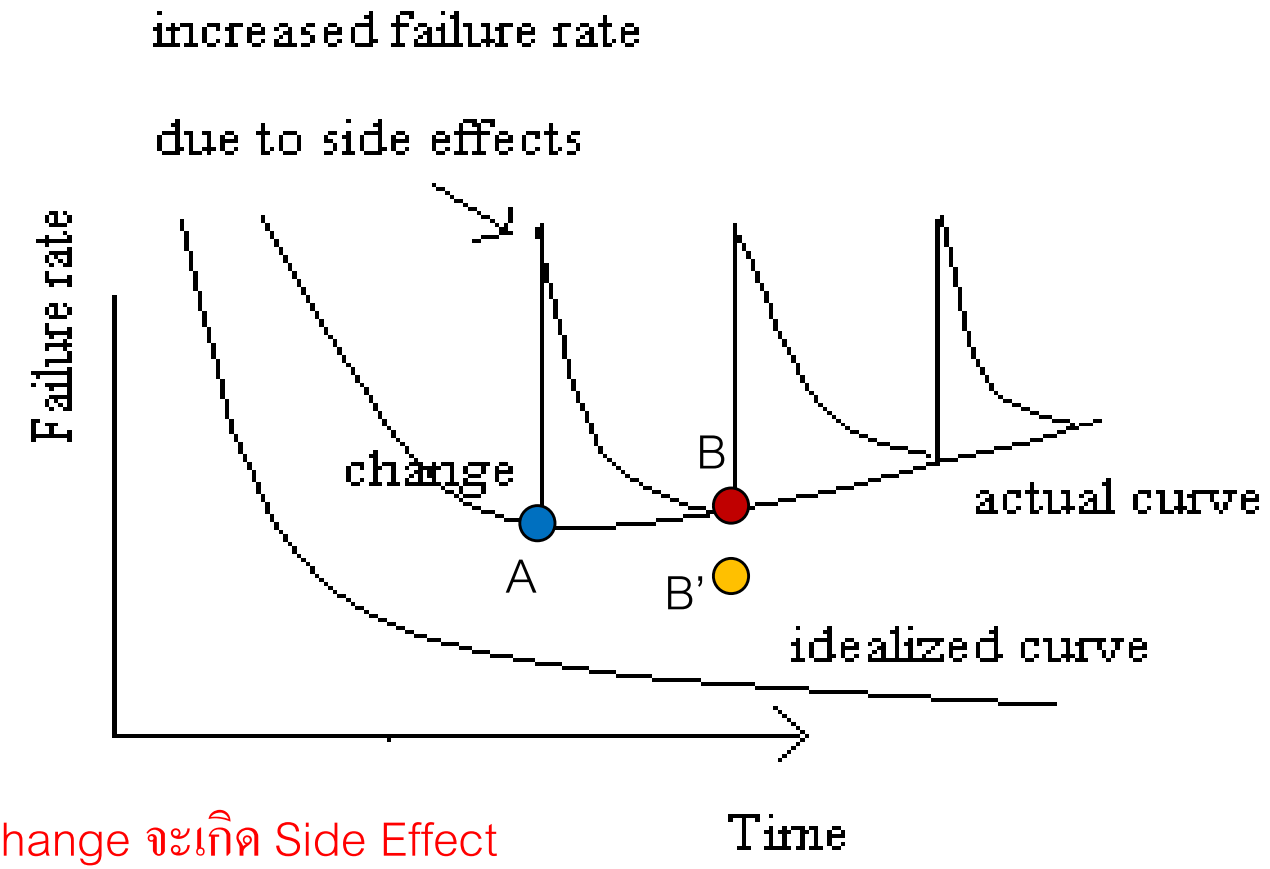


1. Failure curve for hardware



2. Failure curve for software

Actual Failure Curve for Software



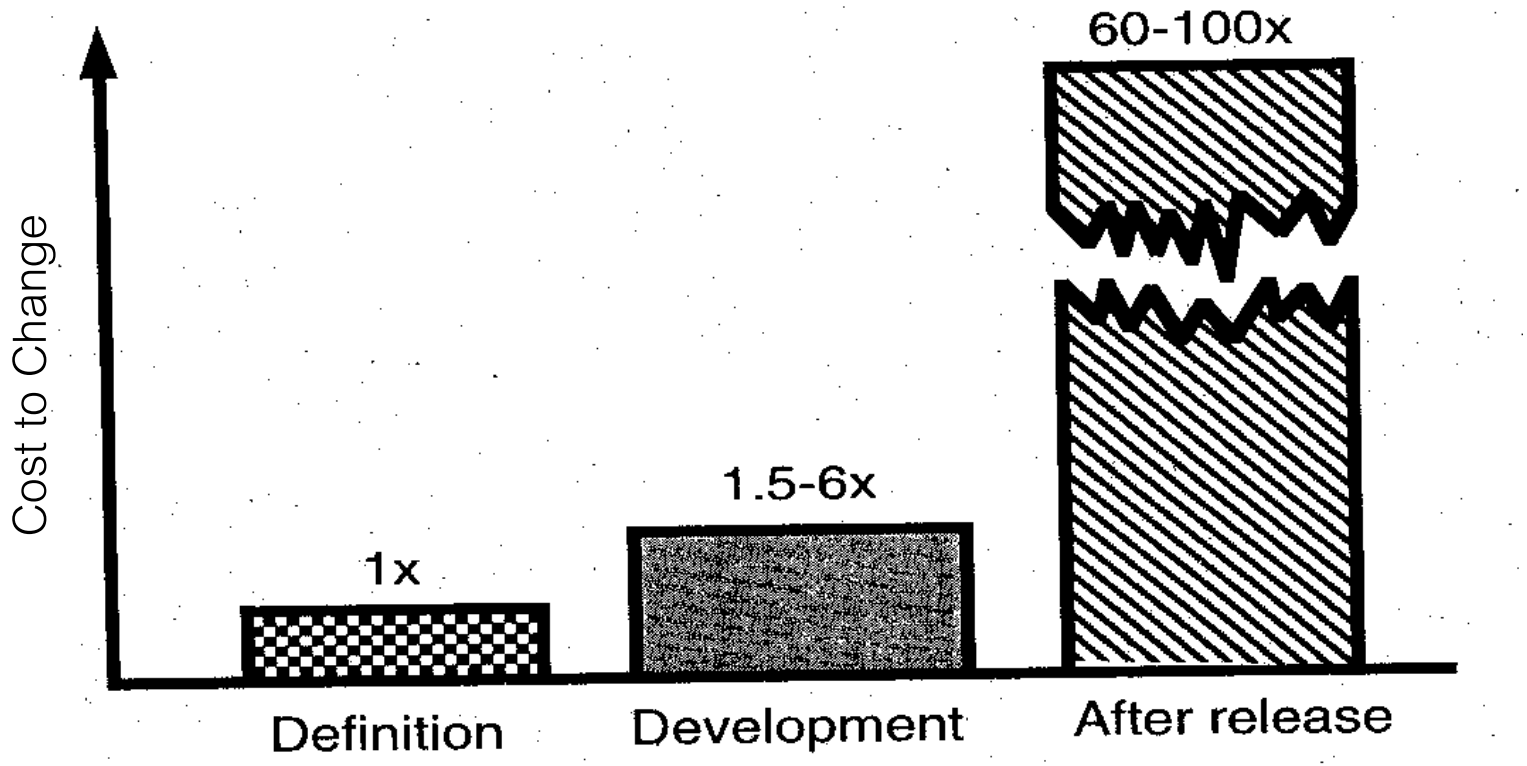
จากจุด A ถ้ามี Change จะเกิด Side Effect

หลังจากแก้ไขจนได้ B (มักจะไม่ลงมาถึง B' แล้ว)

Customer มีความเห็นเกี่ยวกับ custom built อย่างไร

Is Software Flexible?

- due to project requirements continually change
- changes may or may not be easily accommodated
- the impact of change varies with the time at which it is introduced



How Successful Have We Been?

- software engineering is about designing and developing high-quality software on-time and within budget
- software engineer has to produce
  - code that is robust, easy to understand and maintain
- zero defect software is not easy to be produced
- we still have written faulty programs
- lack of quality can be costly; the longer a fault goes undetected, the more expensive it is to correct

Where does Software Engineer Fits in?

เน้นทฤษฎี

- Computer scientists concentrate on the computers and programming language
- Software engineers views them as tools to be used in designing and implementing a solution to a problem

เน้นลงมือปฏิบัติ

  - instead of investigating hardware design or proving theorems about how algorithms works, a software engineer focuses on the computer as a problem-solving tool

Participants in Developing a Project

- Customer
  - is the company, organization, or person who is paying for the software system to be developed
- Developer
  - is the company, organization, or person who is building the software system for the customer
  - includes managers, programmers, and testers
- User
  - is the person or people who will actually use the system
  - customer and user may be the same person

Members of the Development Team

- Requirements analyst
  - work with the customer
  - break down what the customer wants into discrete requirements
- Designer
  - work with analysts to generate a system-level description of what the system is to do
- Programmers
  - work with designers to generate code that implement what the requirements specify

ปกติ Programmer จะไม่ต้องเจอ user

Members of the Development Team (cont.)

- Tester
  - catch faults that programmers overlook
  - work with customers to verify that the complete system is what the customer wants
- Trainers
  - show users how to use the system
- Maintenance team
  - fix faults after being discovered by the customer
  - fix changes