Quality in IT Projects Cheat Sheet

by Natalie Moore (NatalieMoore) via cheatography.com/19119/cs/2211/

Key quality concern for IT projects

Providing customers with systems they need

Meet requirements at affordable price

Requires a commitment from all parties

Costs of remedying lapses in quality great.

Quality characteristics

ISO 9126-1:2001, seeks to define a set of standard characteristics by which software quality can be measured

- Functionality: meet user requirements
- Reliability: Consistent
- Usability: Intuitive, minimum training
- Efficiency: good with resources
- Maintainability: easy to modify
- Portability: between platforms

Quality plan

Specifies standards that apply to the project

Maybe existing, new, industry, modified versions of existing, developed internally

Specifies how, when and by whom the quality control activities should be undertaken

Specifies quality assurance processes

May also include configuration management and change control procedures

Quality process requirements

Entry requirements state what must exist before the stage or activity can begin

Implementation requirements define how the process should be done

Exit requirements indicate what should be in place for a successful sign-off of the activity

Part of quality criteria

Formal inspection structure

Preparation. The reviewers review the documentation and annotating the product and recording defects

Meeting: discussion of potential defects, confirm or deny they actually are defects. Agree follow up of each.

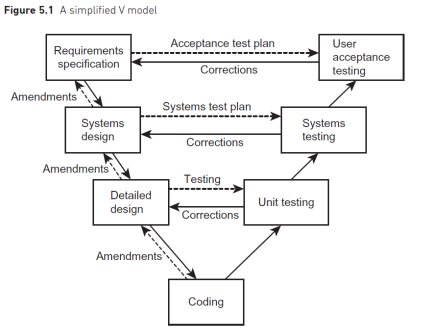
Formal inspection structure (cont)

Recording: follow-up actions, responsibilities, agreement of outcome and sign-off if appropriate

Follow up

- advising the project manager of the outcome;
- planning remedial work;
- Signing off when complete

V Model



Model in which the solid lines represent the forward progress of the project and the dotted lines represent the way in which quality control is exercised

ISO9001:2008

specifically aimed at producers and suppliers of any products and services, not necessarily software

Organisations are inspected and awarded ISO 9001 certification by accredited auditors

ISO 9001:2008 is based on the following principles:

- Customer focus: understanding and meeting or exceeding the customer requirements
- Leadership: providing this for the organisation to give it the purpose, unity and direction to achieve quality objectives
- People: involvement of staff at all levels of the organisations involved
- Process approach: attention to individual processes which produce intermediate or deliverable products

ISO9001:2008 (cont)

- Systems approach to management: focusing on inter-related processes producing deliverable products;
- Continual improvement
- Factual approach to decision-making
- Mutually beneficial client-supplier relationships

Definitions of quality

A degree or level of excellence

Conformance to standard

Deliverables should be fit for purpose

Reliability

Quality criteria

Quality criteria must be specified at beginning, before product developed

Each product definition includes a section headed quality criteria

- Used by team to ensure fit for purpose
- Specific, measureable and achievable

Company should develop standards for product definitions for its quality procedures

Defect removal process

ID defects so you can remove them

Easy at **end** of project in dynamic testing

Techniques for IDing defects at **beginning** stages

- **desk checking**: Authors, or creators, of products review what they have produced
- **document review**: other people read document to ensure meets QC
- **peer review**: The author's co-workers (or peers) examine copies of the document and make comments about it. Answer things liek: is it feasible, is there a better way, does it conform to company standards, does it communicate with other parts of the system, are requirements covered, are there any ambiguities

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Defect removal process (cont)

- **Inspection** Formal review of product.
- **Walkthrough:** The author takes the audience through the documents and they feed back their comments on it
- **Pair programming:** in agile development environments, code developers sometimes work in pairs. The pair take turns to type in code at the workstation while the other advises and checks on what is being entered.
- **Static testing:** Software tools analyse structure of code. Look at the branches and loops in a program and calculate a measure of complexity. More complex = difficult to maintain

Evaluating suppliers

Important to establish whether those third party suppliers have the necessary quality procedures in place to ensure that the software to be supplied is to the standard expected.

Must be recognised that the supplier and the customer have different business objectives. Making a project a success therefore needs both parties to see the project as a joint venture

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Failure

Cannot guarantee software will never fail

Hardware & infrastructure might also fail

Examine ways system will behave in event of various types of failure

Might need to make it 'fail safe' so that it will revert to a safe state

QC vs QA

The **quality control** framework is called the quality management system (QMS)

The QMS may be based on the ISO 9001 series of standards

The QMS includes quality strategy and quality assurance processes

Quality strategy defines QMS and includes

- procedures and standards for creating a project quality plan
- a definition of quality criteria
- quality control procedures
- quality assurance procedures
- a statement of compliance with or allowed deviation from industry standards
- acceptance criteria
- Allocation of responsibilities for defining or undertaking quality-related activities

Quality assurance is like an audit. It is designed to confirm that proper procedures are in place and have been applied correctly

QC = Quality control
QA = Quality assurance

Dynamic testing levels

Unit

Test data for usual range of input

Functions tested

Test various comboss & sequences

Test for outliers of limits

Alphabetic fields tested longer than that which the system should permit

Mandatory fields are left blank

Ensures unit will not fail because of bad data or unusual combinations but will handle them in a predefined way

Record all faults

Integration

Links a number of system components and runs them as a whole

checks that the units communicate properly

Systems

Dynamic testing levels (cont)

Final stage in testing by the development professionals

Running the whole system on the infrastructure that will be used when the system is operational

Operational, response time, workload cope, effect of high loading

User acceptance

Can the users operate the system? Does it meet their expectations, not just their requirements?

Regression

Running an agreed set of test data through the system again to confirm that the original error has been corrected and no further errors have been introduced or uncovered

For each type of testing, a set of test data and a set of expected results must be produced
- Test data for usual range of input expected for system
- Functions tested

Capability maturity models

Where the organisation is assessed as being at a particular level of process maturity

Assessment can be internal or external

Capability maturity model (CMM) has five levels

(1) Initial. Any organisation would be at this level by default. Good quality work may be done, but customers cannot be sure that this is always the case.

(2) Managed. Some basic project management and other systems are in place.

(3) Defined. The way each task in software development is done is defined to enable consistent good practice.

(4) Quantifiably managed. Processes and their products are measured and controlled – for example, the number of errors created in each process

(5) Optimising. The measurement data collected is analysed to find ways of improving processes.

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