MASARYKOVA UNIVERZITA

PV213 Enterprise Information Systems in Practice

05 – Quality management

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Tento projekt je spolufinancován Evropským sociálním fondem a státním rozpočtem České republiky.

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MINISTERSTVO ŠKOLSTVÍ, MLÁDEŽE A TĚLOVÝCHOVY

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UNIVERSITAS MASARYKIANA BRUNENSIS

INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Content of this presentation

- Role of quality management and quality assurance
- ISO, CMMI, EFQM
- QA plan
- Document management
- Reviews
- Tools
- Lean
- Next lesson

Quality

- What is quality?

Quality - definitions

- Reducing the variation around the target
- Quality is meeting customer expectations.
- Quality is conformance to specified requirement & is never an accident

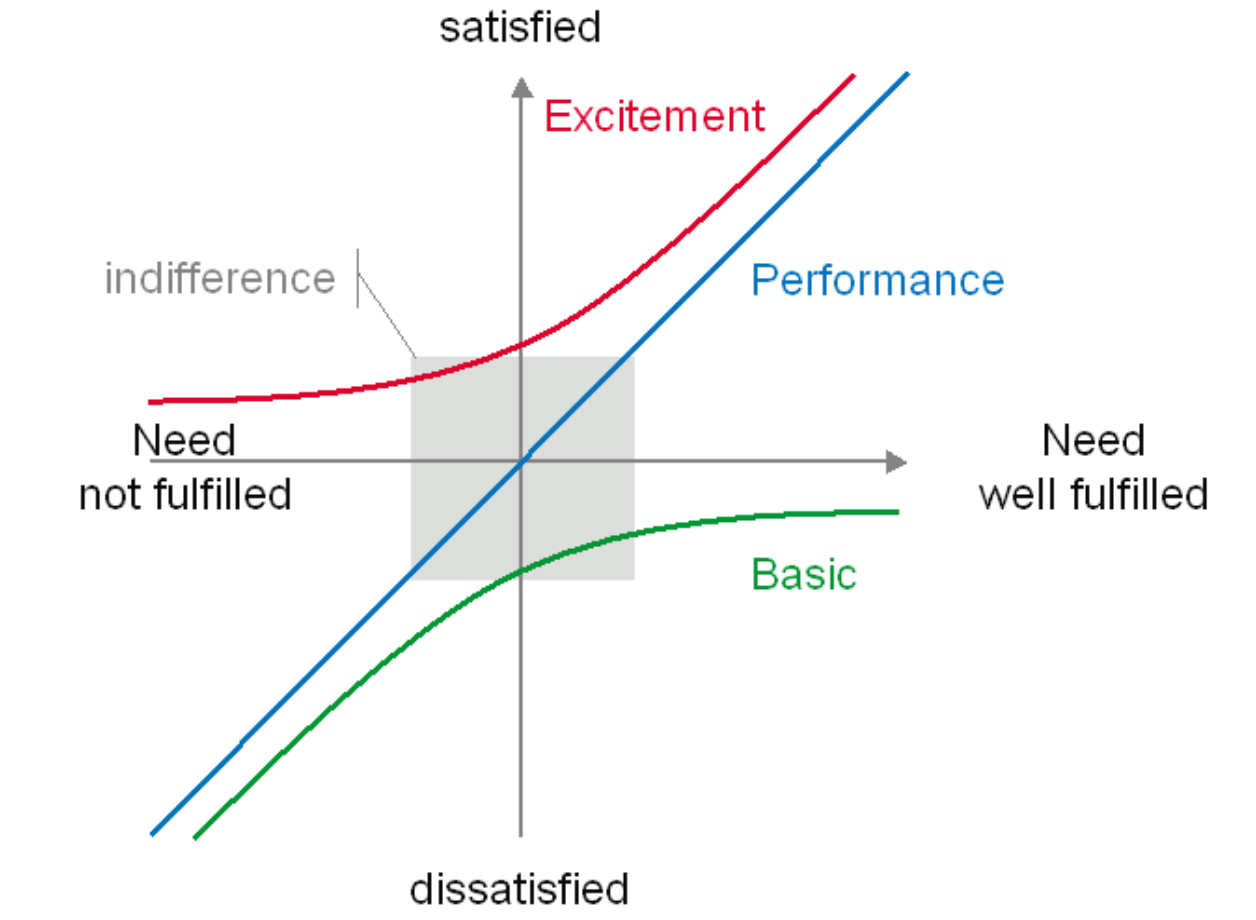
Quality - ISO 9000

- Degree to which a set of inherent characteristics fulfils requirements

- Characteristic – distinguishing feature
- Requirement – need or expectation
  - stated
  - generally implied
  - obligatory

Kano model

- Quality attribu
  - Basic
  - Expected
  - Exciting
  - Indifferent
  - Reverse



Project management areas

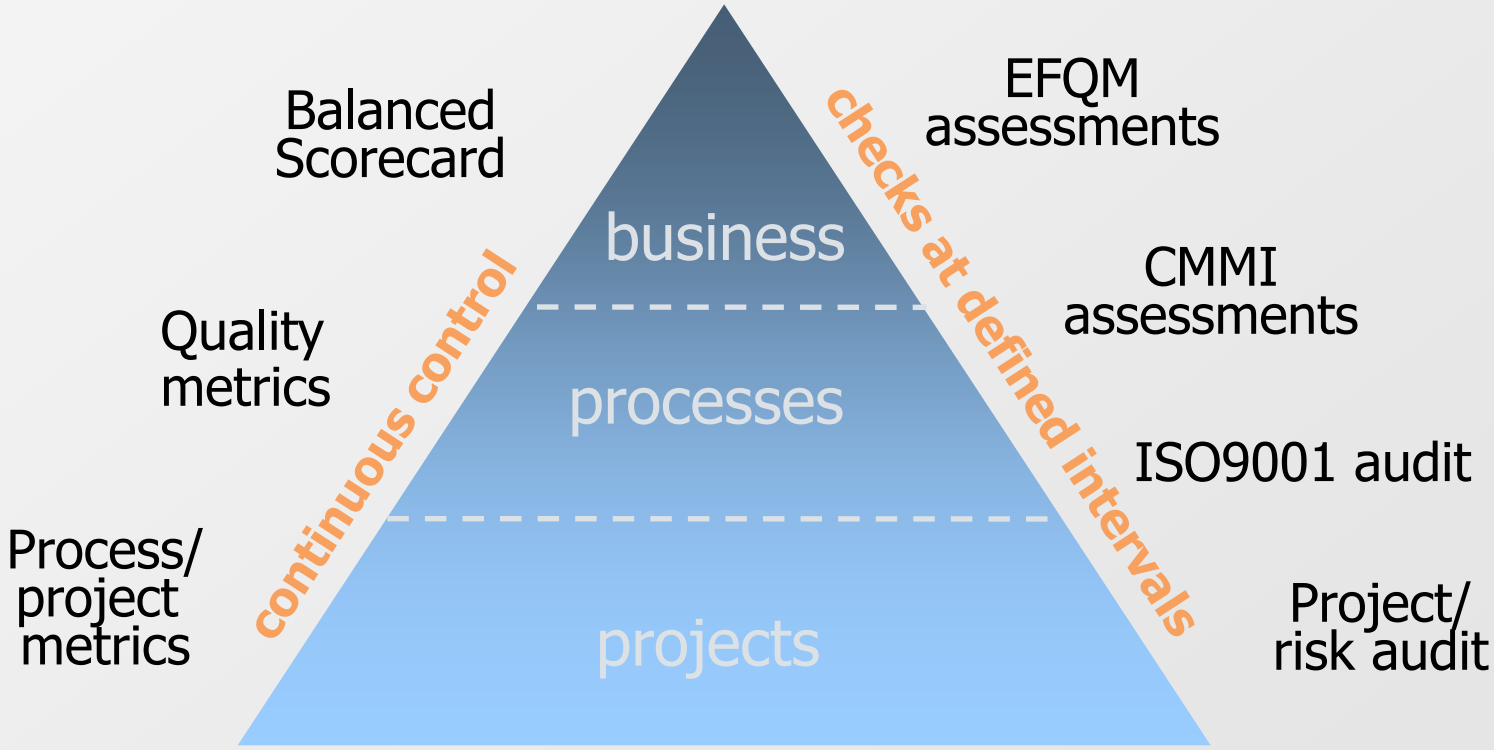
- Integration Management
- Scope Management
- Time Management
- Cost Management and Controlling
- Quality Management
- Human Resource Management
- Communications Management
- Risk and Opportunity Management
- Procurement Management

Quality management

- ISO 9000 definition
  - Coordinated activities to direct and control an organization with regarding to quality

- Activities
  - Planning
  - Control
  - Improvement
  - Assurance

Quality management levels



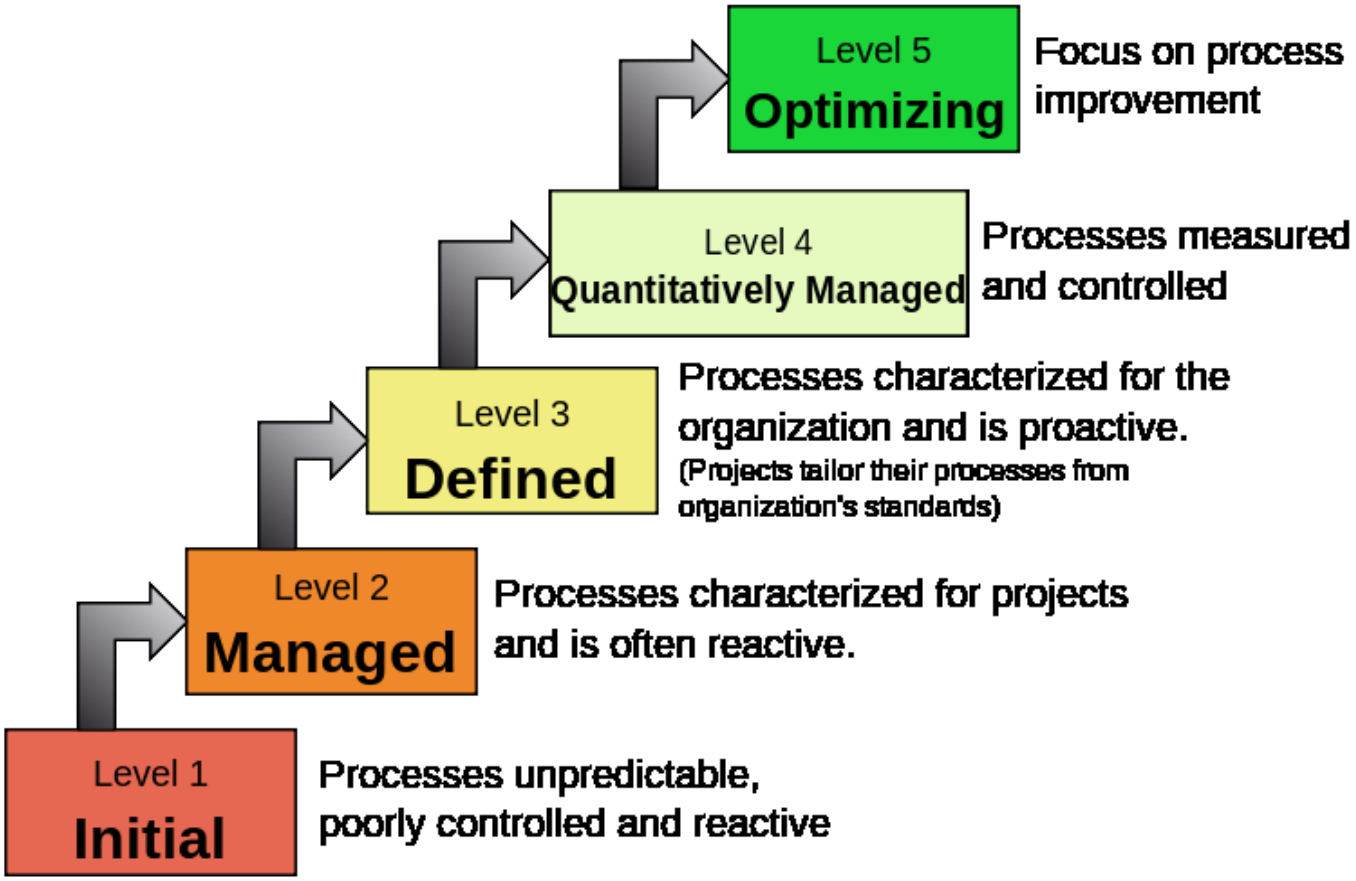
ISO

- International Organization for Standardization
- ISO 9001:2008 Quality management systems
  - Regular internal ISO9001 process audits for the purpose of improvement
- ISO 14001:2004 Environmental management systems
- OHSAS 18001:2007 Occupational Health and Safety Assessment Series
- ISO 27001:2005 Information technology – Security techniques – Information security management systems
- ISO 20000-1:2005 Information technology – Service management
- ISO/IEC 15504 Information technology — Process assessment (Software Process Improvement and Capability Determination – SPICE)

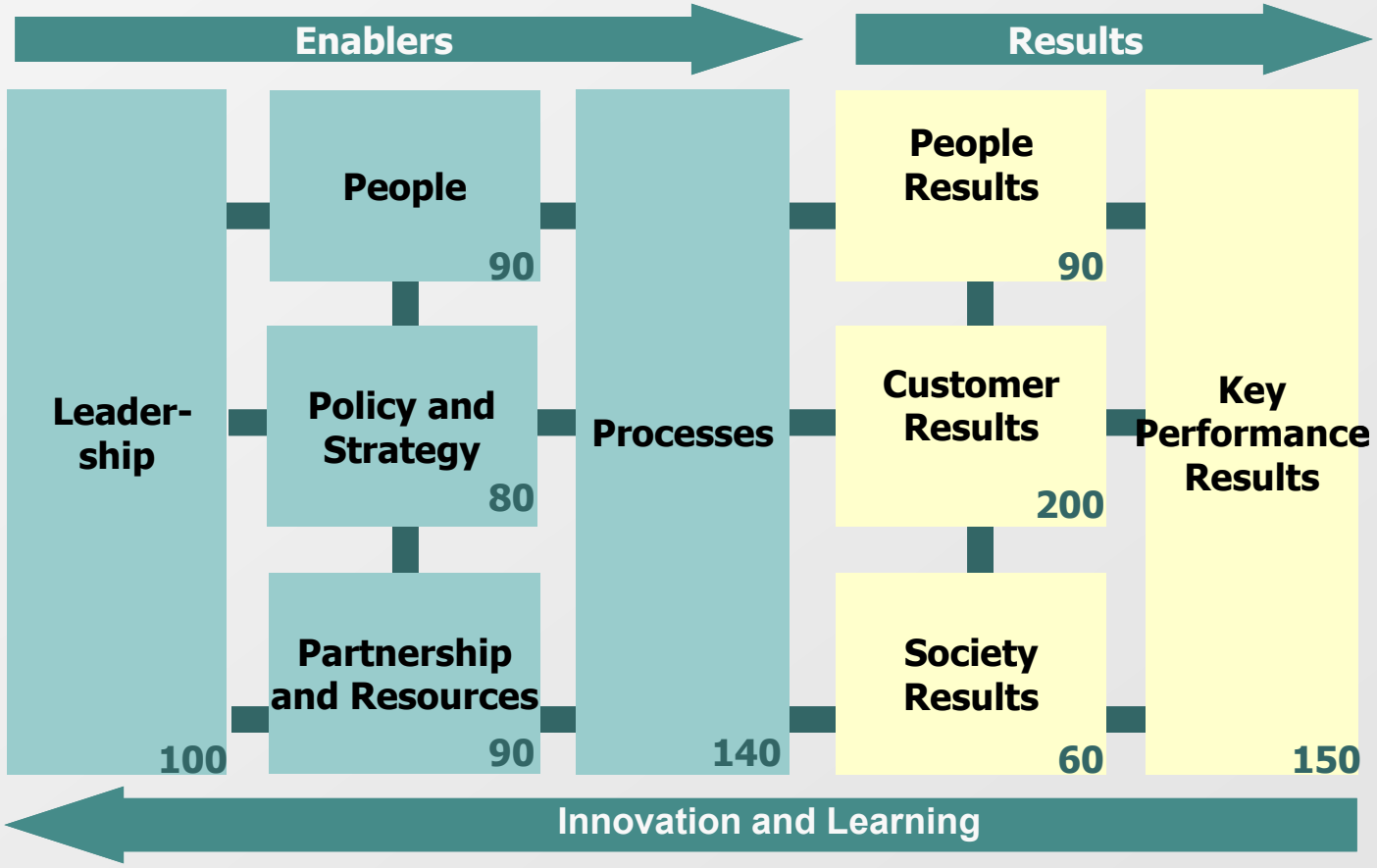
CMMI

- Capability Maturity Model Integration
- Based on CMM (Capability Maturity Model)
- Appraisal – SCAMPI (Standard CMMI Appraisal Method for Process Improvement)
- Published appraisal results
  - http://sas.sei.cmu.edu/pars/

Characteristics of the Maturity levels



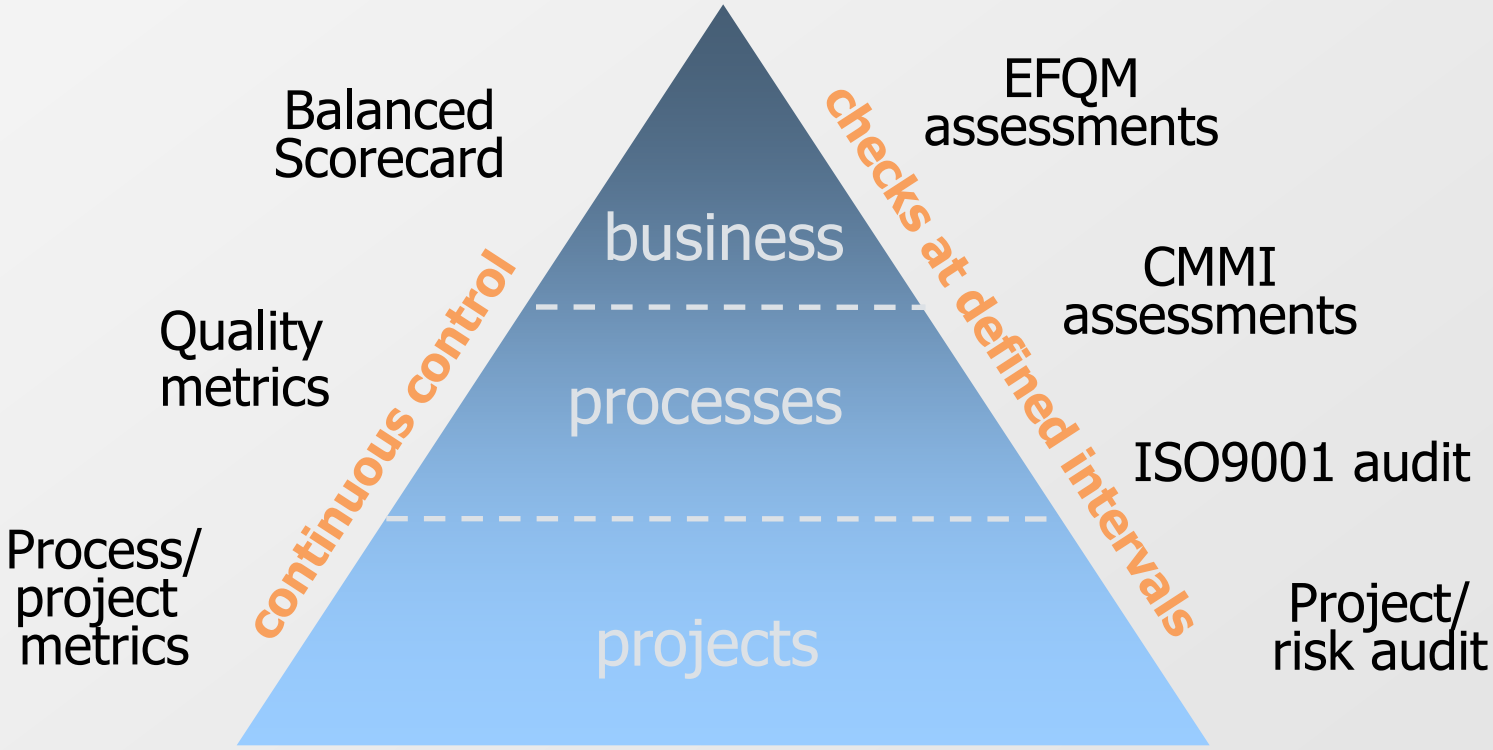
EFQM model


Enablers
Results
Leader-ship
100
People
90
Policy and Strategy
80
Partnership and Resources
90
Processes
140
People Results
90
Customer Results
200
Society Results
60
Key Performance Results
150
Innovation and Learning

Balanced scorecards

- Balanced scorecards perspectives:
  - The customer perspective (Customers / Market)
    To achieve our vision, how should we appear to our customers?
  - The financial perspective (Finances)
    To succeed financially, how should we appear to our shareholders?
  - The learning and growth perspective (Human resources / Innovation)
    To achieve our vision, how will we sustain our ability to change and improve?
  - The internal process perspective (Internal processes)
    To satisfy our shareholders and customers, what business processes must we excel at?

EFQM, BSC, CMMI and metrics



Quality assurance

- ISO 9000 definition
  - A part of quality management focused on providing confidence that quality requirements will be fulfilled
- Different understanding in different companies

Quality assurance manager in project

- Incorporates quality aspects into a project with respect to
  - Strategic targets and goals of quality organization
  - Basic processes
  - Customer interests
  - Third parties
- Four eye principle

Quality assurance plan

- Central planning instrument for all quality activities in project
- Content
  - QA requirements, environmental requirements
  - Development method and tailoring
  - QA measures, environmental measures
  - Quality reporting procedure and quality records
  - Corrective and preventive measures

What went wrong?

This is a story about four people named Everybody, Somebody, Anybody and Nobody.

There was an important job to be done and Everybody was sure Somebody would do it.

Anybody could have done it, but Nobody did it.

Somebody got angry about that because it was Everybody's job.

Everybody thought Somebody could do it but Nobody realized that Everybody wouldn't do it.

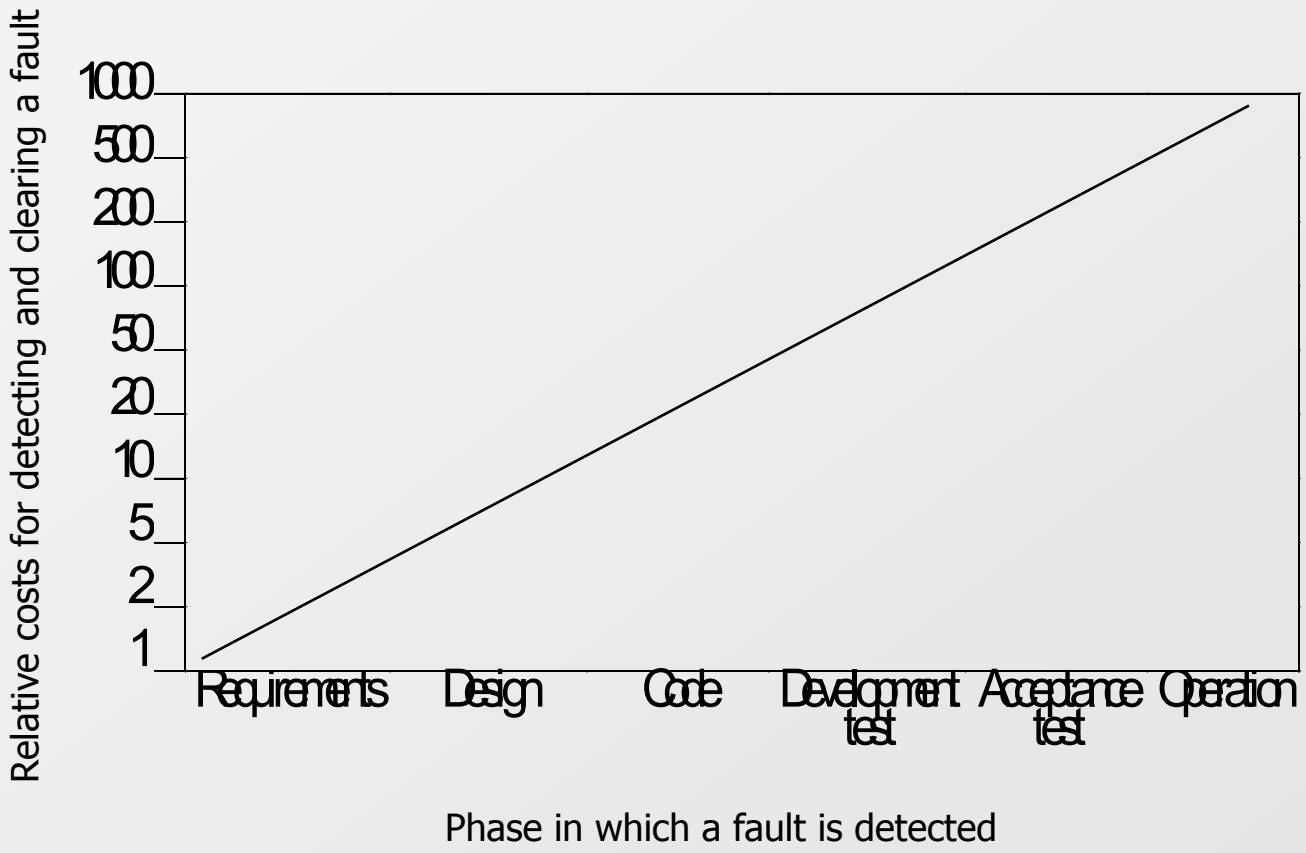
In the end Everybody blamed Somebody when Nobody did what Anybody could have done.

Checks

- Nobody/Nothing is perfect → Errors, Faults, Deficiencies
  - **Checks** to identify them as early and as efficiently as possible

- Different types of checks
  - Automatic code analysis
  - Test
  - Checking compliance with processes
  - Audits (ISO)
  - Assessments (CMM/CMMI, EFQM model)
  - Reviews

Costs of fault identification



Reviews

- Formalized, systematic and critical documented check of development results at the end of defined work stages with purpose of finding errors
- Most efficient method to reduce “error costs”
  - Why?

- Objects under review
  - Project documentation
  - Product documentation
  - Source code
  - Company documentation

Review phases

- Planning
  - At project start
  - What, who, how, when
- Invitation
  - Usually initiated by author
- Preparation
  - Participants according to their role
- Execution
  - Do not blame author, criticize object
- Conclusion
  - Analysis, correction, verification of found errors
  - Release of an object

Comment review technique

- Review object is distributed to reviewers (usually author)
- Reviewers work through the code segments on their own
- Reviewers pass their findings to the organizer
- Author evaluates the comments and incorporates changes

- Roles
  - Author
  - Reviewers

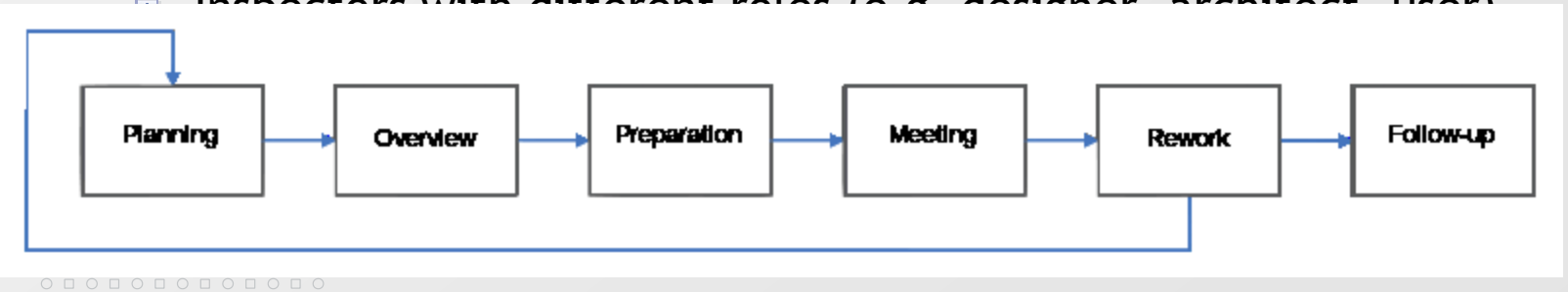
Session review technique

- Review object is distributed to reviewers
- Comments are worked through and assessed in one session
- Author corrects errors and faults identified as agreed

- Roles
  - Facilitator
  - Author
  - Minutes keeper
  - Reviewers

Intensive inspection

- Session technique based on Michael Fagan inspection
- Up to 6 reviewers
- Maximum 2 hours per one session
- Additional step
  - Introductory session
- Roles
  - Author
  - Facilitator, minutes keeper
  - Reader
  - Inspectors with different roles (e.g. designer, architect, user)



Comparison of review techniques (code)

Type of review	Volume	Effort	L2 errors found	L2 errors per volume	Effort / L2 errors	Effort / volume
				Error detection rate		
	kRBLOC	Mh		1/kRBLOC	Mh	Mh/kRBLOC
Intensive inspection	12	501	93	7.8	5.4	41.8
Session technique	745	2373	211	0.3	11.2	3.2
Comment technique	161	307	15	0.1	20.5	1.9

Source: Piloting of intensive inspection for code SR 4/ 1995, at ICM N MC
Level2 errors – major functional errors

Code review – Java example

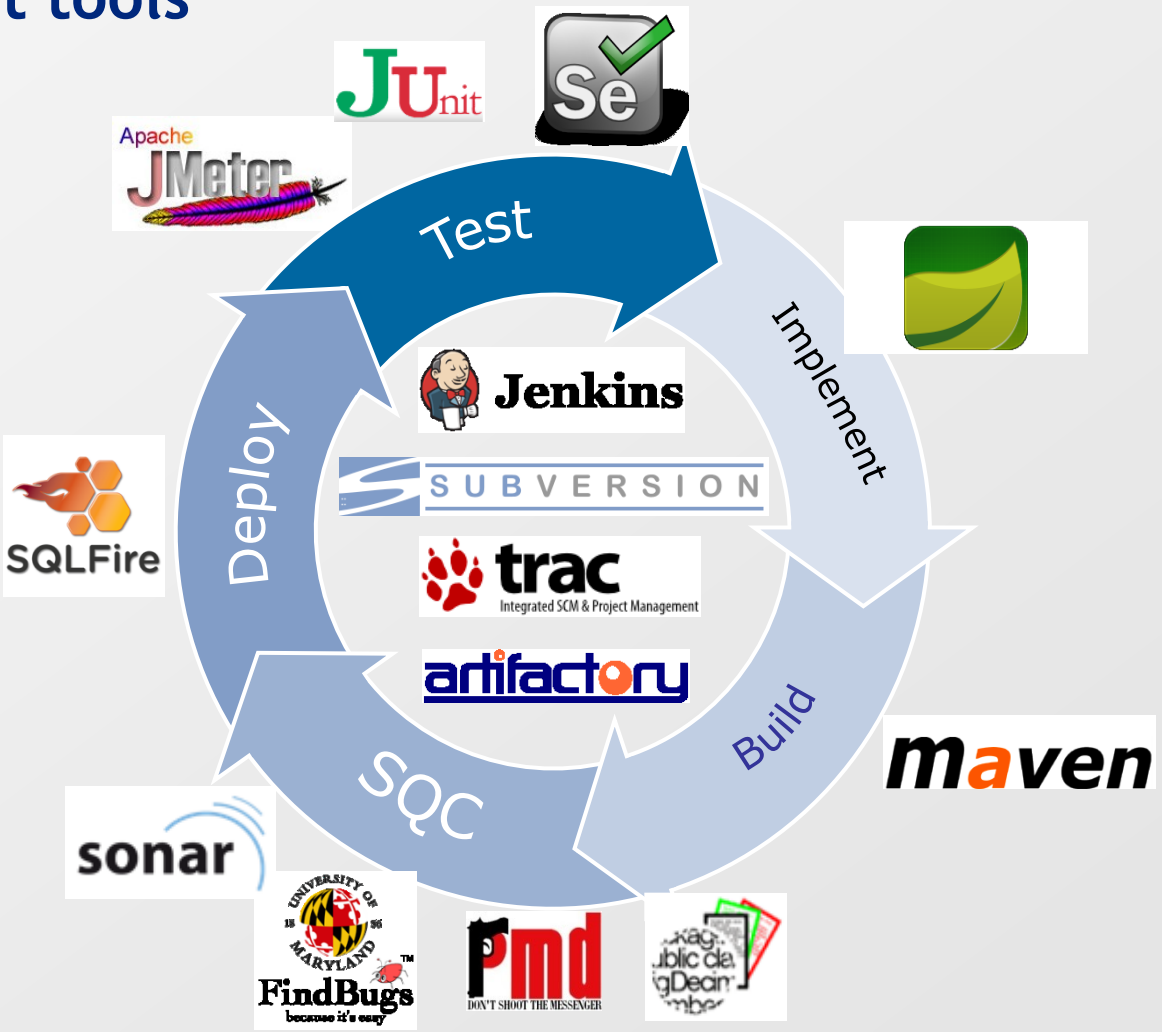
```
class Hello {
   public String text;

   public Hello() {
      text = null;
   }

   // method to set text
   public void set(String t) {
      text = t;
   }

   public String get() {
      return text;
   }
}
```

Development tools example



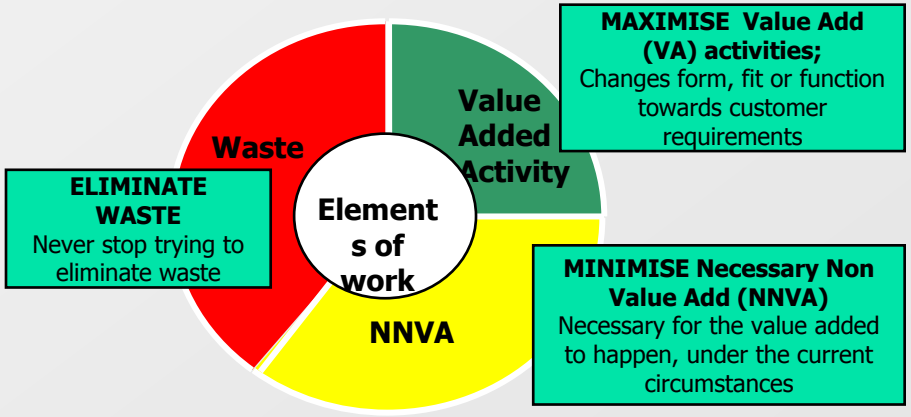
Document management

- Update, release and distribution of documents
- Ensures that most recently released version of the document is used
- Status (validity) of a particular document is identifiable
- Audit trail of a document must be traceable
  - Who created or changed document
  - What was the last change
  - Who made a review and where are the results
  - Who approved it
  - When these actions took place

- Document management systems
  - Livelink
  - Microsoft SharePoint

Lean

- Value added
- Waste
  - Rework
  - Over-processing
  - Overproduction
  - Motion
  - Inventory
  - Waiting
  - Transport
  - Intellect
- Necessary but Non-Value-Added



Lean in SW development

- Eliminate waste
- Amplify learning
- Decide as late as possible
- Deliver as fast as possible
- Empower the team
- Build integrity in
- See the whole

(source: wikipedia.org)

Next lesson

- Development process
  - Development process in general
  - Process tailoring
  - Waterfall
  - Iterative and incremental
  - Agile development
  - Scrum
  - Extreme Programming

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Děkuji za pozornost.

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