



# **Chapter 1**

## **Introduction to Software Engineering**

## Lesson Objectives

- Differentiate between Generic and Bespoke software product
- Describe what is software engineering and its importance
- Discuss the key challenges of software engineering and the professional responsibilities for software engineers

# What is Software?

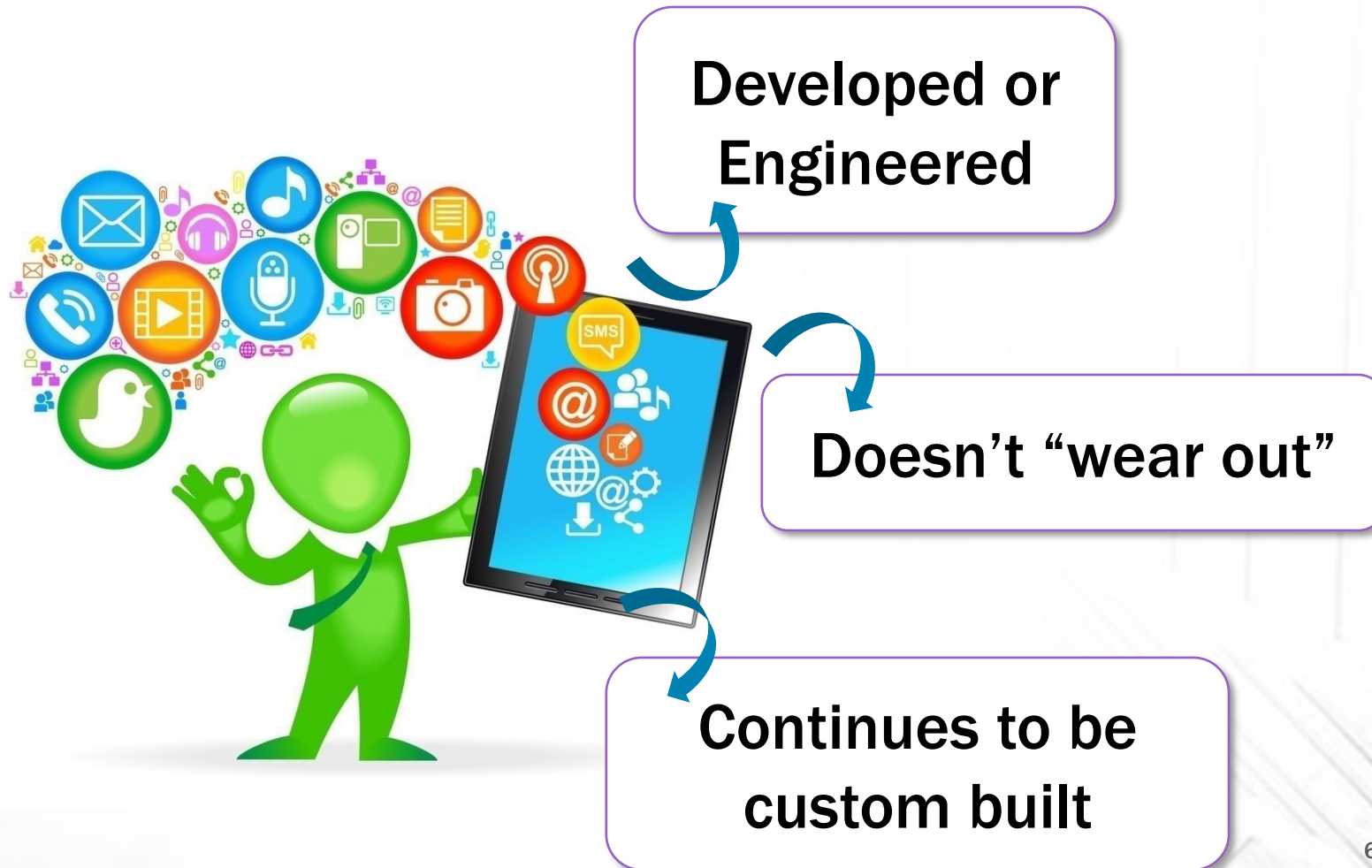
- Software is the **detailed instructions** that control the operation of a computer system.
- Without software, computer hardware could not **perform the tasks** we associate with computers.



# Functions of Software



# Characteristics of Software



# Types of Software

- There are two major types of software: -
  - Application software
  - System software





# Types of Software



**Examples of System Software**

**Operating System**

**Translators**

**Compilers**

**Loaders**

**Utility Programs**

# Types of Software Product

- Software engineers are concerned with developing software products, i.e. software, which can be sold to a customer.
- Two types of software product:
  - **Generic** products
  - **Bespoke** (or customized) products



# Types of Software Product



**What are the main differences between Generic and Bespoke software product?**

**Cost**

**The control of requirement /  
product specification**

## Test yourself

Which of the following are the main differences between Generic and Bespoke Software?

- A. Software usability
- B. Cost and customizability
- c. Needs of software expertise
- D. Needs of computer engineering

# What is Software Engineering?

# What is Software Engineering?

- Software engineering is an **engineering discipline**, which is concerned with **all aspects of software production** from the early stages of system specification through to maintaining the system after it has gone into use.

Software Engineers apply **theories, tools & methods** that are appropriate to discover solutions & work within company's constraints

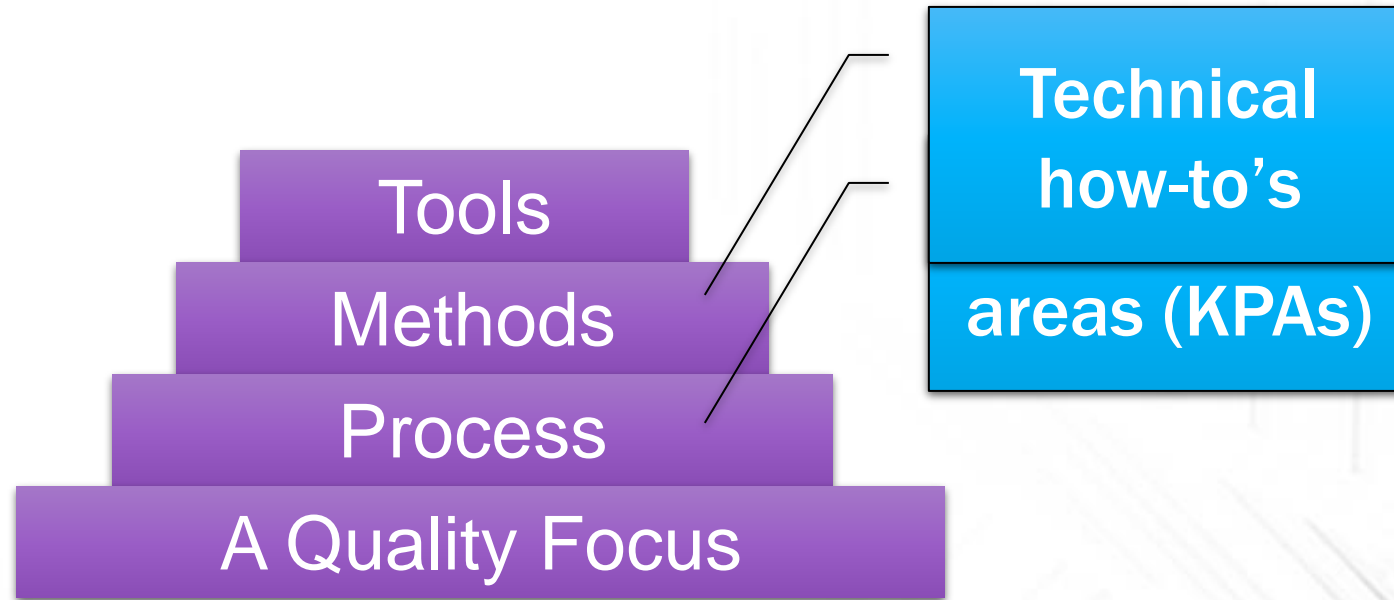
# What is Software Engineering?

- Software engineering is an **engineering discipline**, which is concerned with **all aspects of software production** from the early stages of system specification through to maintaining the system after it has gone into use.

Technical processes, software project management, development of tools, methods to support software production

# What is Software Engineering?

- Software engineering is a layered technology consisting of the following four important layers

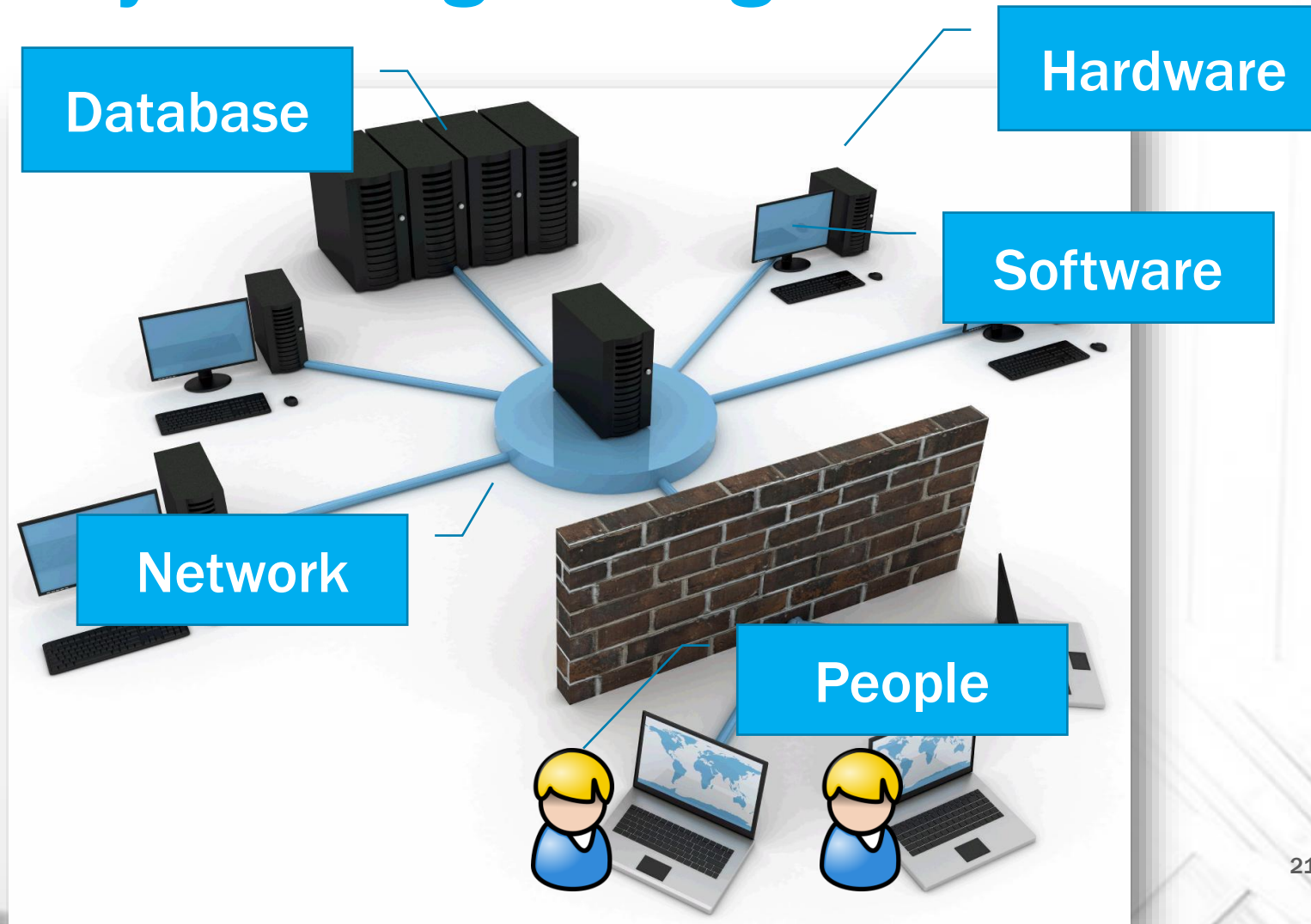




# What is System Engineering?

- Systems engineering is an interdisciplinary field of engineering that focuses on how **complex** engineering projects should be **designed** and **managed**.
- Issues such as logistics, the coordination of different teams, and automatic control of machinery become more difficult when dealing with large, complex projects.

# What is System Engineering?



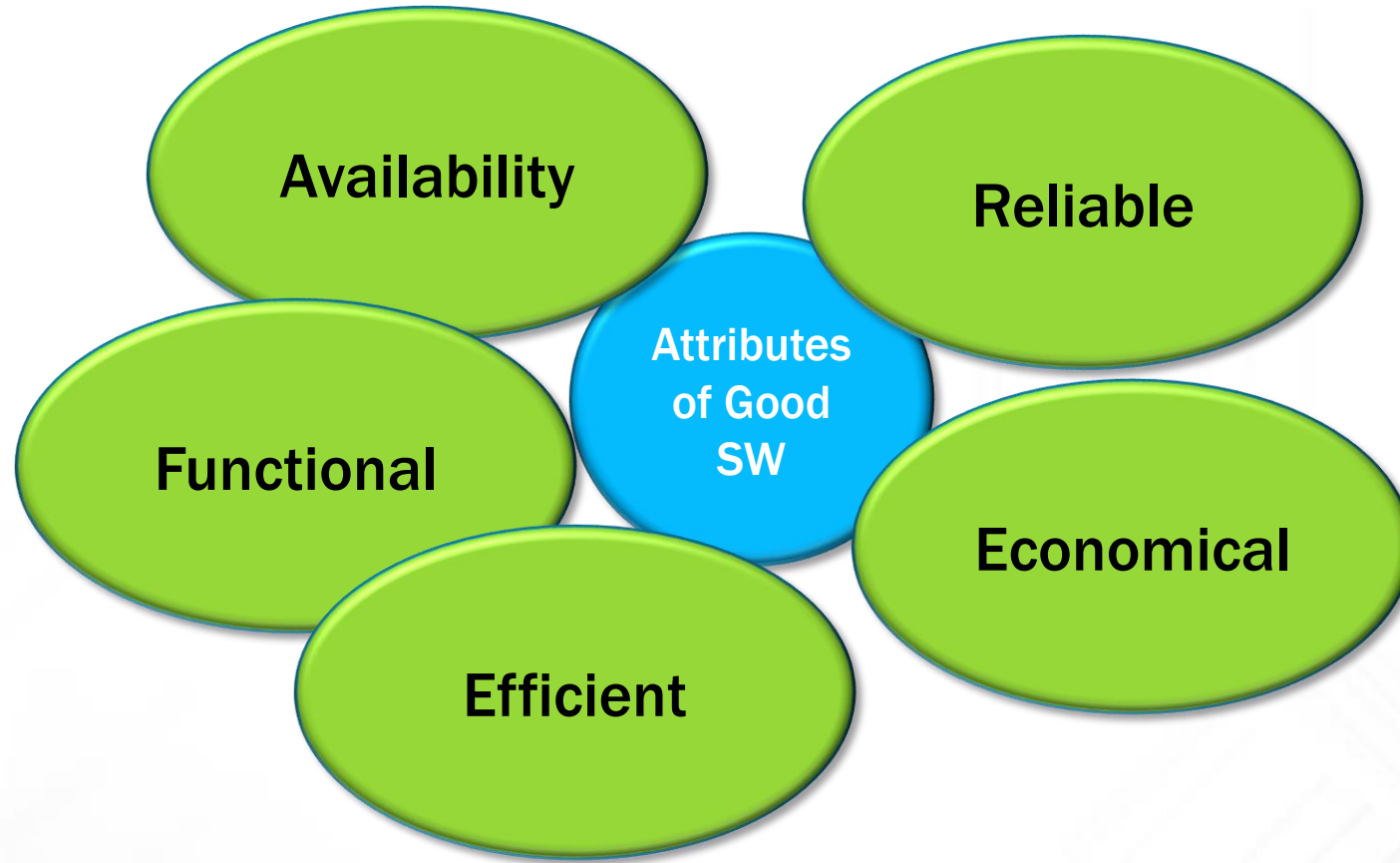


# Test Yourself

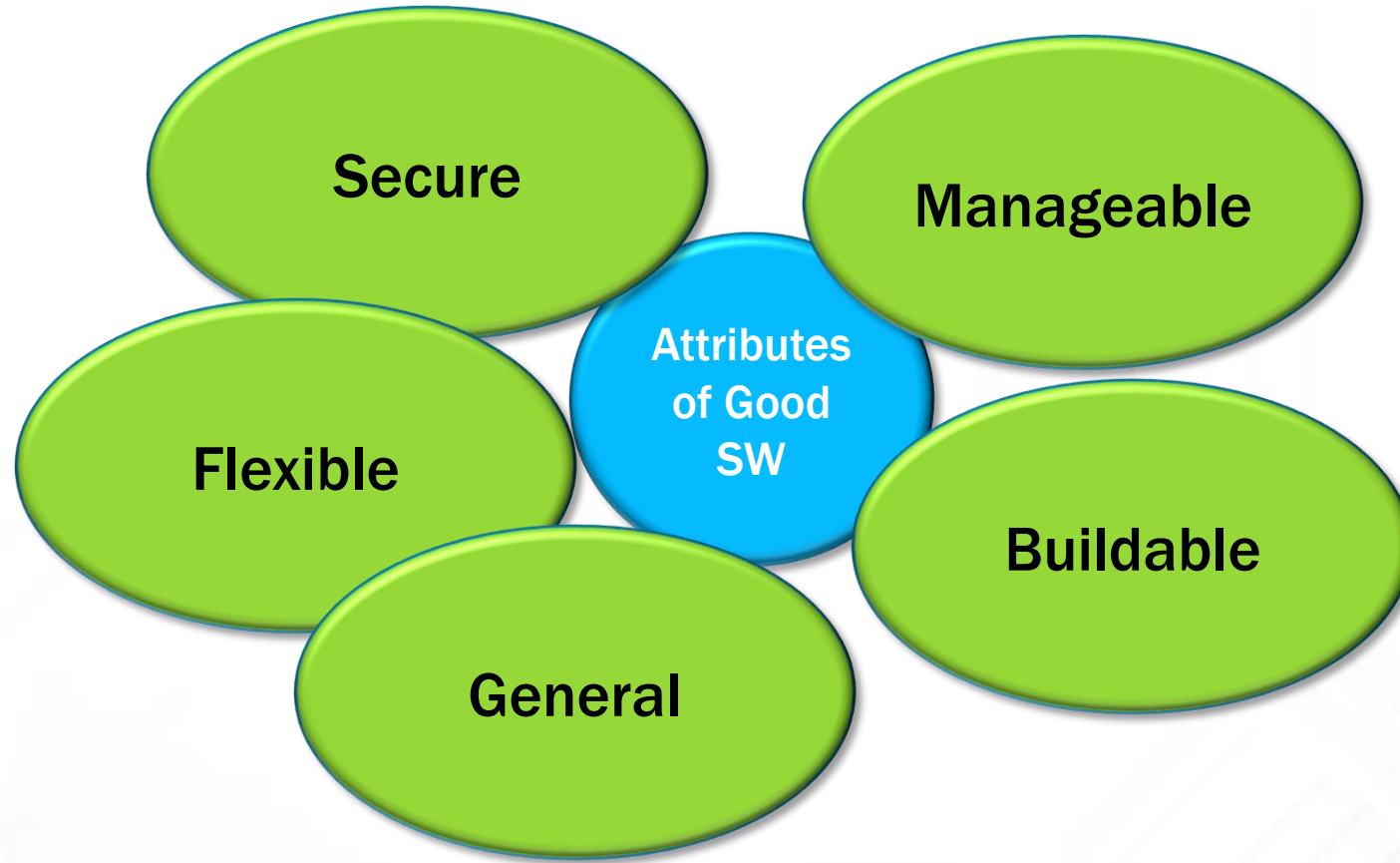
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# Why Software Engineering is Important?

# Attributes of Good Software

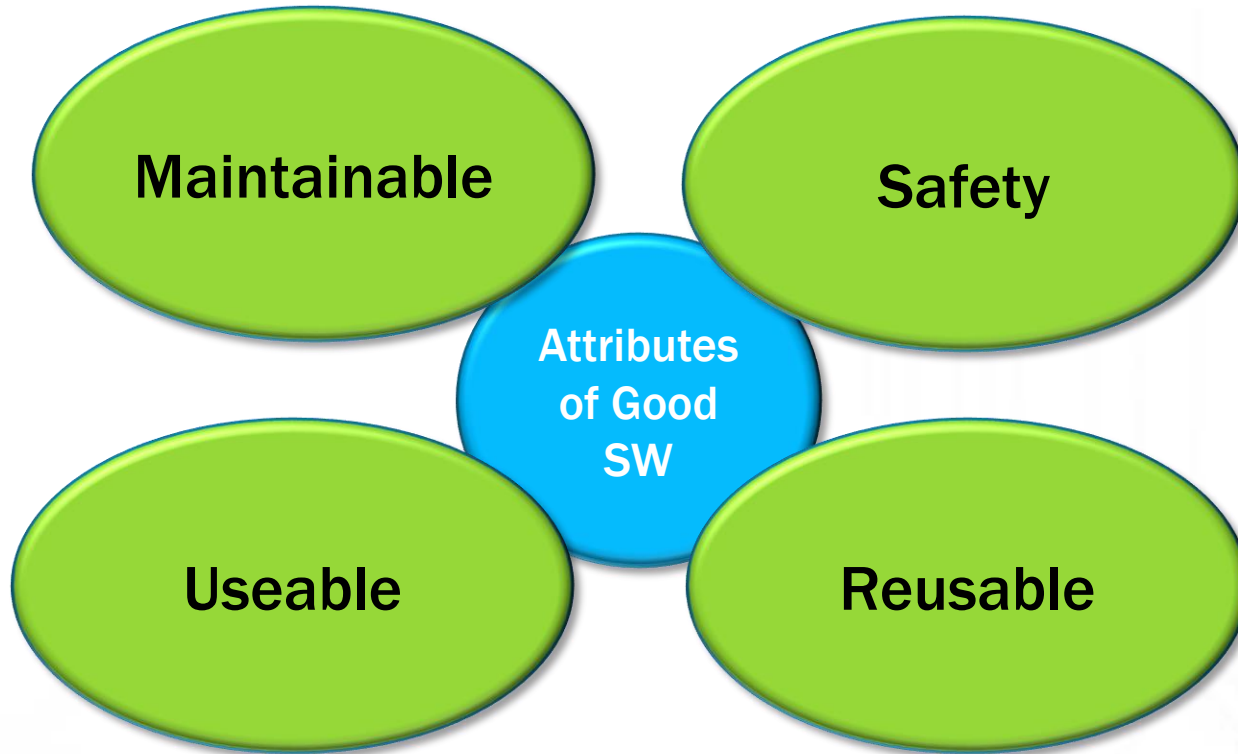


# Attributes of Good Software

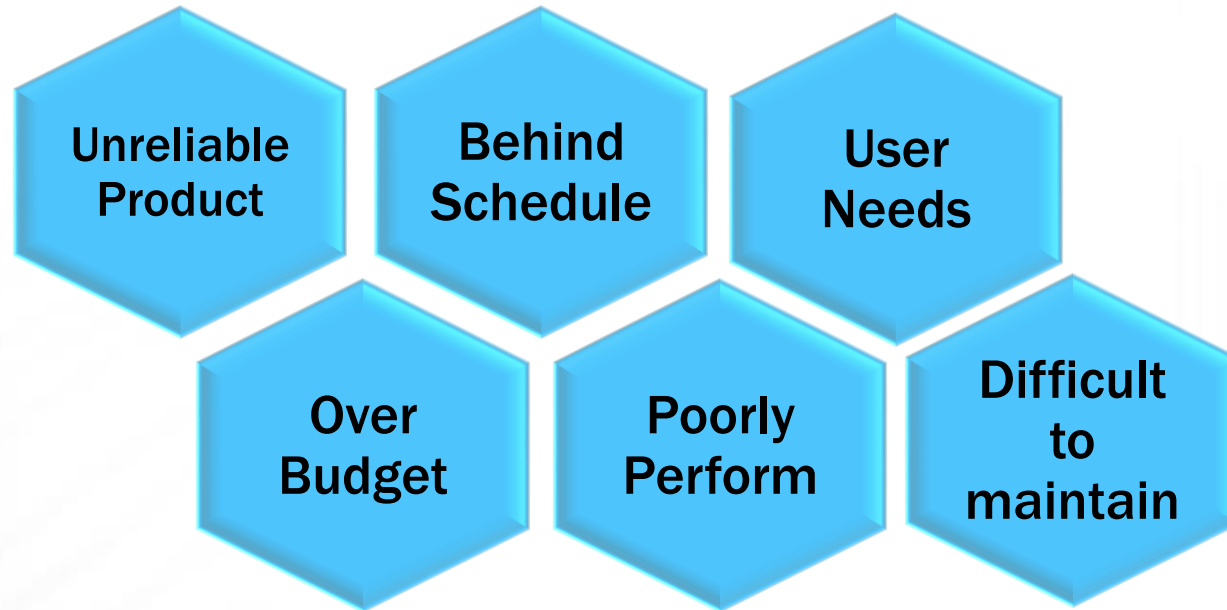




# Attributes of Good Software



# Importance of Software Engineering



***SOFTWARE PROJECT PROBLEM***



# Importance of Software Engineering

Hence, software engineering is an engineering discipline whose goal is **cost-effective** development of software system



***SOFTWARE PROJECT PROBLEM***

# What are Software Engineering Challenges?

# Key Challenges of Software Engineering

**Delivery Challenge**

**Legacy Challenge**

**Heterogeneity  
Challenge**



## Test yourself

Company YenYen initiates a project to sell its products online. As a software engineer who are responsible for this project, suggest **THREE (3)** software attributes that are important to this website.



# Professional & Ethical Responsibility

# Professional & Ethical Responsibility

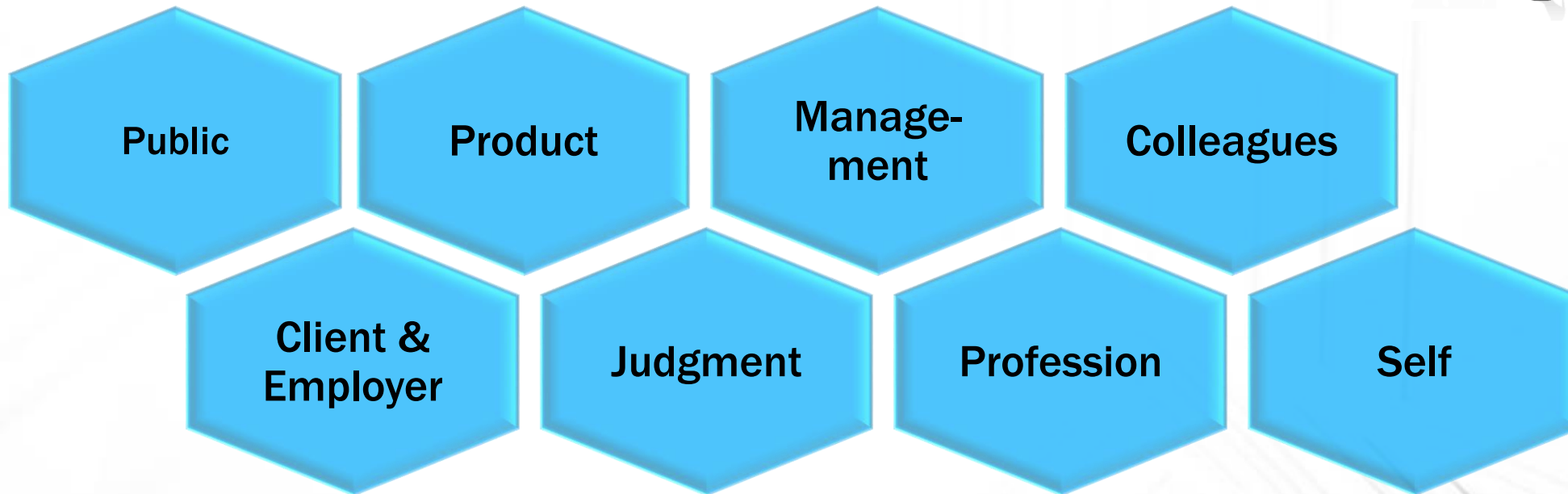
- Professional responsibilities for software engineers include:



- ✓ Confidentiality
- ✓ Competence
- ✓ Intellectual property rights
- ✓ Computer misuse

# Professional & Ethical Responsibility

## ACM/IEEE Code of Ethics



# Revision

- Generic vs. Bespoke software product
- Software Engineering (SE) & its importance
- Software Attributes
- Key challenges of SE
- ACM/IEEE code of ethics