

SE4831 Software Quality Assurance

Organizing for Software Quality

- Objectives

- Define quality program.
- Define software product.
- Define software process.
- Define requirement
- **Explain three relations that the developers may have with the customer.**
- Explain the difference between validation and verification.
- Differentiate between the two major models of SQA
- Explain what infrastructure is necessary for quality software development
- Explain the difference between the internal and external view of quality.
- List the ~~three~~ elements of a quality program.
- Explain how ~~software~~ volatility can indicate the need for software requalification.
- List the ~~five~~ levels of maturity from the CMMI model and explain how quality is impacted at each level.
- ? Explain the role of independence as it relates to a quality program.

Quality Management

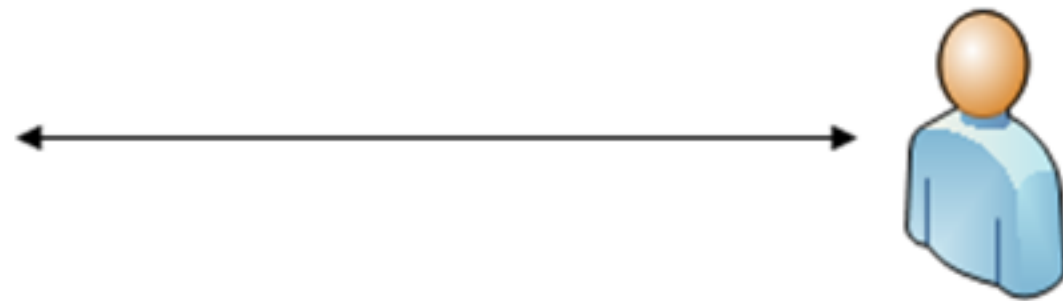
Framework

- Relationship between the quality of a product and organization which produces it is not simple
 - Business strategy
 - Business organization
 - Talent
 - resources

Who is the user?

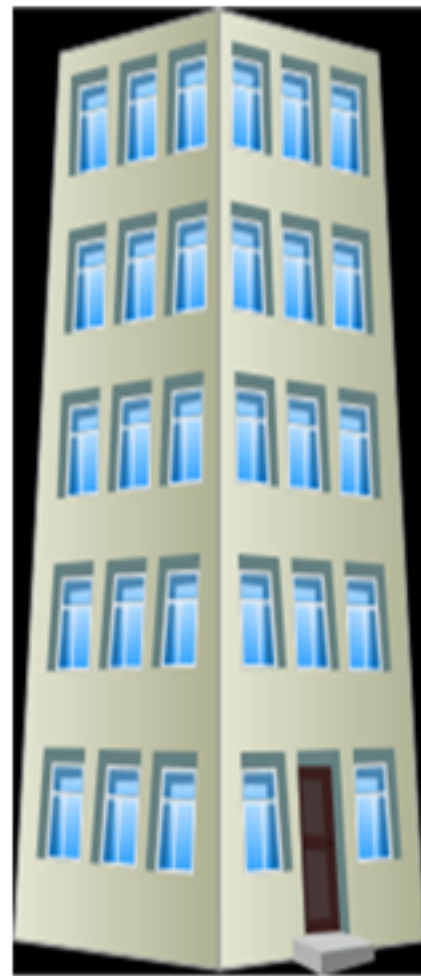


Development Organization

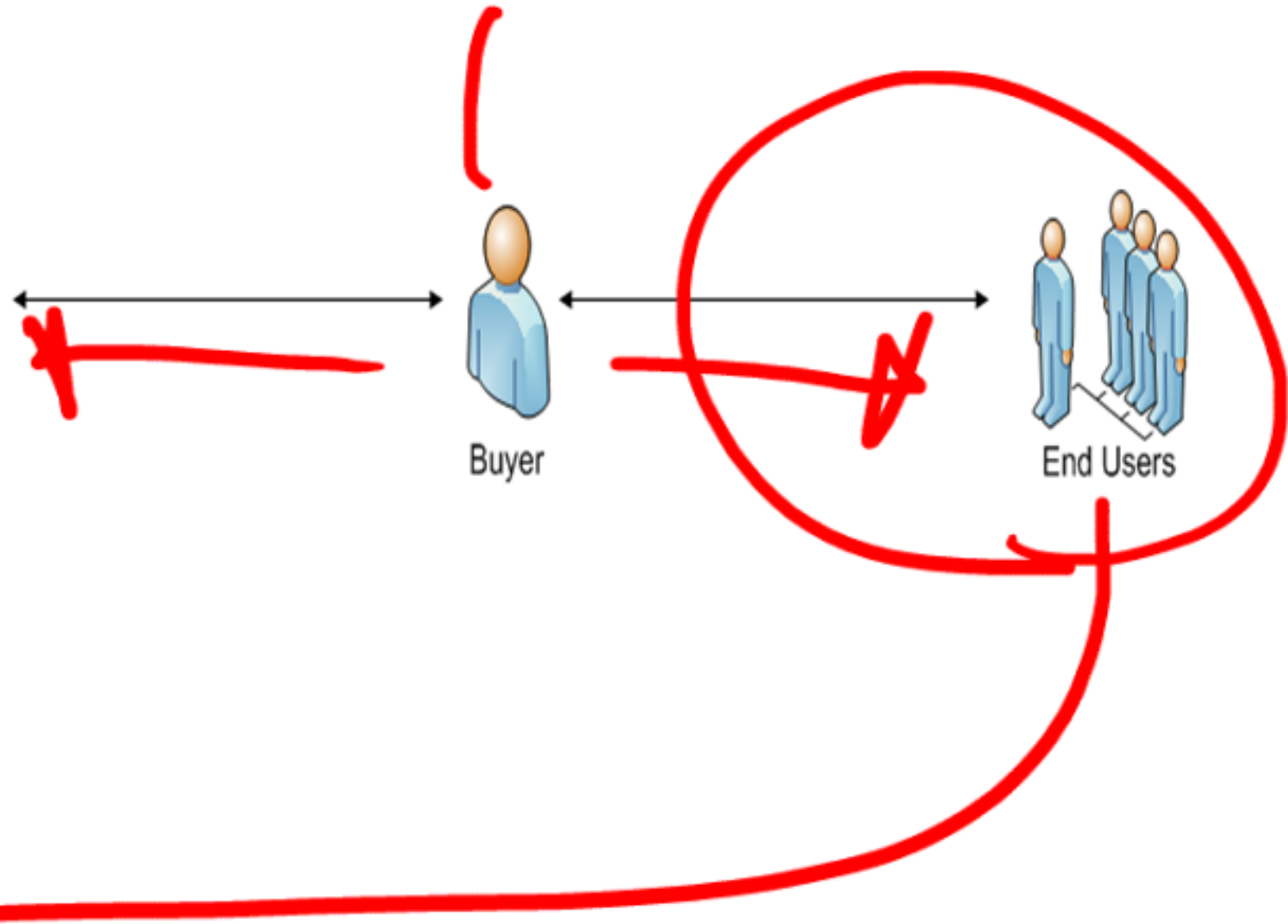


Customer is end user

"Product Owner"

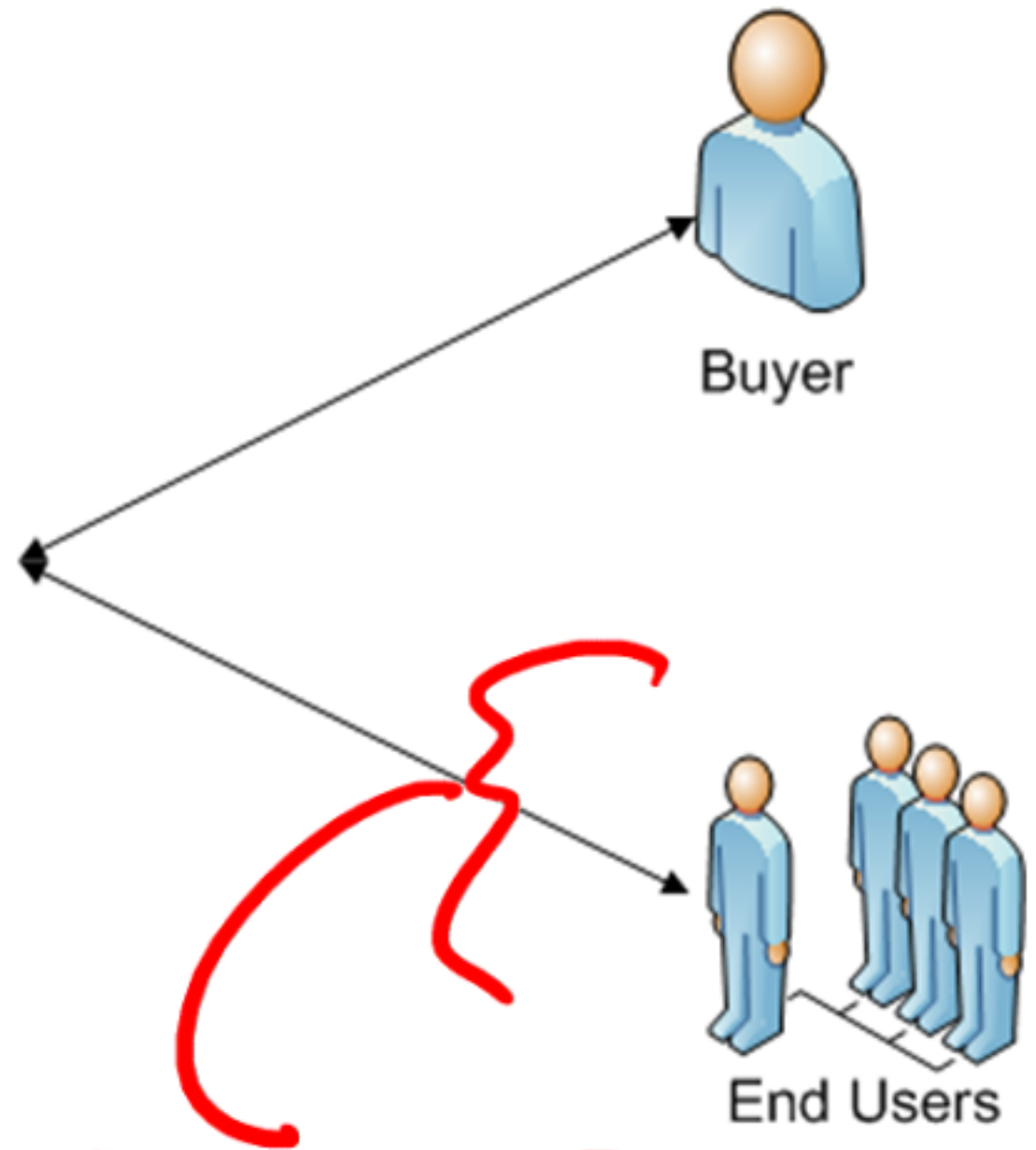


Development Organization



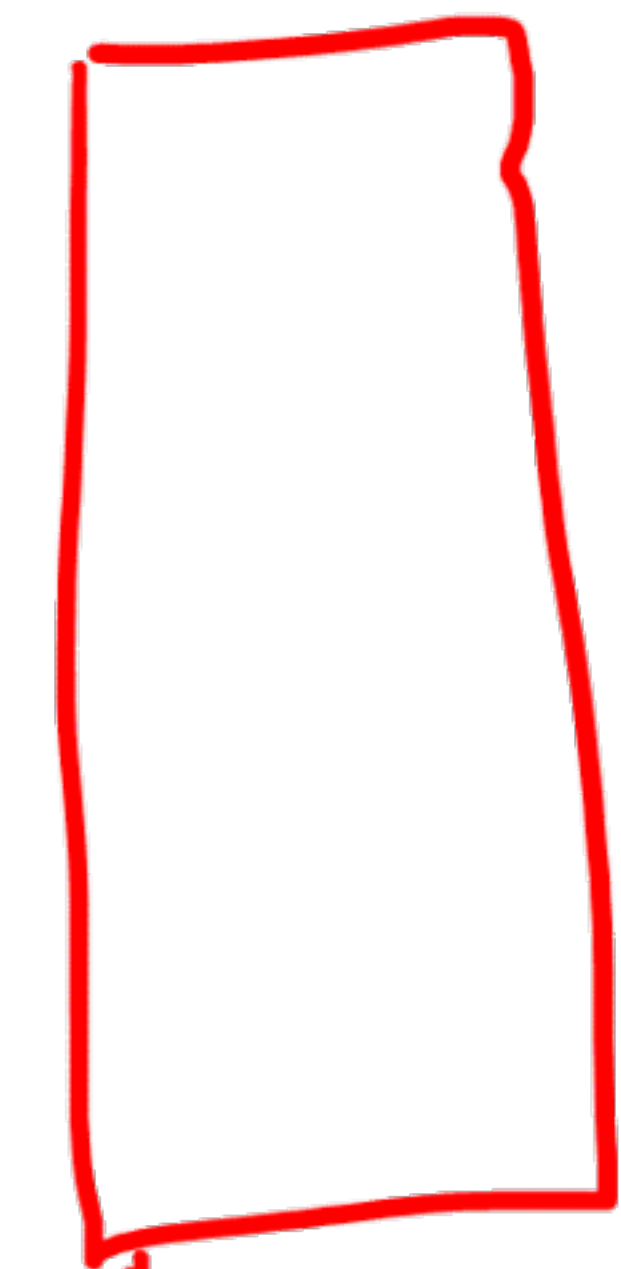


Development Organization



Focus Group





Dev
Org



Definitions

- Product – Any tangible output or service that is the result of a process
- Process – A set of activities performed for a given purpose
- Requirement – A needed capability, condition, or a property that must be possessed by an entity to satisfy a contract, standard, specification, or other formally imposed document.

cloud

Validation versus verification

- Validation
- Verification

Validation versus

verification:

- Validation
 - process of evaluating a system or component during or at the end of the development process to determine whether it satisfies specified requirements
 - Are we building the right product?
- Verification *"Testing"*
 - the process of evaluating a system or component to determine whether the products of a given development phase satisfy the conditions imposed at the start of that phase
 - Are we building the product right?

Two Views of SQA

- Everything Dealing with Defects

Prevention / Elimination
reduction of defects

— More correct view.

- Validation and Verification Activities

Validation checks to see
if functionality is
present.

Verification checks
conformance to spec



10

→ More common
view.

Software Quality Views

- Internal – *Our view as developers.*
- External – *View of a customer.*

Views and Attributes of Software Quality

View	Correctness	Other
Customer (External)	Failures: — Reliability — Safety —	Maintainability Readability Portability Performance — Installability Usability
Developer (internal)	Faults — Count — Distribution — class —	Design — Size — Change — Complexity —

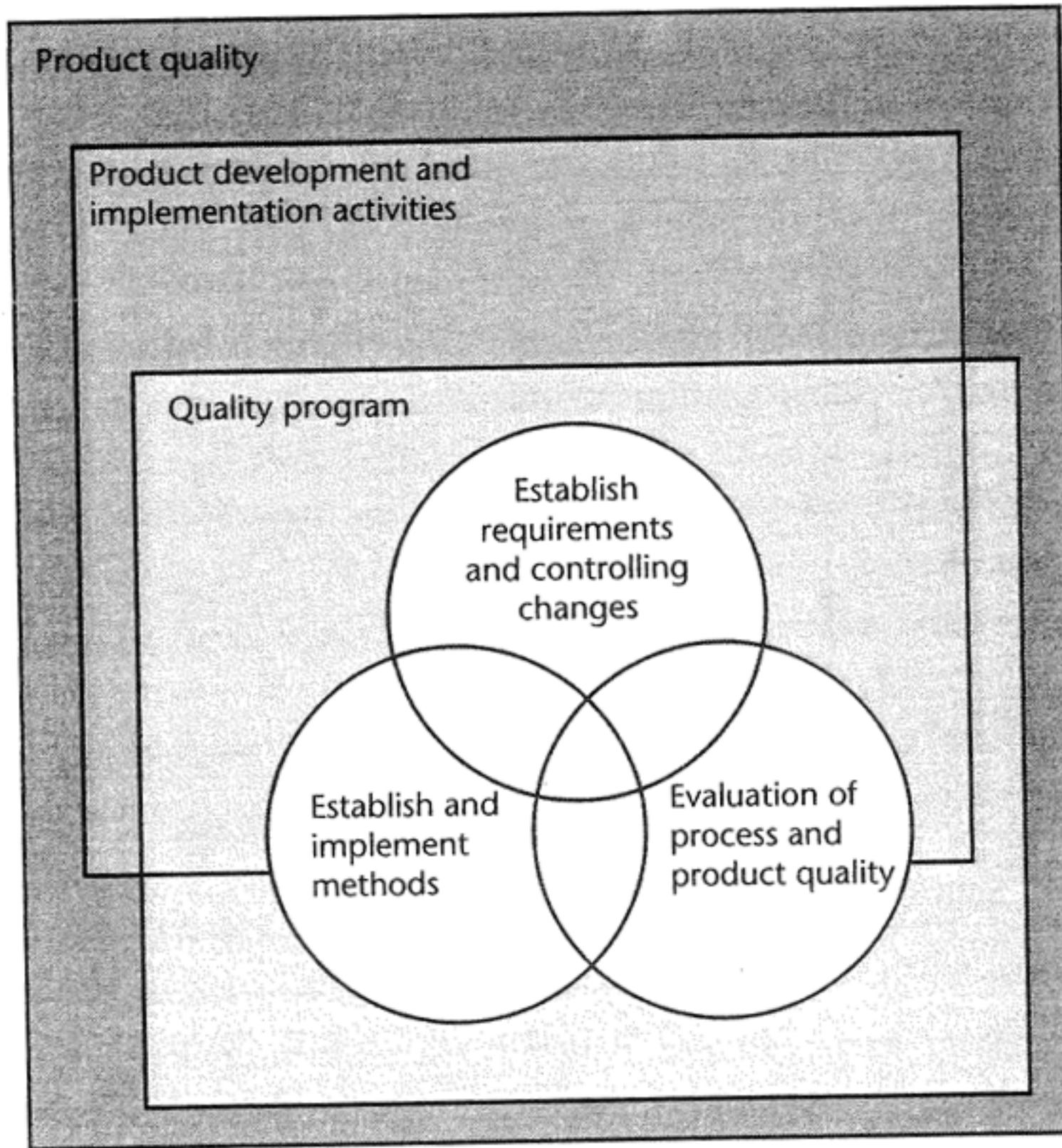
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Quality is everybody's Business

- How do we achieve quality when everyone is responsible?

Quality Program Elements

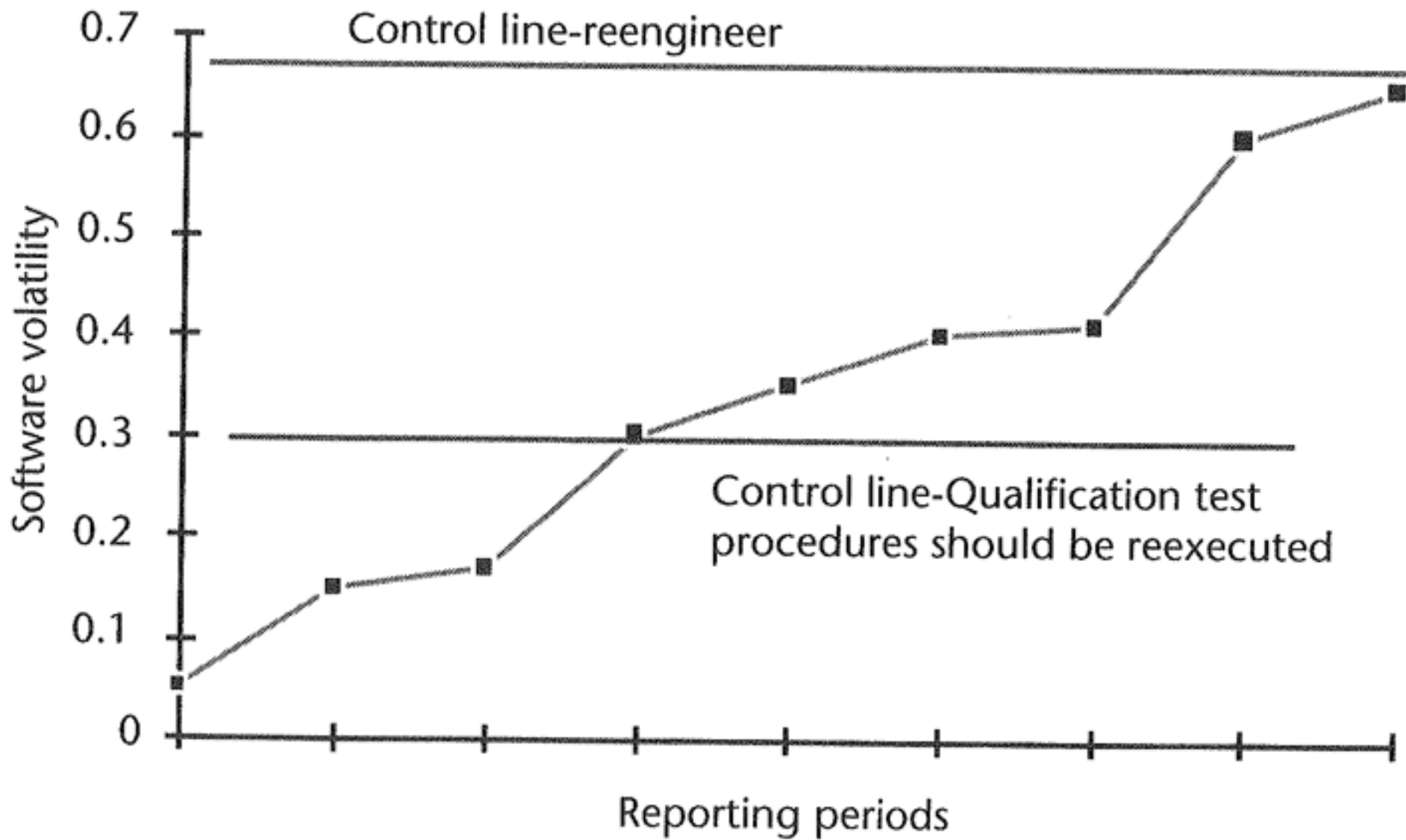


Software Volatility and Quality

$$\textit{Volatility} = \frac{\text{Number of Modules changed due to a software maintenance Request}}{\text{Total Number of Modules in a Release Over Time}}$$

Software Volatility

Indicator



CMMI Levels

