

... work in progress,
not part of eGovMoNet

Saturday 2008-10-25

0920 - 0940

Measuring User Satisfaction - Connecting the **WiBe Concept** to **ISO 9126** – Product Quality



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Measuring User Satisfaction – WiBe 4 and ISO 9126 connected

Recommendations on Economic Efficiency Assessments in the German
Federal Administration with Regard to the Use of Information Technology
International Organization for Standardization: Software engineering –
Product quality – Part 1: Quality model – Part 4: Quality in use metrics

1 background – why and where connecting WiBe 4 and ISO 9126 ...

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Initiator: STQC

Standardisation Testing and Quality Certification Directorate,
Department of Information Technology, Government of India

- **key organization** in rendering **quality assurance** for **e-governance projects** of the Government of India, operates through a network of seven centres in the country
- is looking for a **user satisfaction model** as essential component of the 'Conformity Assessment Framework' to assure quality
- surveyed existing models and frameworks
- suggested **Workshop on User Satisfaction Measurement Model**

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■ Objectives of Model

- **standardize** user satisfaction measurement methodology
- evolving feedback and recommendations for **improvement**
- give **feedback** for (monetary and non-monetary) outcomes of the investments
- mirroring the **state of eGovernance** to the Government of India

2 assumptions and concept

- **STQC – some requirements and assumptions ...**
 - use existing proven models - *primarily ISO 9126-4*
 - consider user satisfaction from **different points of view**
 - consider user satisfaction being directly **linked to quality of product / quality of service** rendered to different user groups
 - take **ISO 9126 as basis** and add **inputs from WiBe 4.1**
 - make it **comprehensive but easy to use ...**

- **WiBe assumptions**
 - cover **development** (*intended user satisfaction*)
and operation and use of an eGovernment service
(*user satisfaction in use*)
 - take into account **monetary impacts**
that will be of importance for decision makers
 - focus on **specific service/product**
not on e-governance in general
 - start with defining **user groups**

2 assumptions and concept – user groups

(1) customers

external users (citizen and businesses);
generally interacting from the front-end,

(2) employees

internal users (of administrations / public service centres
rendering the service); generally interact from the back-end

(3) administrators / **policy makers**

Ministries Department; generally fund the Project,
generally do not operate it

(4) other **administrations**

(State and Local Government, Other Ministries and
Departments) that are involved with the rendered service

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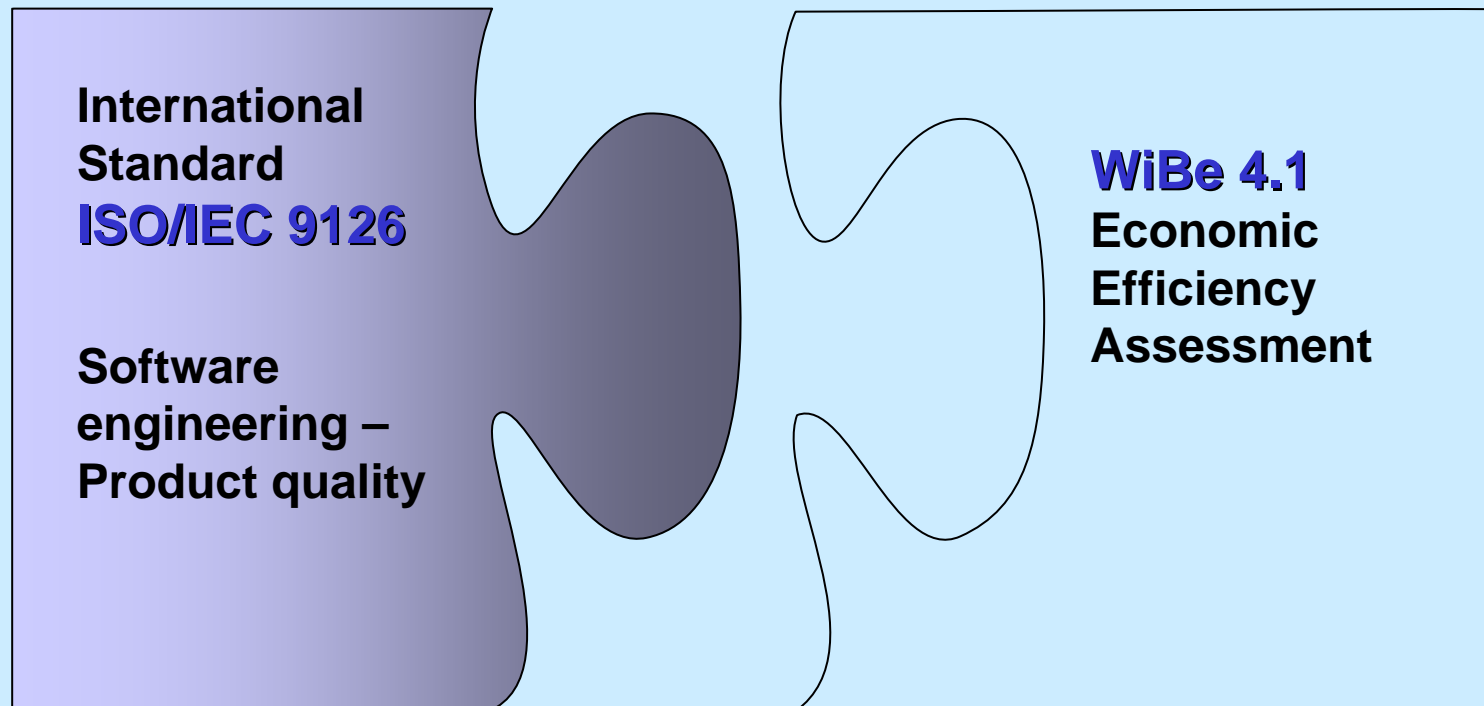
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2 assumptions and concept – ISO 9126 & WiBe

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ISO 9126-1 - quality model for external and internal quality

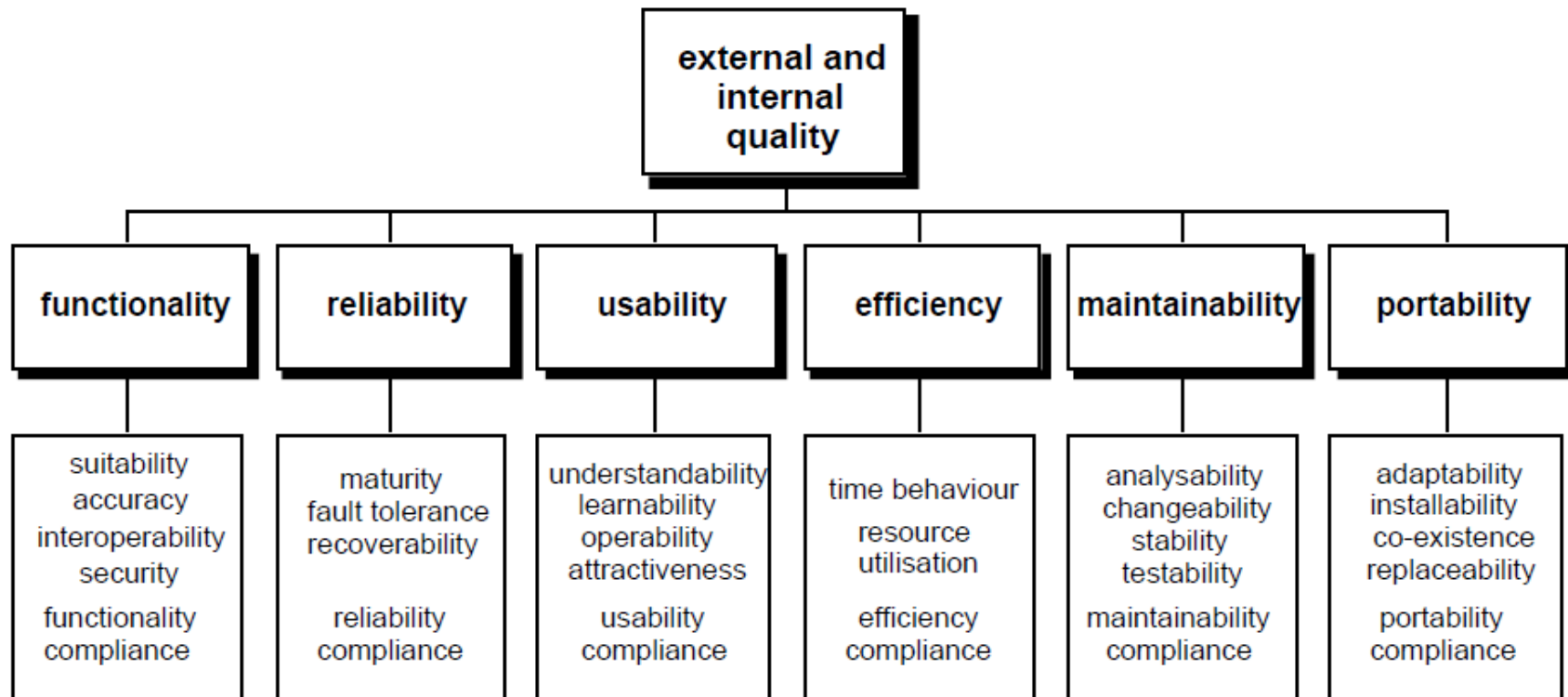


Figure 4 – Quality model for external and internal quality

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External and Internal Quality characteristics

Criteria Group (characteristics)	Criteria (subcharacteristics)	Metrics	relevant to user group:			
			1	2	3	4
Functionality	Suitability	-	●	●	m	m
	Accuracy	-	●	●		
	Interoperability	-	●	●	m	m
	Security	-	●	●	m	m
	Functionality compliance	-	●		●	●
Reliability	Maturity	-	●	●		
	Fault tolerance	-	●	●		
	Recoverability	-	●	●		
	Reliability compliance	-	●		●	●
Usability	Understandability	-	●	●		
	Learnability	-	●	●		
	Operability	-	●	●		
	Attractiveness	-	●	●	m	
	Usability compliance	-	●		●	●
Efficiency <i>(see quality in use!)</i>	Time behaviour	-	●	●		
	Resource utilisation	-				
	Efficiency compliance	-				
Maintainability	Analysability	-		●		
	Changeability	-	●	●	●	
	Stability	-		●		
	Testability	-		●		
	Maintain. compliance	-	●		●	●
Portability	Adaptability	-	●	●		
	Installability	-	●	●		
	Co-existence	-	●	●		
	Replaceability	-	●	●		
	Portability compliance	-	●		●	●

user groups:

- 1 customers
- 2 employees
- 3 administrators/
policy makers
- 4 other admini-
strations

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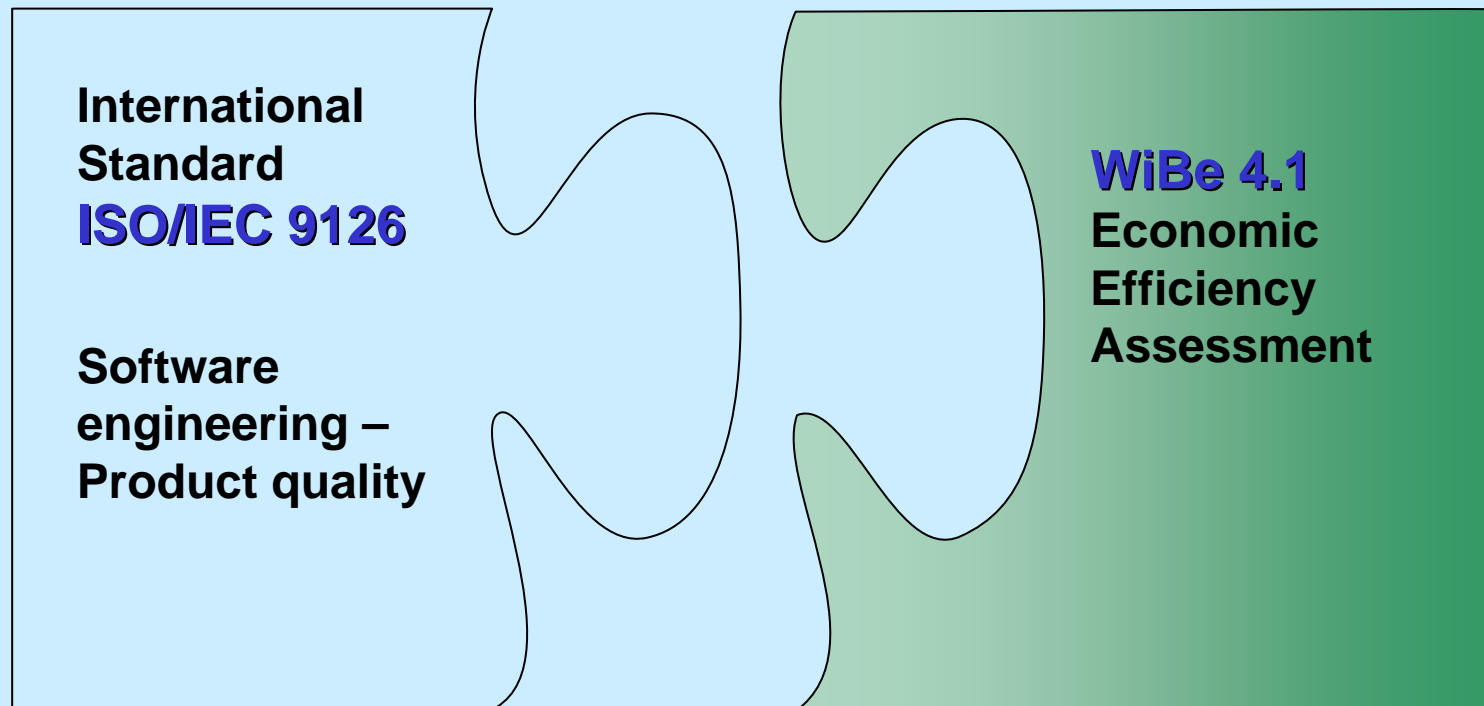
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2 assumptions and concept – ISO 9126 & WiBe

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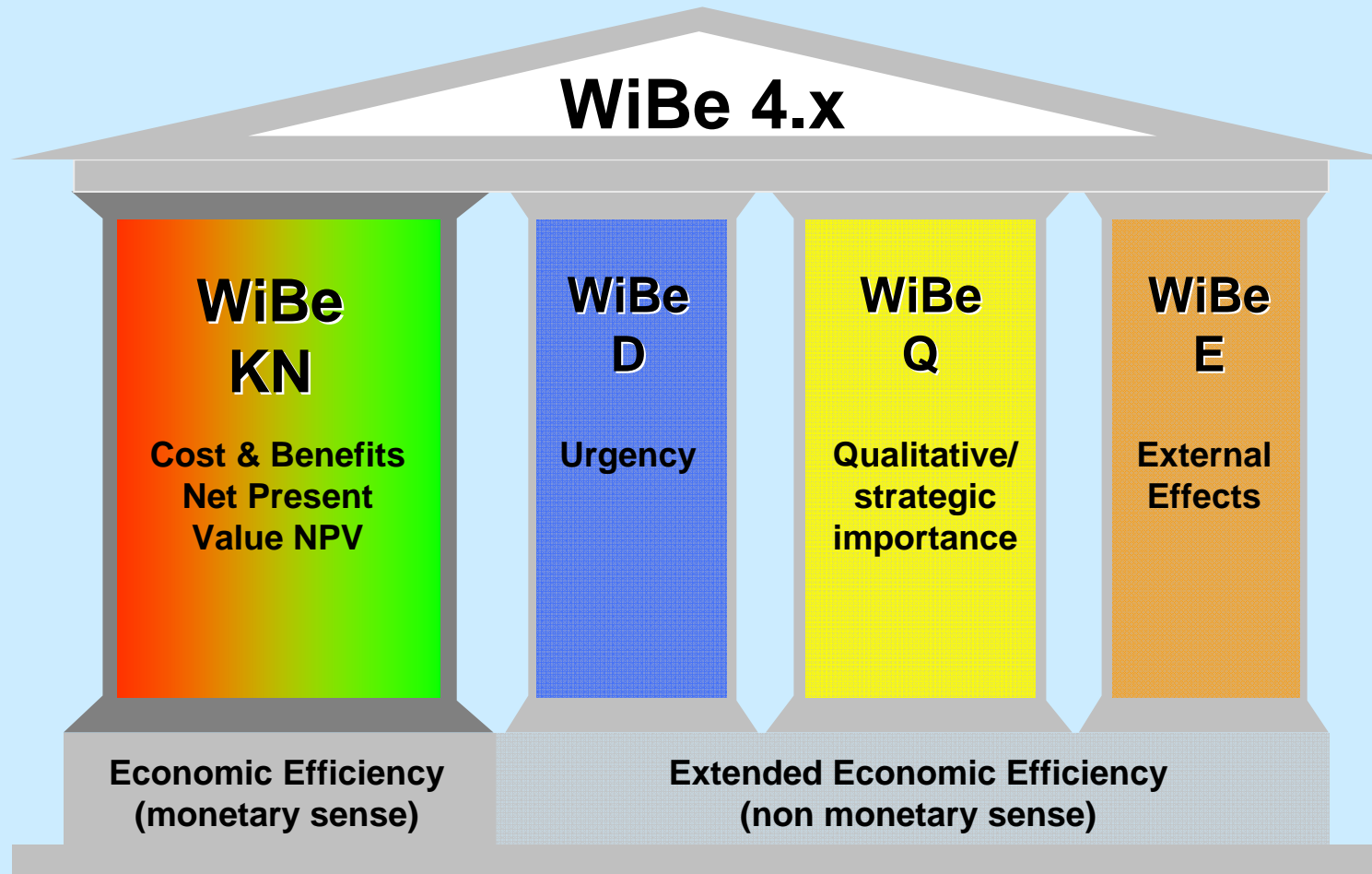
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2 assumptions and concept – WiBe 4.1

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WiBe 4 Criteria – relevance for user satisfaction model (1)

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user groups:

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policy makers
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strations

Criteria Group (characteristics)	Criteria (subcharacteristics)	Metrics (subcriteria)	relevant to user group:			
			1	2	3	4
Development costs & benefits	Planning and development	5 criteria (personnel costs, consulting ...)			▲	
	System costs	9 (hardware, software, installation)			▲	
	Implementation costs	5 (testing, migrating, training, adapting...)			▲	
	Development benefits	2 (once-off cost savings, once-off revenue)			▲	
Operating costs & benefits	Operating costs / savings of operating costs	Communication, host, server, network, work- stations, energy ...			▲	
	Operating personnel costs / savings of personnel costs	Personnel costs related to system use; system administration, training			▲	
	Operating costs / savings for maintenance / system service	Hardware, software maintenance, replace- ment / supplementing			▲	
	Other operating costs / savings	Data protection, external consulting, insurance ...			▲	

Measuring User Satisfaction – WiBe 4 and ISO 9126 connected

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WiBe 4 Criteria – relevance for user satisfaction model (2)

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user groups:

- 1 customers
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policy makers
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strations

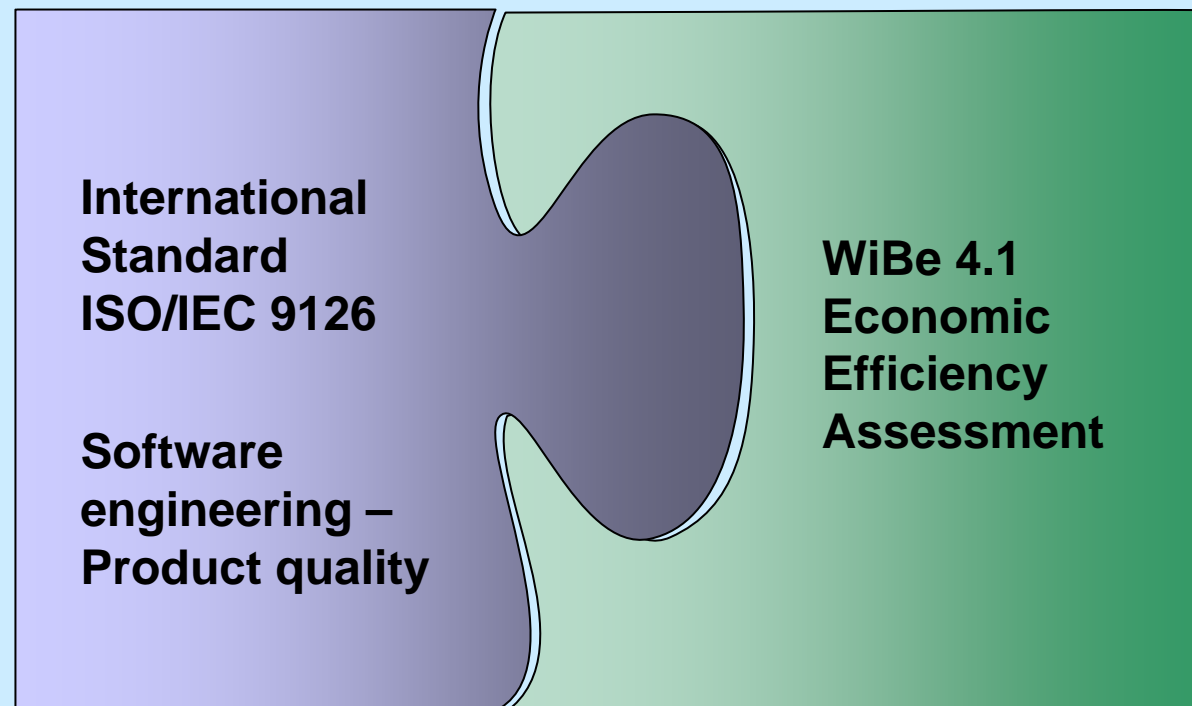
Criteria Group (characteristics)	Criteria (subcharacteristics)	Metrics (subcriteria)	relevant to user group:			
			1	2	3	4
Urgency	Urgency to replace the old system	7 criteria, <i>see WiBe 4, p. 21, 46</i>			•	
	Compliance with administrative regulations/laws	4 criteria, <i>see WiBe 4, p. 21, 49</i>			•	
Qualitative and strategic criteria	Priority of the ICT-measure	5 criteria, <i>see WiBe 4, p. 22, 51</i>			•	
	Increase in quality of dedicated tasks	4 criteria, <i>see WiBe 4, p. 22, 54</i>		•	•	
	Control of information of the administrative level	2 criteria, <i>see WiBe 4, p. 22, 56</i>			•	
	Staff-related effects	2 criteria, <i>see p. 22, 57</i>		•	•	
External effects	Replacement urgency (Customers perspective)	1 criterion, <i>see WiBe 4, p. 23, 59</i>	•		•	•
	User friendliness	4 criteria, <i>see p. 23, 60</i>	•		•	•
	Immediate economic benefits for customers	1 criterion, <i>see WiBe 4, p. 23, 62</i>	•		•	•
	Increased quality and performance	4, <i>see WiBe 4, p. 23, 63</i>	•		•	•
	Synergies	1 criterion, <i>see p. 23, 65</i>	•		•	•

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connect ...

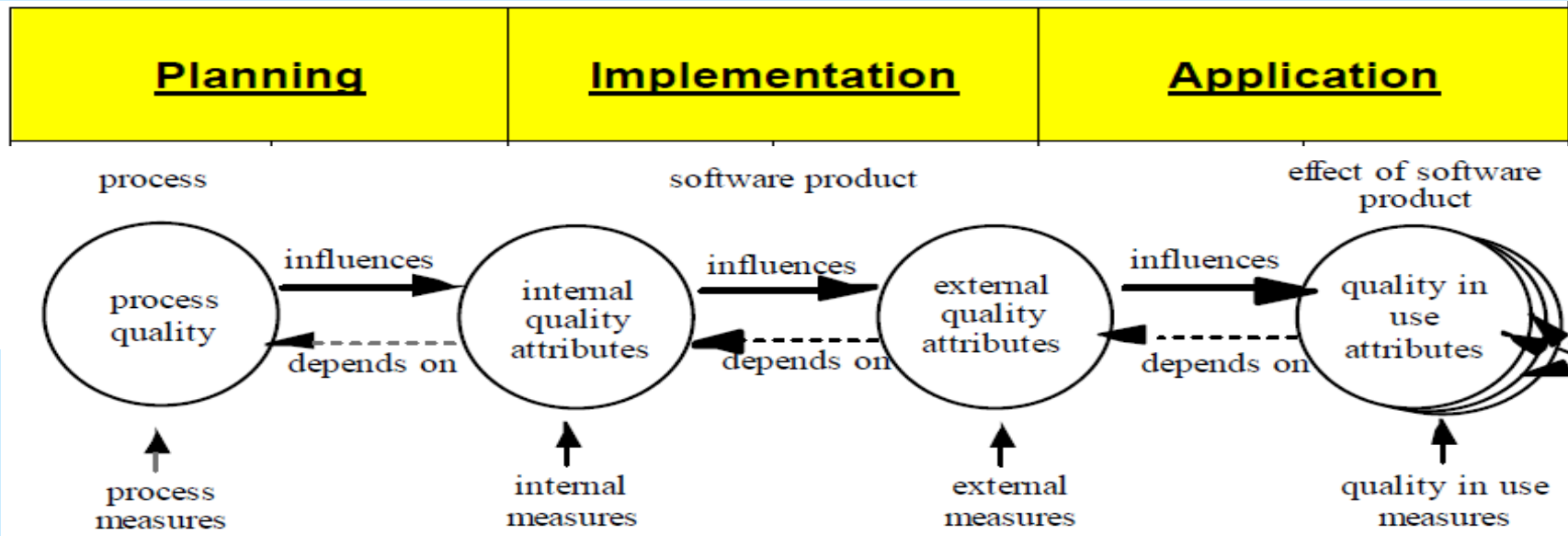


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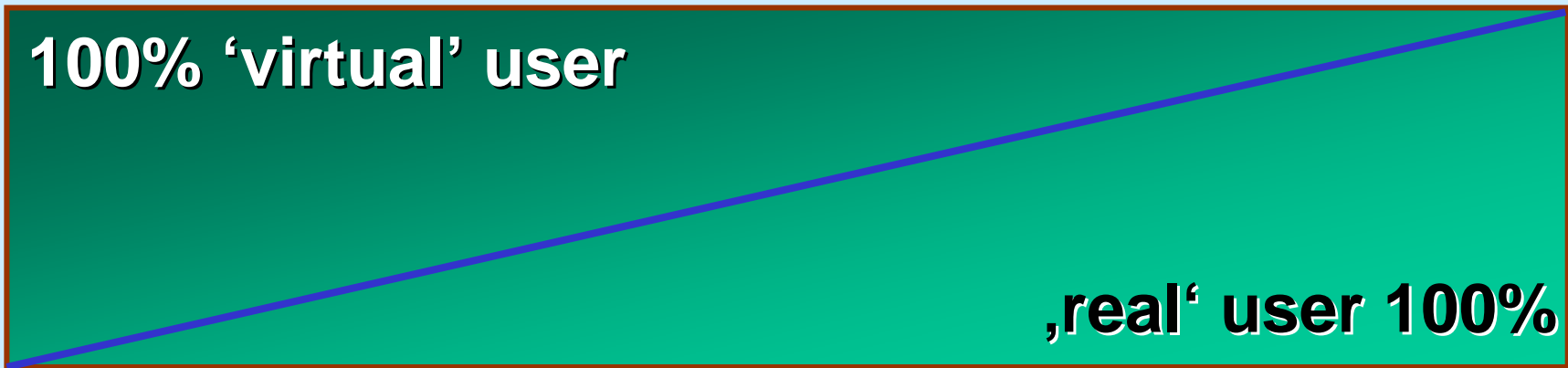
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time (project-/product life cycle) →



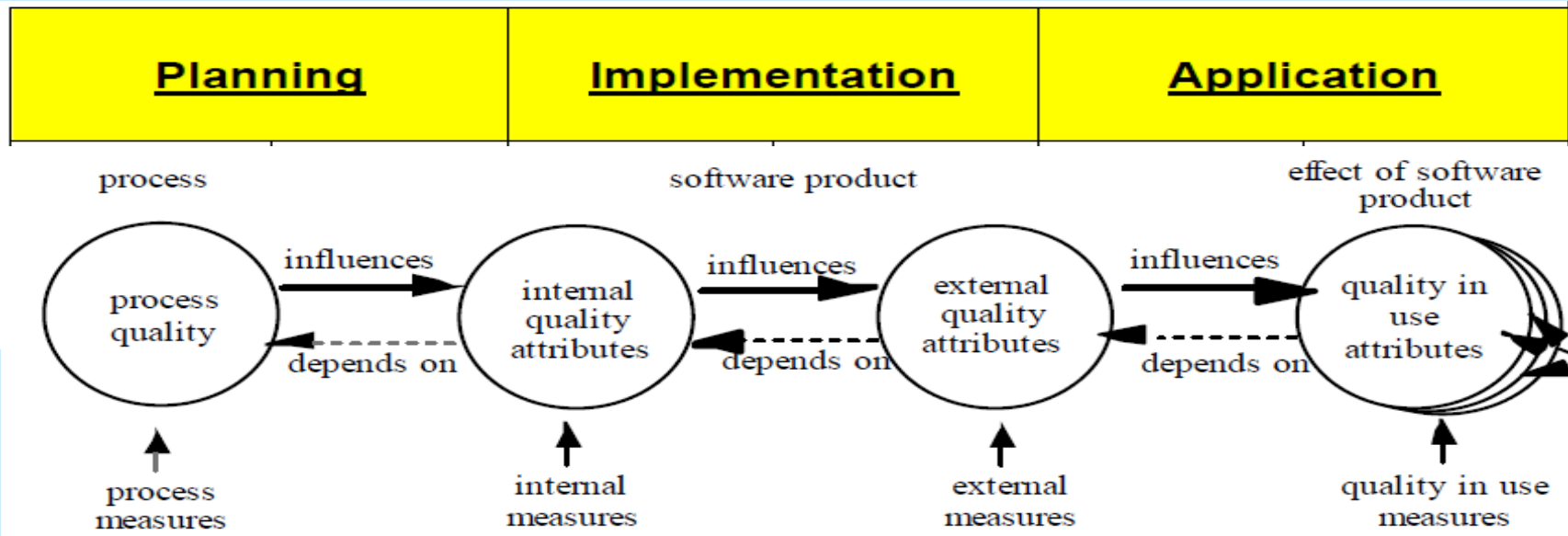
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time (project-/product life cycle) →



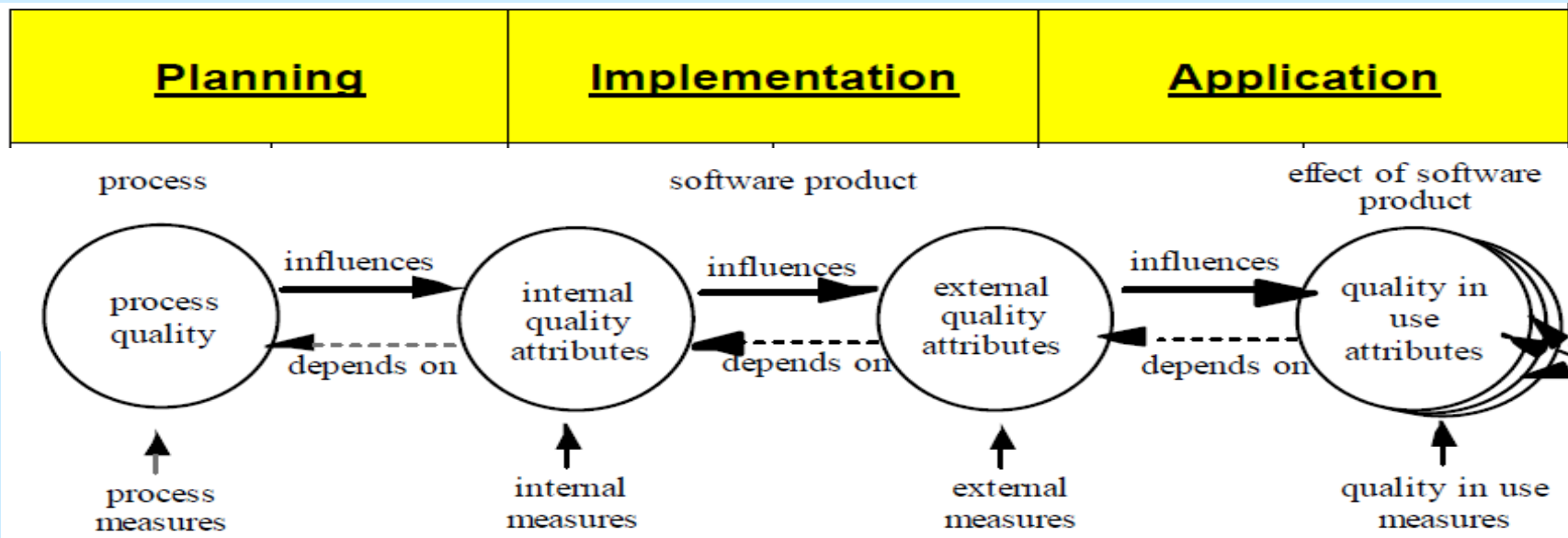
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time (project-/product life cycle) →

**focus on monetary criteria
(contracting authority)**

**focus on qualitative crit.
(customers and employees)**

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3 user group specific indices

- **customer** satisfaction index
- **employee** satisfaction index
- administrators / **policy makers** decision tables
- **co-administrations** satisfaction index

Example: Customer Satisfaction Index

- point of view of **external users** (citizen and businesses)
- measurement criteria are mostly taken from **ISO 9126**
- two parts (80% : 20%)
 - **satisfaction criteria** measured by **questioning „real users“**
after product/service is rendered to customers
 - **additional** criteria about general quality aspects –
via **expert team evaluation** of solution providereach criterion has a predefined measurement scale from 0 to 10
- Result of measurement:
index between 0 (worst) and 100 (best)
- Index below 50 ►
considered as **request to change**

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Customer Satisfaction Index – List of criteria

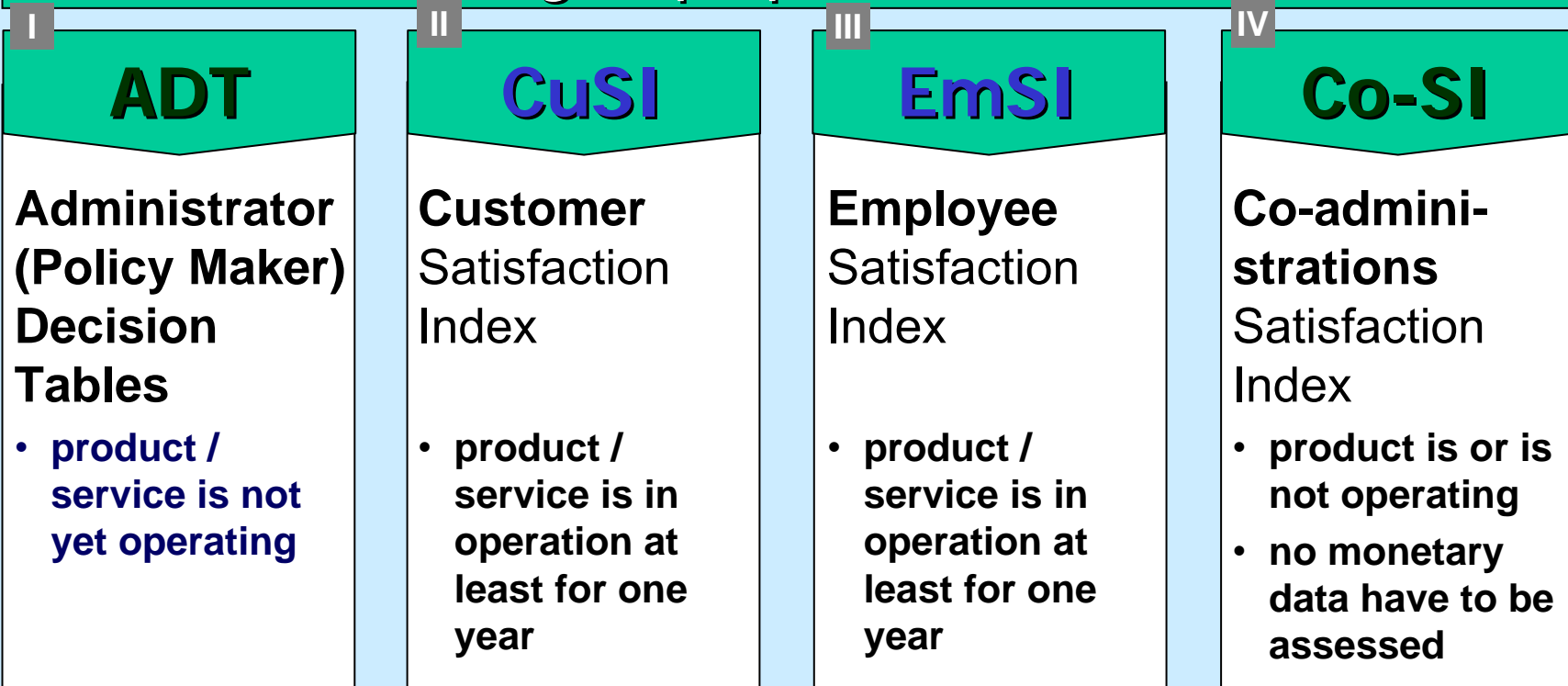
	Criteria Group (characteristics)	Criteria (subcharacteristics)	Subcriteria (Metrics)
1.1	Effectiveness	Task effectiveness	
1.2		Error frequency	
2.1	Productivity	Task time	
2.2		Productive proportion	
3.1.1	Product quality	Functionality	Suitability
3.1.2			Accuracy
3.1.3			Interoperability
3.1.4			Security
3.2.1		Reliability	Maturity
3.2.2			Fault tolerance
3.2.3			Recoverability
3.3.1		Usability	Understandability
3.3.2			Learnability
3.3.3			Operability
3.3.4			Attractiveness
3.4		Time behaviour	-
3.5		Maintainability	-
3.6		Portability	
4.1	General Quality - (by additional judgement of solution provider)	Discretionary usage	
4.2		Immediate economic benefits for customers	
4.3.1		Increased quality and performance	external effect of the acceleration of administrative decisions
4.3.2			simplification/support of multi- level / multi-agency cooperation
4.3.3			increased range of services on offer
4.4		compliance to other requirements and recommendations	
4.5		Replacement urgency (Customers perspective)	
4.6		Synergies	

Administrator Decision Tables

- measure **monetary** and **qualitative** data of the **ICT project proposal** –
 - project is just to be started or has started, but is not closed,
 - **product/service is not in operation yet**
 - data gathering will usually be done by an expert team,
 - results are given to the decision level of funding organization only
- measurement criteria are taken from WiBe 4.1
- **Results** of measurement:
 - **Net Present Value** of ICT Measure (INR Indian Rupies)
 - NPV < 0 INR ► additional arguments become necessary:
 - **Urgency** to replace an old product/solution
 - Qualitative and **Strategic Importance** of the proposed ICT measure
 - **External Effects** of the proposed ICT measure
 - Indices below 50 ► considered as request to **cancel project proposal**

WiBe & ISO 9126 – Measuring User Satisfaction

user group specific indices



4 next steps: testing & improving the model ...