

**Seminario** – «Cose Misurabili e Non Misurabili»

Napoli, 17 Giugno 2016

## Misurare l'Immisurabile? #ioMisuro



**Luigi Buglione**

*Presidente*

**Gruppo Utenti Function Point Italia –  
Italian Software Metrics Association**



- ✓ **1.** Analyze the common perception that some assets are measurable and some others not
- ✓ **2.** Discuss scope, requirements, stakeholders and a proper definition of Entities of Interest (EoI) for allowing a proper measurability
- ✓ **3.** Suggest some best practices for achieving better business results moving from a proper KM deployment





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*You have more potential  
than you believe to do.*

*(Anonymous)*

# Introduction









Three steps back...

Measure or Non Measure: where's the issue?



*You cannot **control** what you  
cannot **measure** but...*

**You cannot **measure** what you  
cannot **define** but...**

You cannot **define** what you  
don't **know**...





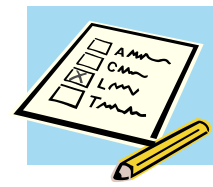
# What is a LOC?

- ✓ **Physical or Logical?**
- ✓ **With/without comments?**
- ✓ **Which variability (abs, %) in estimations?**

```
XPEDIT Editor /home/gjcullen/rms/cbl/rmschangestr.cbl
File Edit View Fonts Info Revision Date: 03/04/2008 A
Command ==>
Pref: Editable Text Hlp
000016 ENVIRONMENT DIVISION.
000017 CONFIGURATION SECTION.
000018 SOURCE-COMPUTER, IBM-9672.
000019 OBJECT-COMPUTER, IBM-9672.
000020 INPUT-OUTPUT SECTION.
000021 FILE-CONTROL.
000022 DATA DIVISION.
000023 WORKING-STORAGE SECTION.
000024 01 IX PIC 9(8) COMP-5 VALUE ZERO.
000025 01 FOUND PIC 9(1) COMP-5 VALUE ZERO.
000026 01 TEMP-OBJECT PIC X(2048).
000027
000028 LINKAGE SECTION.
000029 01 PARAMETERS.
000030 02 STRING-ADR USAGE IS POINTER.
000031 02 STRING-LEN PIC 9(8) BINARY.
000032 02 CHGFROM-ARG PIC X(32).
000033 02 CHGFROM-LEN PIC 9(8) BINARY.
000034 02 CHGTO-ARG PIC X(32).
000035 02 CHGTO-LEN PIC 9(8) BINARY.
000036 02 STRING-RESULT PIC 9(8) BINARY.
000037 01 STRING-OBJECT PIC X(2048).
000038
000039 PROCEDURE DIVISION USING PARAMETERS.
000040 BEGIN.
000041 COMPUTE FOUND = 0.
000042 MOVE SPACE TO TEMP-OBJECT.
000043 SET ADDRESS OF STRING-OBJECT TO STRING-ADR.
000044 COMPUTE FOUND = 0.
000045 EVALUATE TRUE.
000046 WHEN CHGTO-LEN = 0
000047 PERFORM CHANGE-STRING-TO-NULL THRU NULL-EXIT
000048 VARYING IX FROM 1 BY 1
000049 UNTIL (IX > STRING-LEN)
000050 WHEN OTHER
000051 PERFORM CHANGE-STRING THRU CHANGE-STRING-EXIT
000052 VARYING IX FROM 1 BY 1
000053 UNTIL (IX > (STRING-LEN - CHGFROM-LEN))
000054 END-EVALUATE.
000055 COMPUTE STRING-RESULT = FOUND.
000056 GOBACK.
000057
000058 CHANGE-STRING.
```

# What to Measure?

## EAM taxonomy

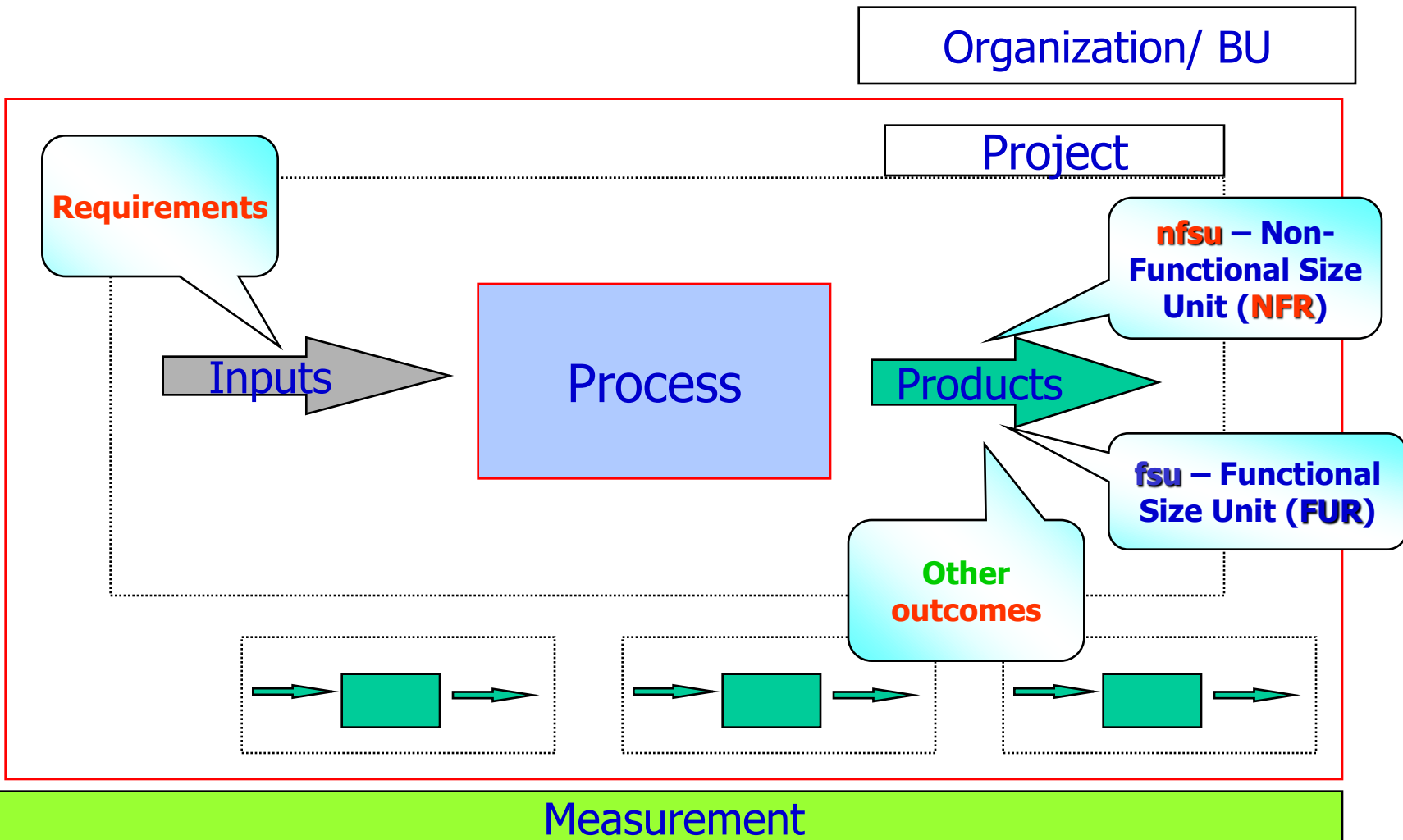


<b>E – Entity</b>	People	People	People
<b>A – Attribute</b>	<b>Height</b>	<b>Weight</b>	<b>Intelligence</b>
<b>M - Measure</b>	Cm / m / ...	Kg / lbs / ...	QI / ...



<b>E – Entity</b>	(software) <b>product</b>	(software) <b>product</b>	(software) <b>product</b>
<b>A – Attribute</b>	<b>Source code length</b>	<b>Functionalities</b>	<b>Complexity</b>
<b>M - Measure</b>	<b>LOC – Lines of Code</b>	<b>Function Point</b>	<b>V(G) – McCabe compl.</b>

Source: Buglione L., Ebert C., *Estimation*, [Encyclopedia of Software Engineering](#), Taylor & Francis Publisher, June 2012, ISBN: 978-1-4200-5977-9



Fonte: L.Buglione & A.Abran, ICEBERG: a different look at Software Project Management, IWSSM2002 in "Software Measurement and Estimation", Proceedings of the 12th International Workshop on Software Measurement (IWSSM2002), October 7-9, 2002, Magdeburg (Germany), Shaker Verlag, ISBN 3-8322-0765-1, pp. 153-167

*You've got to start with the customer experience and work back towards the technology - not the other way around.*

*(Steve Jobs)*



# Requirement & Stakeholders Management





# Req. Management

# Requirements and Stakeholders



How the customer explained it



How the project leader understood it



How the analyst designed it



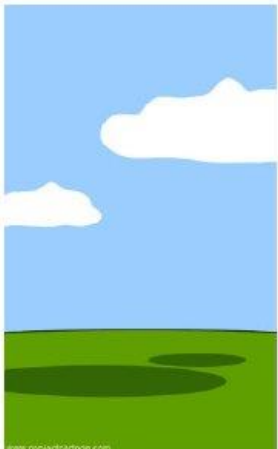
How the programmer wrote it



What the beta testers received



How the business consultant described it



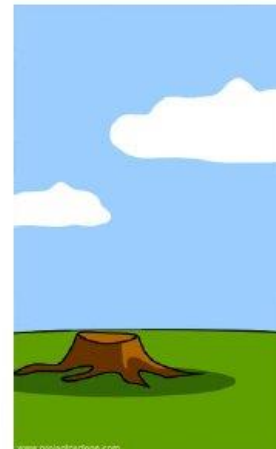
How the project was documented



What operations installed



How the customer was billed



How it was supported

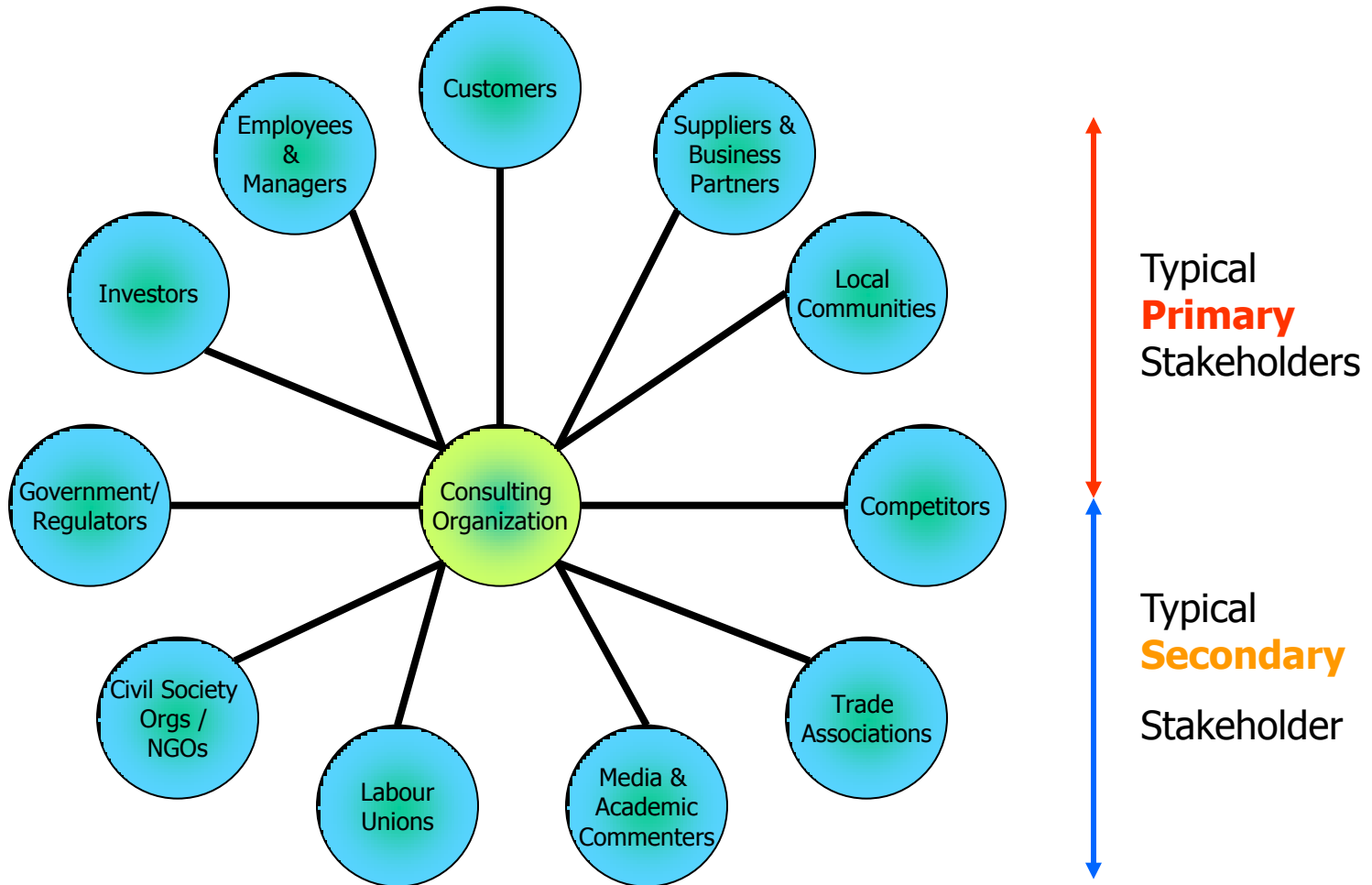


What marketing advertised

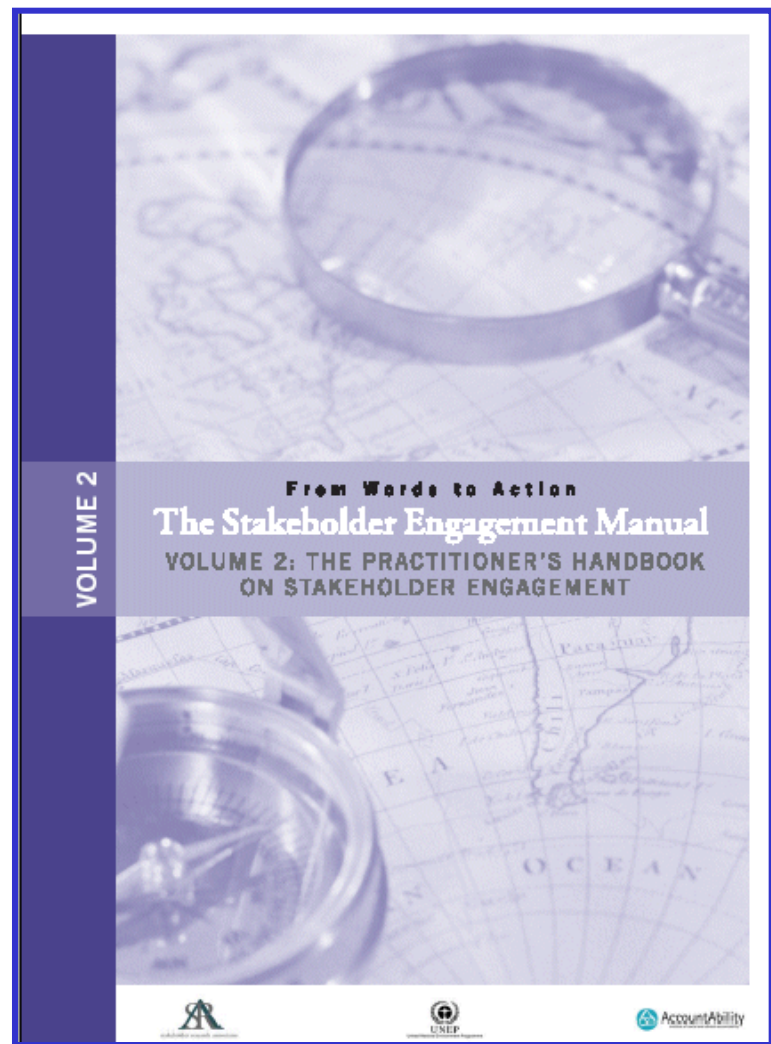
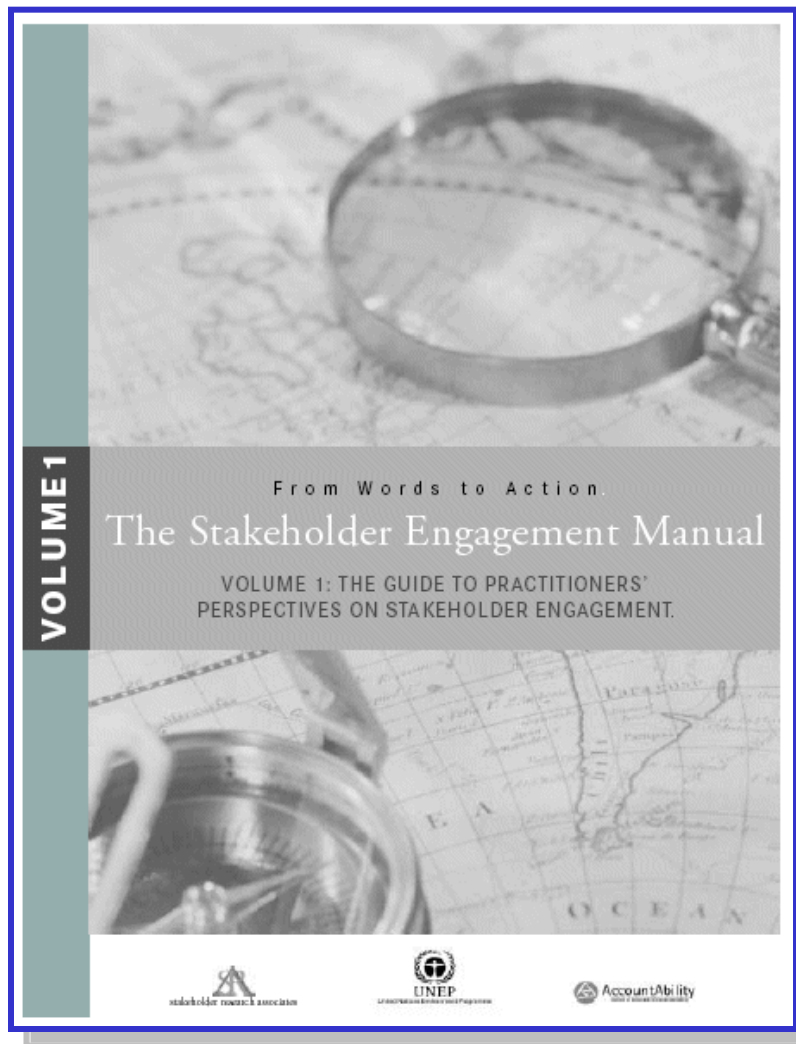


What the customer really needed

• Source: [www.projectcartoon.com](http://www.projectcartoon.com)



**Source:** SRA, The Stakeholder Engagement Manual, 2005, [URL:http://goo.gl/twKpMw](http://goo.gl/twKpMw)





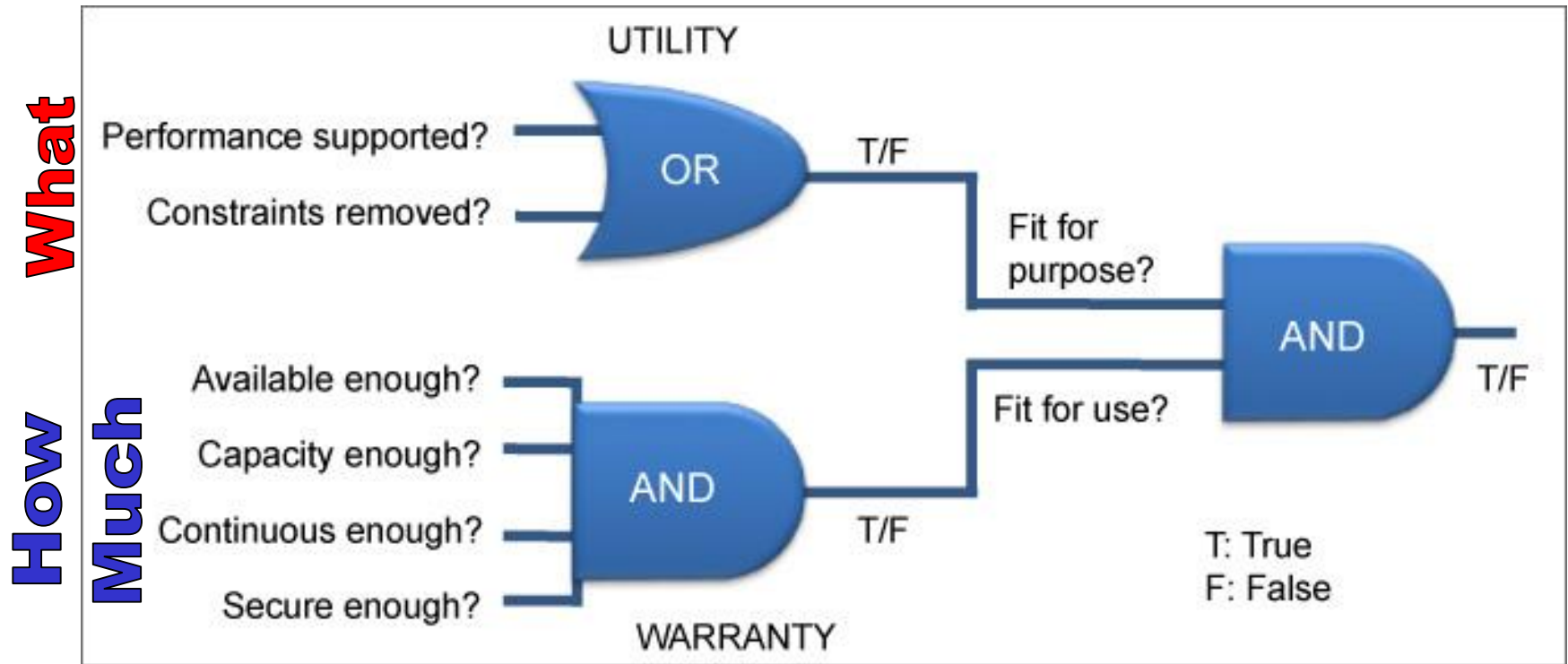
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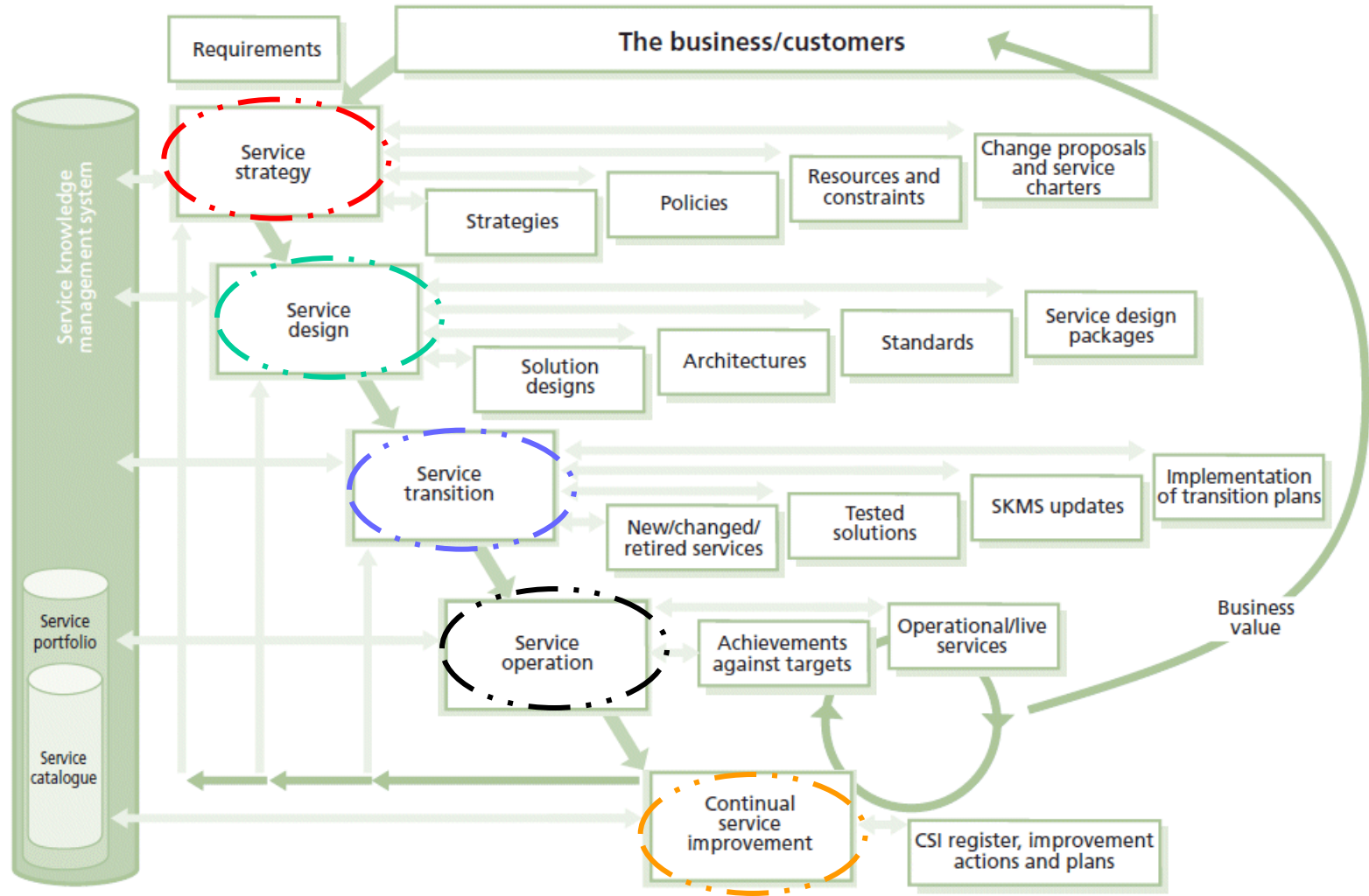
• Source: PMI's PMBOK 5 (2013)





- **Value** ← **Utility** + **Warranty**



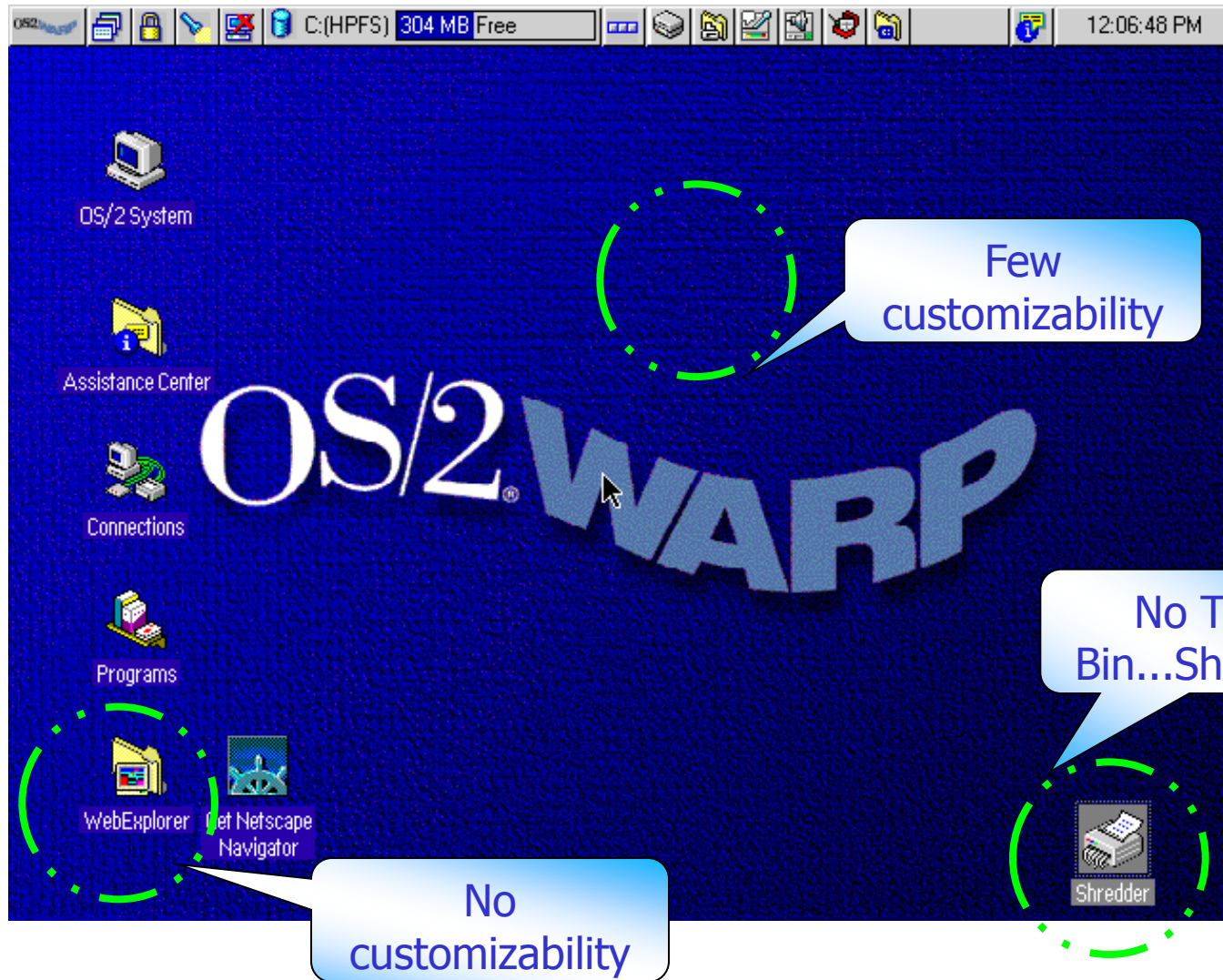


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# How to Design?

# The 'User Experience' – Some bad experiences



© <http://blog.daveburrows.com>

# How to Design?

# The 'User Experience' – Some bad experiences



## Windows 8.0

## Windows 8.1



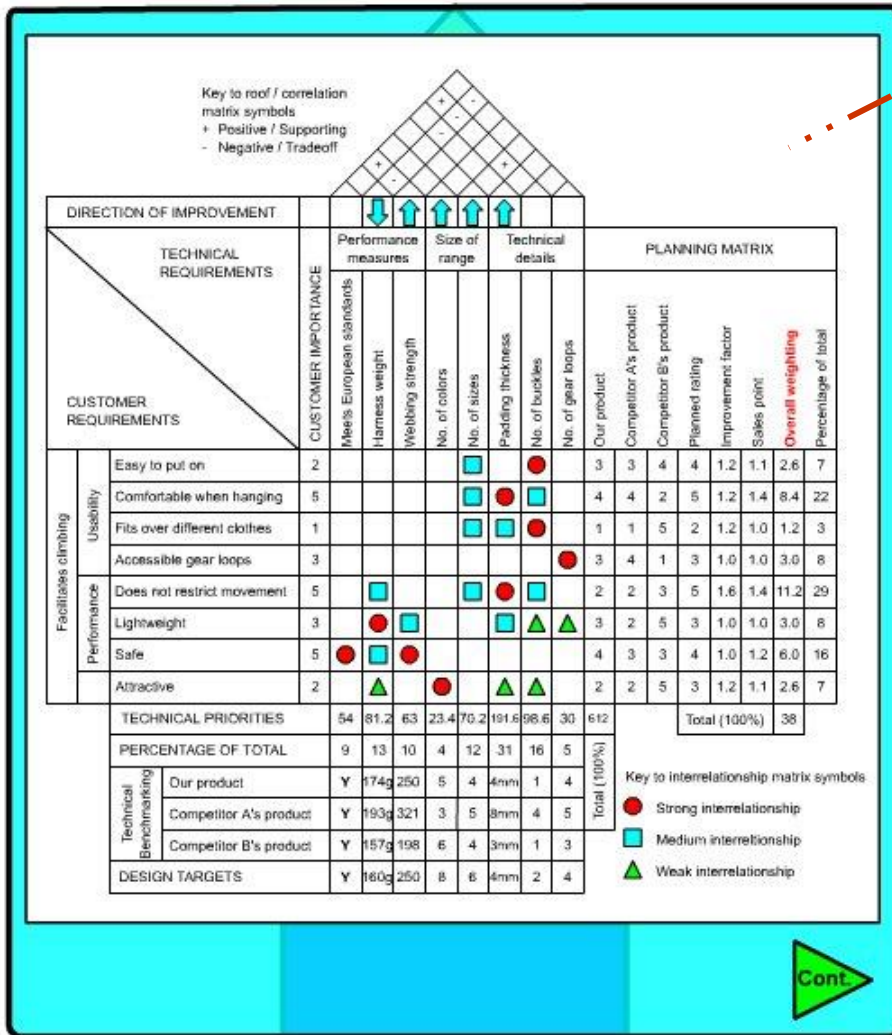
# Which main issues?

Manage **Requirements**, that's the issue!



## Quality Function Deployment (QFD)

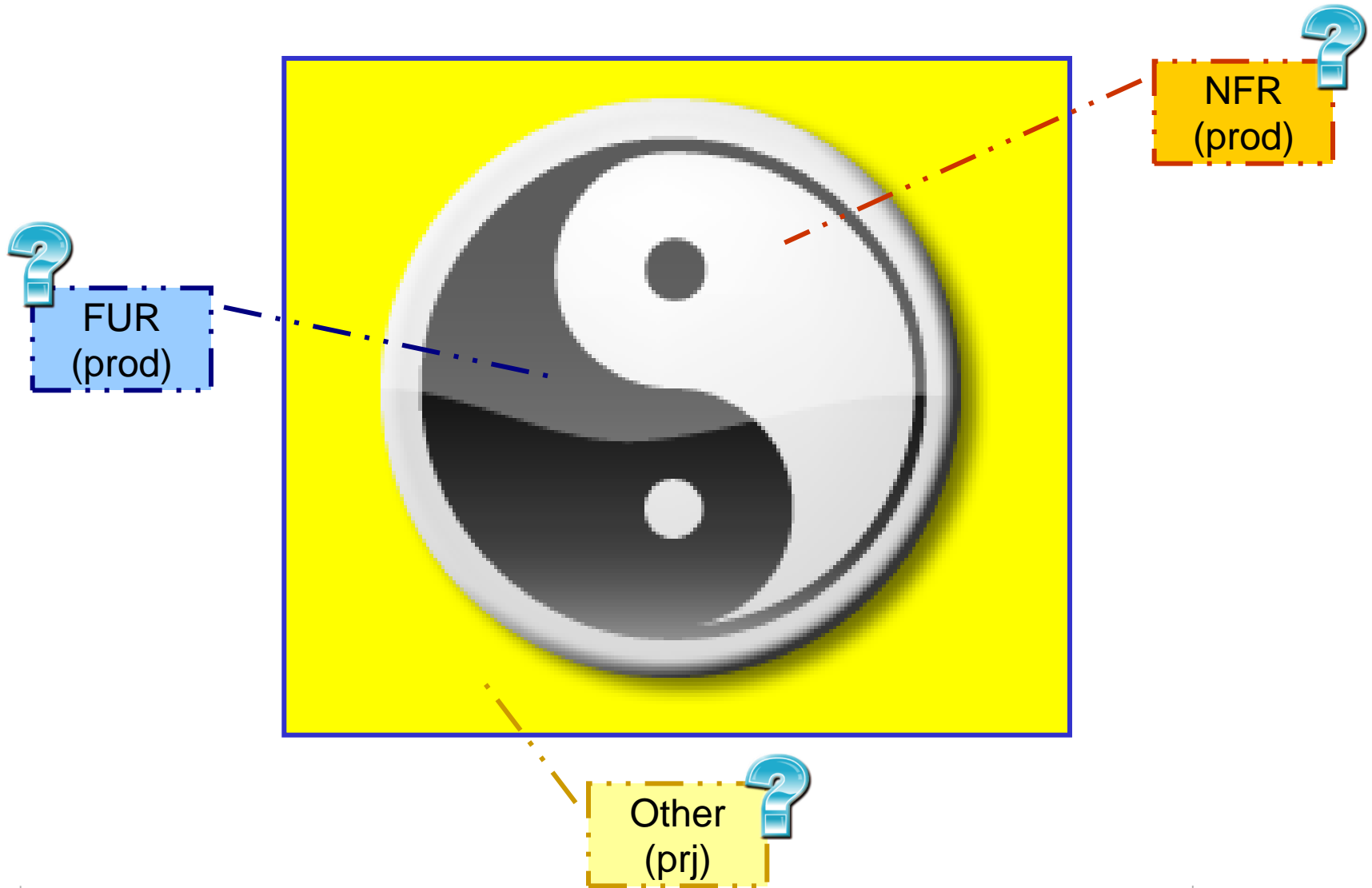
[URL: www.webducate.net/qfd/qfd.html](http://www.webducate.net/qfd/qfd.html)



- Technique proposed by Dr Yoji Akao in 1966
- Combine the 'Voice of Customer' (VoC) with Technical Requirements
- Help in prioritizing requirements
- Allow to do competitive benchmarks before producing a product/service
- Focus on the 'internal' knowledge of a provider, able to hear the other 'stakeholders'

# Which main issues?

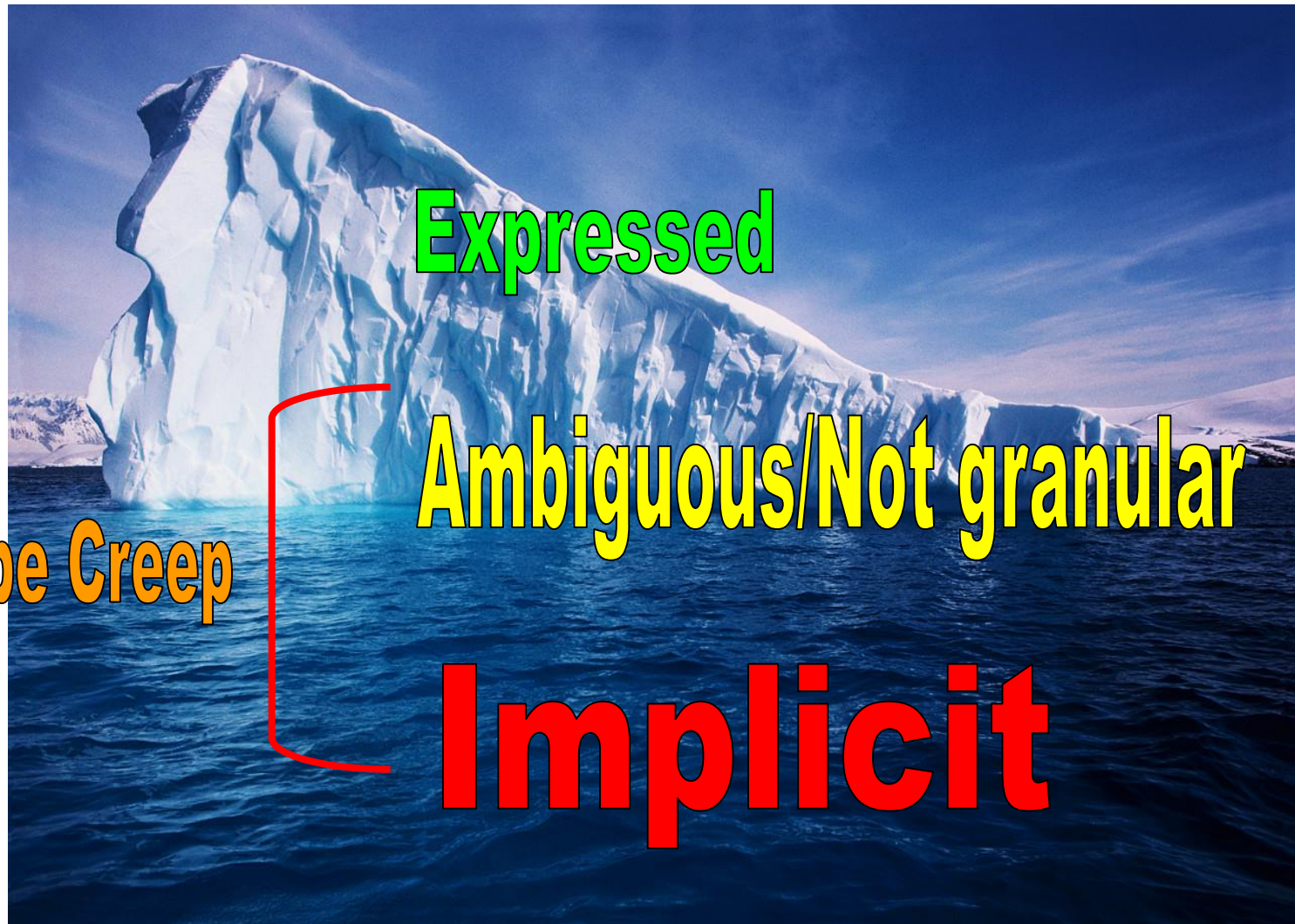
Manage **Requirements**, that's the issue!





Which main issues?

Which requirements?



Which main issues?

Requirements: FUR vs NFR

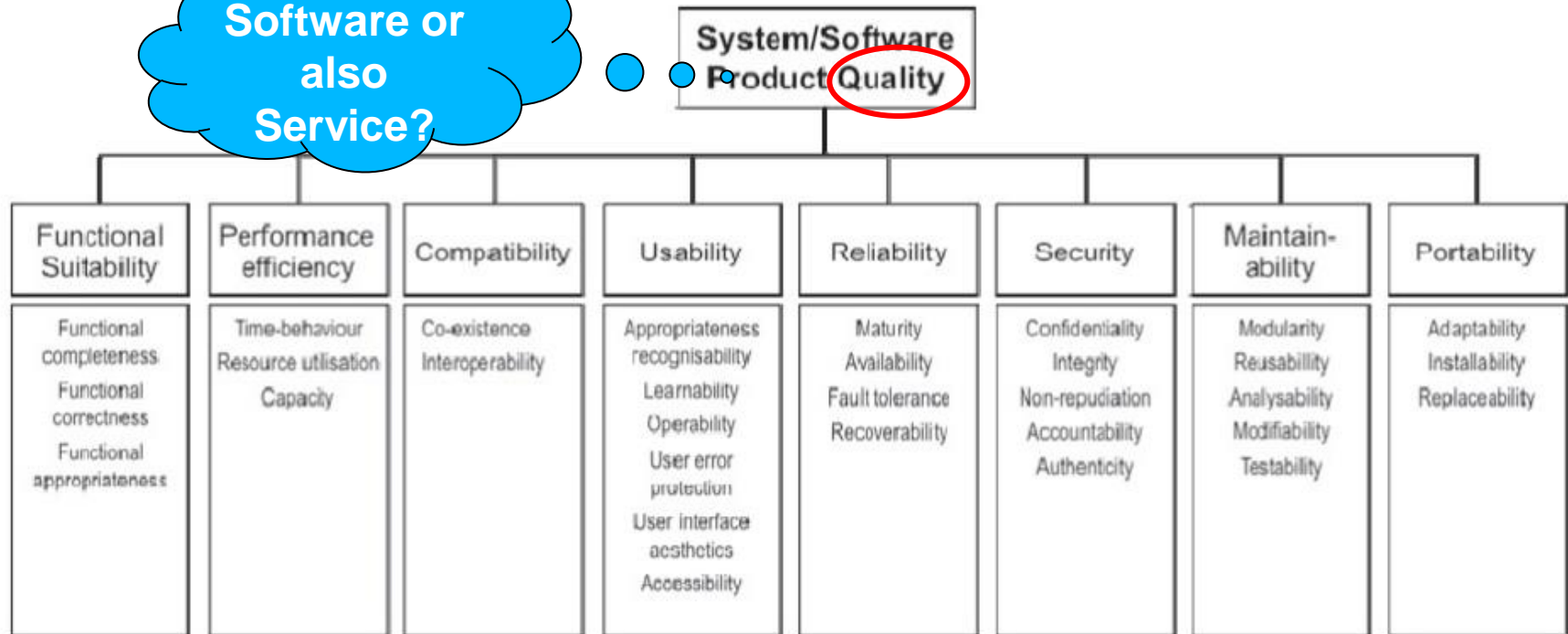


## Which main issues?

## What is a NFR? ISO/IEC 25010:2011



Software or  
also  
Service?



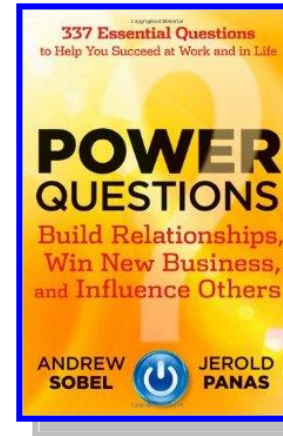
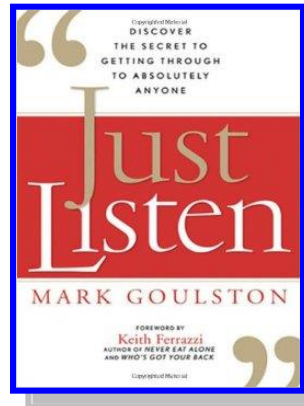
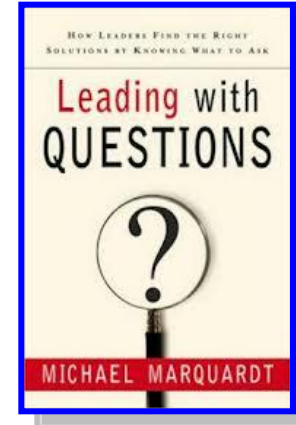
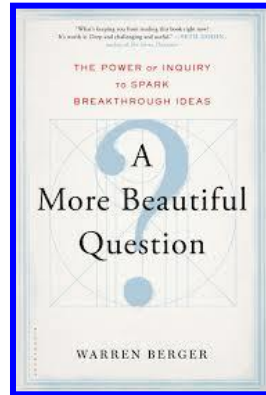
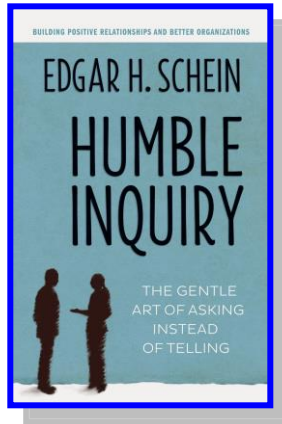
- Evolution of **ISO/IEC 9126-x** series, good starting point for depicting a correct scope
- Valid **also for services**, not only products – see how much do they fit!
- Good checklist for not losing/miss requirements from early stages when estimating





# Where to start?

Questions **FIRST**, answers **LATER!**







## Where to start?

## Questions **FIRST**: The '5W+2H' rule

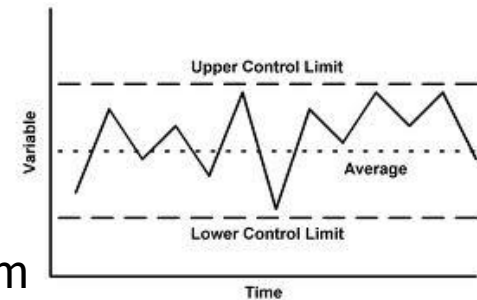
### • The original '5W+H' journalist rule

- ✓ Typically a good paper should contain:
  - ✓ Who, What, Why, When, Where, How
- ✓ Who: not well expressed now → **RACI matrix** for describing who should collect, prepare, and analyze data



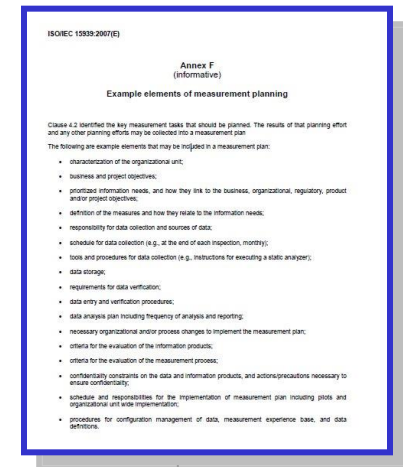
### • The 2° H – a possible addition

- ✓ '**How Much**' → threshold(s) value(s)
- ✓ As in Control Charts (TQM), possibly two (2) thresholds:
  - ✓ UCL (Upper Control Level)
  - ✓ LCL (Lower Control Level)
- ✓ Threshold(s) should be periodically (re)evaluated from MEB data



### • Utility and applicability

- ✓ Same suggestion for a good (whatever) plan: Project, Quality, Communication, Measurement, Improvement plan...
- ✓ In such way it could be possible to check easily with a structured manner what has/hasn't included in a plan





### • **Open-Ended Questions**

→ Explore possibilities, feelings, reasons why, freedom to answer, useful for problem-solving

- Why...?
- How...?
- What do you think about...?
- ...



• **Closed Questions** → Facts, quick, easy to answer, useful at the end of a conversation

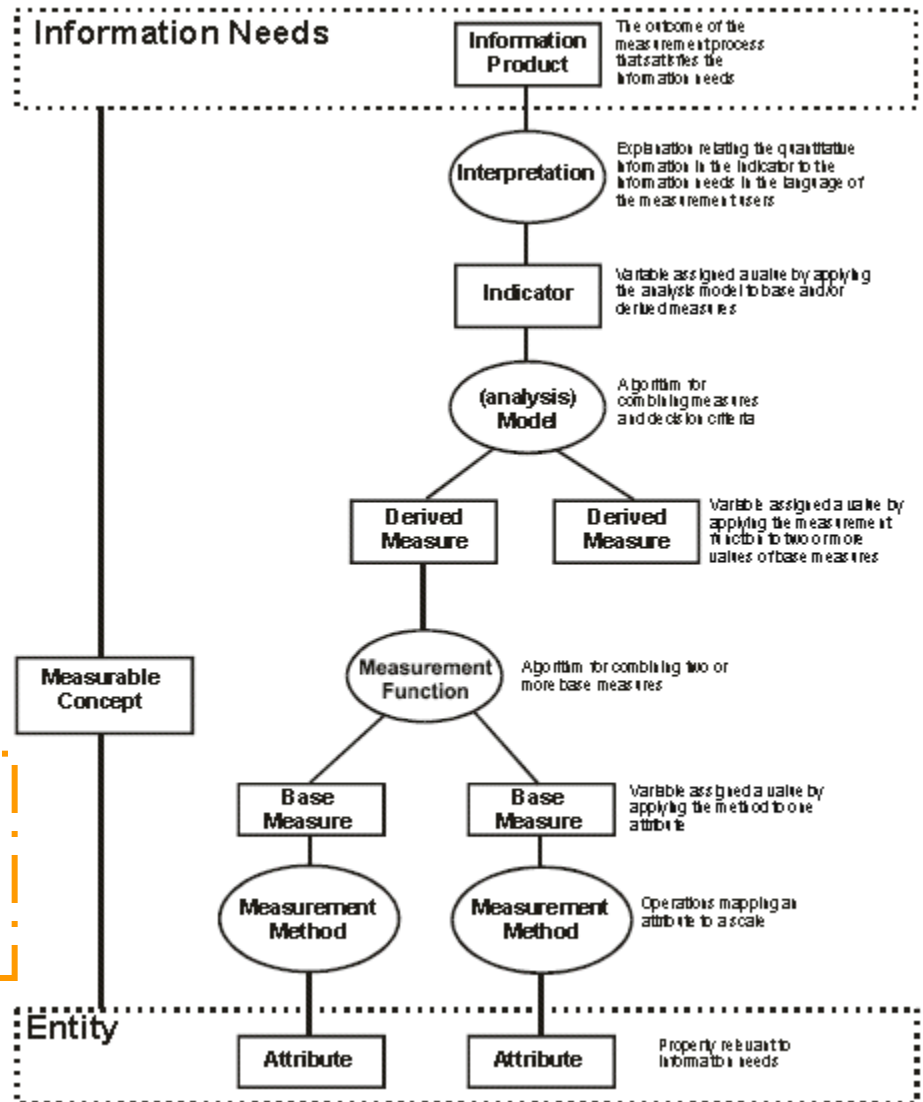
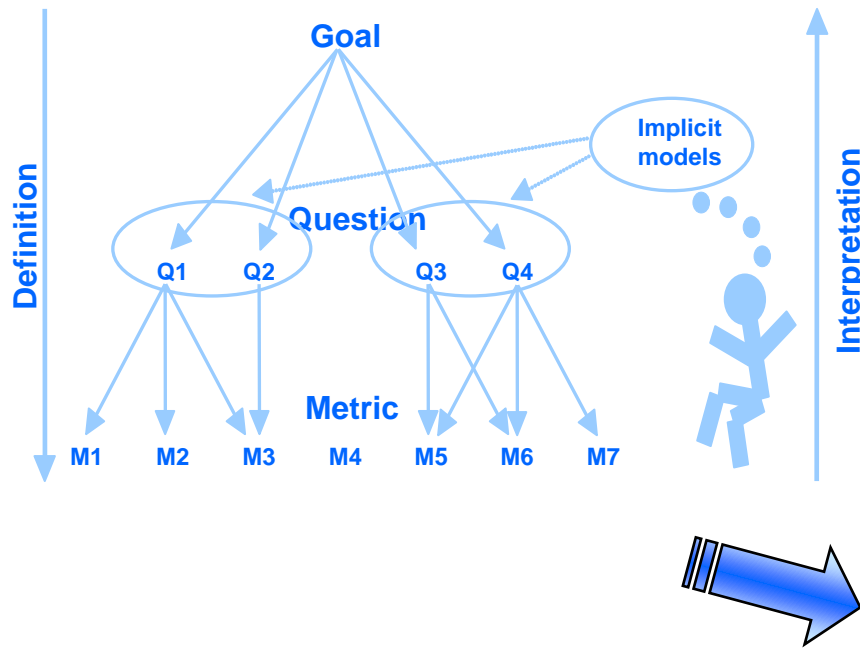
- What...?
- How Many...?
- Did you agree...?
- When...?
- Who...?
- ...



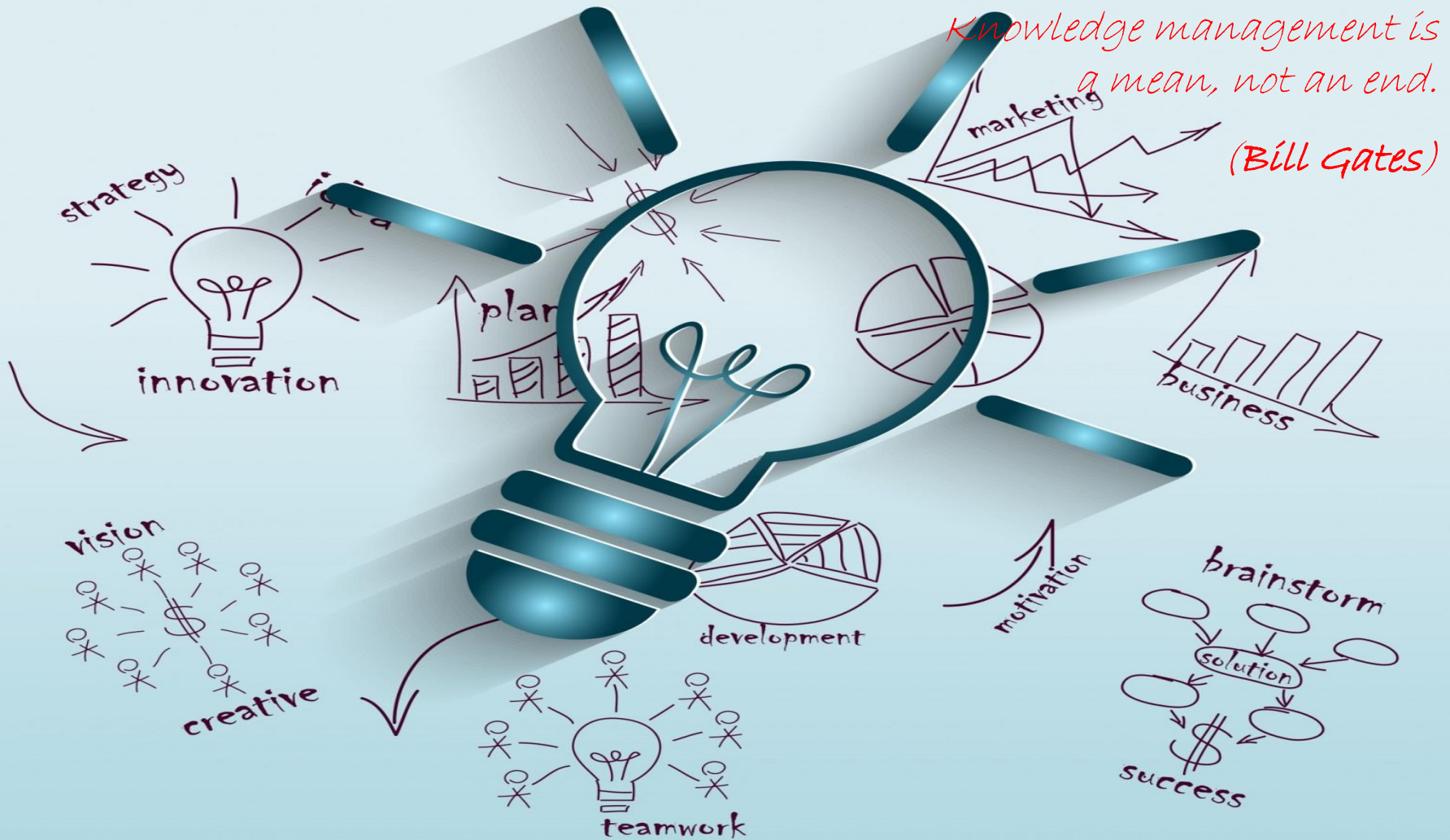


# Where to start?

Questions **FIRST**, answers **LATER!**



- **GQM** (Goal-Question-Metric) [V.Basili, 1984]
- **MIM** (Measurement Information Model) [ISO/IEC 15939:1999 (R2007)]

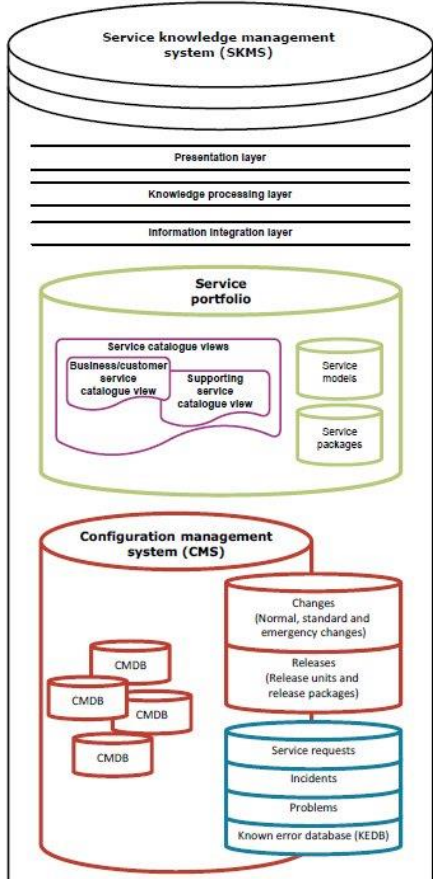


*Knowledge management is  
a mean, not an end.*

*(Bill Gates)*

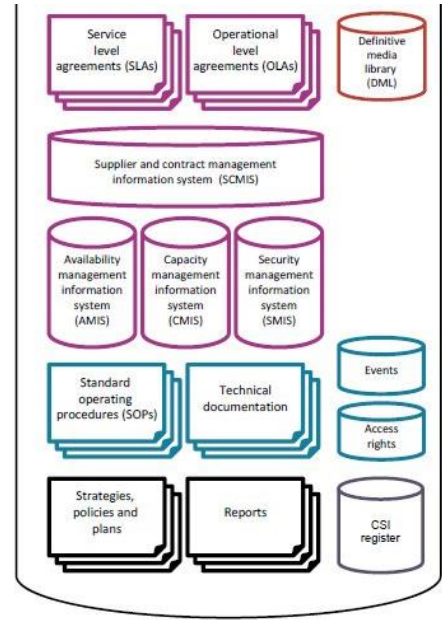
# Knowledge Management





## • SKMS – Service Knowledge Management System

- ✓ It's the logical summation of **ALL the data**, information, knowledge available in an organization
- ✓ Quantitative + Qualitative data (experience, lessons learned, ...)
- ✓ CMS but also a **Risk Register-Catalogue**
- ✓ ...



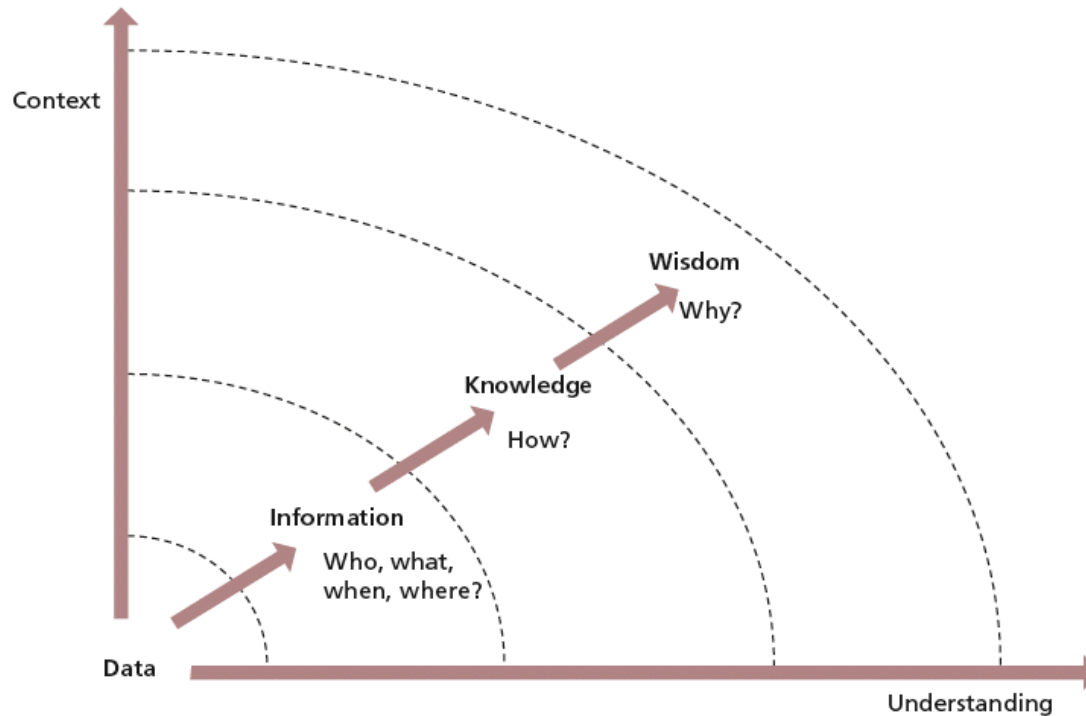
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• **DIKW – Data/Information/Knowledge/Wisdom**

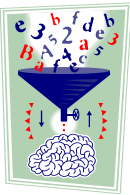
- ✓ Four KM waves
  - ✓ **Verifying (DIKW): Data → Information → Knowledge → Wisdom**
  - ✓ **Building (WKID): Wisdom → Knowledge → Information → Data**
- ✓ **'5W's+H' rule** (who, what, when, where, how, why)
- ✓ Two dimensions: **Context; Understanding**



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## Which main issues?

## An initial list with questions types



- Requirements → WHY, WHAT's (e.g. **EAM** analysis)
- Stakeholders → WHO
- Communication → HOW, HOW MUCH
- Measurement → HOW MUCH
- Reuse → WHAT, HOW
- Benchmarking → WHAT, HOW
- Scope Management → WHERE
- ...



*You have more potential  
than you believe to do.*

*(Anonymous)*

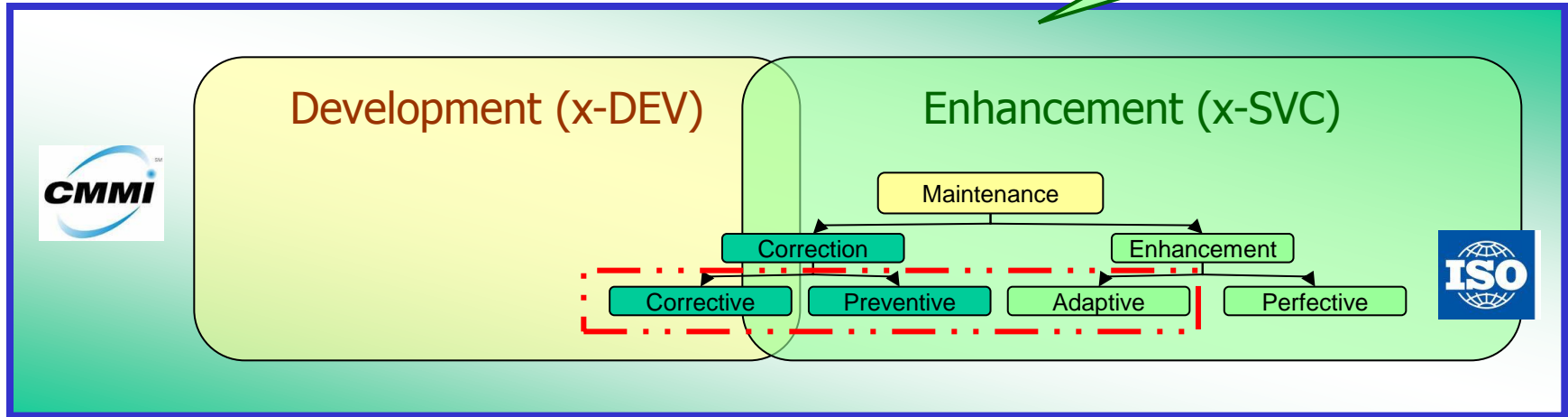


## Defining the right Scope

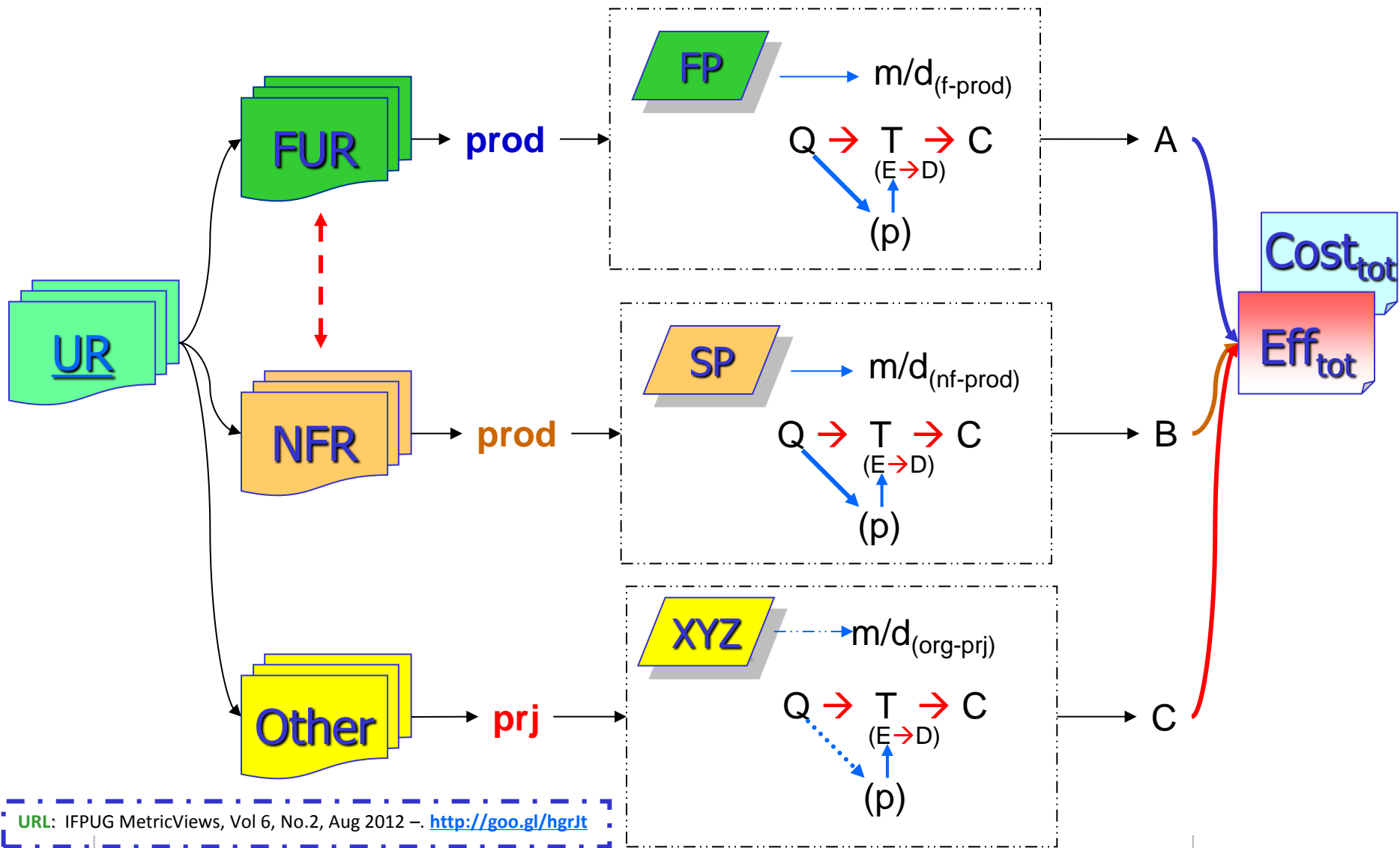




Project Scope



- **Service** → A **means** of delivering value to Customers by facilitating Outcomes Customers want to achieve without the ownership of specific Costs and Risks.
- **Project** → A **temporary organization**, with people and other assets, that is required to achieve an objective or other outcome. Each project has a lifecycle that typically includes initiation, planning, execution, and closure. Projects are usually managed using a formal methodology such as PProjects IN Controlled Environments (PRINCE2) or the Project Management Body of Knowledge (PMBOK).



URL: IFPUG MetricViews, Vol 6, No.2, Aug 2012 – <http://goo.gl/hgrJt>

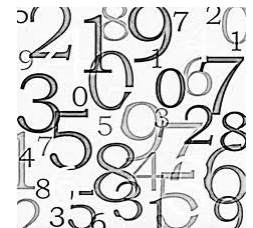


**A:** ... How to plan an activity if it's not clear the 'action space'?



**A:** ...in ICT – moreover than **certifications** on FSM – methods there are also **specific paths** (e.g. [NorthernSCOPE](#), [SouthernSCOPE](#), [ECQA Scope Mgr](#), ...), to stress how relevant the topic is

**A:** ...both PMI's PMBOK than FSM methods ask to define the *scope* as a **preliminary and needed action** to deploy any further activity... **What is in or out?**



Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
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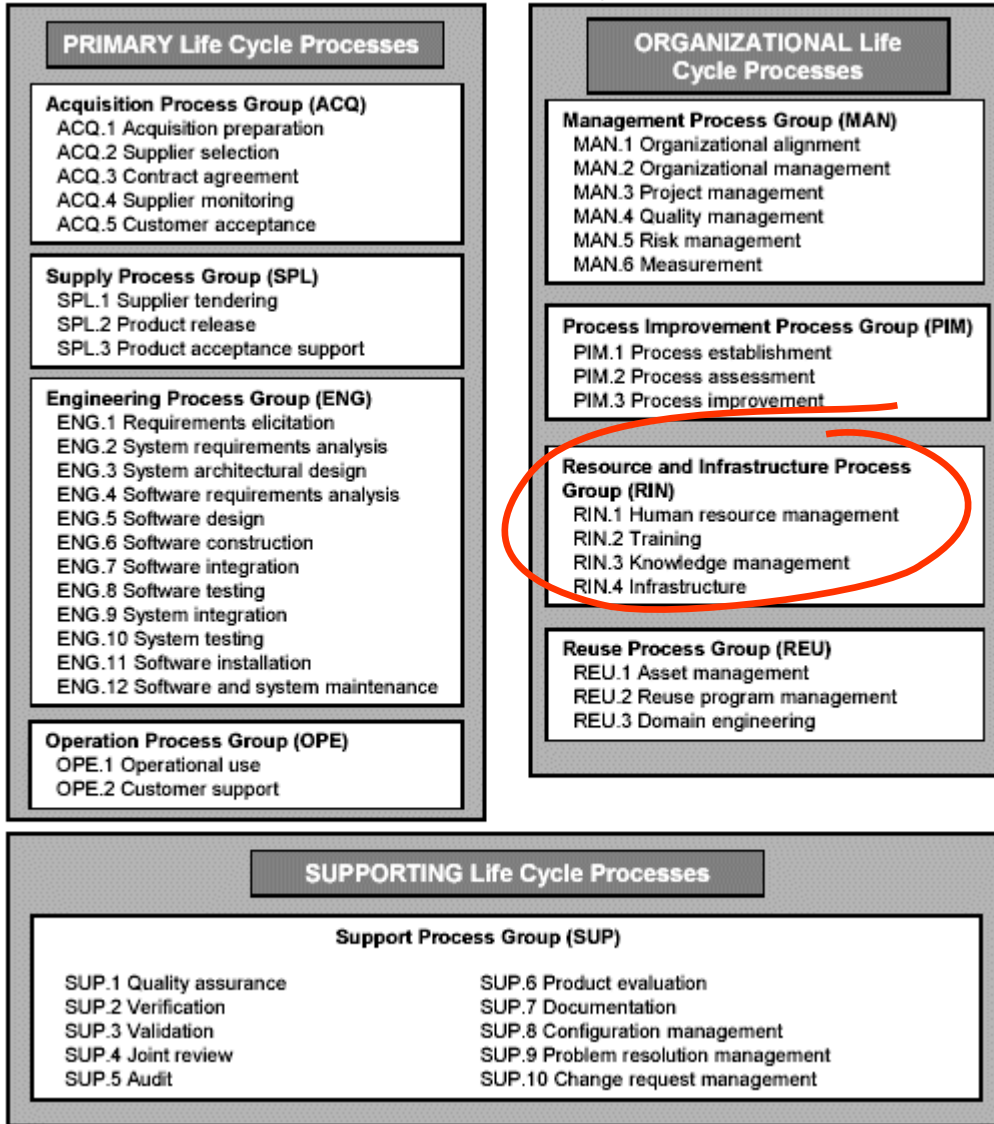
• Source: PMI's PMBOK 5 (2013)



*Not everything that counts can be  
counted, and not everything that  
can be counted counts.*

*(Albert Einstein)*

# Measuring Intangibles



Current **PRM** in **ISO/IEC 15504-5** contains **3 macro-groups, 9 process groups and 48 processes:**

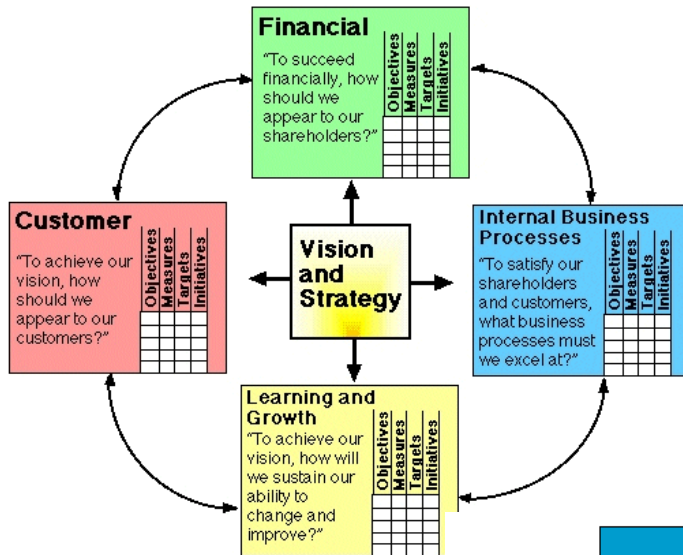
- **Primary**
  - **ACQ** – Acquisition
  - **SPL** – Supply
  - **ENG** – Engineering
  - **OPE** – Operation
- **Organizational**
  - **MAN** - Management
  - **PIM** – Process Improvement
  - **RIN** – Resource & Infrastructure
  - **REU** - Reuse
- **Supporting**
  - **SUP** - Support



Traditional	IC
Tangible	Intangible
Events	Processes
Vision on the Past	Vision on the Future
Cost	Value
Cash Flow	Non-financial measures
Periodical	On-going
Standard	Useful to Management



## BSC



## Navigator



## IAM

Market Value			
Tangible Assets	Intangible Assets		
	External Structure	Internal Structure	Competence
Growth			
Innovation			
Efficiency			
Stability			



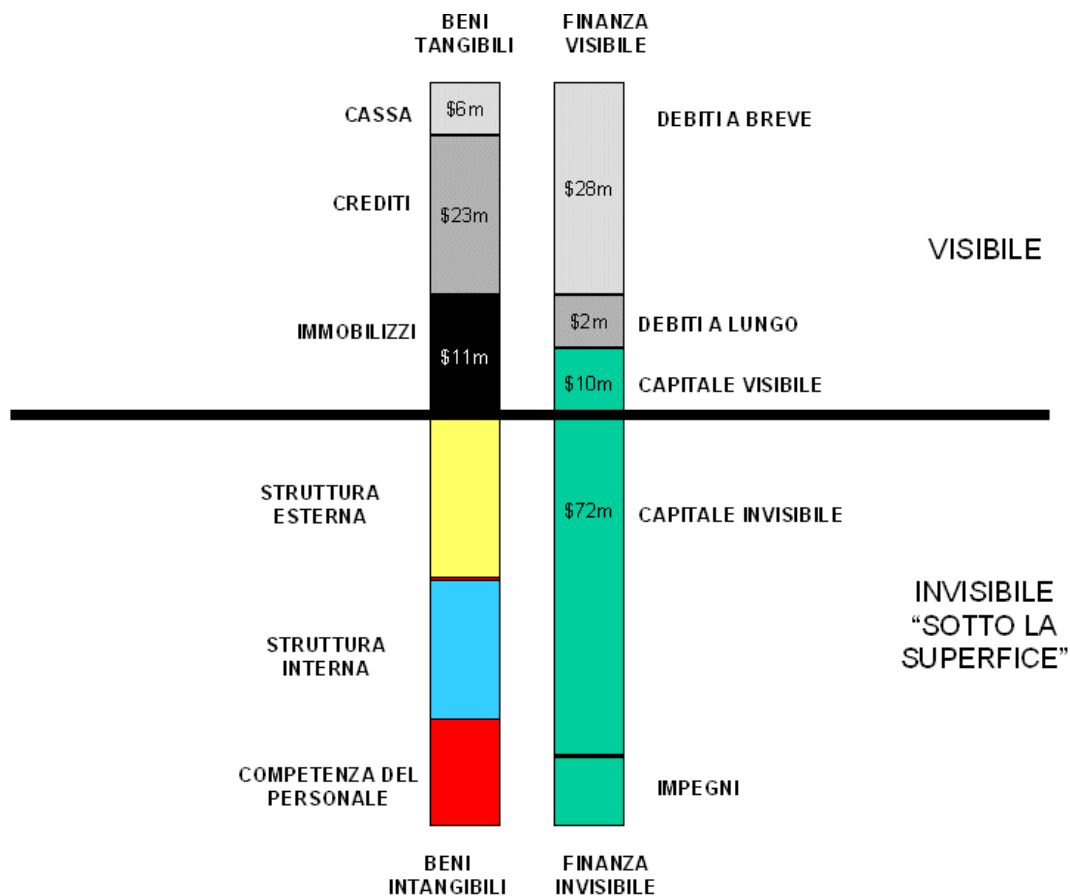


• **Cos'è:** metodo per il monitoraggio degli intangibili, pensato principalmente per le knowledge companies, valido anche quale strumento di comunicazione esterna del *valore* dell'azienda

• **Autore:** Karl Erik Sveiby (1998)

• **Oggetto di misurazione:** *organizzazione*

• **Origine:** analisi degli elementi che costituiscono l'*Invisible Balance*





Consiste nelle relazioni con clienti e fornitori, nei marchi e nella reputazione o "immagine".

È data dai brevetti, concetti, modelli, sistemi amministrativi e reti informatiche. Anche la "cultura" o lo "spirito" appartengono alla struttura interna.

È l'abilità delle persone ad agire in varie situazioni. Include le capacità, l'istruzione, l'esperienza, i valori e le abilità sociali.

	<b>Market Value</b>		
	<b>Tangible Assets</b>	<b>Intangible Assets</b>	
		<b>External Structure</b>	<b>Internal Structure</b>
			<b>Competence</b>
Growth			
Innovation			
Efficiency			
Stability			



## CELEMI IAM 2002

<b>Tangible assets</b> OUR FINANCIAL CAPITAL ( overall rating year )					<b>Intangible assets</b> OUR CLIENTS (External Structure) ( overall rating year )						
	2002	2001	2000		2002	2001	2000		2002	2001	2000
<b>GROWTH / RENEWAL</b>					<b>GROWTH / RENEWAL</b>						
Equity growth		49%	-5%	67%	Revenue growth		-10%	-5%	8%		
Net investment ratio	(15)	13%	9%	7%	Image enhancing clients	(5, 12)	68%	68%	41%		
<b>EFFICIENCY</b>					<b>EFFICIENCY</b>						
Profit margin	(19)	5%	-21%	2%	Revenues per client	(5, 24)	586	537	354		
Net return on equity	(16)	21%	-141%	8%							
<b>STABILITY</b>					<b>STABILITY</b>						
Solidity	(27)	44%	28%	32%	Client satisfaction index	(30)	5	5	5		
Liquid reserves no.days	(14)	64	54	19	Repeat orders	(21)	74%	64%	78%		
					Five largest clients	(5, 10)	34%	42%	39%		
<b>Intangible assets</b> OUR ORGANIZATION (Internal Structure) ( overall rating year )					<b>Intangible assets</b> OUR PEOPLE (Competence) ( overall rating year )						
	2002	2001	2000		2002	2001	2000		2002	2001	2000
<b>GROWTH / RENEWAL</b>					<b>GROWTH / RENEWAL</b>						
Organization enhancing clients	(5, 18)	16%	13%	8%	Average professional experience (years)	(3, 9)	13,7	11,8	10,1		
Revenues from new products	(22)	17%	16%	26%	Competence enhancing clients	(4, 5)	25%	41%	44%		
R&D / revenues		10%	9%	9%	Growth in professional competence	(11)	-3%	-25%	18%		
Intangible investment % value added	(13, 28)	29%	40%	9%	Experts with tertiary degree	(6, 8, 9)	89%	84%	75%		
<b>EFFICIENCY</b>					<b>EFFICIENCY</b>						
Proportion of admin staff	(2, 20)	13%	11%	12%	Value added per experts (tsek)	(9, 17, 28)	1.224	629	813		
Revenues per admin staff (tsek)	(2, 17, 23)	16.006	14.803	12.694	Value added margin on sales (tsek)	(28)	52%	33%	48%		
<b>STABILITY</b>					<b>STABILITY</b>						
Admin staff turnover	(1, 2)	14%	63%	17%	People satisfaction index	(29)	69%	45%	48%		
Admin staff seniority (years)	(2, 26)	6	4,8	4,2	Expert turnover	(7, 9)	20%	38%	16%		
Rookie ratio	(17, 25, 26)	8%	21%	41%	Expert seniority (years)	(9, 26)	6,9	5,5	4		
					Median age all employees (years)	(1, 7)	41	39	39		

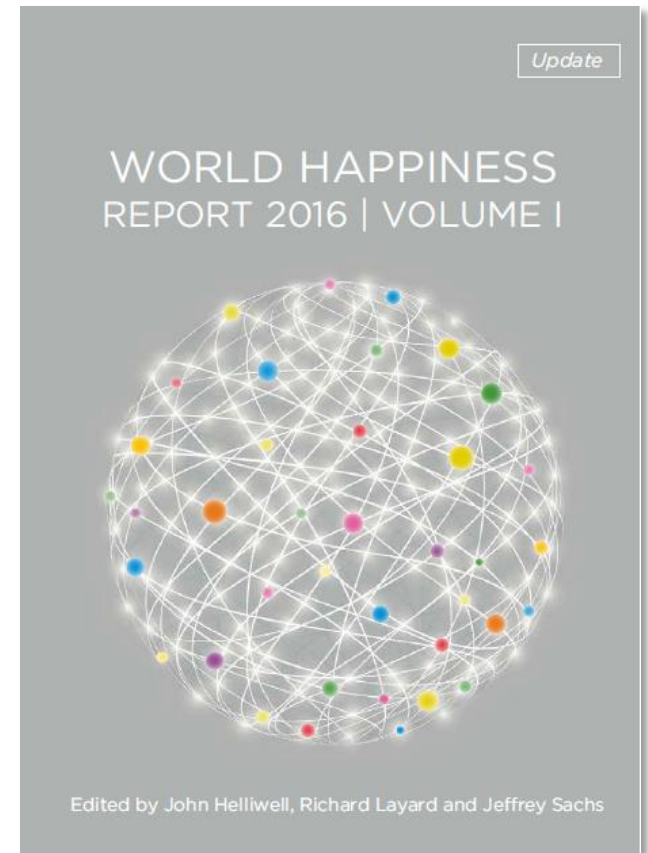


## WORLD HAPPINESS REPORT




## OVERVIEW

The *World Happiness Report* is a landmark survey of the state of global happiness. The first report was published in 2012, the second in 2013, and the third in 2015. The World Happiness Report 2016 Update, which ranks 156 countries by their happiness levels, was released today in Rome in advance of UN World Happiness Day, March 20th. Leading experts across fields – economics, psychology, survey analysis, national statistics, health, public policy and more – describe how measurements of well-being can be used



Which are the most relevant **drivers** for **measuring** happiness?





*It's always the **small pieces**  
that makes the **big picture**  
(Anonymous)*

Some conclusions & next steps for learning (**more**)...



## • People

- ✓ Even if in ICT, People is the real wheel for innovation
- ✓ “Nothing is lost, nothing is created, everything is transformed” ([Antoine Lavoisier](#))
- ✓ ...but you need ideas and somebody modeling knowledge into experience by **creativity**

## • Anything is measurable!

- ✓ Applying the **EAM analysis**, you can drill-down an entity of interest by attributes
- ✓ One measure at a time, one informative value
- ✓ **Quantitative+Qualitative**: two sides of the same coin

## • Starting point? Knowledge!

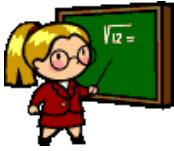
- ✓ The basic is to know, but then you need to know how apply your knowledge to the context
- ✓ Any kind of training, and (don't stop) **READING**: we can access anything on the web...
- ✓ Be **CURIOUS**, trying to find **VALUE** from what you're experiencing looking for contact points with you and your next project and **SHARE** it with your peers

## • Next Steps

- ✓ Start doing things **TODAY**, don't wait...include continual **SELF-TRAINING** in your project plan. You can also know the WHAT but not the HOW
- ✓ **...try & see!**



“Creativity is allowing yourself to make mistakes.  
Art is knowing which ones to keep.” (**Scott Adams**)



*"I have... seen things you people wouldn't believe... Attack ships on fire off the shoulder of Orion. I watched c-beams glitter in the dark near the Tannhäuser Gate. All those... moments... will be lost in time, like [small cough] tears... in... rain. Time... to die..."*

Memory → Data → Experience ... DIKW

Philip Dick, *Do Androids dream of Electric Sheep?*, Del Rey, 1968, [ISBN 0-345-40447-5](https://www.delreypublishing.com/books/9780345404475)



**Grazie per la vostra attenzione!**  
**Thanks for your attention!**





**Luigi  
Buglione**  
**GUFPI-ISMA**

luigi.buglione@gufpi-isma.org  
[https://twitter.com/lbu\\_measure](https://twitter.com/lbu_measure)

