

### **SNS COLLEGE OF ENGINEERING**

Kurumbapalayam(Po), Coimbatore – 641 107 Accredited by NAAC-UGC with 'A' Grade Approved by AICTE, Recognized by UGC & Affiliated to Anna University, Chennai

### Department of Artificial Intelligence and Data Science

SOWMIYA R/AP/AI&DS/SNSCE/23ITT203 OBJECT ORIENTED SOFTWARE ENGINEERING

2/10/2025







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### **Software definition:**

**Definition 1**: Software is instructions (computer programs) that are intended to provide desired Features, function, and performance;

**Definition 2**: Software is a data structure that enables the programs to adequately manipulate information.





#### **Characteristics of software are**

Software is developed or engineered; it is not manufactured in the classical sense. In both activities, high quality is achieved through good design, but the manufacturing phase for hardware can introduce quality problems that are nonexistent for software Software doesn't "wear out."

The failure rate curve for software should take the form of the "idealized curve" shown in Figure. Undiscovered defects will cause high failure rates early in the life of a program. However, these are corrected and the curve flattens as shown. The idealized curve is a gross oversimplification of actual failure models for software. However, the implication is clear—software doesn't wear out. But it does deteriorate!



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### **Software Application Domains**

Seven broad categories of computer software

- **System software**—a collection of programs written to service other programs. Some system software are compilers, editors, and assembler. The purpose of the sysem software is to establish a communication with the hardware.
- **Application software**—stand-alone programs that solve a specific business need. •
- **Engineering/scientific software**—has been characterized by "number crunching" algorithms. lacksquare
- **Embedded software**—resides within a product or system and is used to implement and control lacksquarefeatures and functions for the end user and for the system itself.
- **Product-line software**—designed to provide a specific capability for use by many different lacksquarecustomers.
- Web applications—called "WebApps," this network-centric software category spans a wide lacksquarearray of applications.
- **Artificial intelligence software**—makes use of non numerical algorithms to solve complex • problems that are not amenable to computation or straightforward analysis.

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#### Legacy software systems:

Legacy software systems were developed decades ago and have been continually modified to meet changes in business requirements and computing platforms. A few simple realities to build software that is ready to meet the challenges of the twenty-first century are:

A concerted effort should be made to understand the problem before a software solution is developed.

- Design becomes a pivotal activity lacksquare
- Software should exhibit high quality lacksquare
- Software should be maintainable
- Software in all of its forms and across all of its application domains should be engineered. 2/10/2025 SOWMIYA R/AP/AI&DS/SNSCE/23ITT203 OBJECT ORIENTED SOFTWARE ENGINEERING





### **Software engineering:**

#### A definition proposed by Fritz Bauer is

[Software engineering is] the establishment and use of sound engineering principles in order to obtain economically software that is reliable and works efficiently on real machines. **The IEEE definition is:** 

Software Engineering is the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software.





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#### Software engineering is a layered technology.



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9



### **Quality focus**

A disciplined quality management is a backbone of software engineering technology.

#### **Process layer:**

The foundation for software engineering is the *process* layer. Process defines a framework that must be established for effective delivery of software engineering technology.

#### Methods:

Software engineering *methods* provide the technical how-to's for building software. Methods encompass a broad array of tasks that include communication, requirements analysis, design modeling, program construction, testing, and support.

#### Tools:

Software engineering *tools* provide automated or semi automated support for the process and the methods. When tools are integrated so that information created by one tool can be used by another, a system for the support of software development, called *computer-aided software* engineering, is established.

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