

SOFTWARE ENGINEERING

UNIT – 1

TOPIC – 2 – PART – 2

NATURE OF SOFTWARE AND SOFTWARE APPLICATION DOMAINS

I. Work Product:

Work product is the result or outcome of Software Engineering

The outcome is in 2 perspectives:

1. Software Engineer: The set of programs, the content (data) along with documentation that is a part of s/w.
2. User/Customer: The functionality delivered by the s/w that improves user experience

II. Software Engineering focuses on:

- Quality (While Software development)
 - Functional: To what extent that we have delivered the correct s/w and is it reaching the expectations. Degree to which correct software is produced.
 - Non functional: Also called structural attributes. Features other than functions of s/w like robustness, security, etc.
- Maintainability (After the software has been developed and delivered)
 - Should be easily enhanced and adapted to changing requirements whenever required.

III. Nature of Software:

Software is a key component of modern technology, driving everything from simple mobile apps to complex systems in industries like healthcare, finance, and transportation. Unlike

physical products, software is intangible—it can't be seen or touched. Instead, it exists as a collection of ideas and logic, embodied in code that tells computers what to do.

Key Characteristics of Software:

1. Intangible Nature: Software differs from physical products as it cannot be physically interacted with. Its existence is in the form of code and logical structures.
2. Complexity: Software systems can be incredibly complex, involving millions of lines of code. This complexity can make software development, maintenance, and management challenging.
3. Evolution Over Time: Software is not static. It needs to be continuously updated and improved to adapt to new user requirements and technological advancements.
4. No Wear and Tear: Unlike hardware, software does not physically degrade over time. However, it can become outdated or incompatible with newer technologies.
5. High Dependability: Modern society relies heavily on software, making its reliability essential. Software plays a critical role in everything from communication to transportation.

IV. Software Application Domains

Software is used in a variety of domains, each serving different purposes and industries. Here are some key areas where software plays a vital role:

1. Web Applications: These include websites and online platforms such as social media, e-commerce sites, and blogs. Web applications are accessible through browsers and are essential for modern communication and commerce.
2. Mobile Applications: Designed for smartphones and tablets, mobile apps include games, messaging apps, and fitness trackers. These apps are tailored to mobile devices' operating systems and hardware.

3. Enterprise Applications: Businesses use enterprise software to manage operations, such as accounting systems, customer relationship management (CRM) tools, and human resources (HR) software. These applications are crucial for efficient business operations.
4. Embedded Systems: Embedded software runs on devices like smartwatches, home appliances, and car systems. This type of software controls specific functions and is often embedded directly into the hardware it operates.
5. Scientific and Engineering Applications: These are specialized programs used in scientific research, simulations, or engineering tasks. Examples include weather prediction software and computer-aided design (CAD) tools.
6. Artificial Intelligence (AI) and Machine Learning (ML): AI and ML systems can learn from data and make decisions. Examples include chatbots, recommendation engines, and self-driving cars.
7. Gaming: Gaming software ranges from simple mobile games to complex video games. This domain focuses on entertainment and is a major industry in its own right.

These domains highlight the diverse applications of software and its importance across various sectors.