BAHRIA UNIVERSITY, Karachi Campus)

Department of Software Engineering

ASSIGNMENT # 01 – Spring 2024

Description of Software Quality Models

CLO 02

Course Code: **SEC-311**

Course Title:	**Software Quality Engineering**	
Class:	**BSE – 6(B)**	Shift: **Morning**
Course Instructor:	**Engr. Misbah Perveen**	Date: **12th March 2024**
Due Date:	**07th March 2024**	Max. Marks: **5.0 Marks**

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1. Suppose you have to ensure the quality of an online LMS System. You may consider various quality models to address this situation. Keep LMS in mind, describe (separately) each of the Software quality models as given below with respect to the following questions:

[3]

1. ***What*** are they?
2. ***Where*** are they used?
3. ***Why*** are they used?
4. ***How*** are they ensured / implemented?

a) FURPS
b) Dromey
c) ISO 9126
d) Boehm

FURPS

WHAT?

Functionality, Usability, Reliability, Performance, and Supportability are collectively referred to as FURPS. In order to guarantee the quality of software products, including an online LMS System, this quality model focuses on six essential characteristics.

WHERE?

FURPS is used across various software development projects to ensure the delivery of high-quality software. It is particularly relevant for an online LMS System, where functionality, usability, reliability, performance, and supportability are critical for user satisfaction and system success.

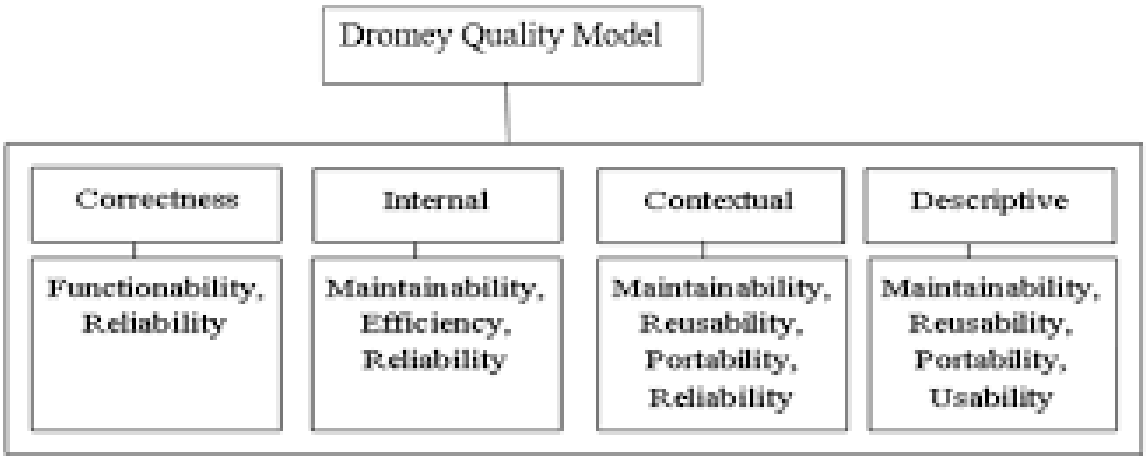
WHY?

FURPS is used to ensure that the software product meets or exceeds customer expectations in terms of functionality, ease of use, reliability, speed, and the level of support provided. For an LMS, these factors are crucial for effective learning management.

HOW?

FURPS is implemented through a combination of quality planning, quality assurance, and quality control activities. This involves defining quality goals, conducting quality reviews, and employing quality improvement processes to ensure that the software product meets the specified FURPS attributes.

Dromey



WHAT?

Dromey is a quality model that focuses on the quality of software from the user's perspective. It emphasizes the importance of understanding user needs and expectations to ensure that the software product is both functional and user-friendly.

WHERE?

Dromey is used in software development projects where user satisfaction is a key concern. This includes the development of an online LMS System, where the user experience is critical for the system's success.

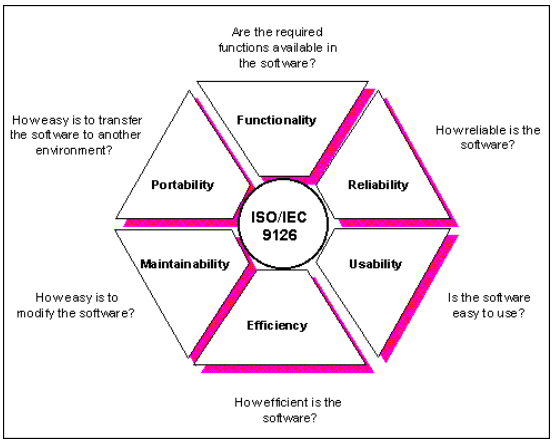
WHY?

Dromey is used to make that the software product satisfies the demands and expectations of its users in addition to being functional. This means that an LMS ought to be simple to use, open to the public, and able to facilitate efficient learning.

HOW?

The user-centered design and development procedures are used to implement Dromey. In order to improve the software product, this entails performing user research, incorporating people into the design process, and regularly obtaining user feedback.

ISO 9126



WHAT?

ISO 9126 is an international standard for software product quality. It provides a framework for evaluating and improving the quality of software products, including an online LMS System.

WHERE?

To guarantee the quality of software products, ISO 9126 is utilized worldwide in the software business. It is especially pertinent to the creation of online learning management systems (LMS), since user happiness and system performance depend heavily on quality.

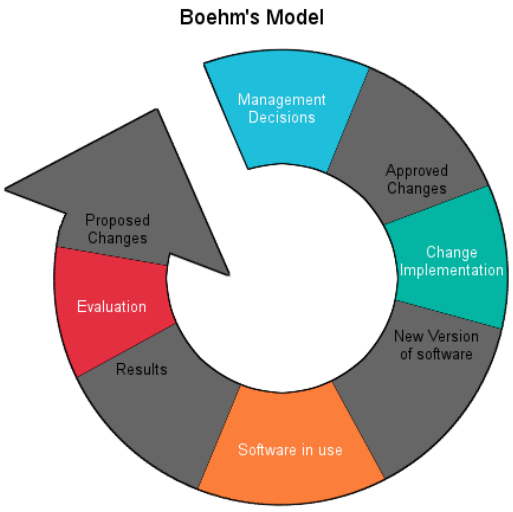
WHY?

The software product is checked to make sure it satisfies international quality standards using ISO 9126. This means that among other quality criteria, an LMS should be dependable, effective, maintained, and portable.

HOW?

Activities related to quality assurance, control, and planning are combined to execute ISO 9126. To make certain that the software product satisfies the required ISO 9126 quality attributes, this entails setting quality targets, carrying out quality evaluations, and utilizing quality improvement procedures.

Boehm



WHAT?

The model represents a hierarchical quality model like McCall Quality Model to define software quality using a predefined set of attributes and metrics, each of which contributes to overall quality of software. Boehm's Model is a type of software model that is used to define software quality based on certain parameters.

WHERE?

Boehm's Model is used to represent a hierarchical model that has the structure around the high-level characteristics, intermediate and primitive characteristics.

WHY?

To make sure the software product satisfies or surpasses the required quality attributes, Boehm's Model is employed. This means that among other quality criteria, an LMS should be dependable, effective, maintained, and portable.

HOW?

Boehm's model is applied in software development to help with resource allocation, risk management, decision-making, and process improvement by estimating project cost, effort, and schedule.

2. Summarize the five software quality models (as mentioned in the following table) with respect to the quality factors/attributes available in all the five models (write them in the first column). In the next five columns, mention which quality factor/attribute is available in which model. Sample is given in RED. Complete the following table.

Quality Factor/Attribute	McCall	Boehm	FURPS	DROMEY	ISO 9126
Testability	✓	✓			
Functionality	✓		✓	✓	✓
Reliability	✓			✓	✓
Usability	✓		✓	✓	✓
Efficiency					✓

3. **Briefly explain how one can measure the manufacturer's view of software quality.**

One way to measure the manufacturer's view of software quality is through internal quality metrics. These metrics concentrate on things like fault density, code coverage, code complexity, and standardization of coding. Software makers can evaluate the software's quality from their point of view by examining these measures. To pinpoint areas in need of improvement and guarantee that software quality requirements are fulfilled throughout the development process, manufacturers may also carry out internal quality audits and reviews.

The metrics for measuring software quality can be extremely technical, but can be boiled down into the following four essential categories:

Code Quality

Bug-free and semantically correct code is very important for premium software. Code quality standards can be divided into quantitative and qualitative metrics. Quantitative quality metrics measure how big or complex the software program is, the number of lines and functions it contains, how many bugs there are per 1,000 lines of code, and more. Qualitative code quality metrics measure features like maintainability, readability, clarity, efficiency, and documentation. These metrics measure how easy the code is to read, understand, and if it is written according to coding standards.

Performance

Every software program is built for a purpose. Performance metrics measure if the product fulfills its purpose and if it performs the way it is meant to. It also refers to how the application uses resources, its scalability, customer satisfaction, and response times.

Security

Software security metrics measure the inherent safety of a software program and ensure there are no unauthorized changes in the product when it is handed over to the client.

Usability

Since all software products are built for an end-user, an important quality metric is whether the program is practicable and user-friendly. We also ensure that the client is happy with the features and performance.

REFERENCES:

[1] https://www.youtube.com/watch?v=PC0mfsw7zBA

[2] https://www.professionalqa.com/comparison-quality-models

[3]https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=b370350257bd747b09334b030e53f0d33f1bd75b

[4] https://www.researchgate.net/figure/Boehms-software-Quality-Model_fig4_328460644

[5] https://jecei.sru.ac.ir/article_1076_4c6cc5df48fb9ac127e4a46eef04dd9d.pdf

[6] https://medium.com/@leanardbuenaflor/iso-9126-software-quality-characteristics-a25a26e7d046

[7] https://www.geeksforgeeks.org/boehms-software-quality-model/

[8] https://www.one-beyond.com/how-we-measure-software-quality/