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Quality Management

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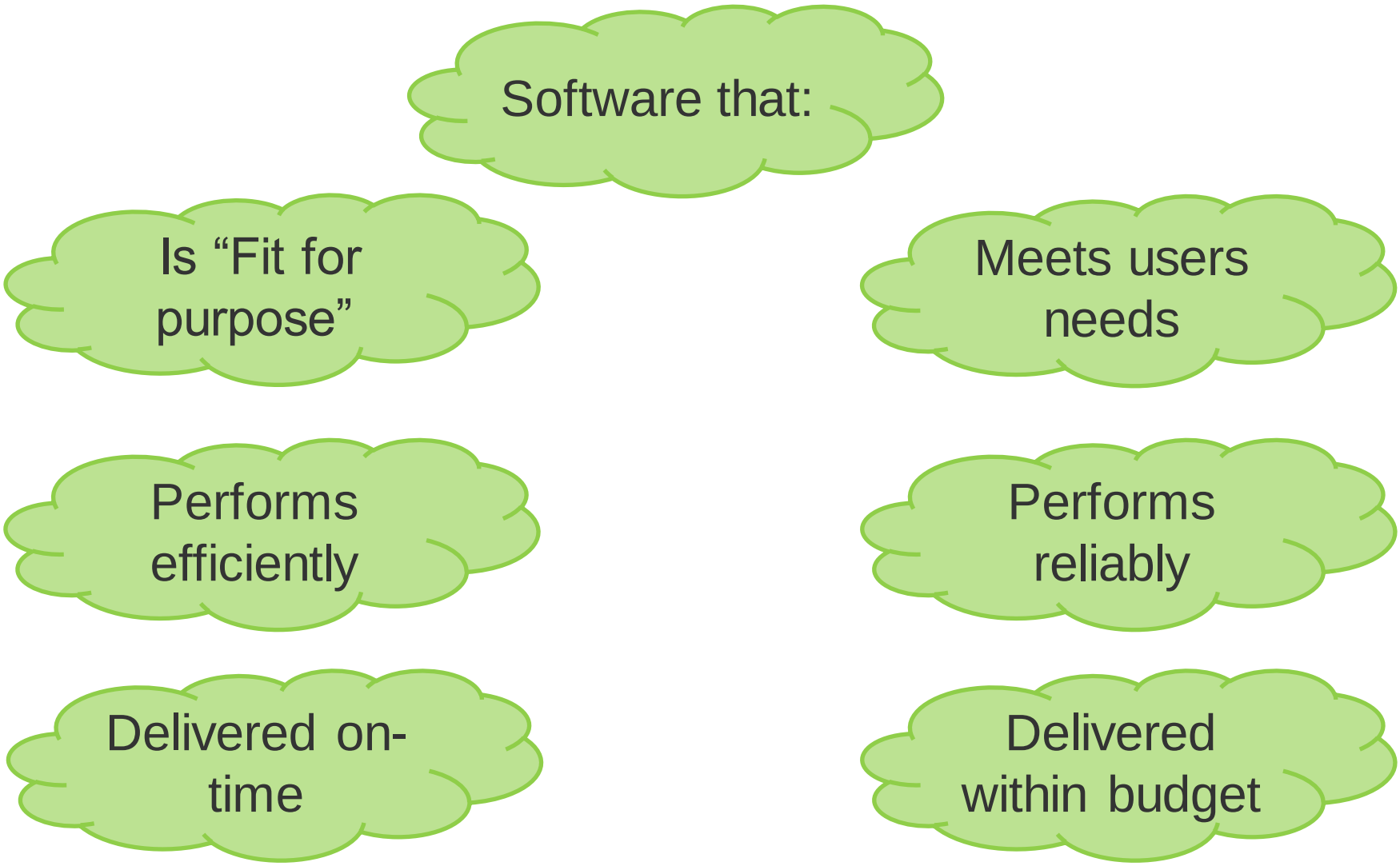
What is Quality?



How is Quality Achieved?

Organisational Level

QM team

"Establish framework of organisational processes and standards that lead to high-quality software"

Define development processes

Define standards

Apply software

Apply documentation

Requirements

Design

Code

Project Level

Project Team

Apply processes

Check processes are followed

Ensure outputs meet standards

May define quality plan for project

Project specific processes

Quality goals for project

Project specific standards

QM Team

Independent of development team

Manage testing and release

Check deliverables

Check project documentation

Check test coverage

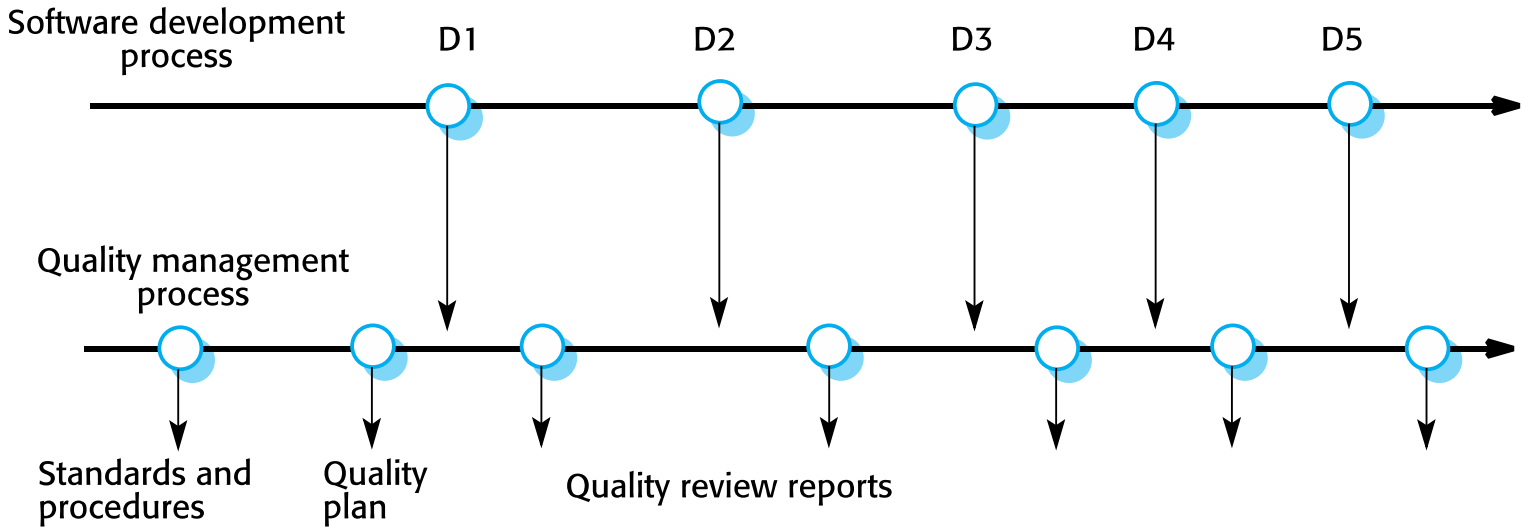
Consistent standards

All tasks performed

Consistent goal

Consistent assumptions

Quality management and software development



Quality Planning

- A quality plan sets out the desired product qualities and how these are assessed and defines the most significant quality attributes.
- The quality plan should define the quality assessment process.
- It should set out which organisational standards should be applied and, where necessary, define new standards to be used.

Quality Plans

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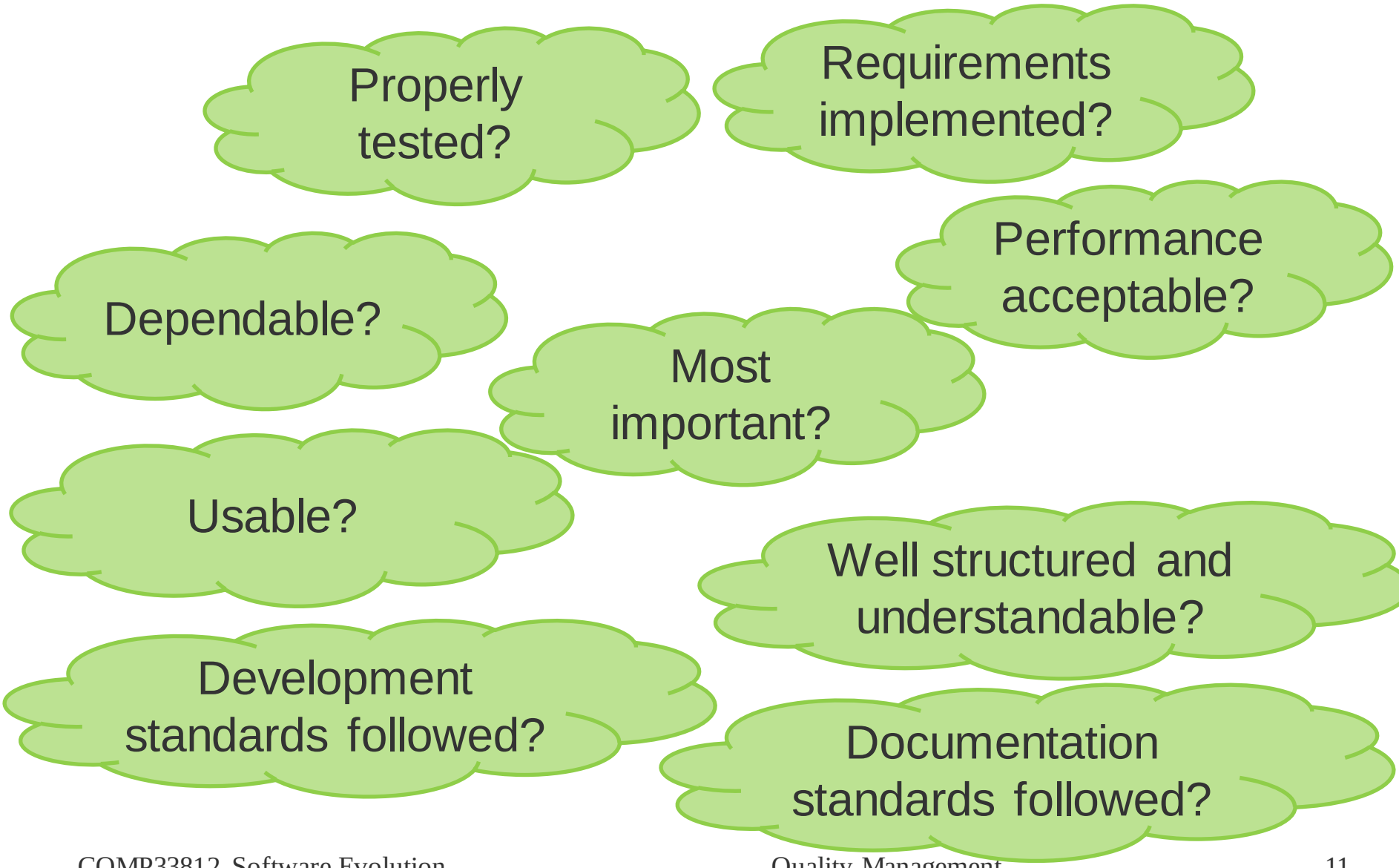
Software Quality

- Quality, simplistically, means that a product should meet its specification.
- This is problematical for software systems
  - Some quality requirements are difficult to specify in an unambiguous way;
  - Software specifications are usually incomplete and often inconsistent.
  - There is a tension between customer quality requirements (efficiency, reliability, etc.) and developer quality requirements (maintainability, reusability, etc.);
- The focus may be 'fitness for purpose' rather than specification conformance.

What does Fit for Purpose Mean?



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Non-functional Characteristics

- If the software's functionality is not what is expected, then users will often just work around this and find other ways to do what they want to do.
- However, if the software is unreliable or too slow, then it is practically impossible for them to achieve their goals.
- The subjective quality of a software system is largely based on its non-functional characteristics.

Software Quality Attributes

Usability

Efficiency

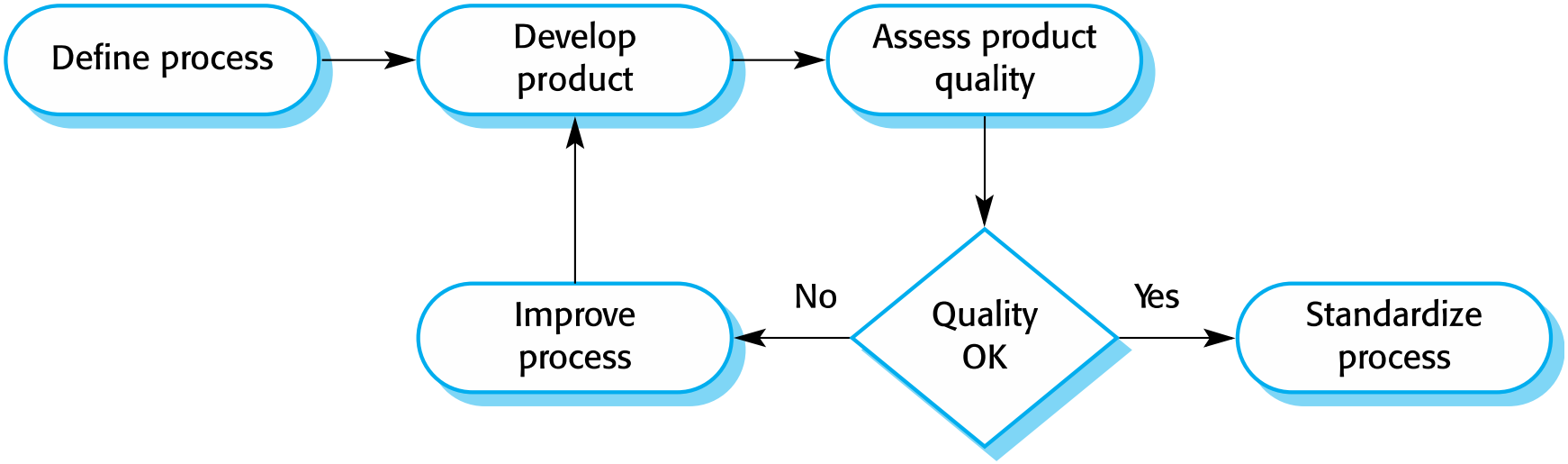
Maintainability

Safety	Understandability	Portability
Security	Testability	Usability
Reliability	Adaptability	Reusability
Resilience	Modularity	Efficiency
Robustness	Complexity	Learnability

Compromise

Plan defines most important

Manufacturing Quality Mang.



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Process and Product Quality

- The quality of a developed product is influenced by the quality of the production process.
- This is important in software development as some product quality attributes are hard to assess.
- However, there is a very complex and poorly understood relationship between software processes and product quality.
  - The application of individual skills and experience is particularly important in software development;
  - External factors such as the novelty of an application or the need for an accelerated development schedule may impair product quality.

Quality Culture

- Quality managers should aim to develop a ‘quality culture’ where everyone responsible for software development is committed to achieving a high level of product quality.
- They should encourage teams to take responsibility for the quality of their work and to develop new approaches to quality improvement.
- They should support people who are interested in the intangible aspects of quality and encourage professional behavior in all team members.