Software Quality Models.

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BSE-5B
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Software Quality Models are the universal methods through which we evaluate software products. They also shows the degree to which a system or a component meets its requirement or the expectation of user. We usually compare these models based on how accurate they estimates the quality in different environment. We have Generalised (overall, segment, dynamic) & Product-specific (semi-customized, observation-based, measurement-driven) models.

- McCall

The McCall model measures the product quality through several features. It includes Product Review, Product Operation & Product Transition so it comes under the category of product specific. It also analysis the relation between external factors and product quality criteria. But the major part of this model covers the relation between the quality characteristics and metrics. As this model is based on Yes or NO response, so it would not consider functionality. This way the user's expections would be disregarded.

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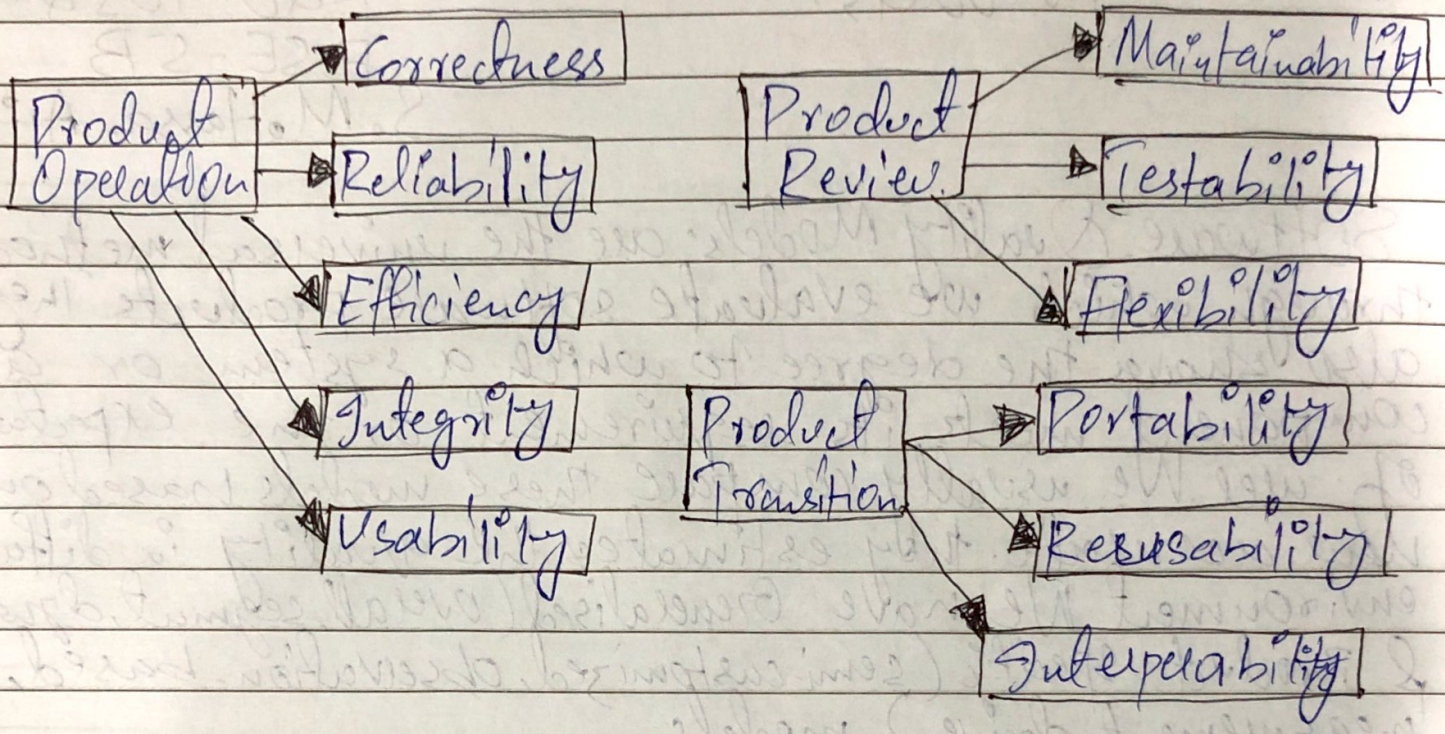

- FURPS

The FURPS model divides the characteristics as as Functional Requirements (RF) and non-functional (NF). The FR are defined by inputs and outputs expected. but the NFR is based on Usability that is the user experiance to make ease for users. R in the model represents Reliability, how failure proof it can be from errors. P stands for Performance, to measure, robustness and S stands for supportability. This model comes under generalised as it covers overall NFR and FR.

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Fuctionality → Features
→ Business logic

Usability → Usee Experience
→ Ease of control

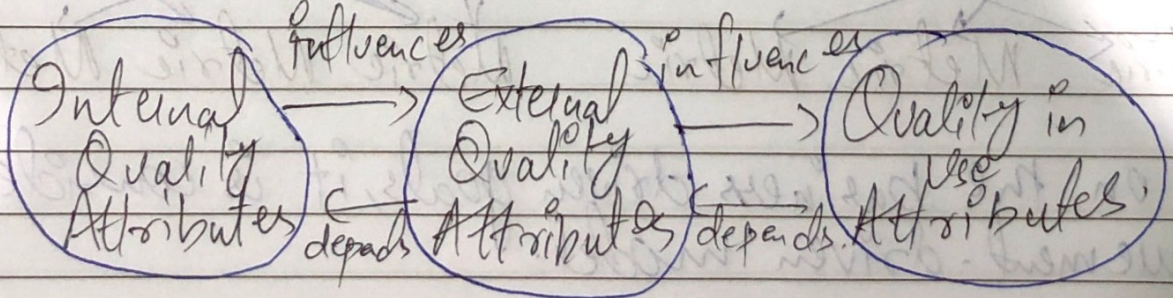
Reliability → Recoverability
→ Defect Avoidance

Performance → Efficiency
→ Availability

Supportability → Testability
→ Compatibility

- ISO 9126.

Originally the ISO 9126 model was derived from McCall and Boehm models. It comprises of two major parts, attributes of internal and external quality and the quality attributes that are in use. The model considers the internal attributes that can be run without executing the external properties of system. Users can use those properties while the system is in operation.



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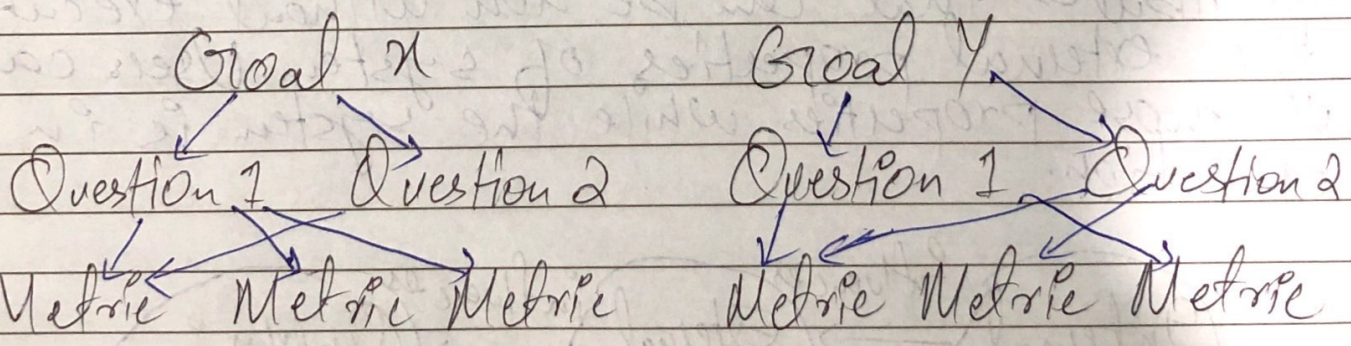
No other model focuses on internal and external quality as much as ISO-9126 model.

- GQM (Goal Question Metric).

The GQM model provides a measurement that helps in during the course of a project, to assess its progress and all to take corrective action based on this assessment. This model also complements McCall model. when it couples product quality criteria. It consist of three major parts, conceptual level (Goal) that is defined from different point of view. Operational level (Question), series of questions to assess specific goal based on model requirement. Quantitative level (Metric), the data used for answering the quantitative questions.



Based on the business driven goals, it is considered as measurement-driven model.

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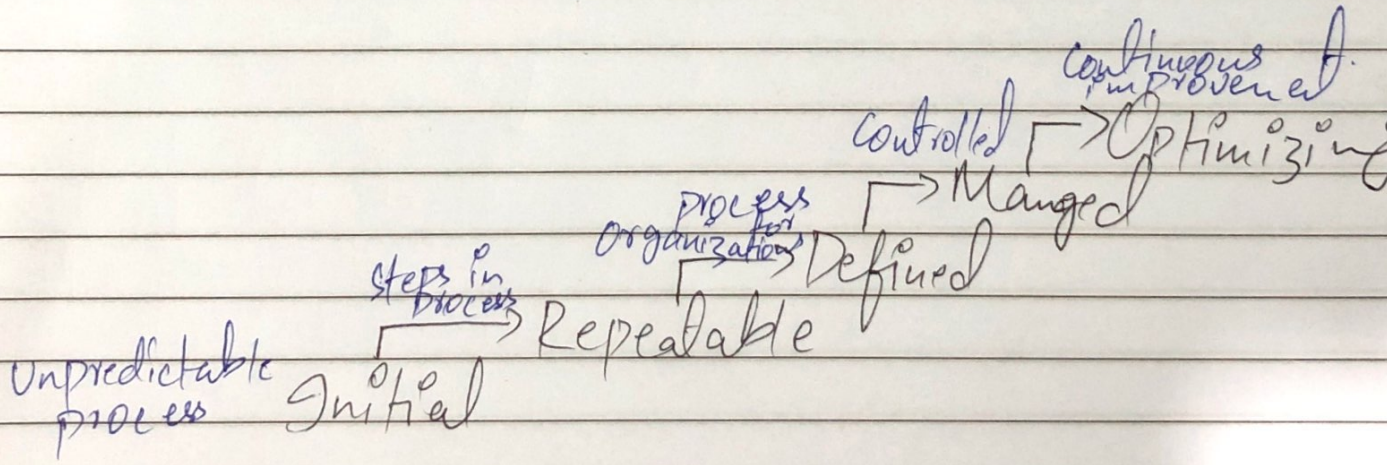
- CMMI (Capability Maturity Model Integration)

This model is a behavioral model that works for product improvement and to reduce the risk of errors in product and service deployment. It helps in improving the business logics and developing measurable benchmarks for creating encouraging products. So this model is more than a process model. It has capability levels known as incomplete, initial, managed & defined that used to appraise an organization's performance. Maturity levels are shown below in diagram.



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Brief Comparisions of Models.

Quality	McCall	FURPS	ISO9216	GQM	CMMI
Flexibility	✓	✓		✓	✓
Maintainability	✓	✓	✓		
Portability	✓		✓	✓	
Reusability	✓				✓
Efficiency	✓	✓	✓	✓	✓

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