
An Integrated Approach to Quality Modelling

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Product Quality

Quality Models

Problem

Dimensions of
Quality Models (1)

Dimensions of
Quality Models (2)

An Integrated
Approach

Cost Factor

Components

Method

A Meta-Model

Conclusions

Future Work

Garvin (1984): “Quality is a complex and multifaceted concept. It has also been the source of great confusion.”

- transcendent
- product-based
- user-based
- manufacturing-based
- value-based

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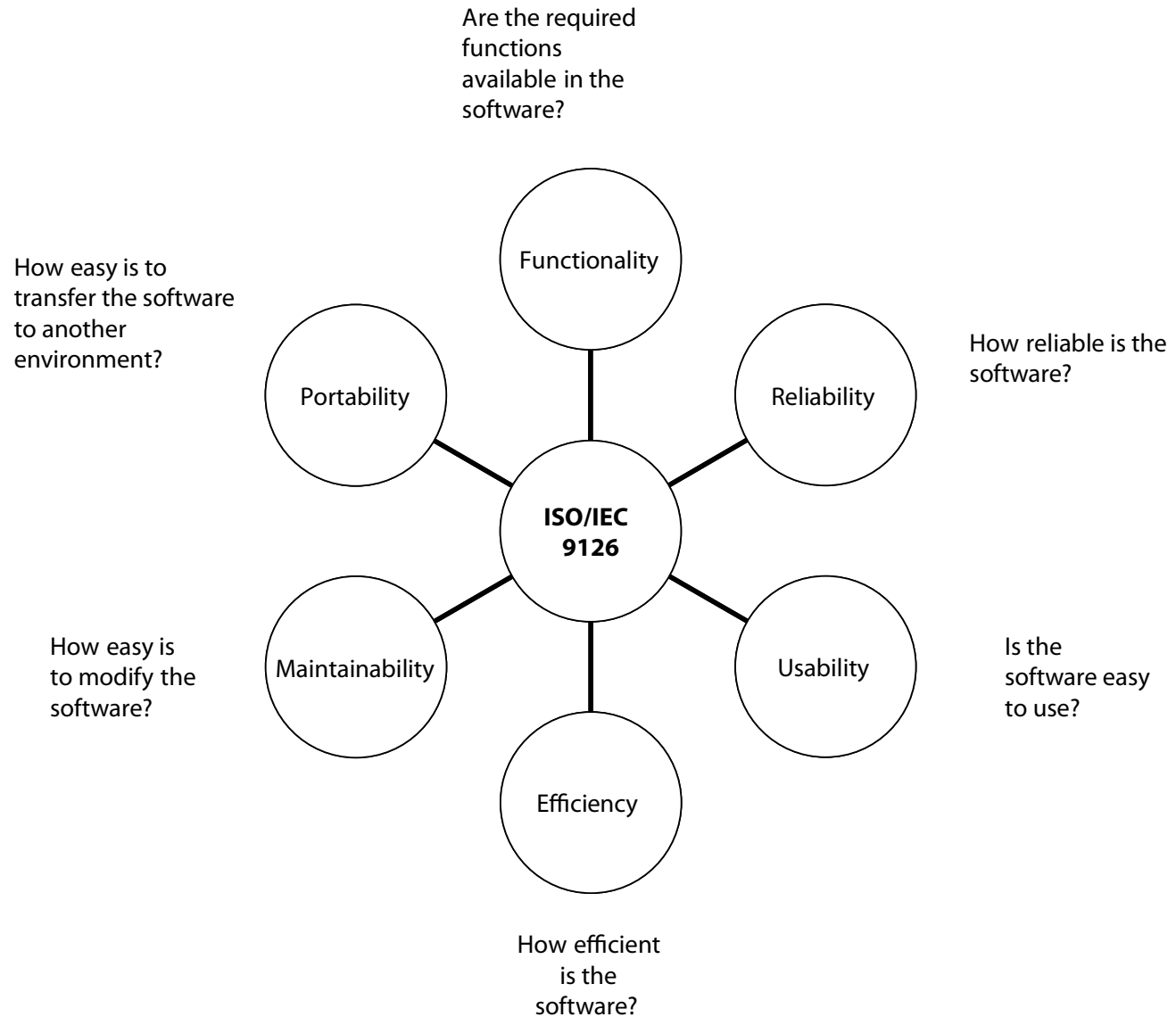
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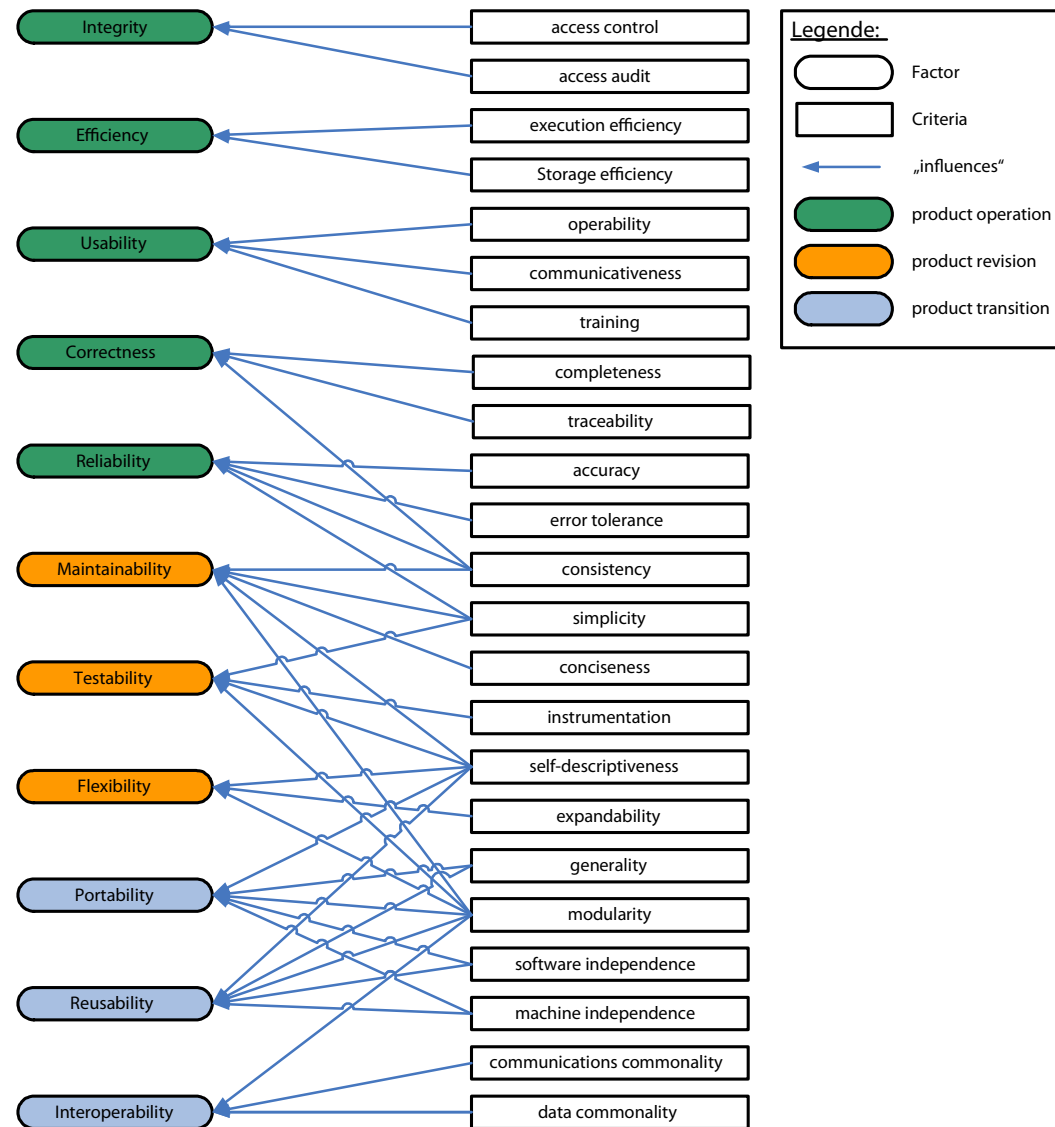
Components

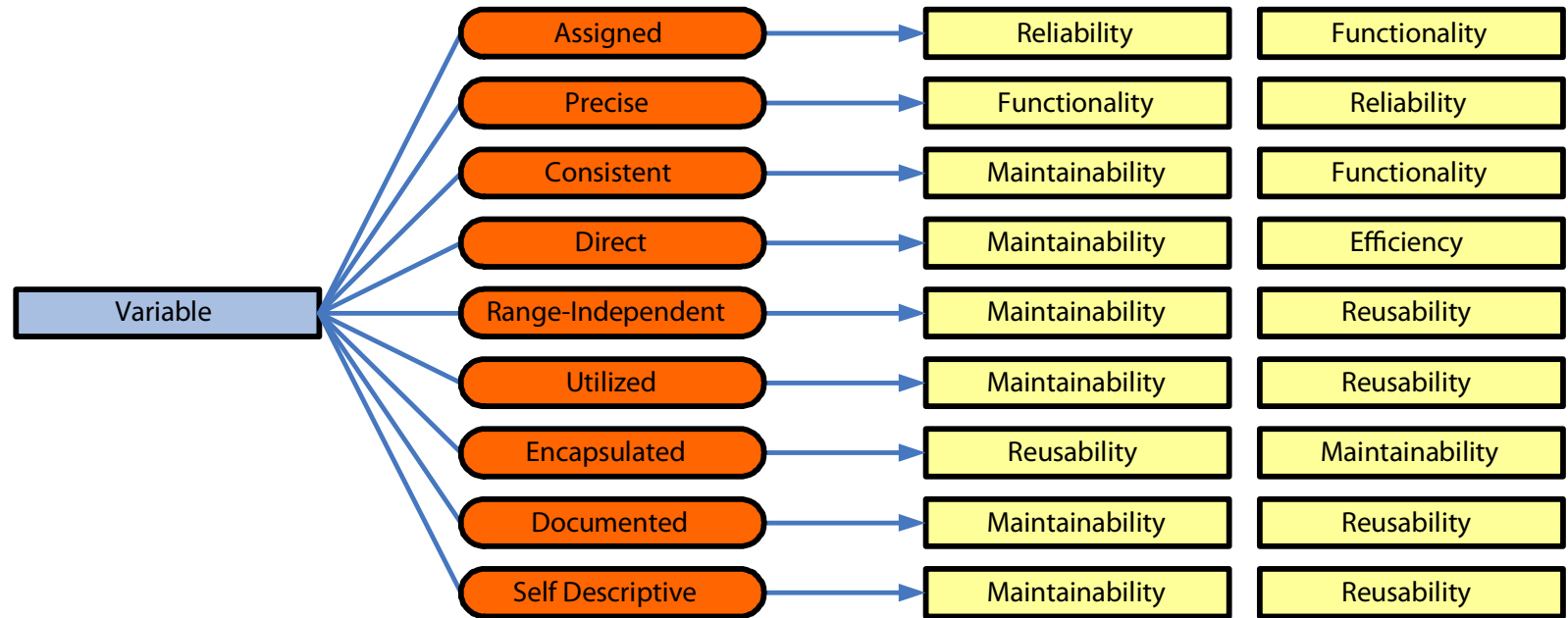
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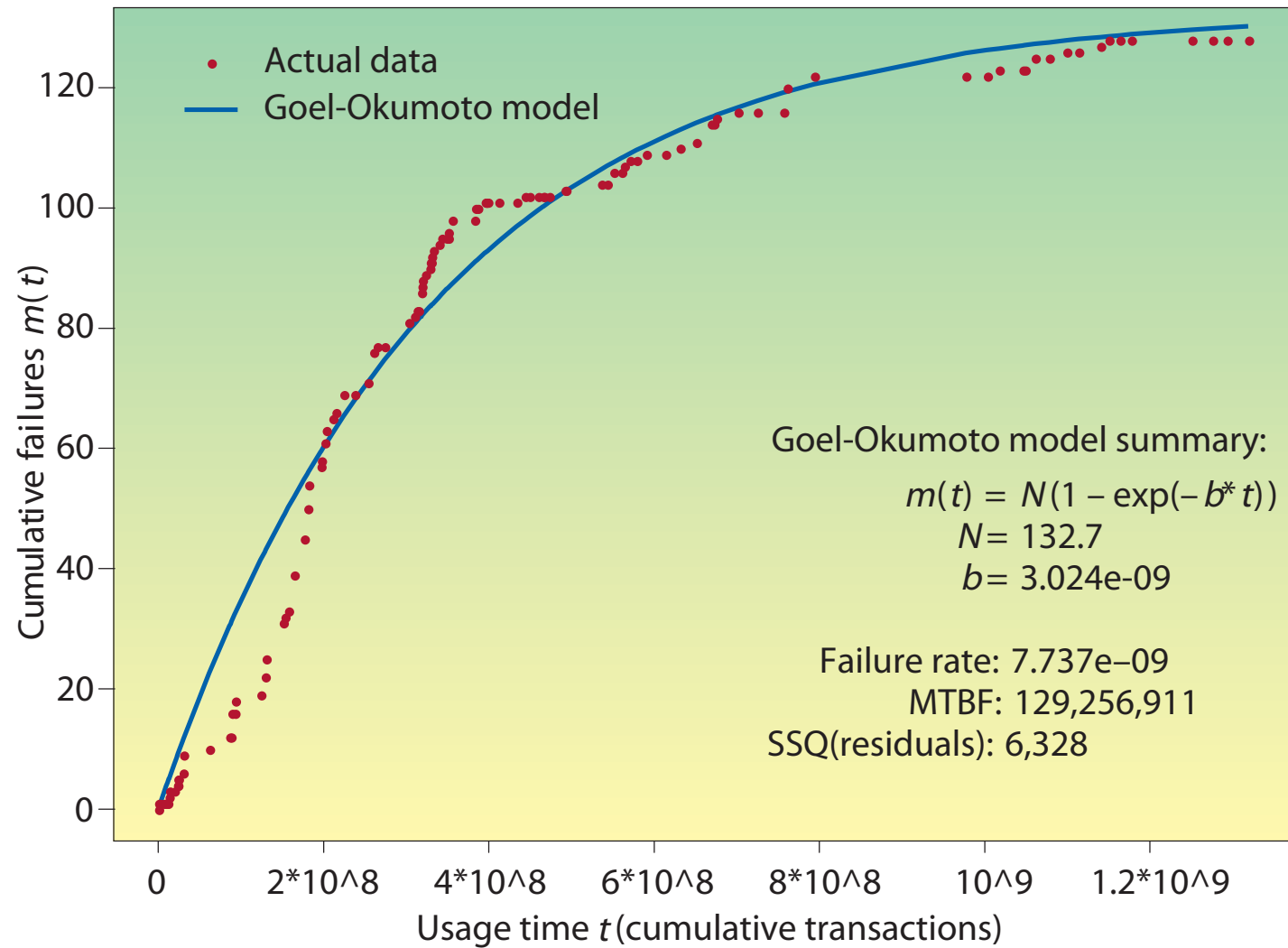
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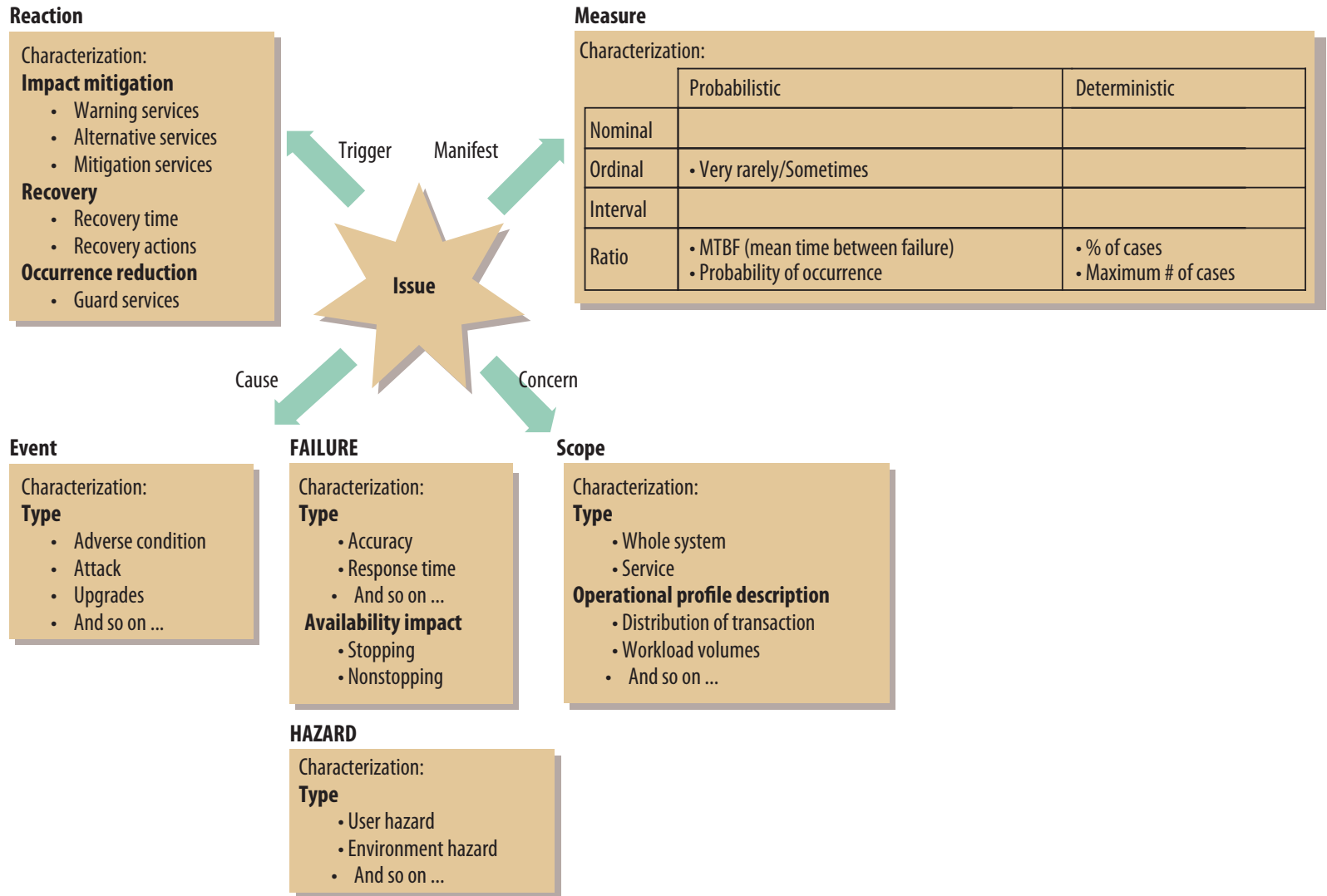




Dromey



(Taken from IEEE Software)



Basili, Donzelli, Asgari (Taken from IEEE Software)

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- SEI Maintainability Index
- Seffah et al.'s consolidated usability model
- CMMI
- SPICE
- ...

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- Rich set of models and techniques
- For various quality-related issues
- But mainly isolated approaches
- However, interrelations and overlaps

⇒ **Lack of an integrated approach**

- Purpose
 - ◆ Constructive
 - ◆ Predictive
 - ◆ Assessing
- View
 - ◆ Transcendent
 - ◆ Product-based
 - ◆ User-based
 - ◆ Manufacturing-based
 - ◆ Value-based
- Attribute
 - ◆ Reliability
 - ◆ Maintainability
 - ◆ Performance

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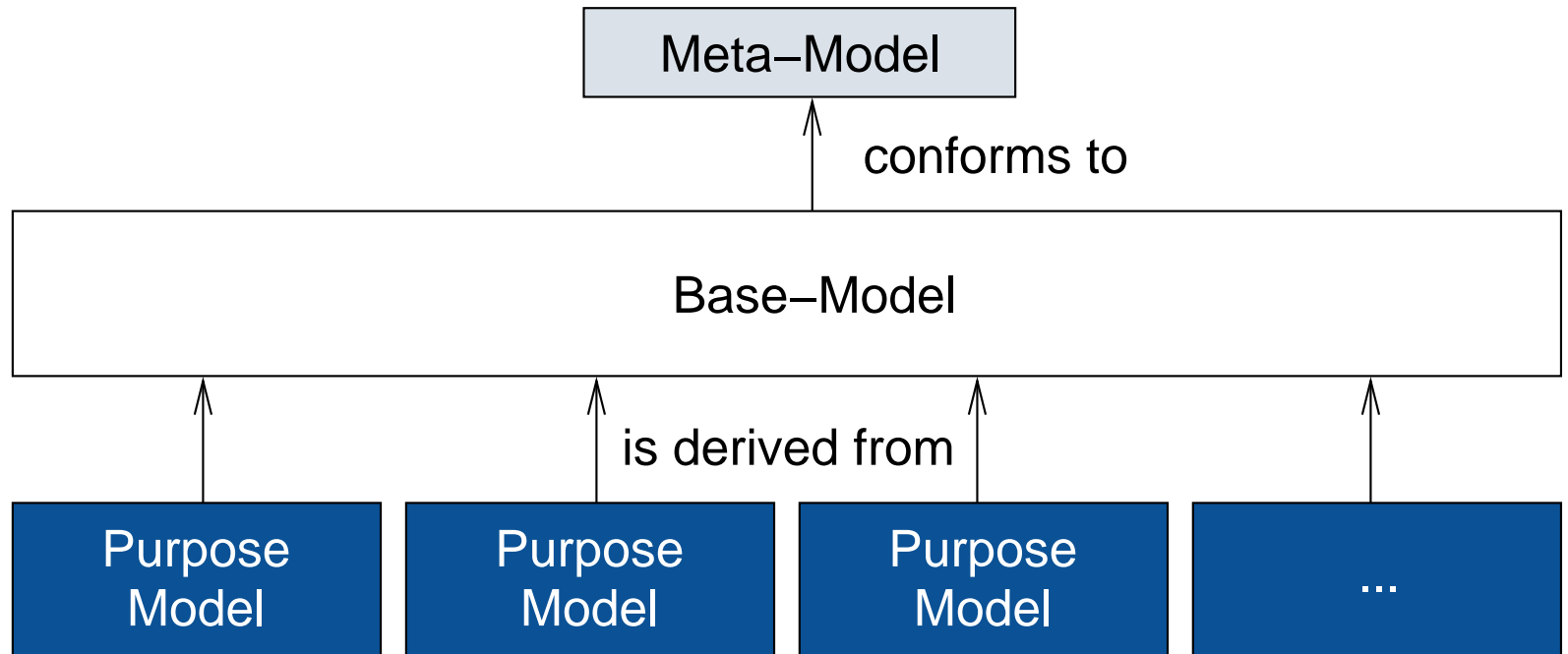
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- Phase
 - ◆ Design
 - ◆ Test
 - ◆ Maintenance
- Technique
 - ◆ System-Test
 - ◆ Inspection
- Abstractness
 - ◆ General
 - ◆ Product-specific



- Primary means of decomposing the base model
- Reasons
 - ◆ Monetary value is the aim of commercial projects
 - ◆ Universal unit
- Examples
 - ◆ Development activities
 - ◆ Hardware
- Mapping to quality attributes
- Facts in the base model are related to cost components

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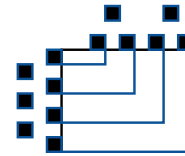
Setting quality goals



.375
.045
.003
.002

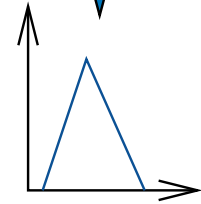
Quality requirements

Building base model

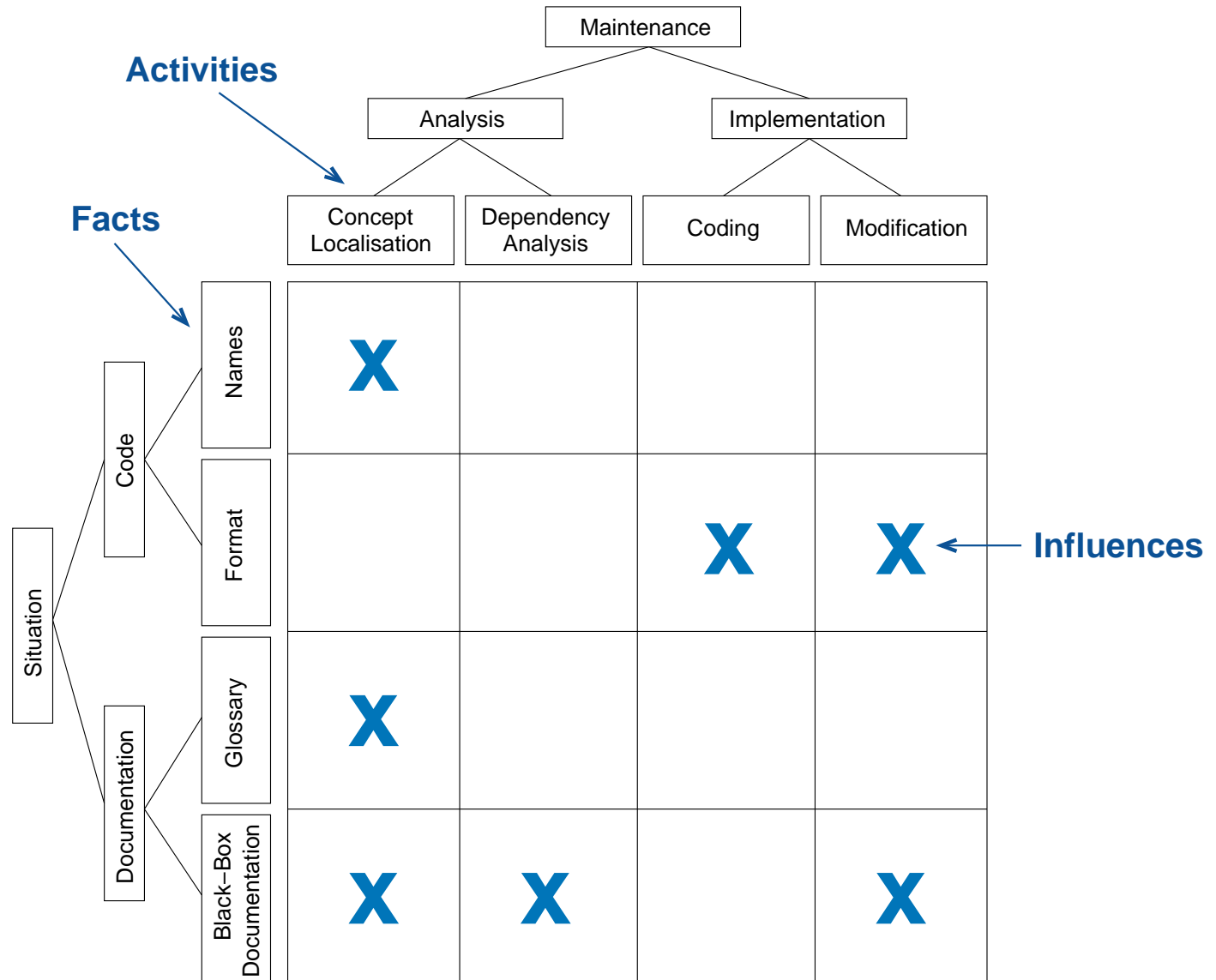


Base Model

Deriving purpose models



Purpose models



- Problem
 - ◆ Isolated approaches to software quality
 - ◆ Interrelations exist
- Approach
 - ◆ Three layers: meta-model, base model, purpose models
 - ◆ Cost factor components

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- Meta-model validation
- “Upper-level” base model
- Derivation of purpose models

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