Training Session 2

Types of Applications

Cloud Based Application	Legacy Application	Digital Application	Enterprise Applications	AI	IOT Devices	Embedded	Gaming	Virtual Reality
IAAS	Desktop	Websites	CRM					
PAAS	AS 400	Mobile Apps	SCM					
SAAS	Mainframes	Chatbots	ERP					
			PLM					
			HRMS					
			CMS					
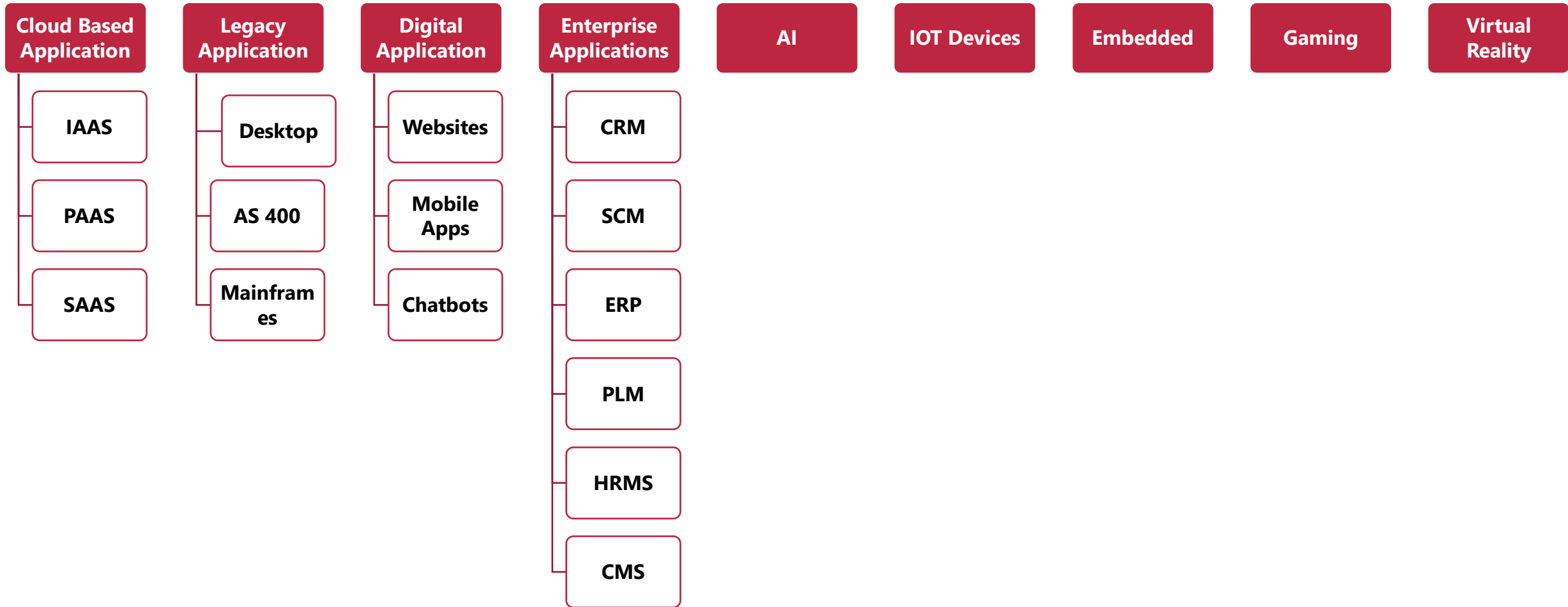
What are the different Characteristics of An Application?

Functionality	**Scalability**	**Reliability**	**Usability**
Performance	**Maintainability**	**Security**	**Portability**
	Quality of Service	**Compatability**	

What is the Impact of Software Failures

Financial Loss	Loss of Employee Productivity	Data and Security Breach	Customer Dissatisfaction

	Safety Hazard	Compliance Lawsuits and Fines	Reputation Damage

Examples of Software Failures

Boeing 737 MAX Crashes (2018-2019)

- **Business Impact**: Grounding of the entire 737 MAX fleet, loss of trust in Boeing, significant financial losses, and legal consequences.
- **Reason for Defect**: A software flaw in the Maneuvering Characteristics Augmentation System (MCAS), which was designed to prevent the plane from stalling. The system received erroneous sensor data, causing it to forcefully push down the nose of the plane, leading to two fatal crashes.

Knight Capital Group Trading Disaster (2012)

- **Business Impact**: A loss of $440 million in about 45 minutes, severely damaging the company's financial position and leading to its acquisition.
- **Reason for Defect**: A software glitch in the automated high-frequency trading system. An old, unused piece of software was accidentally reactivated, which interacted wrongly with the new system, causing rapid, unintended stock trades.

## HealthCare.gov Website Failure (2013)

- **Business Impact**: Damaged public perception of the Affordable Care Act, technical and customer service costs, and political fallout.
- **Reason for Defect**: The website, intended to provide health insurance under the Affordable Care Act, was plagued with issues like slow performance, error messages, and crashes. The problems were due to inadequate testing, high user traffic, and complex system integrations.

What is a Software Defect?

- **A software defect, also known as a bug, is a problem in a computer program that makes it work incorrectly or unexpectedly.**
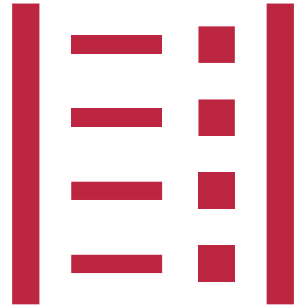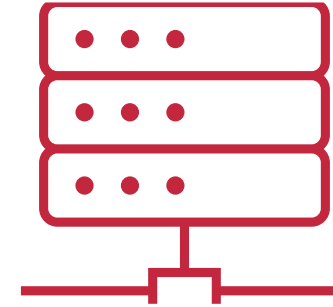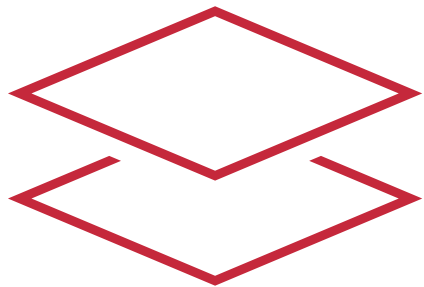
Incorrect Requirement
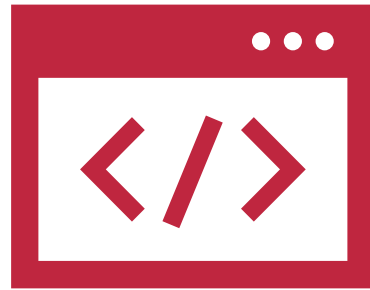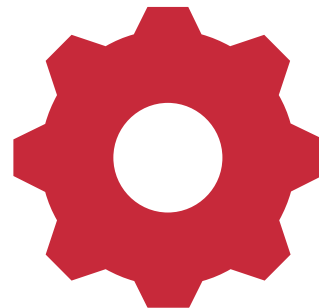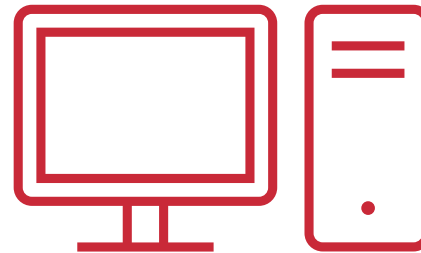
Programming Error

Testing Error

Data

Integration

Design Flaw

Poor Configuration

H/W or S/W Compatibility
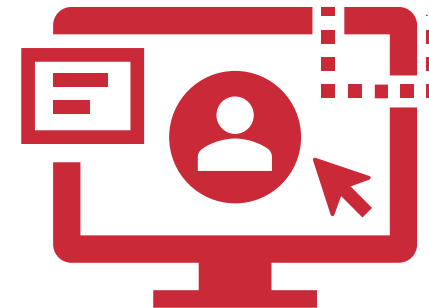
Poor UI Design

Poor Exception Handling

Why Test Software?

Ensures quality and functionality

Guarantees reliability and security

Assesses performance under various conditions

Enhances user satisfaction and experience

Reduce Cost by Finding Defects Early

Ensures legal and regulatory compliance

Simplifies future maintenance and updates

Cost of Fixing Defects

Relative cost to fix bugs, based on time of detection

Bar chart showing relative cost (0x to 30x) by stage:
- Requirements / Architecture: ~1x
- Coding: ~5x
- Integration / Component Testing: ~10x
- System / Acceptance Testing: ~15x
- Production / Post-release: ~30x

Software Testing Principles

Presence of Defects : Testing can indicate defects, not their absence.

Exhaustive Testing Impossibility   : Complete testing is unfeasible; prioritize based on risk.

Early Testing   : Begin testing early in the software development lifecycle.

Defect Clustering : Defects tend to cluster; focus on high risk areas.

Pesticide Paradox : Regularly revise tests to uncover new bugs.

Context Dependent Testing : Tailor testing strategies to the specific software and context.

Absence of Errors Fallacy : Software without defects may still not meet user needs.

Verification & Validation

Focus Area	Verification	Validation
Objective	The process of evaluating work-products of a development phase to ensure the software at that stage meets the specified requirements.	The process of evaluating the final product to ensure it meets the business and user requirements
Activities	Reviews, inspections, walkthroughs etc	Actual testing of the functionality and behavior of the software.
Outcome	Are we building the product, right?	Are we building the right product?

testhouse

A Quality Engineering Solutions Company

contact@testhouse.net
www.testhouse.net

United Kingdom (HQ)	United States	United States	Australia	Middle East	India
Level 18, 40 Bank Street Canary Wharf London E14 5NR, UK	260, Madison Avenue 8th Floor New York 10016	10100 Santa Monica Boulevard #300 Los Angeles California 90067	Level 35, Tower One International Towers, 100 Barangaroo Avenue Sydney, NSW 2000, Australia	Module No. 3, Office No. 214 Block-B Business Village Al-Maktoum Street, Deira, Dubai	2nd Floor, Nila Building Technopark Campus Trivandrum 695581
+44 20 8555 5577	**+1 917 793 9266**	**+1 224 323 6188**	**+61 452 043 774**	**+971 459 16013**	**+91 471 270 0117**