**QUALITY ATTRIBUTES : SOFTWARE**

**ARCHITECTURE**

**by.**

**19SW42**

# Introduction

**2**

* Functionality and Quality Attributes are orthogonal
* Overall factors that affect run-time behavior, system design, and user experience

Software **quality is the degree to which software possesses a desired combination of attributes** (e.g., reliability, interoperability).

**Architecture and Quality Attributes**

**3**

* Architecture, by itself, is unable to achieve qualities
* Architecture should include the factors of interest for each attribute

**Quality Attributes Scenario**

**4**

 Is a quality-attribute-specific requirement.



It

consists

of

six

parts

:



Source

of

stimulus



Stimulus



Environment



Artifact

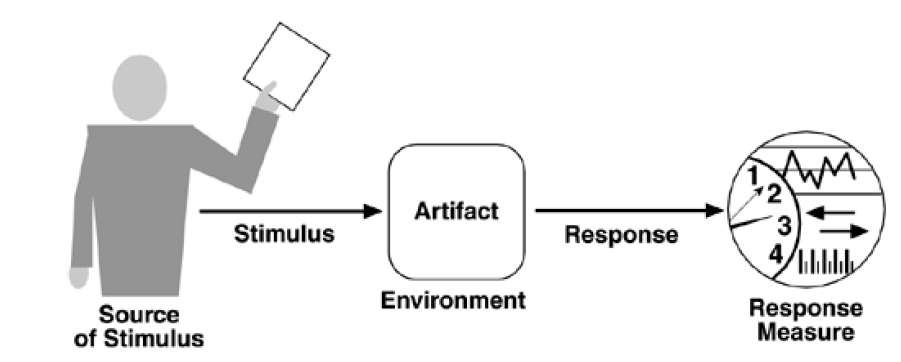


Response



Response

measure



**Figure**

**1**

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**Quality attributes Parts**

# Common Quality Attributes

**5**

 It categorizes the attributes in various specific areas

* Design qualities
* Runtime qualities
* System qualities
* User qualities
* Non-runtime qualities
* Architecture qualities
* Business qualities

# Design Quality Attributes

**6**

 **Conceptual Integrity:**

* Defines the consistency and coherence of the overall design
* Includes the way that components or modules are designed

 **Maintainability:**

* Ability of the system to undergo changes with a degree of ease  **Reusability:**
* Defines the capability for components and subsystems to be suitable for use in other applications

# Runtime Quality Attributes

**7**

 **Interoperability:**

* Ability of a system or different systems to operate successfully by communicating and exchanging information with other external systems written and run by external parties  **Manageability:**
* Defines how easy it is for system administrators to manage the application

 **Reliability:**

 Ability of a system to remain operational over time

 **Scalability:**

 Ability of a system to either handle increases in load without impact on the performance of the system, or

the ability to be readily enlarged

 **Performance:**

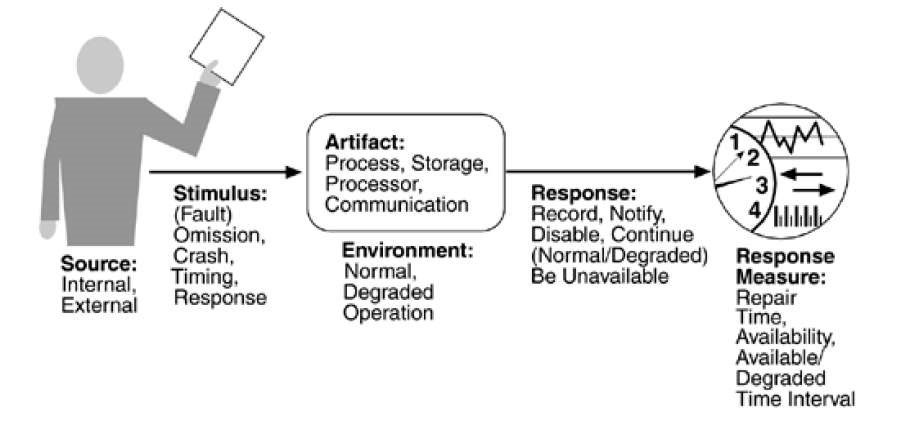
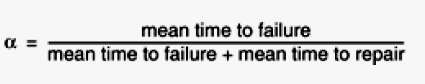
 Indication of the responsiveness of a system to execute any action

 **Security:**

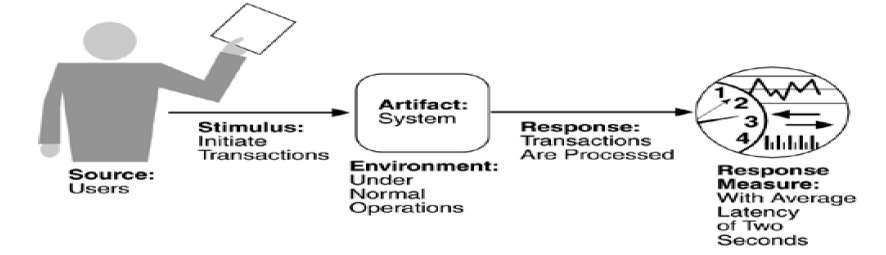
 Capability of a system to prevent malicious or accidental actions outside of the designed usage

 **Availability:**

* Proportion of time that the system is functional and working
* Measured as a percentage of the total system downtime over a predefined period



**Figure 2: Availability of general scenario**



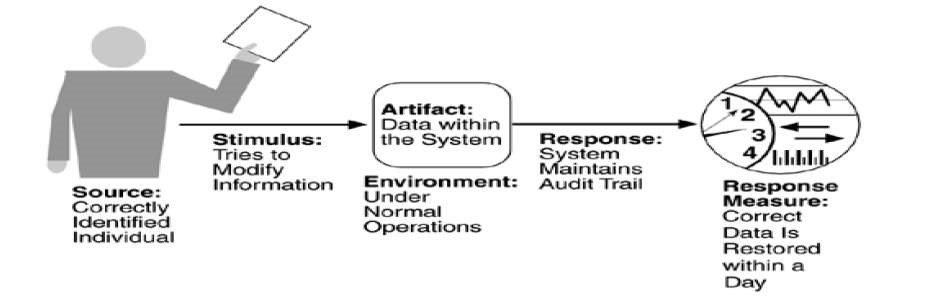
**11**

**Figure**

**3**

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**Sample performance scenario**

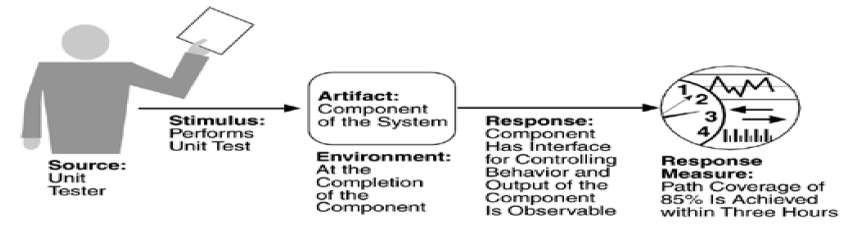


**Figure 4: Sample security scenario**

# System Quality Attributes

**12**  **Supportability:**

* Ability of the system to provide information helpful for identifying and resolving issues when it fails to work correctly  **Testability:**
* Measure of how easy it is to create test criteria for the system and its components



**Figure 5: Sample testability scenario**

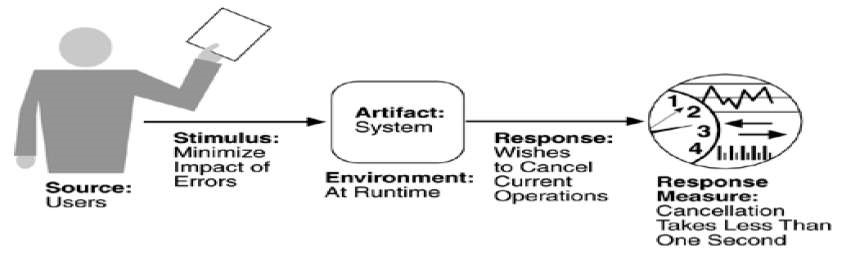
# User Quality Attributes

**13**

 **Usability:**

 Defines how well the application meets the requirements of the user and consumer by being

intuitive



**Figure**

**6**

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**Sample usability scenario**

# Non-runtime Quality Attributes

**14**

 **Portability:**

 Ability of a system to run under different computing environments

 **Reusability:**

 Degree to which existing applications can be reused in new applications

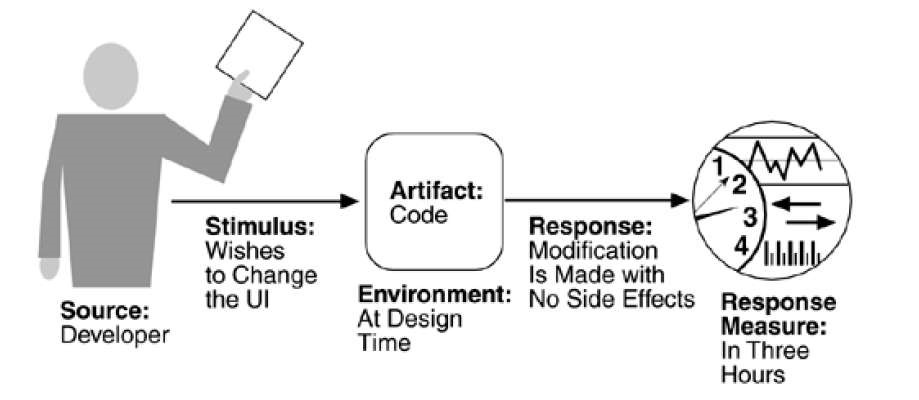
 **Integrability:**

 Ability to make the separately developed components of the system work correctly together

 **Modifiability:**

 Ease with which a software system can accommodate **15**

changes to its software



**Figure 7: Sample modifiability scenario**

# Architecture Quality Attributes

**16**

 **Correctness:**

 Accountability for satisfying all requirements of the system

 **Conceptual Integrity:**

 Integrity of the overall structure that is composed from a number of small architectural structures

# Business Quality Attributes

**17**

 **Cost and schedule:**

* Cost of the system with respect to time to market, expected project lifetime, and utilization of legacy and COTS systems  **Marketability:**
* Use of the system with respect to market competition

**18**

# THANK YOU

**By 19SW42**