Quality Factors

Hvad er Kvalitet?

- **Conformance to specification**:
  Quality that is defined as a matter of products and services

- **Meeting customer needs**:
  Quality that is identified independent of any measurable characteristics.

Hvad er Kvalitet?   Del 2

Walter A. Shewhart defines quality

1. The consideration of the quality of a thing as an objective reality independent of the existence of man.
   (Kvantitative – tit tæt på kvalitets faktorer)

2. What we think, feel or sense as a result of the objective reality. In other word, there is a subjective side of quality.
   (Kvalitative – sværere at beskrive)

Kvalitet faktorer

- Et redskab til
  - Et bedre system udvikling forløb
  - Et fokuseret system udvikling forløb
- Afklare bruger krav
- Bør indgå i krav specifikationen

- *NB! Det er nemmere at specificere 'objektive' krav end subjektive*

Kvalitet faktorer   DEL 2

- En række Kvalitets Modeller

  - McCall (conform to specification)
  - Boehm (You can conform in diff. degree)
  - FURPS (Same but fewer categories)
  - ISO – international Standardisation Organisation
    - 900x – focus on process
    - 9126 – a la McCall, Boehm, FURPS
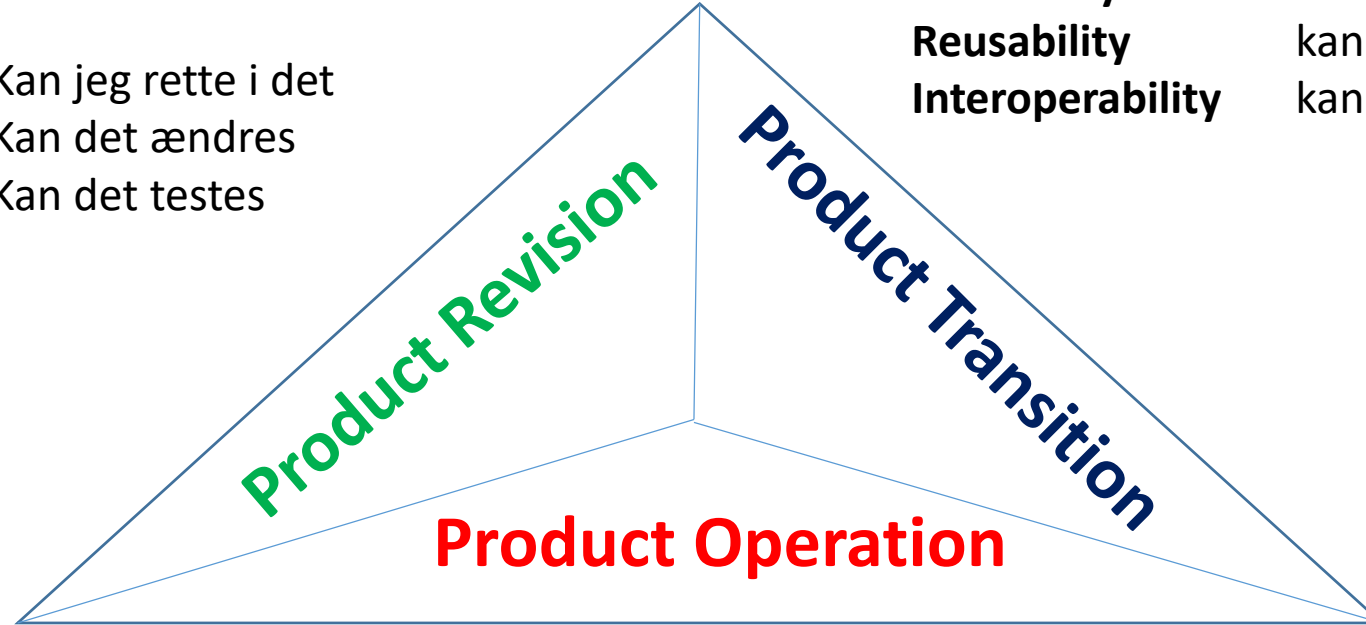   - 25010 – Newest version of SW Product Quality

McCall - Major Perspectives

Maintability — Kan jeg rette i det
Flexsability — Kan det ændres
Testability — Kan det testes

Portability — kan det køre på andre platforme
Reusability — kan jeg genbruge dele af SW
Interoperability — kan det kobles til andre systemer

Product Revision

Product Transition

Product Operation

Correctness — Gør vi det rigtigt
Reliability — Gør vi det nøjagtigt hele tiden
Efficiency — Kører det optimalt på min HW
Integrity — Er det sikkert
Usability — Kan jeg køre det (brugervenligt)

McCall - Kvalitets Faktorer

- Correctness
- Reliability
- Efficiency
- Integrity
- Usability
- Maintainability

- Testability
- Flexibility
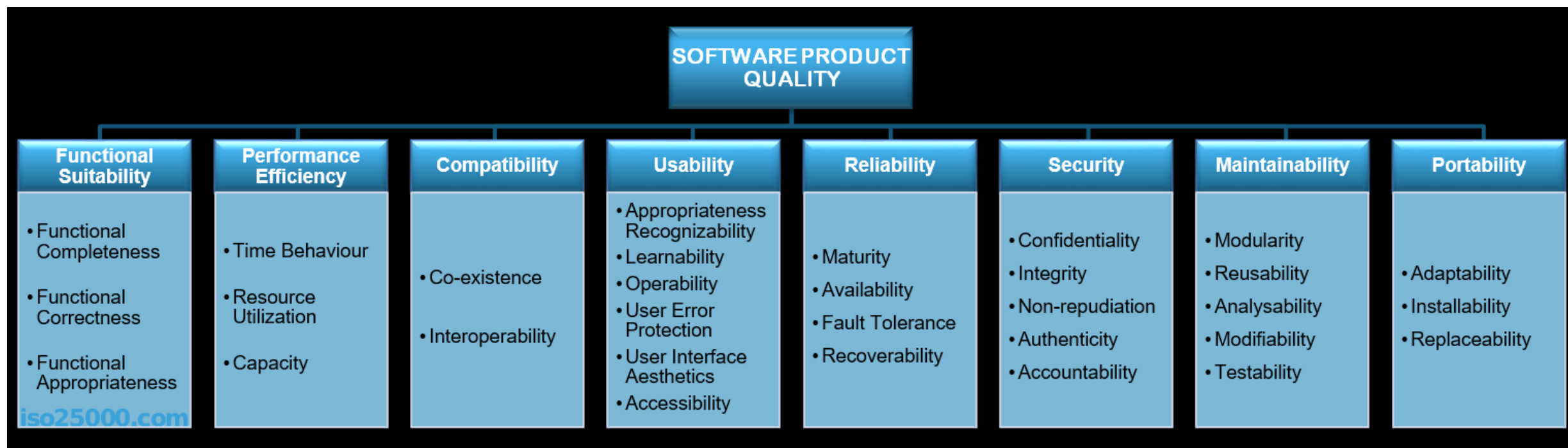- Portability
- Reusability
- Interoperability

FURPS

- **Functional** features, capabilities, security.
- **Usability** human factors, help, documentation.
- **Reliability** frequency of failure, recoverability, predictability.
- **Performance** response times, throughput, accuracy, availability, resource usage.
- **Supportability** adaptability, maintainability, internationalization, configurability.

FURPS+

- **Implementation** resource limitations, languages and tools, hardware, …
- **Interface** constraints imposed by interfacing with external systems.
- **Operations** system management in its operational setting.
- **Packaging** for example, a physical box.
- **Legal** licensing and so forth.

ISO - 25010

ISO – 25010 – Functional Suitability

- **Functional completeness.**
- Degree to which the set of functions covers all the specified tasks and user objectives.
- **Functional correctness.**
- Degree to which a product or system provides the correct results with the needed degree of precision.
- **Functional appropriateness.**
- Degree to which the functions facilitate the accomplishment of specified tasks and objectives.

ISO – 25010 – Performance efficiency

- **Time behaviour.**
  Degree to which the response and processing times and throughput rates of a product or system, when performing its functions, meet requirements.

- **Resource utilization.**
  Degree to which the amounts and types of resources used by a product or system, when performing its functions, meet requirements.

- **Capacity.**
  Degree to which the maximum limits of a product or system parameter meet requirements.

ISO – 25010 – Compatibility

- **Co-existence**.
  Degree to which a product can perform its required functions efficiently while sharing a common environment and resources with other products, without detrimental impact on any other product.

- **Interoperability.**
  Degree to which two or more systems, products or components can exchange information and use the information that has been exchanged.

ISO – 25010 – Usability

- **Appropriateness recognisability.**
  Degree to which users can recognize whether a product or system is appropriate for their needs.
- **Learnability**.
  Degree to which a product or system can be used by specified users to achieve specified goals of learning to use the product or system with effectiveness, efficiency, freedom from risk and satisfaction in a specified context of use.
- **Operability**.
  Degree to which a product or system has attributes that make it easy to operate and control.
- **User error protection**.
  Degree to which a system protects users against making errors.
- **User interface aesthetics**.
  Degree to which a user interface enables pleasing and satisfying interaction for the user.
- **Accessibility.**
  Degree to which a product or system can be used by people with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use.

ISO – 25010 – Reliability

- **Maturity**.
  Degree to which a system, product or component meets needs for reliability under normal operation.
- **Availability**.
  Degree to which a system, product or component is operational and accessible when required for use.
- **Fault tolerance**.
  Degree to which a system, product or component operates as intended despite the presence of hardware or software faults.
- **Recoverability**.
  Degree to which, in the event of an interruption or a failure, a product or system can recover the data directly affected and re-establish the desired state of the system.

ISO – 25010 – Security

- **Confidentiality**.
  Degree to which a product or system ensures that data are accessible only to those authorized to have access.
- **Integrity**.
  Degree to which a system, product or component prevents unauthorized access to, or modification of, computer programs or data.
- **Non-repudiation**.
  Degree to which actions or events can be proven to have taken place, so that the events or actions cannot be repudiated later.
- **Accountability**.
  Degree to which the actions of an entity can be traced uniquely to the entity.
- **Authenticity**.
  Degree to which the identity of a subject or resource can be proved to be the one claimed.

Source:: http://iso25000.com/index.php/en/iso-25000-standards/iso-25010?limit=3&limitstart=0

ISO – 25010 – Maintainability

- **Modularity**.
  Degree to which a system or computer program is composed of discrete components such that a change to one component has minimal impact on other components.
- **Reusability**.
  Degree to which an asset can be used in more than one system, or in building other assets.
- **Analysability**.
  Degree of effectiveness and efficiency with which it is possible to assess the impact on a product or system of an intended change to one or more of its parts, or to diagnose a product for deficiencies or causes of failures, or to identify parts to be modified.
- **Modifiability**.
  Degree to which a product or system can be effectively and efficiently modified without introducing defects or degrading existing product quality.
- **Testability**.
  Degree of effectiveness and efficiency with which test criteria can be established for a system, product or component and tests can be performed to determine whether those criteria have been met.

ISO – 25010 – Portability

- **Adaptability**.
  Degree to which a product or system can effectively and efficiently be adapted for different or evolving hardware, software or other operational or usage environments.
- **Installability**.
  Degree of effectiveness and efficiency with which a product or system can be successfully installed and/or uninstalled in a specified environment.
- **Replaceability**.
  Degree to which a product can replace another specified software product for the same purpose in the same environment.

Source:: http://iso25000.com/index.php/en/iso-25000-standards/iso-25010?limit=3&limitstart=0