QUANTeer

‘Kvantør’ =. Norwegian for Quanteer.

How to quantify values.

https://LeanPub.com/Quanteer

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Current Version see Date in File Heading for accurate current version

mid 19th century: from Latin ***quantus*** ‘how great, how much’

-eer | ˈɪə |
suffix
1 (forming nouns) denoting a person concerned with or engaged in an activity: *auctioneer* | *puppeteer*.
2 (forming verbs) denoting concern or involvement with an activity: *electioneer* | *profiteer*.
ORIGIN
from French ***-ier***, from Latin ***-arius***; verbs are often back-formations (e.g. *electioneer* from *electioneering*).

Key concepts in Value Quantification

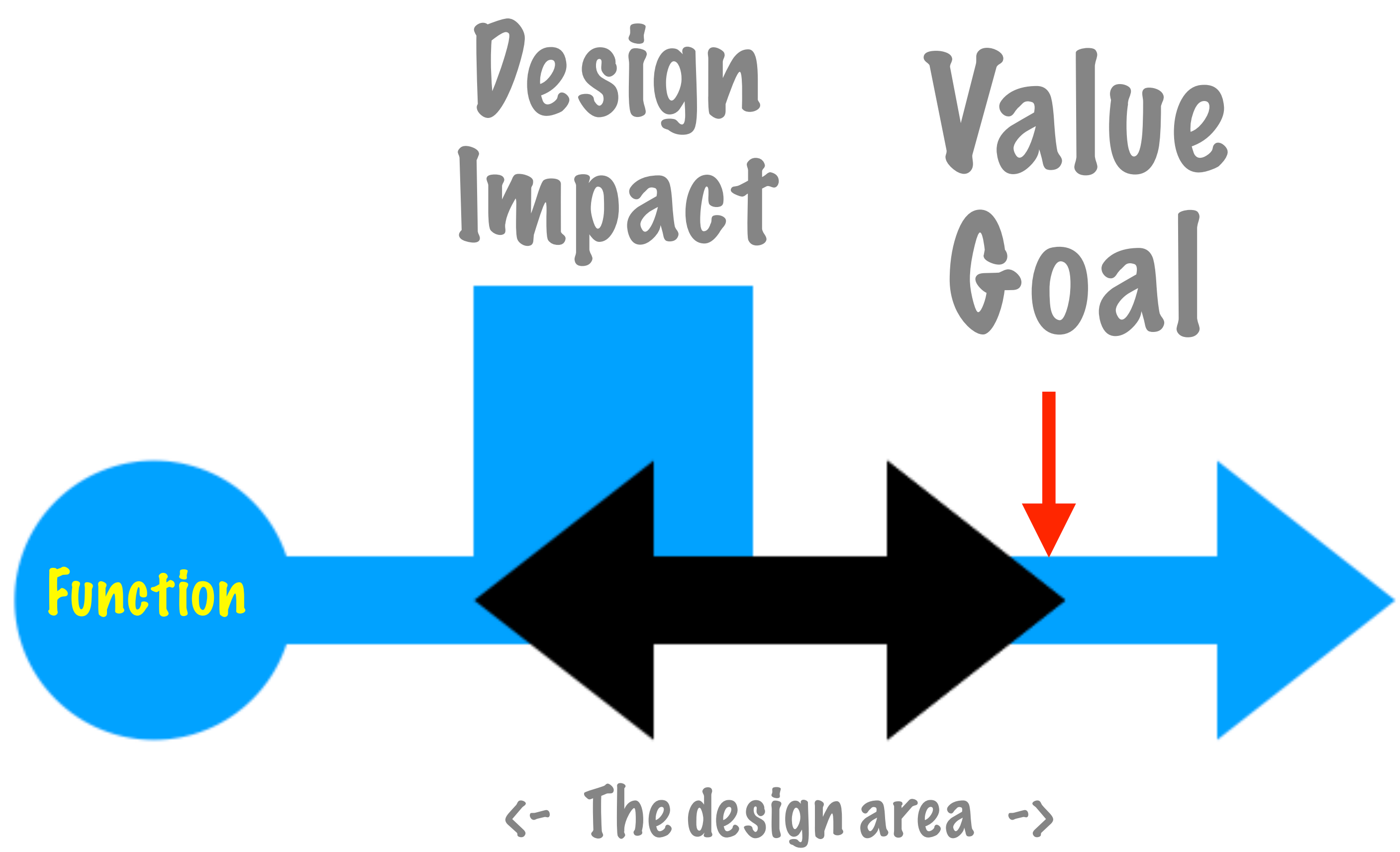


Figure: Cover. ***Key Quantification concepts***
A Scale (blue arrow)
A Stakeholder Value Goal Level (on the Scale)
A Design or Strategy (Blue Rectangle), which moves us half-way towards our goal
The Design Gap, between a Benchmark Level (left of black arrow tip),
and the Goal level (right of black arrow tip)..
The 50% gap between the impact level and the Goal (right half of black arrow), is a lack of sufficient design.
The Stakeholder value is always an attribute of some function (what system does)

Outline

Quanteer: how to quantify values.

0.0 The One Page Quanteer Book.

0.1 **Why is quantification useful ?**
0.2 What are the barriers to quantification?
0.3 what are the limitations of quantification?
0.3 What are the applications of value quantification
0.4 Principles of Quanteering

1. **Defining a Scale of Measure ….. Stakeholder influence, Set of Scales, [Scale Qualifiers]**

2. **Deriving numbers on the scale of measure. Goals etc.**

3. **Estimating Future Levels of Value Quantities (Impact Estimation Table)**

4. Rounding Off, Principles, Advice, Do Now, Warnings

References

There is a dynamic table of contents in pdf, epub and Pages versions.

0.0 The One-Page QUANTeer Book

How to Quantify a Value: Outline

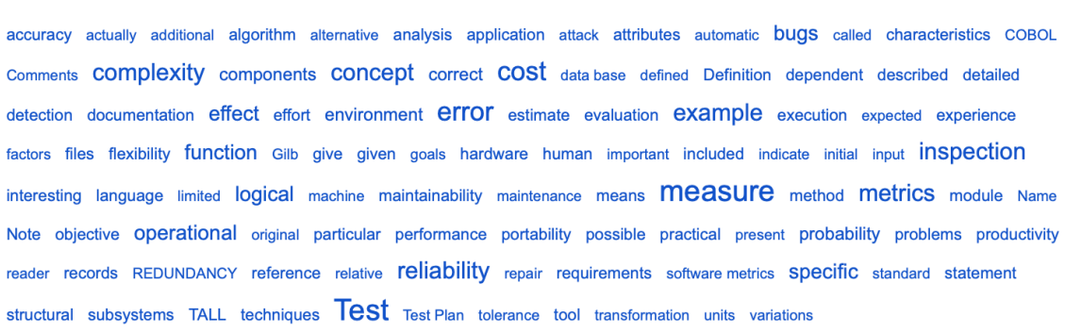


Figure 0.0 A. Word-cloud from Software Metrics 1976 [G18]

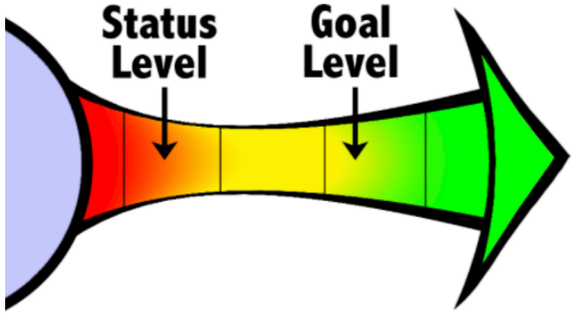


Figure 0.0 B
Defining a Benchmark (Status) and A Target (Goal) On a Scale (the arrow)

1. Define a Scale of Measure

1.1 Use domain knowledge, common sense, tradition

1.2 Derive Scale from Ambition Level

1.3 Lookup 'Value' Name' METRICS

1.4 Decompose into Sub-Values

1.5 Insert [Scale Qualifiers]

2. Define Points on Your Scale

2.1. Define Targets

2.2 Define Constraints

2.3 Define Benchmarks

2.4 Define Time Horizons, Deadlines

3. Test the Scale, QC, Review,

4. Get Agreement and Responsibility

5. Define Meters

6. Add Background

7. Exercise with Strategy estimations (IET)

8. Exercise with Evo Value Delivery steps

9. Present value delivery requirement results, in relation to targets and constraints, and timing.

0.0 The One-Page QUANTeer Book

How to Quantify a Value: Examples

1. Define a Scale of Measure.

Scale: % of hackers who penetrate your files.

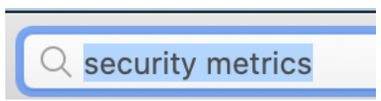
1.1 Use domain knowledge, common sense, tradition

"We are a council organization"

1.2 Derive Scale from Ambition Level.

Ambition: reduce security breaches.

1.3 Lookup 'Value' Name' METRICS



1.4 Decompose into Sub-Values

File Security, Program Security, IT Security, Physical Security, Employee Security.

1.5 Insert [Scale Qualifiers]

Scale: % of [**Intruders**] who [**Action**] on [**Security Objects**] with [**Damage**].

2. Define Points on Your Scale

2.1. Define Targets

Goal [Next Year] <0.1% Intruders = Hackers, Action = Penetrate, Security Objects = Databases, Damage = {Ransom, Locked Out}.

2.2 Define Constraints

Tolerable 1%

2.3 Define Benchmarks

Past 5%

2.4 Define Time Horizons, Deadlines

3. Test the Scale, QC, Review,

4. Get Agreement and Responsibility

Approved By Council Unanimous Vote 2020

Figure 0.0 C 2005 Handbook for 'Quanteering' [B1]

5. Define Meters

Meter: Automated Security Measures

6. Add Background

Issue: Low, quarantined, security staff levels.

7. Exercise with Strategy estimations (IET).....

8. Exercise with Evo Value Delivery steps.

9. Present value-delivery requirement-results, in relation to targets and constraints, and timing

0.0 The One-Page QUANTeer Book

How to Quantify a Value: *More* Text

1. **Define a Scale of Measure.** Define an unambiguous scale-of-measure, that reflects our values well, and which we can use to communicate about the values, and specify, measure, and estimate value levels; and manage projects with.

1.1 Use domain knowledge, common sense, tradition. Know your environment, know your many stakeholders, and *their* values and constraints.

1.2 Derive Scale from Ambition Level. The 'Ambition Level' is the political headline. It is rarely quantified, unambiguous, or structured well enough. But it may be official and legal. You must reflect it, and respect it, while you refine it, to a useful operational scale.

1.3 Lookup 'Value' Name' METRICS. The web has millions of practical examples of how to specify a scale or measure for your immediate area. There is no such thing as 'it cannot be quantified' Learn from people who quanteer for a living. No need to reinvent a wheel. You can tailor their template to *your* exact needs.

1.4 Decompose into Sub-Values: the value concept might well be a very disparate set of values, which need very different Scales, compared to the *other* values in your value set. List the sub-values. Do not try to quantify them at the 'umbrella name' level [B1, Ch. 5 many examples].

1.5 Insert [Scale Qualifiers]: Scale Qualifiers are terms in the Scale which are generalities (patterns), but are defined as a 'set of conditions'. [Intruder] = {Terrorist, Hobby Hacker, Ransom Hacker, Insider Hacker, Accidental Hacker, Revenge Hacker, Military Cyber Hacker}. Useful for modeling a complex world, and for defining subsets of it, for prioritization and special case treatment.

2. Define Points on Your Scale

2.1. Define Targets: 'Targets' are value levels we wish to attain in the future. Wish, Goal, Stretch, Ideal [B1]. **Wish** is stakeholder desire, but maybe impractical, uneconomic, or down-prioritized. **Goal** is a commitment. Practical, economic, prioritized.

2.2 Define 'Constraints': a **Tolerable** level is a worst-acceptable level, just before the system becomes 'intolerable. It is a scalar 'constraint' level.

2.3 Define Benchmarks: 'Past' is a static historic level somewhere, for comparison. Status is an updated running incremental level: how good is this value now? Benchmarks are *background*, not core requirements.

2.4 Define Time Horizons, Deadlines: all points (levels) on a scale should have a **time** associated with it. Otherwise it is meaningless. The Targets and Constraint times-dates are 'deadlines' for that spec only. Not the whole project. This gives considerable opportunity, flexibility, and prioritization ability.

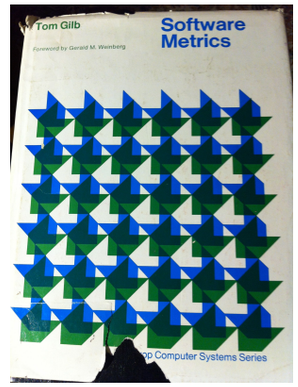


Fig. 0.0 D. 1977 USA [G18]

3. Test the Scale, QC, Review. Your initial draft scale might well need some improvements and editing, like adding new Scale Qualifiers, making sure you can really use a number with it ('start with %' is a good initial draft).

4. Get Agreement and Responsibility. At some point, before you seriously use the Scale and Goal, for architecture or strategic planning, you need some level-of-approval or sanction, from some authority. Otherwise it is not official, and you risk wasting time using it.

5. Define Meters: Define or roughly sketch ("manual counting") a way to measure where your new system changes *are*, on the scale. It does not have to be perfect, but it should give you useful practical feedback, quickly, cheaply - if possible.

6. Add Background: here are some examples of 'background' specifications. Stakeholders, Issues, Dependencies, Assumptions, Spec Owner, Implementation Responsible, Type (Objective). Level (Organization, Project), Status (draft, approved), Design Suggestions.

7. Exercise with 'Strategy estimations' (IET): One good way of testing your strategy specification is to *use it* with an Impact Estimation Table [B1, B2] to *estimate* the *value expected* from various strategies. If estimates are satisfactory, your strategy might be OK for practical use.

8. Exercise with 'Evo Value Delivery steps': the 'acid test' is doing 'incremental value delivery' (Agile) measuring step-by-step. You should have a feeling that, 'we are making real progress', that value improvement is obvious to users and observers, and the incremental measures confirm that feeling, in an objective, presentable way.

9. Present 'value-delivery requirement-results', in relation to targets and constraints, and timing. When constraint levels (Tolerable level) are reached, and Goal levels are reached later, it is time to present the planned achievement to some stakeholders. Hopefully they buy in to the numbers and accomplishment, and their scale definitions, as a reality which interests them, and confirm that they got what they wished for. If they did not get what they thought they told you they needed, maybe you did not analyze their value ideas well enough, and did not develop well-aligned Scales and Targets. Be humble, try again.

0.0 Introduction for Quanteers - 1 Page

The art of 'value quantification' = *Quanteering*

This book is written for people who would *like to clarify* the *most important things* for any project, process or plan: the '**Value Objectives'**. The **stakeholder** values are the *whole point*! Yet, it is common practice to *totally fail* to quantify the critical values for the effort [B12, B13, B9, V13] even for High Profile Universities [S9], the UN [B9] and UK and Norwegian National Health Services [B13, B12].

The main point is not simply 'quantification', it is **clarity of purpose**. Quantification is a major tool, but 'structuring' (like [Scale Qualifiers]) is a tool too. Critical stakeholder objectives must not be misunderstood by *any* stakeholder. Objectives must be *unambiguously clear to all who need to understand them*. Even a slight misunderstanding, can lead to partial or total project failure; and to cost overruns - that are 1000x worse than the cost of doing a proper job in the first place, on the objectives.

The cost of a well-crafted quantified objective is something like a day's work. The cost of getting one objective, of the top ten, wrong - can be €10,000,000 to €10 Billion, on a *small* country's government project, like a Health Service [PL1] or Police system [B13, 3.2.6].

Yet *most all* value objectives, from *all* sources, with *few* exceptions, are as bad as the ones I have analyzed in detail, in the books and slides above. And *these* are from high-profile, reputable institutions, trying to save the world [PL2], or human lives (Health, UN, Police).

The non-government (private sector) objectives, according to my international, many decades of experience, are no better [PL4]. Planners learn planning from the same poor sources [G15, S8.3]. The simple rate of *ambiguous words per page* is at least 100/page, and up to several hundred/page. I have measured this for decades [S8.1, S8.2, G16]. It is such a predictably consistent pollution of our planning specifications, that I usually predict the result (at least 100 defects/300 words) 'blind', i.e. *before* I even know or see, the actual plan to be measured, using the Spec QC [G16, B1] method. We know we can reduce this 100x [R.Intel].

Last night (120820)I was listening to a man in London explaining the merits of the SAFe Enterprise Agile method. He had years of experience at a Telecom, and could refer to a good collection of method case studies [https://www.scaledagile.com/customer-stories/]. The central idea is delivering value, but the real, dominant, so-called 'value' is in fact 'how fast the IT code is pumped out' (A Scrum virtue).

But, outputting the wrong values fast is not 'value'. It is **rapid pollution.**

I asked him (the video is at BCS SPA, where my videos reside, [V1]) 'did they quantify stakeholder values, and report when they were delivered'? He sort of waved at the case studies, but did not give himself, or others, as specific examples. Then he pointed to a big map of the method, to 'design thinking'. He said *"that is where this value stuff is done (no examples yet) and they output some stuff for SAFe to build (strategies, architecture) and I lead the building of it (using SAFe). I have to have trust or confidence that what they ask me to build. I assume that gives them the value they want".*

OK, so he has no knowledge, direct or indirect, of stakeholder values. It is all about speed of building an IT system, Scrum Enterprise. Keep in mind there is a well-documented IT project failure rate (https://vitalitychicago.com/blog/agile-projects-are-more-successful-traditional-projects/), and a big cause is *bad requirements* (https://www.whizlabs.com/blog/top-10-reasons-for-project-failure/). Almost all failure causes, are at least *related* to unclear planning.

The SAFe lecturer mentioned something about the *'values being difficult to quantify'*. This book is for him. I will send a copy. I have already sent him stuff. But then I got a second question in, I asked,' if we took **Security** as a *specific valu*e example. Would you, in SAFe, deal with it? Can you quantify 'how *much* security is needed', and *measure* that the SAFe process, in fact, delivers it' ? At that point, he simply said that, he "*had no idea of how to quantify 'security*" [B1, P9, P10].

People who cannot articulate critical stakeholder values, clearly and quantitatively, should not spend so much energy saying the **buzzword 'value'.**

We all know, you cannot manage, what you cannot quantify.

Are *you* so ill-trained that you actually 'buy into' the *talk* about 'customer value', and you believe it, without one single credible value *example*?

What about managing '25 simultaneous values'? [P2] *Successfully,* and well documented? That is what I know that this book will give you the tools to do.

Everything I am going to say in this book, I have written, and spoken about many times before. But it is embedded in texts which are focussed on something else. So I felt it was time to write a book where I focussed intently on this one simple thing. ***Quantification of Values.*** So next time I hear "It is too difficult to quantify' (so, implied, 'we use b**s**t instead') I will give them this text and say, 'Can you read and learn?' Are you motivated to do stakeholder values, seriously?

I think every adult professional should be equipped with this **very basic skill**, to quantify their critical values, throughout a lifetime of planning, to make their organization, products, services and world-saving advances, much better. We demand 'literacy'. Now, demand '**Digit** Literacy'!

It is a 'lack of literacy' when you cannot intelligently plan and discuss *security*, *hunger*, *privacy, usability, poverty, flexibility and other non-financial values,* as well as you can discuss the famous 'bottom line' (which is actually less important than *life and death, and security*).

0.0 Introduction for Quanteers*: 3 ideas

Even simpler. Even shorter.

1. **QUANTIFY: You must, no option, no excuses, learn or leave, *quantify all critical stakeholder values*.**

2. ***DESIGN TO GOALS*: Your strategies must be picked to *probably* meet your value Goals, at minimum costs**

3. **VALUE PROOF You will need to *prove* that your strategies *really* deliver the *values and costs* expected; in *small increments* - or *change them so they do*.**

Figure 0.0 E https://blog.kiddom.co/how-might-schools-quantify-personalized-learning/

*. Quanteers =
People or organizations who quantify and clarify critical variables, like objectives, and strategy attributes.

STRATEGY
?
Will it deliver the value level?

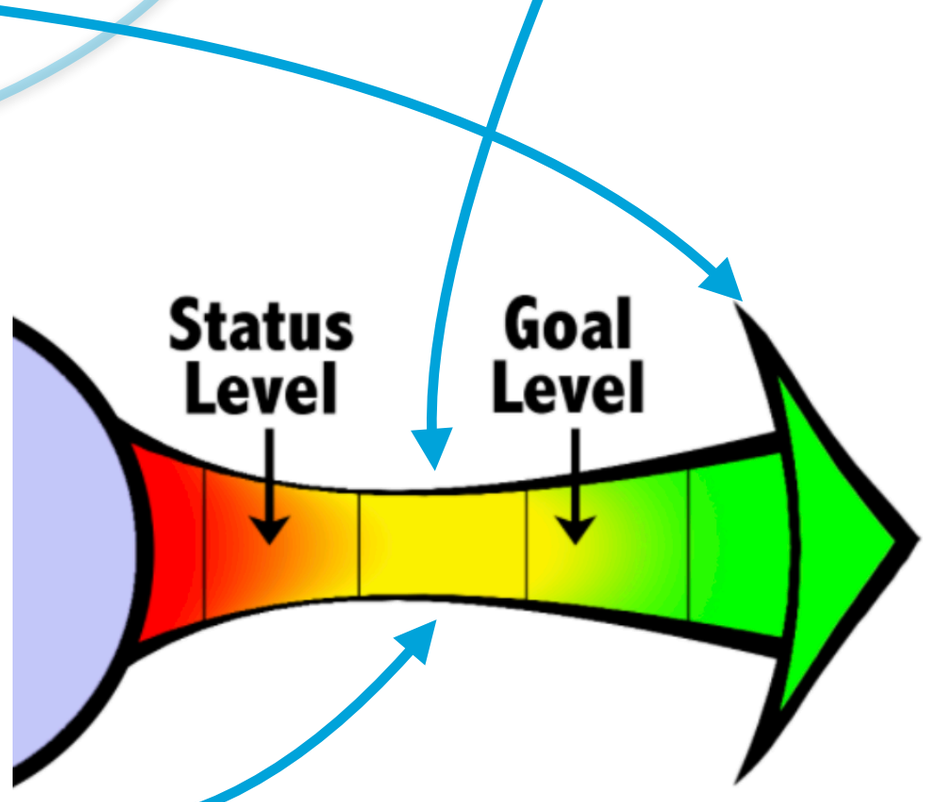


Figure 0.0 B (Kai Gilb)
Defining a Benchmark (Status) and
A Target (Goal)
On a Scale
(the arrow)

0.1 Why is quantification useful ?

There is an attitude among many planners and managers: 'if we cannot quantify our critical objectives, this is OK. Nice Words alone is normal. We can live with this. We always have, tolerated it.'

My opinion, and I hope to show you that it is based on the fact that everybody *can* quantify all values, is that failure to quantify values, is a failure of a simple **competence**, one that everybody can acquire. It is also of failure of **leadership**, that should lead by saying ***'we must get control over critical values, and we must quantify'.*** And those who can 'quanteer', have a job. Why should we '*pay consultants and employees to fail*': by 'failing to start with clear-enough value objectives', to set the stage for success. That's a *leadership* failure.

If you have employees or suppliers who told you that they *'have difficulty reading your requirements, your values, and your contracts: so, please can we skip that reading stuff and just 'wing it' or just talk about it'.* That is ridiculous. Reading is **basic** to communication. If there is a reading problem we will teach reading, or get the computer to read it aloud. But, we are *not* going to skip over the written specifications. We need not just '*word* literacy', but '*Quantity* literacy'.

Unquantified, non-financial critical stakeholder values, is a form of illiteracy in today's complex, fast-moving high-tech world. Maybe it was not as necessary 100 years ago. But it *is* a necessity today. Just as 'quantification' long ago has been a necessity in engineering, science, and running nations.

Quantification as a tool is not at all new. The idea of science, engineering, medicine, research and running the country, without plenty of quantification, is unthinkable, indisputable.

But there are new areas, emerging, and quickly becoming dominant, for which there is unfortunately no strong quantification tradition.

Let me list some *weak quantification areas*: enviromental control, artificial intelligence transparency, financial transparency, security of IT systems that run our industries and government systems, the challenge of raising world standards for education, economics and health, *substantially* within a decade or so, international peace agreements, International trade agreements, International legal co-operation, transportation safety, self-driving vehicles, and much more.

In addition to the new areas, above, each one of the *areas*, has critical **new *types* of stakeholder values;** that we have little-to-no tradition, for managing. Let alone quantifying. Let me list some. *Artificial Intelligence transparency, IT Network Security. Internet Election Corruption. Self Driving Automobile Safety. Usability of automated systems for all users. Adaptability of Education Systems to individual variation. Privacy of personal information from ' collection. Ownership of personal data. Sharing and Integration of Medical Research data digitally in real time. Digital and free higher education with the most effective teachers, syllabus [B11]. Respect for minorities. Fair elections. Control of pandemic disease, and consequent rapid disintegration of economy and activity. Migrant labour. International terrorism. Refugee explosions [B9].*

Of course this is just a sample of important values, that perhaps have *always* been under *some* consideration, like fair elections, terrorism, refugees, and pandemic diseases, but somehow, because of communication, internationalization, and specialization - these 'old' problems threaten us, with a whole new level of failure consequences, a whole new speed and scale of change, for good or not.

We, long since, mastered quantifying *money, time, distance, weight, speed, power, inductance, current, resistance, brightness*. We learn this in early schooling.

But we have largely failed to learn to **quantify the qualitative** like *flexibility, security, secrecy, usability, transparency, learning,* and many other such concepts. But, of highest priority, is the fact that we have not learned the **general art of quantifying** *any and all* values, as soon as they become urgent for us to deal with, even if we did *not* learn them at school. New values will forever emerge and become high value and critical priority. So we need to develop quantified value definitions **as needed**: and never again make excuses like *'hmm security, that is difficult or impossible to quantify'*

The purpose of this book, and these methods, are to help us all' catch up' with todays 'problems out of control', and to re-arm our decision makers with the capability of dealing with tomorrow's problems, effectively, immediately: without waiting for a 50 year cultural awakening.

All people skills effects CAN be quantified, if you learn how, like in this book!

0.1 Why is quantification useful ? Simplified

1. **Quantification helps us discuss emerging new areas and their values**
2. **Quantification helps us get real agreement on our objectives**
3. **Quantification helps us get feedback and knowledge, when we try out new strategies for new problems**
4. **Quantification gives a scientific basis for collecting knowledge in the new areas and new values**
5. **We are going to get workable solutions faster, because we can learn faster with numbers than words**
6. **We can get more help from Intelligent Tools, because they can understand numbers better than words.**
7. **Quantification bridges the gaps better between citizen-scientist-manager-planner-politician. Better real alignment.**

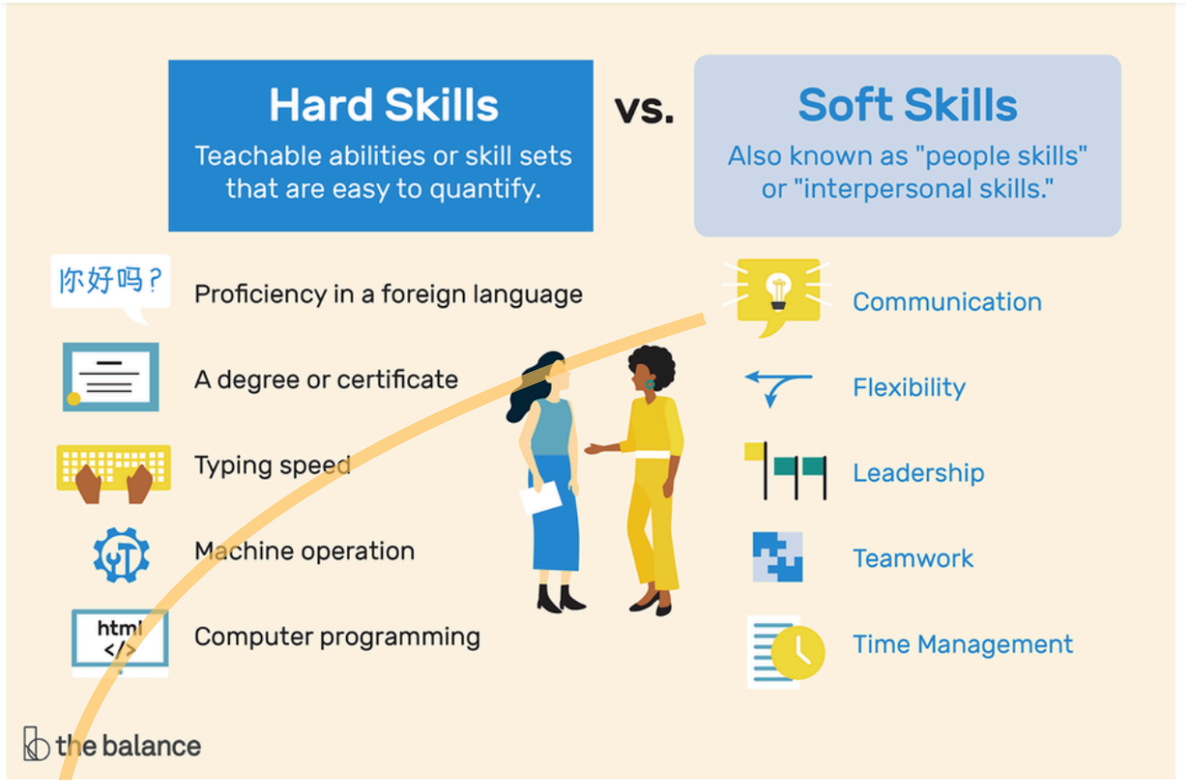


Image by Melissa Ling. © The Balance 2018

*Figure 0.1 Soft Skills are only 'harder to quantify' because we have not learned how. They can all be quantified, easily, in useful ways. If they are important (and they are ALL more important than the so-called hard skills), Then we must take the attitude that we **will** quantify them, so as to bring out the best in people and organizations. Source: https://www.thebalancecareers.com/hard-skills-vs-soft-skills-2063780 The URL above has links to details for each soft skill, which shows how to begin a structuring and finally, for me, quantification process. See Communication: https://www.thebalancecareers.com/hard-skills-vs-soft-skills-2063780 What they do not explicitly recognize, but I will teach it here, is that decomposition is a great first step towards quantification. Cartesian analysis! Look it up.*

ARTICLE TABLE OF CONTENTS Skip to section

- What Are Communication Skills?
- Types of Communication Skills
- Written Communication
- Verbal Communication
- Nonverbal Communication
- Reconciliation / Conflict Management
- Communication Mediums
- More Communication Skills

0.2 What are the barriers to quantification?

Why are we not good enough at logical and rational management of critical values?

1. **Leadership**: we have virtually no political leaders, academic leaders, author, idea leaders methods developers, industry leaders, idea leaders, or media leaders who *clearly insist on quantification* of all critical stakeholder values. They quantify a lot (money, time, headcount, distance), but not the critical 'soft' stakeholder values, like security. They don't say '**don't** quantify'. They simply take no position. They quantify what they *can*, not what they *need* to quantify. I have seen one single 'powerless' shop-floor idealist individual change thousands of co-workers at places like Boeing, Intel, HP, IBM, and Ericsson [Cases for all in B2]. But these are exceptional engineering cultures. Never in commercial businesses, like Banks (it does not stick in place) and government [B12] like Health Services (not motivated). They need much better planning clarity, but they don't get it.

2. **Motivation**: there is no clear motivation to *really* deliver the values quantitatively, No *responsibility* for doing it. No financial rewards for doing it, and no financial or legal penalties for *not* delivering values. Nobody gives a s**t.

3. **Education**: almost no educational institutions have extended quantification of values beyond traditional system attributes. They talk about 'balancing the scorecard', but they skip proper quantification, (do it half way, do it badly) of many non-financial values [S10]. Engineering universities make the same error, using badly-quantified methods like Quality Function Deployment [P11]. Education fails, largely, to teach useful skills for todays environment [B11]. No idealism here either. Name one. Positive example. I have problems doing it. Cheer me up.

4. **Training**: our industrial training in *quantification* methods is close to non-existent. Especially compared to the massive flood of training in non-quantified methods (Agile area for example), business management and product development are also very weak in quality quantification. Employers, especially in some countries like UK, are so bad at this that I have experienced people who wanted to attend my free local BCS 1-or-2-day courses, who were not allowed to attend on company time, in spite of their personal strong belief they should. And yet others took sick leave and holidays to get the training that their employers *denied* them. Getting 'certification', at great expense, in weak toothless non-quantified methods (like Agile, IT Architecture) seems more important than learning real value-management skills. Shameful, and wasteful. What 'gets me the job', is more important than doing a great value delivery job. We train in 'rituals' not 'results'. We have weak ethical positions and are selfish. Sad.

5. **Methods Knowledge**: never before has it been possible to freely access so much knowledge. Yet because of motivation and leadership, 99% of those who really need this 'quantification training' do not make use of it. Self study in free time, is quite demanding, when your culture does not really care. You have to be an idealist to persist. And I know a bunch of idealists, But there are too few.

6. **Legal Drivers:** imagine if it were 'legally required to quantify all critical values', and especially for public and private investments in 'digitization', and 'transformation' programs. Imagine if there were personal and corporate, legal consequences, if 'security' was not quantified, and the hospital system had to shut down; if 'safety' was not quantified, and 1,000 people died in faulty aircraft; if ''speed of reaction to pandemics' was not quantified with demanding targets; and leaders could be impeached and removed, and fined if they did not make more serious efforts. Millions die instead, needlessly.

7. **Insurance Drivers**: imagine if all large projects and investments had legally required failure insurance, and the insurance instances demanded a better standard of quantification for critical factors, like safety, security, and cost excesses. We have too much self-insurance for failure.

8. **Politics**: what if large investment failures were, when optimistically based on quantified agreed value-objectives, a legal-and-automatic reason for ministers to be removed, and new elections to be held. And if the failure causes were independently transparent, as the *management* failure (minister, director, CxO) they *inevitably* are.

0.2 What are the barriers to quantification? Simplified

1. **Leadership**: someone, like *you* has to *demonstrate* the ability to quantify, demonstrate that it is *useful*, and *offer to help* anyone who wants to learn the skill.

2. **Motivation**: we need to create cultures that have great pride in delivering a flow of measurable stakeholder-value results, early and continuously. Again, they can lead by doing it, and showing it can be done, always, at every opportunity.

3. **Education**: if any teacher, at any level, wants to use (as basis, or direct copies) any of my materials, for free, and possibly even get direct free help from me to develop teaching materials. Do it! A great example of this is Erik Simmons of Intel (hoofdwerk@gmail.com), who did just that, and taught 21,000 Intel people.

4. **Training**: the conventional education institutions are slow to change, so direct, local, this year, industrial or organization training, is going to be necessary. See 3 above.

5. **Methods Knowledge**: spreading a culture (Quanteering) and teaching the practical details, can take hundreds of years to reach a large part of the world. So, I have started. Will you join the culture? Become a pioneer?

6. **Legal Drivers:** we need to *make it the law* that people have a minimum professional standard for large projects. Some engineering and other professions do this. Now we need to do it where we are not so good, like IT and management.

7. **Insurance Drivers**: here is a new market for Insurance. A startup? 'We insure your project's success.' And so, we the insurer, will train, guide and demand actions towards your success.

8. **Politics**: Failed projects, the minister or director resigns, as a matter of honor! The Government is judged at election time by their '% value delivery success', keeping value promises, and making election promises with value numbers. Political Quanteering.

Why are we not good enough at logical and rational management of critical values?

As usual, multiple barriers to necessary change.

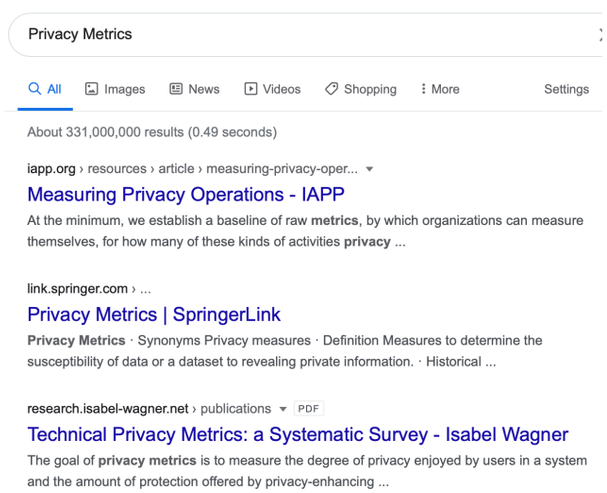
Figure 0.2 Source https://www.bluebeyondconsulting.com/2019/04/9-barriers-to-successful-culture-change-and-how-to-overcome-them/

One of them is '"There are no metrics or measurement tools"

No serious barriers to quantification for you:

do it now

331 million ideas for Privacy metrics



These ‘short pages’, which follow a detailed page of ideas, are my attempt to give you a very simplified summary, of the main message in the previous page.
Tom

0.3 What are the *applications* of value quantification?

Where do we plug in ‘Quanteering’?

We plug in numbers, and clarity structures, wherever we find *fuzzy unstructured* word-streams. And where there is a clear big payoff from getting it right early. Lives and money.

The Quantified Self

1. OBJECTIVES

1. MAJOR PROJECT OBJECTIVES
2. GOVERNMENT CHANGE OBJECTIVES
3. INTERNATIONAL OBJECTIVES
4. POLITICAL

2. STRATEGIES

1. STRATEGIC PLANNING
2. IT SYSTEM ARCHITECTURE
3. DESIGN OF ORGANIZATIONS

3. PROJECT MANAGEMENT

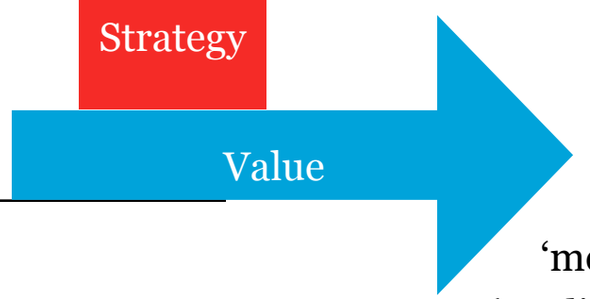
1. IT PROJECT MANAGEMENT
2. GOVERNMENT SERVICES
3. CHARITY WORK
4. UN-LEVEL PLANS

4. QUALITY CONTROL, REVIEWS

1. QC OF OBJECTIVES
2. QC OF STRATEGIES
3. QC OF CONTRACTS.

Figure 0.3, Source https://www.economist.com/technology-quarterly/2012/03/03/counting-every-moment

0.4 Principles of Quanteering



1. **QUANTIFY ANY VARIABLE**: All variable attributes can be expressed numerically, for greater clarity.

2. **ANY 'QUANT' CAN BE MEASURED**: If you can quantify a system attribute, there is always a set of measuring methods to track change, which are cost effective for your purposes.

3. **TOP CONTROL**: Quantified top-level critical stakeholder objectives, are the definition of success, and of failure; and the primary instrument for managing anything.

4. **OBJECTIVES LEVELS:** There can be many related levels of objectives, some supporting others, and it is important to be clear about these relationships and responsibilities.

5. **MEANS SERVE ENDS**: All specifications, that have as a purpose, to deliver improvements in objectives, are the 'strategies' or 'means', for *those* objectives or 'ends'. There are 2 main kinds, *strategies* (something to do) and *means objectives* (an attribute level to meet, to support a higher one)

6. **STAKEHOLDERS DECIDE:** Stakeholders are the source of all objectives and constraints. They may be wrong, wavering, unclear, and internally inconsistent about these requirements, but they have a right to be subjective ('we want'), yet also responsible for their opinion.

7. **STRATEGY SIDE EFFECTS:** Strategies, all 'means', have a large set of their own attributes (qualities, costs, constraints) which will impact your system; these need to be estimated, measured, and 'monitored for the system lifetime'.

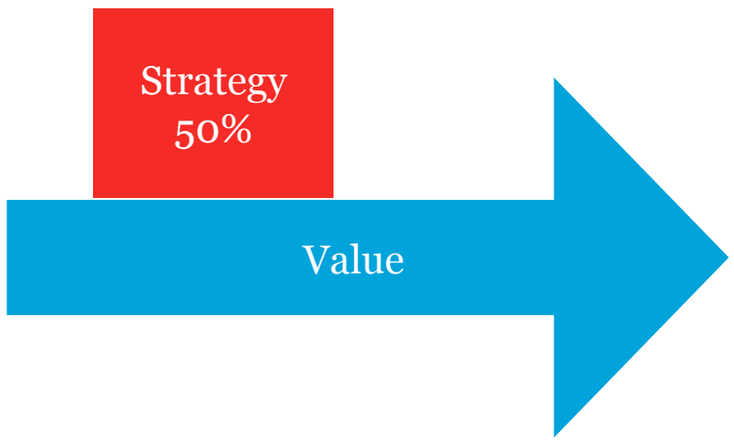
8. **MANY TO MANY**: In any system, no matter size, there is a top-level viewpoint of the top-critical-requirements (objectives and budgets), which are impacted by the strategic architecture (the main means for delivering requirements), and this can always be modeled on a table, and measured on a table. [B1, IET Chapter]

9. **DECOMPOSITION**: all objectives, all resource budgets, and all strategies, can be decomposed by factors of 10x and 100x into prioritizable incremental value-delivery steps; in order to manage the project of 'reaching the goals'. [B2, Decomposition Chapter]

10. **DYNAMIC DESIGN TO ATTRIBUTES**: Iron triangles are false ideas. You can only *roughly* estimate the long-term effects of strategies on requirements (values and costs). But you can choose to prioritize any requirement level, at any incremental step; you can design explicitly to reach any resource requirement or value Goal; and then you can tune your requirements, and above all your strategies, step by step, learning by feedback, so as to generally attain a very high level of value-attributes early, or/and within contractually fixed, costs-and-deadline constraints. [P3.3].

The Quanteering Principle:

Quantifying Clarifies



1.0 Defining a Scale of measure, Intro

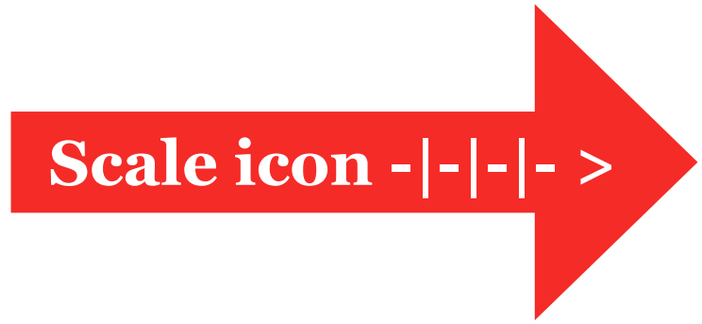


Figure 1.0 A, A Scale Icon, the Arrow, with increments -|-|- [B12]

The core of this book, and the core of my Planning Language (Planguage, [B1]) is *this* subject. The **'Scale of Measure'**, or 'The Quantification Scale'. For short: 'Scale', with 'capital S' (indicating a 'defined concept'), which is a formal Planguage 'defined concept' (NOT 'term') in Planguage [P4]. All Planguage concepts can have synonyms, and all have a *unique* numeric Tag synonym, the asterisk-number (*nnn). In Scale's case it is *132.

Scale of Measure **Concept *132** **[P4]**

A scale of measure defines a single scalar attribute dimension.

It helps us 'quantify'. It is the basis for quantifying variable attributes.

It essentially *defines* the variable attribute concept.

All scalar numeric-level estimates, specifications, or measurements, are used with an implied (specified nearby and immediately previous), or explicit, reference to a defined scale-of-measure.

A 'Scale:' parameter specification defines the units of measure, and includes any other useful context, including [Scale Qualifiers] ('for defined [Tasks and other Conditions]'), normalizers ('per week'), and environment specification ('for Expert Hackers').

Some elements of the *context* of a scale of measure, but never the units of measure themselves, may be specified *outside* the Scale specification; for example in Target qualifiers, or in formal term definitions.

A Scale is a pattern for quantification, which gets tailored to current purposes by both defining levels on the Scale, and by defining [Scale Qualifiers].

To avoid inevitable confusion, the Scale is NOT any sort of measuring or testing process. It is NOT what we call a 'Meter' in Planguage, which is a defined measurement process, on a defined Scale. We only allow one single official Scale definition, for a *single dimension variable concept*. A Multi-dimensional attribute, of which there are *many* [B1, Chapter 5, example Usability, Flexibility] can be defined, by a *set of Scales*, as we shall see here, in this book chapter.

You cannot logically define a *measuring process* in detail, until you have a *well-defined Scale,* to base it on. When you do have a well-defined Scale, it is possible to define any useful number of 'Meters', for different purposes, with different qualities and cost attributes.

May I introduce the Scale **Icon** ? [B12]. For as many concepts as possible, in Planguage, I have defined a graphic, called an Icon, which is independent of human languages like English and arabic.

The analogy is music notation, and electrical schematic symbols.

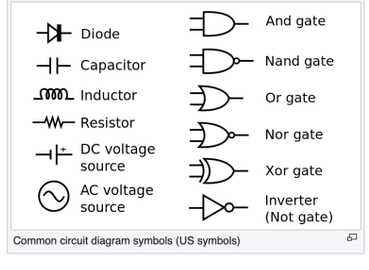


Figure 1.0B Electrical Symbols (Wikipedia)

Planguage Icons have 2 basic versions, *Drawn* Icons, and *Keyed* icons. So the *Keyed* Icon for Scale is **-|-|->**

Scales —/—/—/—>

Define

The value idea

UN Poverty Goal 1.5

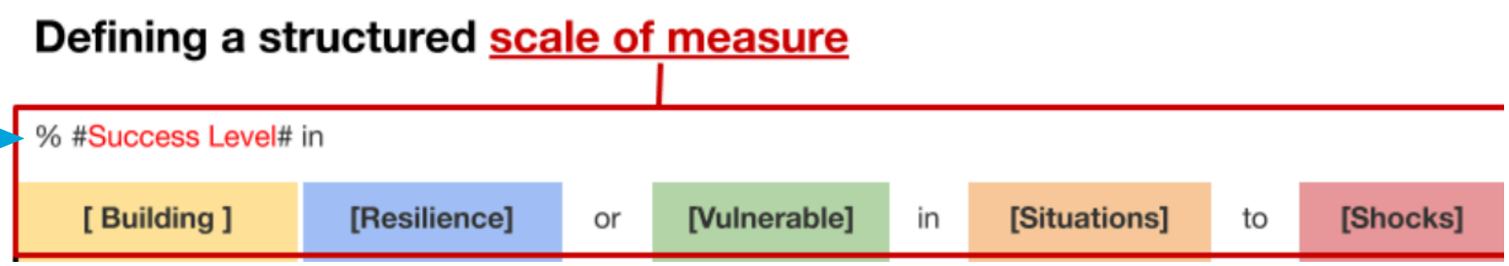


Figure 1.0A A Scale 'pattern' with 5 [Scale Qualifiers] to enable selected conditions, to define future levels, on the Scale. We can select critical sets of conditions, and thus prioritize them for earlier delivery. This is a powerful modeling language for complex and large systems. See more later Chapter 1 and 2..

1.0 Defining a Scale of measure: Purposes

Why do we define a Scale of measure?

It is common practice to simply refer to the name (like volt) or abbreviation (Mbps) of an existing standard scale measure:

125 km, or KmH, or deg. C, or M(eter).

No problem, except when there is no 'standard' that we can refer to, and that is the frequent case, in almost all engineering [B1], national [B12], international, and Business planning [B2].

So, the first Scale purpose: we need to ***define*** Scales locally for ourselves, or at least re-use our previously defined Scales, for most everything. We can include and re-use any existing standard Scales, such as Seconds, Km, Degrees C, and usually we reuse them, *within* a more-complex Scale definition. Example:

Scale: % of starts where we achieved 125 KmH, in 100 Deg C.

A second purpose of us taking the effort to define a Scale, has been hinted at, when we used abbreviations to refer to well-established Scales, like Degrees C. It is 're-use' of patterns/

Reuse. Define once, and then refer to a name Tag for your definition, or use an implied reference (the Scale above a list applies at the default Scale to use). The *only* Scale in the specification object (like a Requirement) applies by default.

If you have only one single use, or reference to, the Scale, you can just as well, as usual, add the Scale to the end of the number (100 KpH). But if you need to *refer* to it, and *reuse* it many times, for different purposes, then define your Scale **once**, re-use **many times**, is less effort.

Re-usable Scale definition has another useful side effect:

1. We can *safely use **long** (20 word) Scales*, which give us *more accurate or complete* information, better real-world modeling, without fear we will have to retype, and repeat such long definitions. That fear leads to corrupted shorter versions

2. There is *no danger of inadvertent corruption*, of a Scale, when it is rewritten, or is copied into different presentations (the slides!), and the 'copy' is *different*. Or the copy is not synchronized, when the original is updated. There is **only one official master version**, for all purposes, by rule! [B1, Rules]

A third purpose of defining Scales, will become obvious in the book, later. We can creatively and usefully model the many dimensions of the real world *much* better. Leading to much more precise communication between people, fewer misunderstandings (about 50X better according to my case study measures).

Scales -/-/->
are
Reusable

1.0 Defining a Scale of measure: Scale Components

The Scale has a finite set of tools, which we can think of as the 'possible components' of the Scale. Let me present them and define them, and justify them, to some degree. Then later we will see them in use, and in context. A full appreciation will take some more learning (including learning about design, Chapter 2), but let us start by announcing the Scale toolkit.

1. **Planguage parameter 'Scale:'.** English name: The 'Scale:'. This uses to one official definition (*132, Scale, cited above). It allows us to re-use that definition, and to lock in that concept, without everybody having their personal, implied, in-*their*-head-only, 'scale' definition. You could also use -|-|- (the keyed icon), or Skala: (norwegian for Scale), or *132. They are all synonym 'pointers' to the same 'Scale' concept.

Scale: ……

-|-|- **: ….**

2. **Possible Name Tag**: The 'Tag For The Scale': not always necessary, but a possibility to refer to the tag and reuse it, from outside the current specification object. Otherwise, inside the spec object, there is only one option, by default.

Suggested Scale Not Official: Scale: …..

3. **Units**: The Units of Measure. Like % or Seconds.

Scale: Seconds to ….. <do something>

4. **WWWWW**: The stuff that defines what the 'Seconds' mean. Generally the Where, Who, What, When, Why, How dimensions, which we can state directly. Or, more usefully as [Scale Qualifiers] = Conditions.

   Scale: Seconds to serve a burger to a customer on a hot day.

What we do NOT include in the scale, is the 'level of performance'. We do that *separately* in Benchmarks, Targets, and Constraint level statements. Reusing the Scale, and ensuring perfect synchronization of Scale meaning for all of them.

Burger: Scale: Seconds to serve a burger to a customer on a hot day.

Burger: **Scale**

Past: 60 seconds.

Goal 40 seconds.

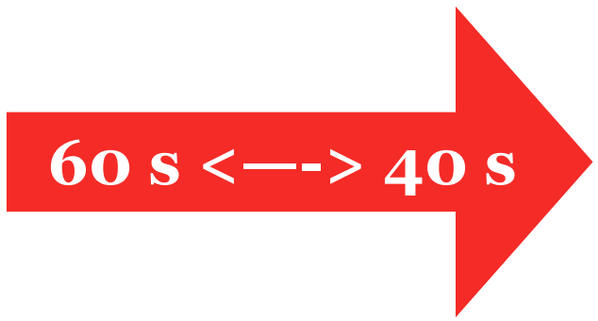
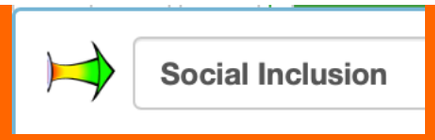


Figure 1.0 C, 2 Key points on a Scale, a Benchmark (60s), and a Target (40 s)

Tag:
Scale:
Units
Conditions
(who, what, where, when, why)



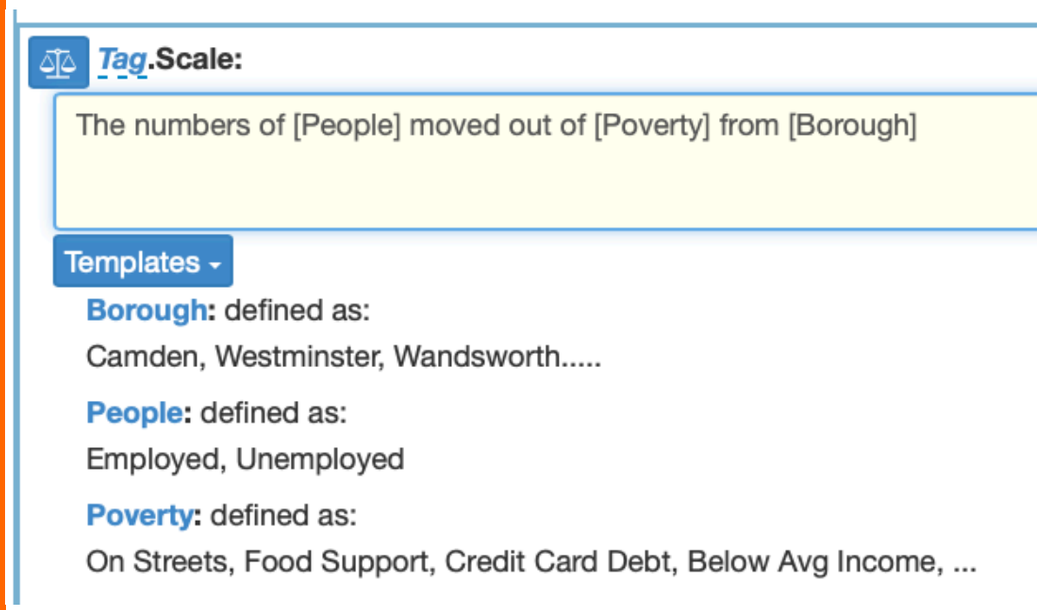


Fig. 1.0 D A Scale with 3 [Qualifiers], and their Qualifier Conditions

1.0 Principles of Scales of Measure: Source [B1, Ch 5].

1. The Principle of 'Defining a Scale of Measure'
If you can't define a scale of measure, then the goal is out of control.
Specifying any critical variable starts with defining its scale.

2. The Principle of 'Quantification being Mandatory for Control'. If you cannot put numbers on your critical system variables, then you cannot expect to communicate about them, or to control them.

3. **The Principle of 'Scales should control the Stakeholder Requirements'**
Don't choose the easy Scale, choose the powerful Scale.
Select scales of measure that give you the most direct control over the critical stakeholder requirements. Choose the Scales that lead to useful results.

4. The Principle of 'Copycats Cumulate Wisdom'
Don't reinvent Scales anew each time – store the wisdom of other Scales for reuse.
Most scales of measure you will need will be found somewhere in the literature or can be adapted from existing literature.

5. The Cartesian Principle
Divide and conquer said René – put complexity at bay.
Most high-level performance attributes need decomposition into the list of sub-attributes that we are actually referring to. This makes it much easier to define complex concepts, like 'Usability', or 'Adaptability,' measurably.

6. The Principle of 'Quantification is not Measurement'
You don't have to measure in order to quantify!
There is an essential distinction between quantification and measurement. "I want to take a trip to the moon in nine picoseconds" is a clear requirement specification without measurement."
The well-known problems of measuring systems accurately are no excuse for avoiding *quantification*. Quantification allows us to *communicate* about how good scalar attributes are, or can be – *before* we have any need to measure them in the new systems.

7. The Principle of 'Meters Matter'
Measurement methods give real-world feedback about our ideas. A 'Meter' definition determines the quality and cost of measurement on a Scale; it needs only to be sufficient for control, and for our purse.

8. The Principle of 'Horses for Courses'
Different measuring processes will be necessary for different events.

9. The Principle of 'The Answer always being 42'
Exact numbers are ambiguous, unless the units of measure are well-defined and agreed. Formally defined scales of measure avoid ambiguity. If you don't define scales of measure well, the requirement level might just as well be an arbitrary number.

10. The Principle of 'Being Sure About Results'
If you want to be sure of delivering the critical result – then quantify the requirement.
Critical requirements can hurt you if they are badly specified – and you **c**an always find a useful way to quantify the notion of 'success'

Scales Communicate Clearly

Status [People = **All**, Poverty = **{On Streets, Food Support,Below Avg Income}**, Borough = **Camden**] @ 26 Sep 2017 : **12** *<- Jennifer Thomas, Jane Batui*

1.1 Sources of Scales: Where do we get a Scale from?

1. We can import it, reuse it

2. We can re-use internal Scales from other projects

3. We can search on the internet for template scales, and use them for inspiration. We can tailor them to our purposes.

4. We can derive them from stakeholder analysis

5. We can work them out with domain experts

6. We can derive them from the content and patterns in the 'Ambition' level statement.

7. We can start with some rough draft, and get feedback, and experience and gradually develop a better Scale.

8. We can select it from a digital library of Scales, such as are found in [R.ValPlan] derived initially from [B1, Ch 5 Scales of measure], but which can be incrementally enhanced from corporate learning

9. You can cut and paste from other of your organizational projects, and modify to taste.

A Scale Library built into an App [R.ValPlan], which you can add to, as you wish, at several levels of Project, Organization, and App Tool

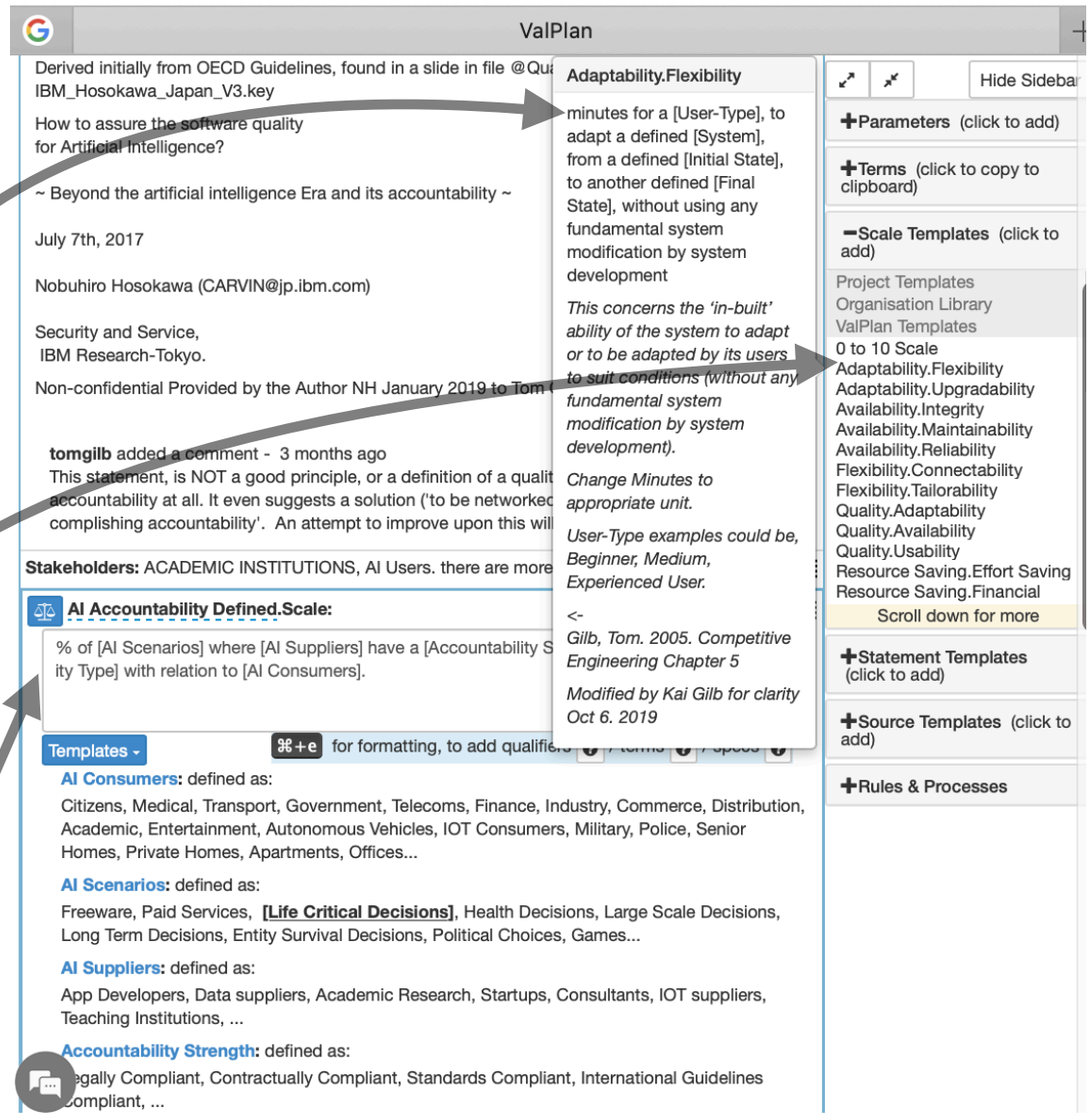


Figure 1.1 A Source ValPlan "GDPR Privacy 2020: TomGilbPrivate

Scale ideas are easily found by observation, and conversation.

Medical

Consumers: defined as:

Medical, Transport, Government, Telecoms, Finance, Industry, Commerce, Distribution, mic, Entertainment, Autonomous Vehicles, IOT Consumers, Military, Police, Senior mes, Private Homes, Apartments, Offices...

AI Scenarios: defined as:

Freeware, Paid Services, **[Life Critical Decisions]**, Health Decisions, Large Scale Decisions, Long Term Decisions, Entity Survival Decisions, Political Choices, Games...

AI Suppliers: defined as:

App Developers, Data suppliers, Academic Research, Startups, Consultants, IOT suppliers, Teaching Institutions, ...

Accountability Strength: defined as:

egally Compliant, Contractually Compliant, Standards Compliant, International Guidelines ompliant, ...

1.1 Sources of Scales: Where do we get a Scale from?

Example of a Usability Decomposition to a Set of Sub-objectives, each with a template Scale of Measure

EXAMPLE

Usability:
Type: Complex Quality Requirement.
Includes: Type: Elementary Quality Requirement {Entry Conditions, Training Requirement, Computer Familiarity, Web Experience Level, Productivity, Error Rate, Likeability, Intuitiveness, Intelligibility}.
Entry Conditions:
Scale: <Grade Level of User>.
Training Requirement:
Scale: Time needed to read <any instructions> or get <any help> in order to perform defined [Tasks] successfully.
Computer Familiarity:
Scale: Years of <experience with computers>.
Web Experience Level:
Scale: Years of <experience with using the web>.
Productivity:
Scale: Ability to correctly produce defined [Work Units: Default: Completed Transactions].
Error Rate:
Scale: Number of Erroneous Transactions requiring correction each <session>.
Likeability:
Scale: Option of <pleasure> on using the system on scale of −10 to +10.
Intuitiveness:
Scale: Probability that a defined [User] can intuitively figure out how to do a defined [Task] correctly (without any errors needing correction).
Intelligibility:
Scale: Probability in % that a defined [User] will correctly interpret defined [Messages or Displays].

Figure 1.1 B, Source CE [B1] these were cumulated from my client experience over many years.
The notation <fuzzy brackets> means 'this is not defined,' just a <hint. So fill in your local knowledge.
The [Square Brackets] notation means this is a Generic idea (a [Scale Qualifier]), which needs specific conditions defined in the scale level specification (Past, Goal etc.). More about that below in the book.

One of the most frequently asked questions I get about quantification is, how to quantify Usability (User Friendliness) [S11, V14]. I am amazed at the fact that most people professionally involved with this aspect, like User Experiences (UX) designers, do not know or practice this quantification. It is sort of like an electrician not being taught Ohms Law, Volts, Amps, Ohms. I guess we have to cite this as an example of the many things where the technology came so fast, and the appreciation of Usability was slow to dawn on people, and the educational institutions failed us, by not teaching us how to find quantifications for new values.

You will notice that in spite of a tendency to treat usability as a single dimension, it is obvious that it is useful to treat it as a set of sub-usability attributes, in order to really deal with it seriously, like for an automobile interface.

If all else fails
Finding Scales

It is in my books!
(without any sales)

Maintainability:
Type: Complex Quality Requirement.
Includes: {Problem Recognition, Administrative Delay, Tool Collection, Problem Analysis, Change Specification, Quality Control, Modification Implementation, Modification Testing {Unit Testing, Integration Testing, Beta Testing, System Testing}, Recovery}.

Problem Recognition:
Scale: Clock hours from defined [Fault Occurrence: Default: Bug occurs in any use or test of system] until fault officially recognized by defined [Recognition Act: Default: Fault is logged electronically].
Administrative Delay:
Scale: Clock hours from defined [Recognition Act] until defined [Correction Action] initiated and assigned to a defined [Maintenance Instance].
Tool Collection:
Scale: Clock hours for defined [Maintenance Instance: Default: Whoever is assigned] to acquire all defined [Tools: Default: all systems and information necessary to analyze, correct and quality control the correction].
Problem Analysis:
Scale: Clock time for the assigned defined [Maintenance Instance] to analyze the fault symptoms and be able to begin to formulate a correction hypothesis.
Change Specification:
Scale: Clock hours needed by defined [Maintenance Instance] to fully and correctly describe the necessary correction actions, according to current applicable standards for this.
Note: This includes any additional time for corrections after quality control and tests.
Quality Control:
Scale: Clock hours for quality control of the correction hypothesis (against relevant standards).
Modification Implementation:
Scale: Clock hours to carry out the correction activity as planned. "Includes any necessary corrections as a result of quality control or testing."
Modification Testing:
Unit Testing:
Scale: Clock hours to carry out defined [Unit Test] for the fault correction.
Integration Testing:
Scale: Clock hours to carry out defined [Integration Test] for the fault correction.
Beta Testing:
Scale: Clock hours to carry out defined [Beta Test] for the fault correction before official release of the correction is permitted.
System Testing:
Scale: Clock hours to carry out defined [System Test] for the fault correction.
Recovery:
Scale: Clock hours for defined [User Type] to return system to the state it was in prior to the fault and, to a state ready to continue with work.

Source: The above is an extension of some basic ideas from Ireson, Editor, Reliability Handbook*, McGraw Hill, 1966* (Ireson 1966).

Figure 5.4
A more detailed view of Maintainability.

1.1 Sources of Scales: Where do we get a Scale from?

Decomposition of Values into sub-values leads to quantifiable notions.

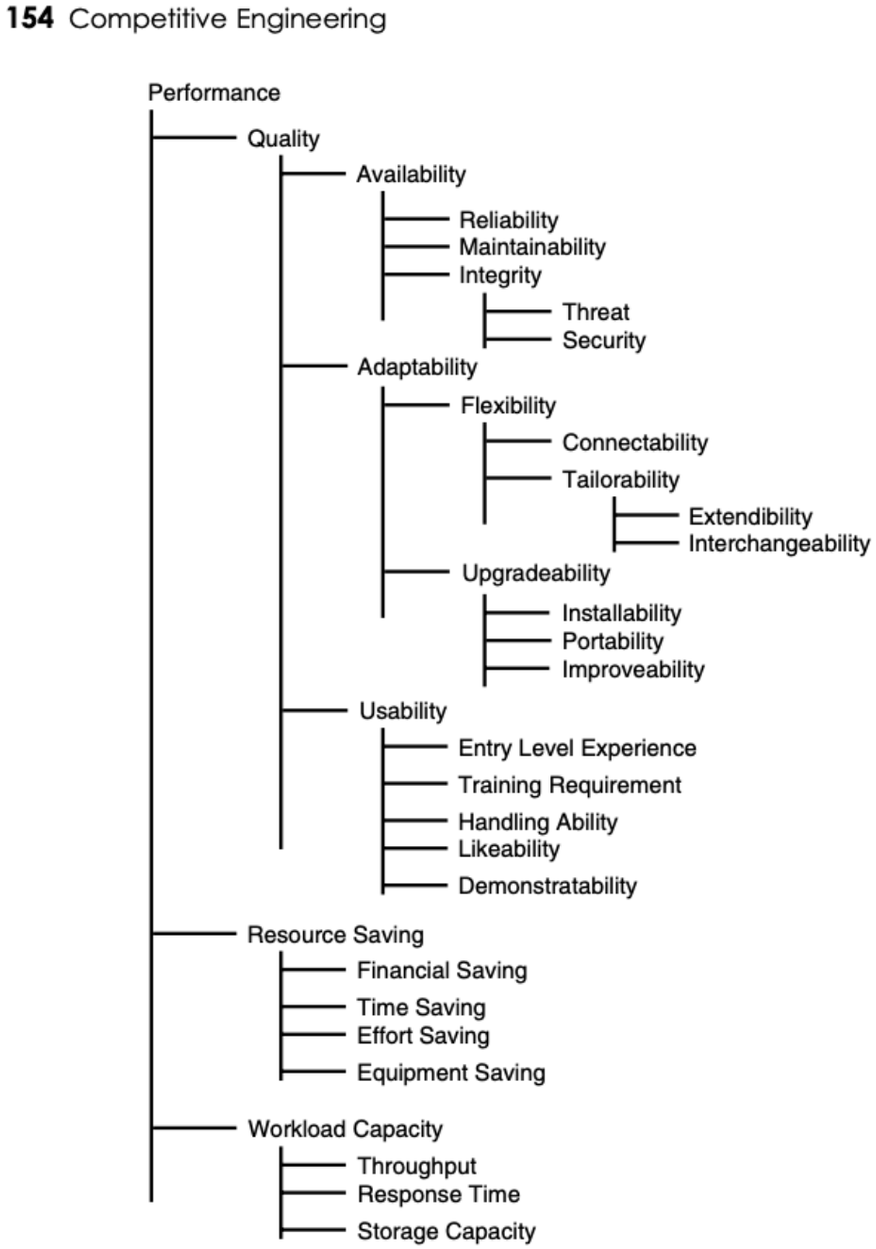


Figure 5.3
One decomposition possibility for performance attributes with emphasis on the detail of the quality attributes.

Figure 1.1 C. [B1, Ch 5] A diagram of many conventional qualities for almost any product or service. These are all defined with template scales in the CE Book [B1 Ch 5] and in the ValPlan app [R.ValPlan].

The most important observation I can make here is that you should observe the clear *decomposition* of many *conventional* terms, like **'Adaptability'**, into a **set** of distinctly *different, but related* value ideas. I will return in this book, with the notion that one of the most powerful ideas I ever learned (Thank you René D) is that one **road to quantification** starts by a *decomposition* process, maybe at more than one level of decomposition. The more you decompose, the more you move towards something more distinct, more finite, more specific - and more easy to define a scale measure for. "**Decompose until quantification becomes obvious"**, a wise engineer wrote (Juran's Handbook)

So, one reason we initially deny that something is quantifiable, and call it 'soft' [Figure 0.1] is that it is not yet decomposed. It is just an *umbrella title* for a set of very different attributes. So we *say* it is 'soft' or it is *not measurable*. And in one sense that is correct. The umbrella concept is a *set of different dimensions*, not a single dimension.

We can in fact 'quantify the umbrella' as a variable, if we can somehow quantify the set of sub-values. In fact this is easy, and I do it regularly. But it requires some simplified modeling.

You will see this in practice later in the Impact Estimation Table [B1] where my trick is to re-compute the very-different scales to an equivalent, but common-language scale, which is '% of meeting the Targets', on any Scale. A simple trick, but very useful in practice. More later.

Some value names are Just *umbrella* names for a group of ‘real’ values.

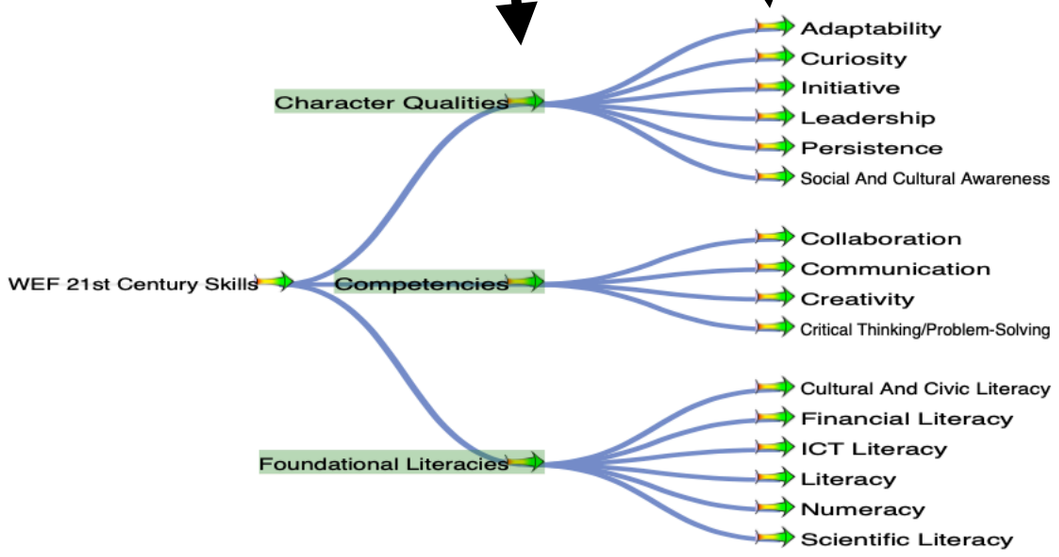


Figure 1.1 C2 Source KEN book World Economic Forum 21st Century Skills

1.1 Sources of Scales: Where do we get a Scale from? Internet

So hello my friend (Chapter 0.0, who could not imagine how to quantify something as critical to his client (large telecoms) as 'security'. You do not have to be an expert on everything. Least of all security. I am not either. But all of us can search 'security metrics' and ascertain on the first page returned, that *somebody does* know how to quantify 'security', in ways that could be *used by us*, with a little tailoring. Searching 'security metrics **telecoms**' gives *only* 13,8 million hits, but enough to be useful, I see.

Here is the observable principle: of Ain't Nothin' New: **if you are interested in some critical values, then somebody has already published, for free on the internet, some pretty good answers and experiences.** So stop being in denial. Stop saying it is soft or un-quantifiable, or un-measurable. Stop *avoiding* quantification, and serious responsibility for critical - life and death values (like security). Just do it!

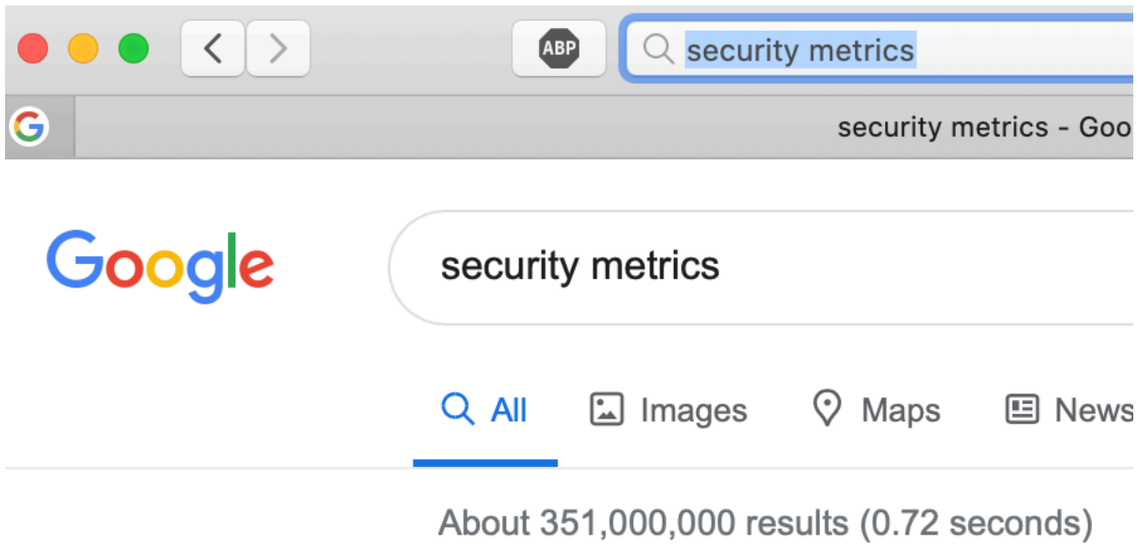


Figure 1.1 D. If you do not know how to find suggested quantification scales of anything at all, try the internet. 'Key attribute' Metrics does the trick.

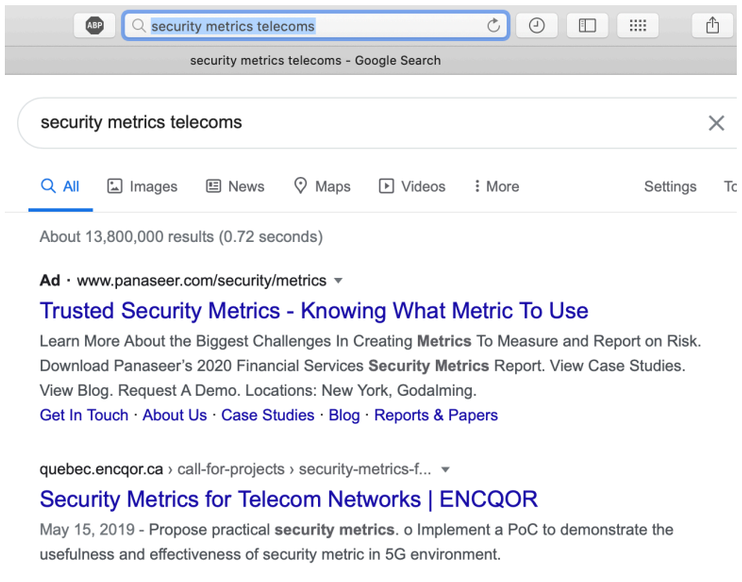


Figure 1.1 F, Focussing in on the telecoms security domain. ***I want to remove all your invalid excuses for not quantifying critical values, all of them. All invalid excuses, all values. Always.***

Suggested example of security decomposition metrics, and suggested scales of measure. 1st hit of 350 million. So, there are more than this. Not 'none'.

Security Ideal	Metric
1. Security Group (SG) knows current control system perfectly	Rogue Change Days Security Evaluation Deficiency Count
2. Attack Group (AG) knows nothing about the control system	Data Transmission Exposure
3. The control system is inaccessible to AGs	Reachability Count Attack Path Depth
4. The control system has no vulnerabilities	Known Vulnerability Days Password Crack Time
5. The control system cannot cause damage	Worst Case Loss
6. SG detects any attack instantly	Detection Mechanism Deficiency Count
7. SG can restore control system integrity instantly	Restoration Time

Figure 1.1 E, ***This was the first image of 350 million hits on 'security metrics'.***
Source: https://www.researchgate.net/publication/255201483_Measurable_Control_System_Security_through_Ideal_Driven_Technical_Metrics/figures?lo=1

3.1.10 Estimating Future Levels of Value Quantities. Value-to-Cost Ratio & ± sum.

A complete Table, with all ± Uncertainty made visible in each cell.

Figure 3.1.10 Source: Value Agile V=200520.1652 (Course Slides). Artificial example.

In this case the '± uncertainties' are used, to calculate the 'worst case': the 'lowest values' in the estimated range, and the highest costs in the range.

"**Product Design**" strategy, in the '**worst case**', comes out best (Green 3.20).

If everything went wrong, within the ± range, it would still give the best values for costs.

It is twice as good as the next best, '**Financials**', which only *looks* like the best (Green), barely, until we consider the ± uncertainty.

3.1.10 Estimating Future Levels of Value Quantities. Value-to-Cost Ratio & ± sum.

Sum of all values. for one Strategy

Before an adjustment for 'Worst case uncertainty'

Worst = the 'bad' direction in ±

Sums of ± uncertainty For each value or each resource estimate

Sums of ± uncertainty give us an overall picture of the uncertainty of our L*anding Area* (deviant result, from main estimate).

This is a *risk management* tool.

It helps us 'shy away' from ('gives lower priority to') strategies that are *highly unpredictable*.

3.1.11 Estimating Future Levels of Value Quantities . Value to Cost Ratio and Risk

This assumes worst case level in all value and all cost ranges above

This adjusts for Credibility
0.5 x 60% = 30%
For all values and costs

Worst-Worst case
60%± 20% = 40%

40% x 0.5 = 20%

The Values/Costs Levels, without 3 different Risk ideas.

Requirements		Health Architecture	Transport Archite...	Tore Architecture	Workplace Arc
Collect Information Status: 50 → Wish: 90 % [Relevan...	Δ:	5 13 %	20 50 %	25 63 %	30 75 %
Education Status: 42 → Wish: 95 % [Student...	Δ:	3 6 %	30 57 %	30 57 %	20 38 %
Get People Where They Need ... Status: 42 → Wish: 99 [Important...	Δ:	???? ????	30 53 %	2 4 %	???? ????
Healthy Employees Status: 70 → Wish: 99 [Work Acti...	Δ:	???? ????	10 34 %	20 69 %	25 86 %
Stay Healthy Status: 30 → Wish: 90 % [Capacit...	Δ:	10 17 %	30 50 %	25 42 %	25 42 %
Sum Of Values:	Σ%:	36 %	244 %	235 %	241 %
Days To Implement Status: 0 → Budget: 1k Days Neede...	Δ:	30 3 %	10 1 %	15 2 %	10 1 %
Capital Cost In Million NOK Status: 0 → Budget: 1k Million No...	Δ:	0 0 %	50 5 %	40 4 %	100 10 %
Sum Of Development Resources:	Σ%:	3 %	6 %	6 %	11 %
Value To Cost:		12.00	40.70	39.20	21.90
Ratio (Worst Case)		7.30	21.60	25.80	18.80
Ratio (Cred. - adjusted)		0.70	13.50	14.50	5.00
Ratio (Worst Case Cred. - adjusted)		2.80	22.50	113.40	292.00

Figure 3.1.11. (cut from Figure 3.1.9A OSWA)

How much risk are you willing to take?

Are you feeling lucky today, punk?

Decision-makers can choose, at any increment, to estimate impacts of the remaining gaps to Goal. Or they can just use original estimates, when the purpose is to see if there are any clear value/cost priorities. Sometimes it is faster, a few days work, to just deliver a pretty good increment, than to research some dubious evidence and relations, to try to get a better estimate, and maybe a better prioritization. But you have such options available.

You can also choose the degree of risk, Me, I always prefer the best option of the Worst-Worst evaluation. I like to play safe, And I am afraid that dubious options are actually worse than our dubious estimate. But there are warning traffic lights here. It is up to you to understand how serious your estimation process has been, and what you have to lose by a bad decision.

3.1.11 Estimating Future Levels of Value Quantities . Value-to-Cost Ratio and Risk

Some strategies are less risky than others. Your choice.

Value To Cost:	12.00	40.70	39.20	21.90
Ratio (Worst Case)	7.30	21.60	25.80	18.80
Ratio (Cred. - adjusted)	0.70	13.50	14.50	5.00
Ratio (Worst Case Cred. - adjusted)	2.80	22.50	113.40	292.00

Figure 3.1.11 B. The Bottom Lines.
Notice that a choice of degree of risk,
can give 3 different priorities of strategy, to do next.

How much harm can a bad decision do?

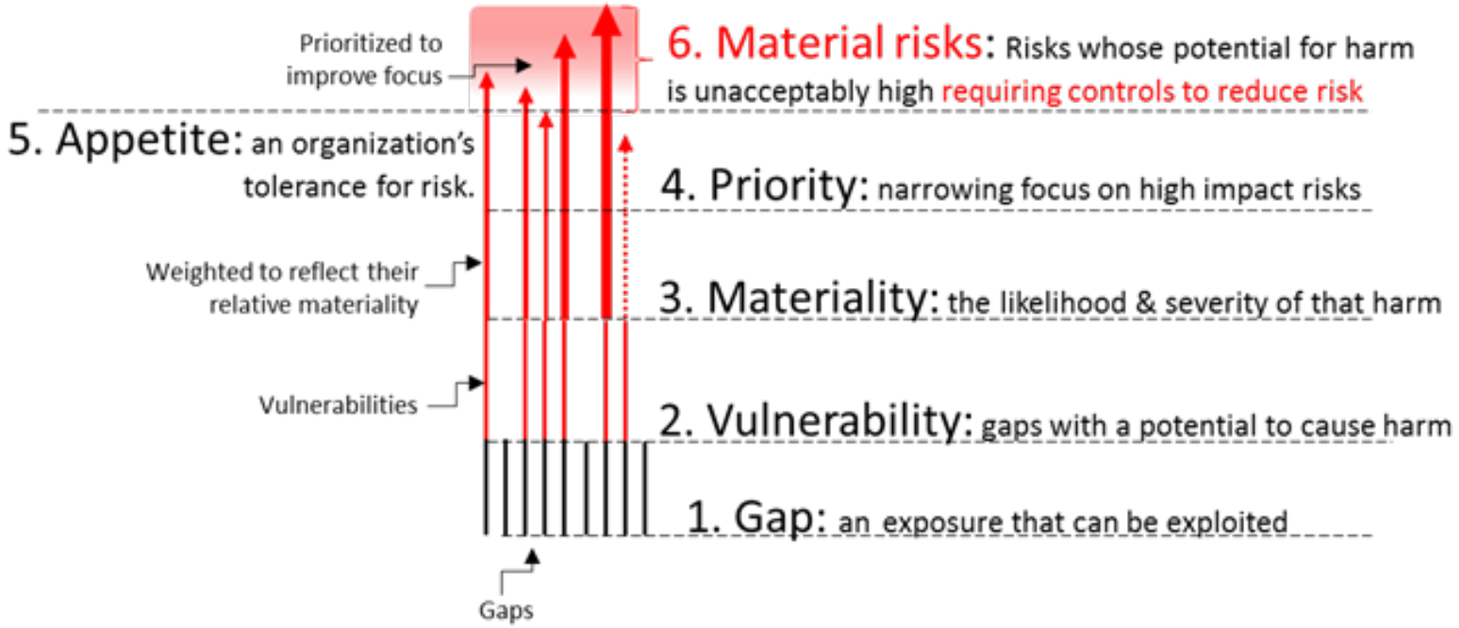
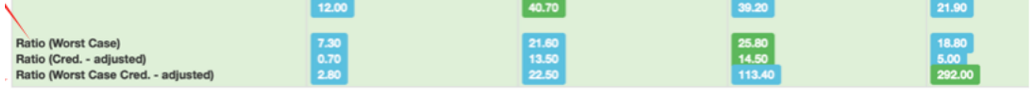


Figure 3.1.11 B,
Source https://www.preemptive.com/blog/article/927-the-six-degrees-of-application-risk/90-dotfuscator

Before the sort —>



3.1.12 Estimating Future Levels of Value Quantities. Sorting for Priority.

I am not feeling lucky today, show me the worst-worst case sequence, from left.
What do those '????' mean? They are ***Unknowns***, and mean that **I cannot at all be sure** what is best yet.
Back to the planning board, and **get rid of the *known unknowns*** before making a dangerous decision.

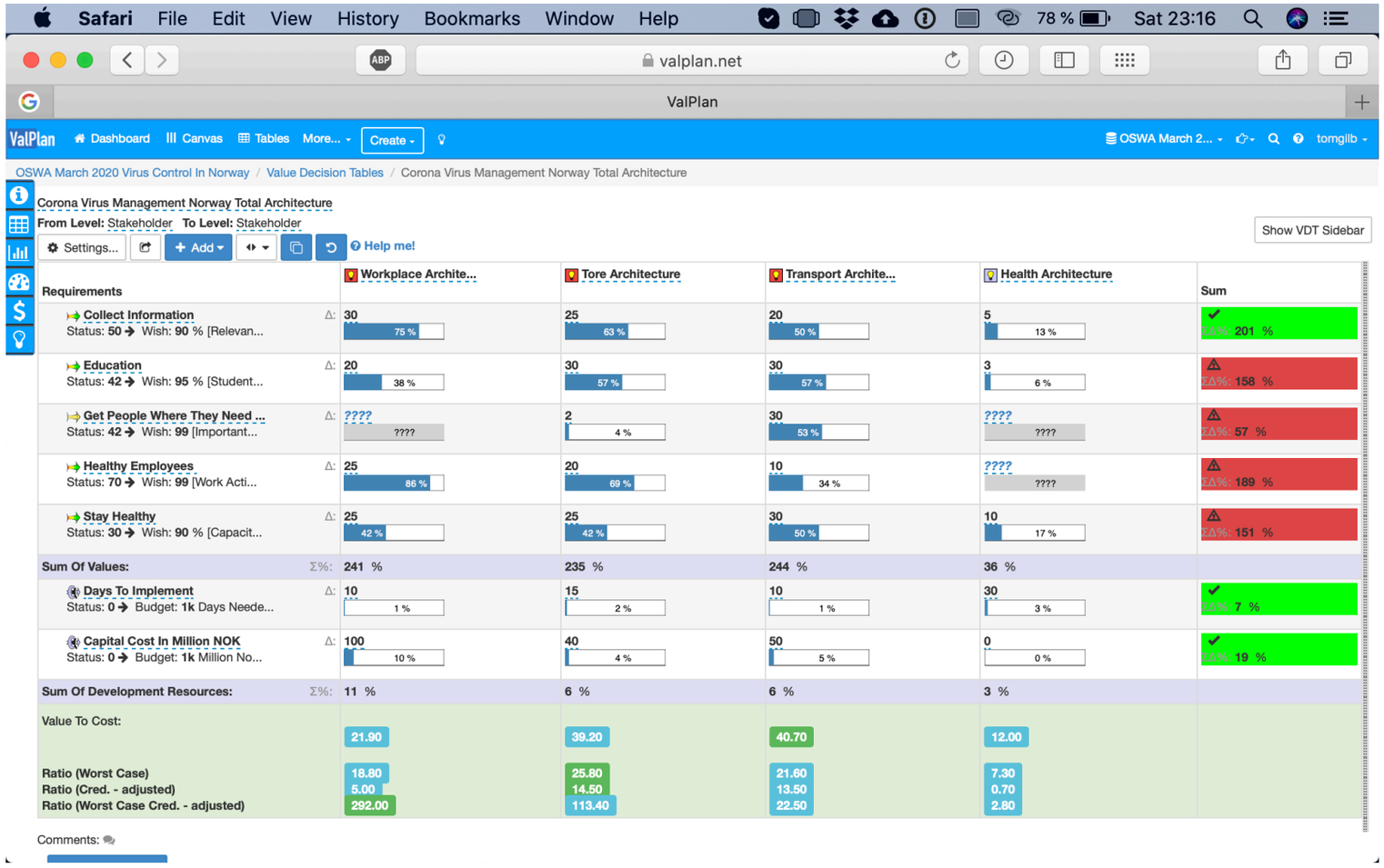


Figure 3.1.12 A The table from above Figure 3.1.11 has been sorted by worst-worst case from left to right. See the bottom row numbers 292, 113, 22.50, 2.50. This is a possible prioritization sequence. At least for the first one. Except for the fact that it is first mainly due to the ???? Unknowns being set to zero impact. So I would prefer to put in some estimates there before believing it is my highest priority.

What me worry about risks?

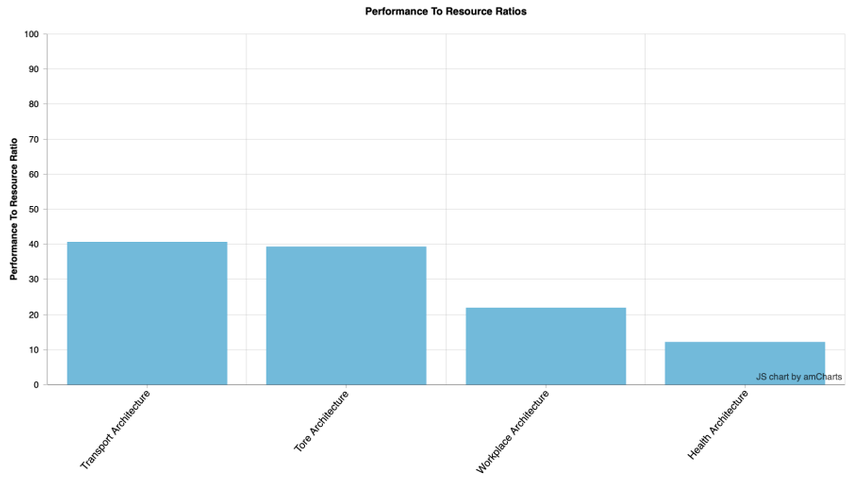


Figure 3.1.12 B Here is a bar chart of the table data, based on performance (values) / resources ratio, without any uncertainties and risks being considered.

Once we have the cost, value, uncertainty, and credibility numbers in the table or any spreadsheet, we can see which options are looking good. We are mainly interested in question like. (1) is the table complete and trustworthy? No ????. (2) is any one of the strategy options *significantly* ahead of the others, in all respects? (3) if two options are close, should we flip a coin to pick one? Or do both in parallel? Or do more research to get better numbers (reduce bad credibility, reduce ± deviation). With a large table it is clarifying to let the software sort the options. But the main point is not actually the delivery sequence. It is the *next* move, the next increment, like chess.

3.1.12 Estimating Future Levels of Value Quantities. Sorting for Priority.

An Impact table has many similarities with a chessboard.
So maybe the experienced planning master can quickly spot useful patterns from a glance at the table data, and quickly work out a few ‘candidate next moves’ to explore further. I think that sounds right to me. I can.
In fact I’ll bet an artificial intelligence program, or something simpler, can do the same, maybe better than a master human!

We are exploring ways of doing this.
And sorting the strategies automatically based on the estimates is a good first step.

Other immediate steps would be to remind us of defects and weaknesses in the table, like ‘????’
The warning of low credibility evidence is also in place already too.

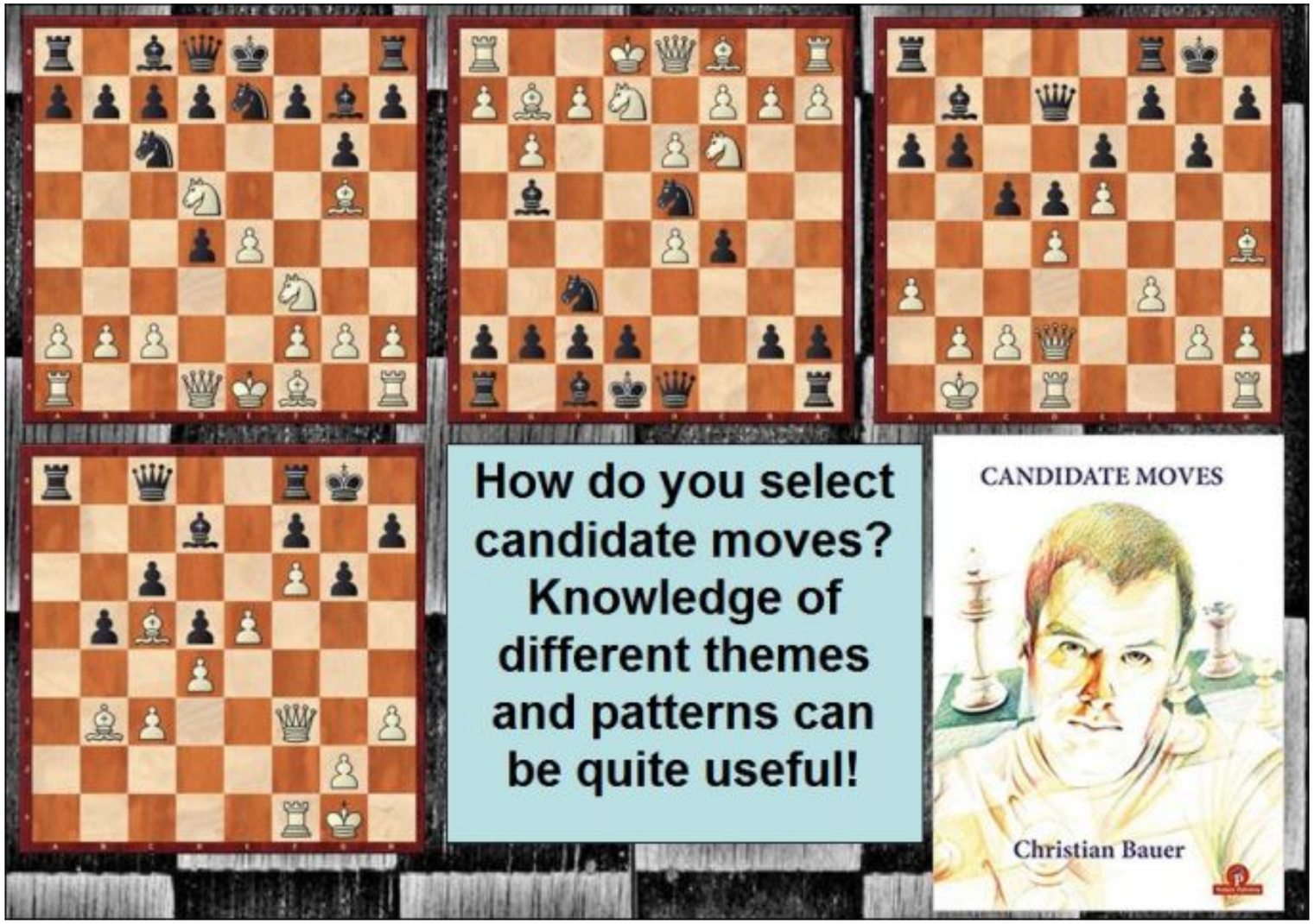


Figure 3.1.12 C. https://en.chessbase.com/post/candidate-moves-a-grandmaster-s-method

3.1.13 Estimating Future Levels of Value Quantities. Limitations and speculations.

What are the *limitations* of an Impact Estimation table ?

I have mentioned quite a few limitation and problems above, as I commented the various components of my quantification methods. Here is a systematic overview.

1. The table is a form of unnecessary bureaucracy, a genius knows what to do without it, because they have something like this table their head already. But not all of us are geniuses. *My Dad (100 patents) said the if you could not rotate your design in detail in your head, and needed drawings, you were not much good. I personally (0.0 patents, need the written models).*

2. People will need a study-effort to pick up the IET method. One good friend of mine, Chris D, did not realize fully the power of IET for almost 25 years. Then he had to plan Brexit, and he 'fell in love with IET'. So appreciating IET, can take time. Sorry I won't be around to see you 'get it'. (I'm 80)

3. All models are wrong, but some are useful, the old saying goes. If you can make this IE model quickly, a day or so, then it may be *more useful than wasting the next incremental step of a week or a month*. That is what we really do. A day drafting an IET, using a handful of teams (3 to 20 teams) working in *parallel*. But using a year, to build the table, is probably *not* a good idea, simply because small weekly increments and feedback, can give you ***better* estimations**. Reality beats models any day, I think.

4. **Dwight Eisenhower** said, "planning is everything, the plan is nothing." Because the moment you go into battle, everything changes, and the enemy and competitor will do everything to invalidate the planning you have invested in. Planguage quantification makes people think deeply. That is a simple reason managers should insist on it. So if their teams do not actually do deep thinking, Planguage and IET will expose their superficial work. To themselves, and if they ignore the warnings, to others.

5. The accuracy of the Impact Table is something like 'order of magnitude'. I have seen clients, experts in their domain, get better than that, say ±20 % within reality. One reason, is that it is faster to get even more accurate data by experiments and incremental steps. Feedback. Real agile.

6. In practice, it turns out that at the table cell intersection of every strategy (some new and untried, some undocumented) and every value and cost, we really *know very little*. We have very few cases, facts or experience at all, let alone scientifically proven data. *My father warned me to never trust the tables in engineering handbooks anyway. Measure reality, was his way.*

7. The problem is that technology, economy, politics, social mores: change so rapidly today, that we don't have a stable basis, to measure things. So we don't easily get solid data in the IE tables. But that is not a good reason to not see the best you *can* get, and see what is uncertain.

8. The desire for the most ambitious project; to be world beaters, and go where no one has gone before them, by using entirely new technology, does not help to give us high-credibility estimates. We are always pushing the *unknown*. The *well known* is *uncompetitive*.

9. I think that rapidly-made, and simple IET versions, followed up by decomposition of the most promising strategies, and testing them measurably, is the best practical IET-use we have seen. That is the Evo method [B2.**Decomposition].**

10. Using the IE-table as a *format*, to keep track of an emerging complex systems, for project management has been done successfully [P2] but has not yet been validated on a large scale, as most other of my methods have been validated (at HP, Intel, Boeing etc.). Even 25 real aircraft projects, which seemed to work well at McDonnell-Douglas, was not 'research proof' of the method. I'd like to see 25,000 people using it for 10 years in hundreds of projects. It can happen. Even then it is likely that the method will be improved, and not least, *will be automated. Automated* so much, we will hardly know what is really 'under the hood'. It will just give us some hot tips, that will tend to work better the our human planning. Big Data and AI.

3.1.13 Estimating Future Levels of Value Quantities. Limitations and speculations.

The biggest **limitation** of the Impact Estimation Tables is that it is a *simplified model.*
It's corresponding **strength** compared to other system models, is that it is more
quantified, structured, and transparent.

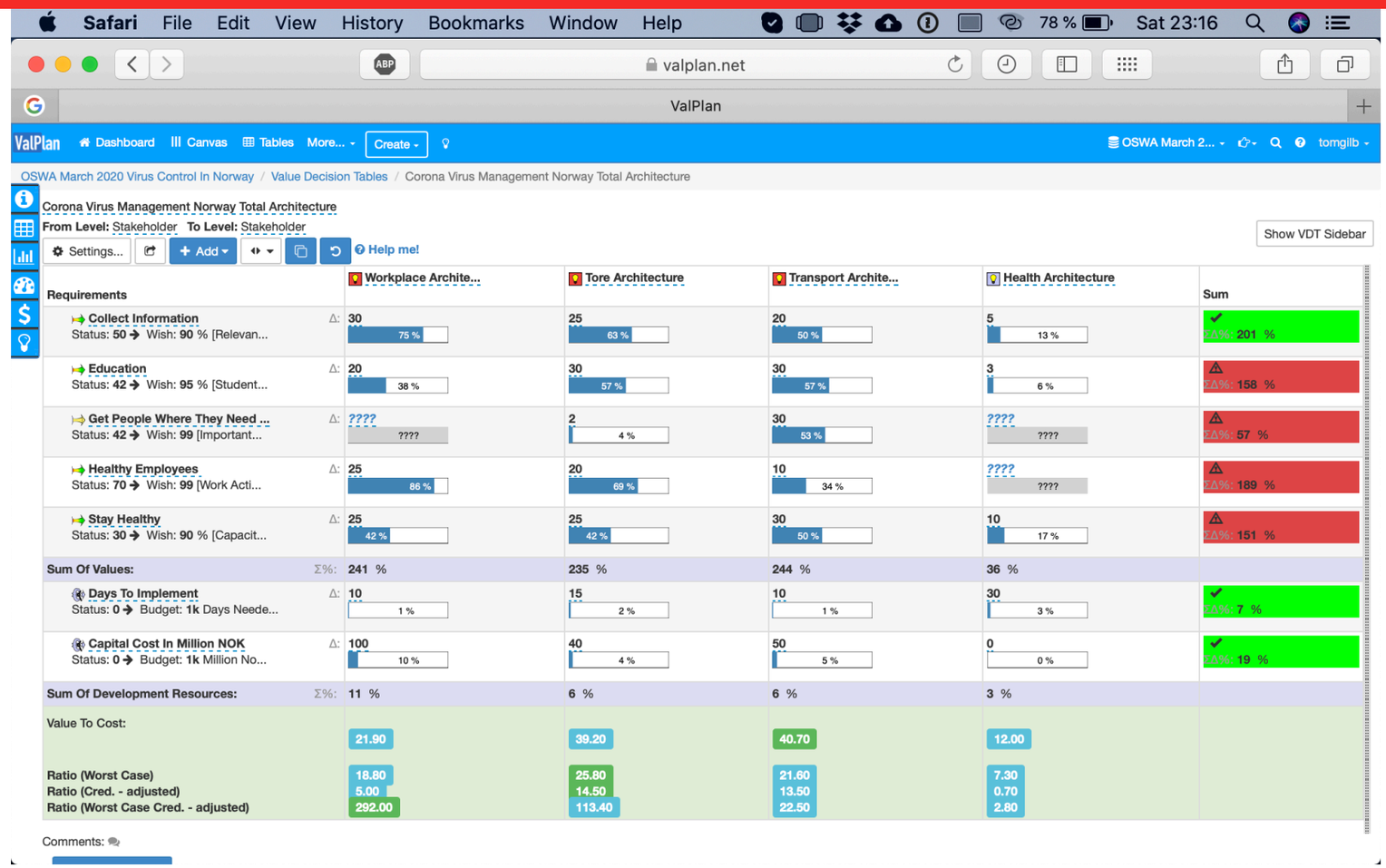


Figure 3.1.12 A

3.1.14 Quantifying Delivered Levels of Value Quantities. Actual and feedback.

Tracking Value Delivery, and Cost expenditure against plans

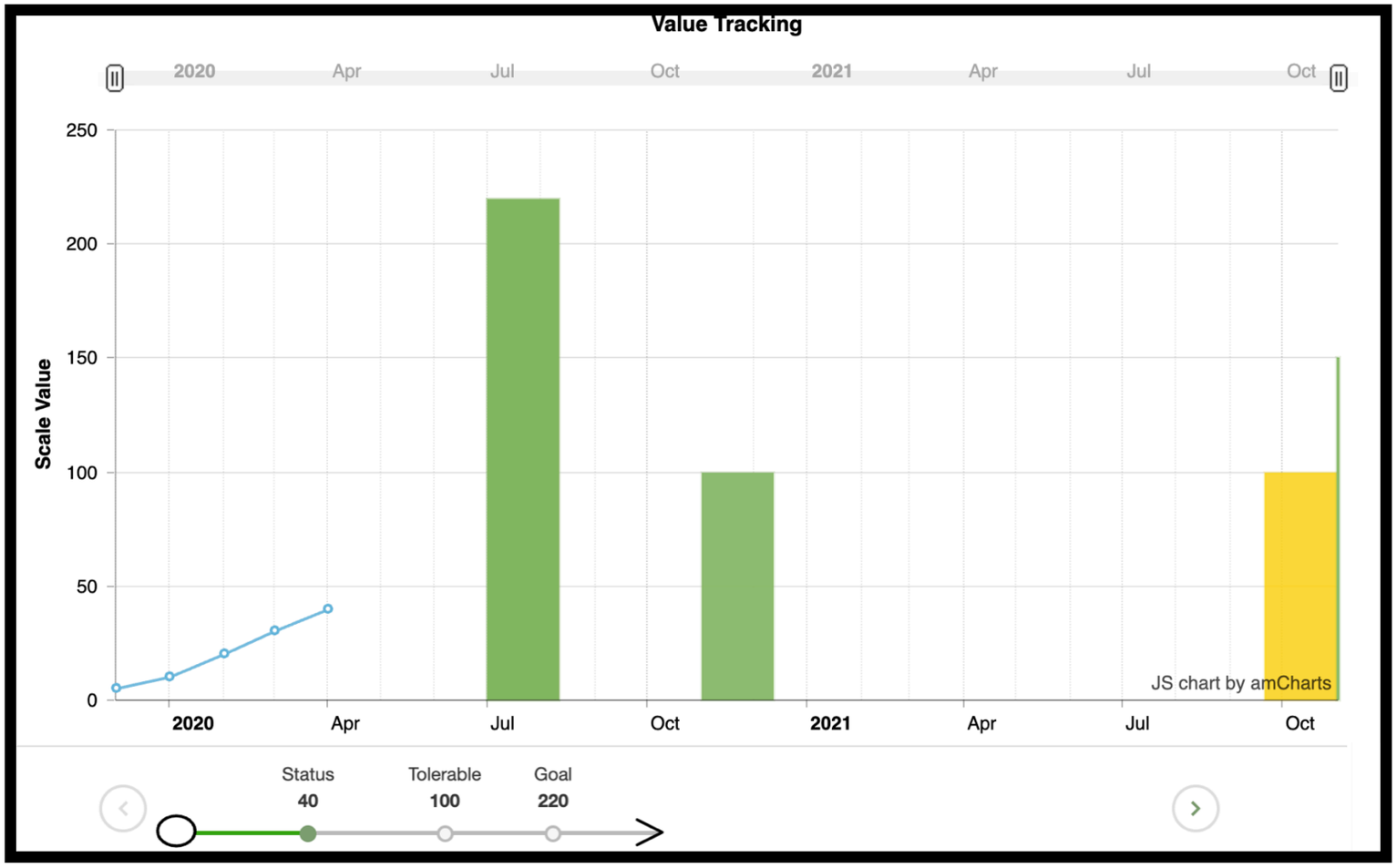


FIGURE 3.1.14 A. STEPWISE AGILE DELIVERY TRACKING AS COMPARED TO REQUIREMENTS LEVELS AND TIME [R.ValPlan]

Up to now we have treated *planning* quantification. Quantification of *requirements*, and quantification of the effectiveness, and cost-effectiveness of *designs (strategies)*.

For decades, using simple spreadsheets, our clients have gone one step further. They have integrated the plan, with *agile incremental feedback*. This is that same concept as *budgeting* and *accounting*. The difference is that we use it to keep track of far-more than *money*. In fact we use IET to keep track of far-more important things than the money expenditure needed to produce the critical values for critical stakeholders, *like* **'your life'** in a pandemic. (agreed? 😏).

This process of quantification is called **measurement**.

That means we somehow measure the incremental changes in values and resources, when we insert an incremental value delivery sub-strategy into a system.

In simple terms, if we get 'all critical values and costs', within an expected range [2.12, R.LandingZones], we have succeeded with the increment. We can then think about delivering the next increment.

If we are *negatively impacted* on a critical requirement value or its costs, compared to expectations (Landing Zones, Tolerable and Goal levels), as measured by planned Meters, then we need to take action.

Actions can be; to remove the increment, and/or to improve the design of the increment, or at an extreme, to re-negotiate more realistic requirements. A great example of this is IBM Cleanroom [P3.2] where Architect Quinnan makes such decisions (re-architect, change requirements, do nothing) every increment. This is the same as my Evo method [B1, B2, B7] in principle. It is 'agile as it *should* be' [B8], but it is 'not yet' popular, for there are too many people; who have 'agile without value quantification', with '*coding'* and '*stories'* as *their* 'value' ideas. Terrible for society, but I can't order it to stop. Perhaps *you*, can 'stop the madness' in your territory. You probably have the power, but do you have the courage and idealism?

3.1.14 Quantifying Delivered Levels of Value Quantities. Meter.

The ‘Meter’ Planguage parameter, is a *designed-for-a-scale-and-system* test process. ‘Meter’ specifies *how* we are going to measure the systems values and costs, at any given time, and for any given conditions. It is a **quantification tool. A Test tool, a measuring tool.**

Meter: Our Automatic Built-In Measure of Security XYZ, applies Operational Status = {Incremental Sub-strategy Delivery, Ordinary Full System Operation}

We can plan any number of Meters, for each single Scale of measure, at any time, Some during incremental development, some during maintenance, some for system recovery,
some for daily use.

Some Meters will be quick and cheap, some will be expensive and take a long time, like testing a Virus Vaccine.

In large systems, like a health system, or a space-travel system, the design of meters is a major engineering undertaking, and an evolution in measurement sophistication, that may continue for the life of the system.

The design of a Meter, for large and complex systems must consider, like all complex systems, a set of **Meter Values**, like *Accuracy, Reliability, Usability, Security*, and more. The Meter attributes must also consider a set of resources (*development, setup, operation, training, recruitment,* and more). Sometimes Meter development is a major project in its own right. ‘Meters’, in general can be a costly part of the system. Perfect instant, measurement has infinite cost. So, all real Meters are cost-effective balanced designs; between the ‘measuring qualities we Wish for’, the ‘value of increased Qualities of measurement’, and the various *cost* aspects.

At the other end of the scale of Meter complexity, it might be quite satisfactory to simply use Meters that already exist (the stock market, UN Statistics, old Meters built into the old system being changed) or the simplest, and arguably not too shabby one, of *waiting to see if the stakeholders complain*; the Politician’s Meter.

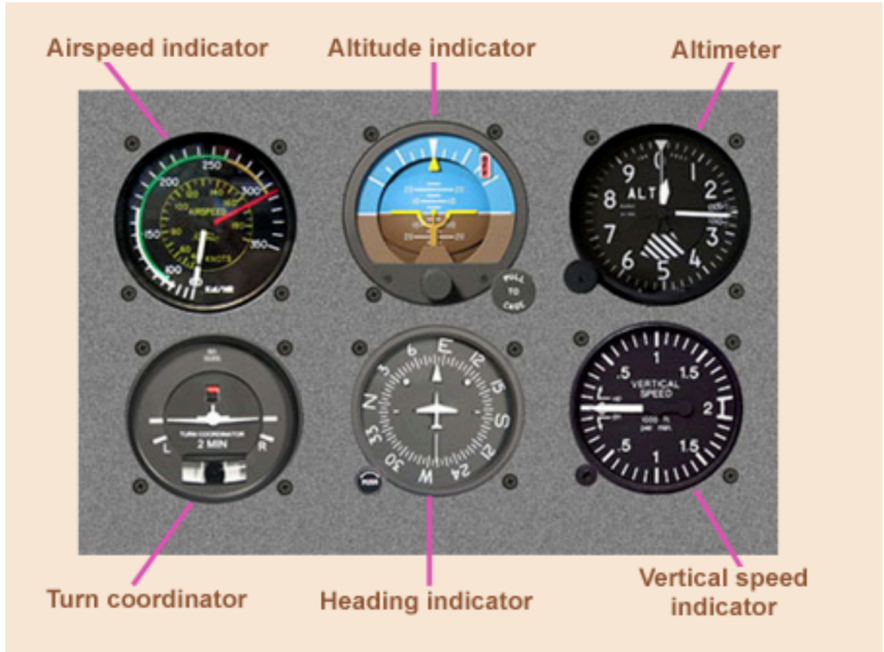


Figure 3.1.14 B, https://www.lavionnaire.fr/VocableInstVol.php

The point of other Meters always being, to *quantify now*, *before* the mob riots in the streets (Minsk, Portland and Lebanon are in the news today). In simpler terms; the Meters are an investment, and they have to ‘pay off’.

I do not need to have defined a Meter, up front, when designing a Scale. A Scale alone is a powerful planning communication tool. If I tell you “I Wish to get to the moon and back in 5 seconds”. I do not need a Meter. The Meter only comes in to play to prove that a plan implementation works well, or not. A planning idea that is never going to happen, does not need a Meter, and certainly not an expensive one.

In agile, my agile Evo methods, that might be the ‘week after project start’, we need a Meter. But some planning systems have a long time, from start of planning, to real action on the battlefield.

3.1.14 Quantifying Delivered Levels of Value Quantities. Meter.

Security:

Scale: % of [Attacks] which [Succeed] on [Components] located in [Areas].

Long Term Security Statistics: **Meter: by 2025,** [Attacks = Hackers, Succeed = Lockout, Components = IT Infrastructure, Areas = Government Areas] ISO Standard 22335, Product Sec-X Latest Generation, by F-Secure.

Expert Spec Owner: F-Secure, CTO
Justification: Required by National Security Law, and option approved by Emergency Cabinet 23 Aug -20

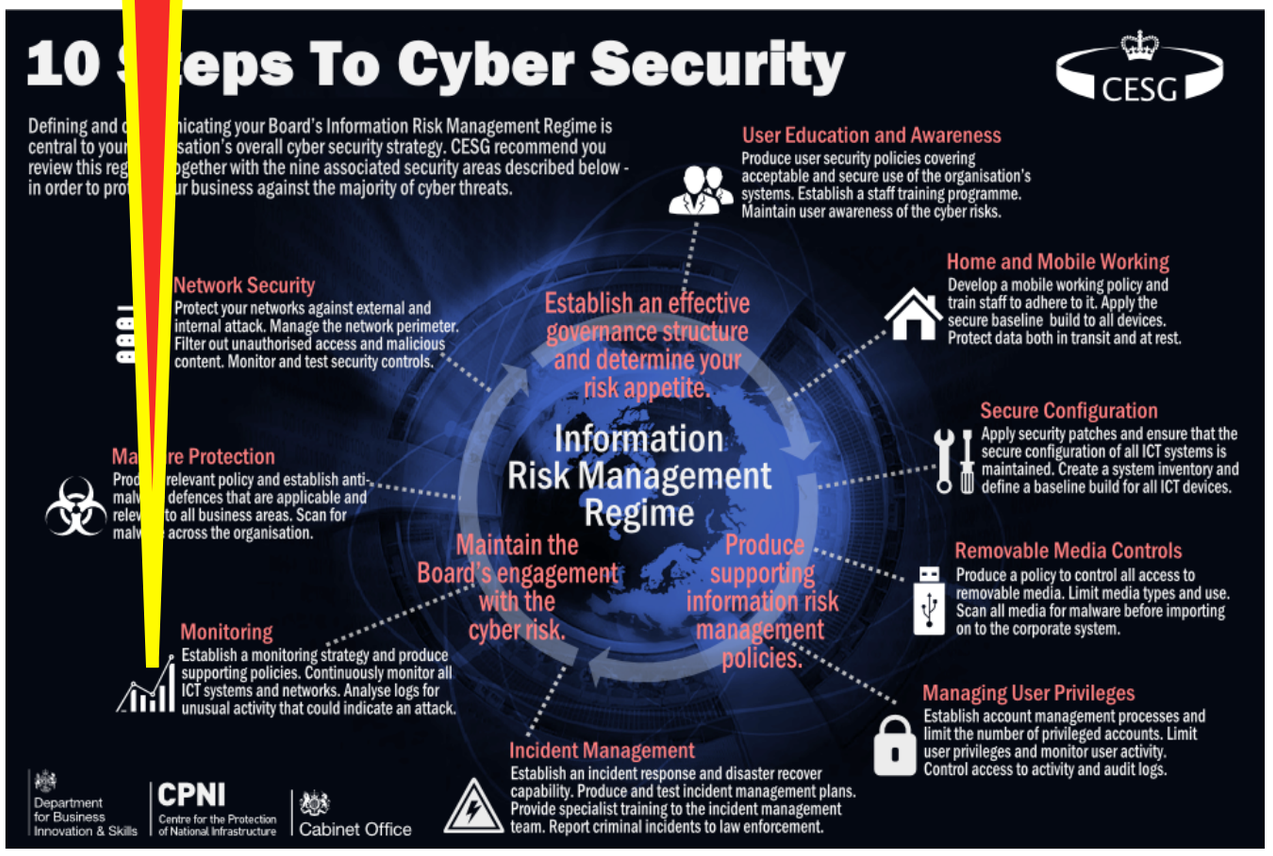


Figure 3.1.14 C. https://www.gov.uk/government/publications/cyber-risk-management-a-board-level-responsibility/10-steps-summary

3.1.15 Estimating Future Levels of Value Quantities. IET Applications.

OK we can quantify our 'soft' values. We can then quantify our designs' impact on those values. What can we do with such tools? They are very general tools, like the Swiss Army knife.

They can be used for any systems, in any domain, large or small. Even the largest [S13, P14]. As to the smallest, they can run on intuition alone, no IET, and do little damage.

The range of applications is without any known limit, according to my experience. I can hardly think about any challenging new problem,(and I seem to find them weekly) before I must bring out these tools to think about it.

I suppose Planguage is a tool similar to language and mathematics, a systems engineering language, a planning language, and certainly a Pattern Language.

The origin of Planguage was about 1960-1 when I worked at an insurance company (Storebrand, Oslo) which wanted my help selecting their first electronic computer. I realized that there was far more to acquiring a computer than its speed, which was the dominant talking point then. There were things like the degree of long-term service, and maintenance, that could be expected, and whether the supplier would at all be in Business in 5-years time. So I realized that the evaluation of computers, would be the evaluation of many soft values, not all about the hardware alone. I also knew my client, the Actuaries were both interested in numbers, and interested in the long term. So I drafted something looking very much like an Impact Estimation table, minus many of the developments I have shared with you in this book. I was not yet an expert on turning values into numeric scales. But I treated it as a multi-value multi-cost problem. We made a good choice (IBM 1401) and IBM did indeed stay in business to this day. None the others did. That was 60 years ago. And I used the time since, to improve the methods. And to try them out in a wide variety of applications. It made life quite amusing.

So, this first application of multi-dimensional evaluation was for ***comparing alternative options.***

Other applications followed, a list on the next page. Here is a list of the basic applications.

1. Comparing complex options.
2. Building and evaluating a total architecture.
3. Managing a project.
4. Presenting complex systems, selling them.

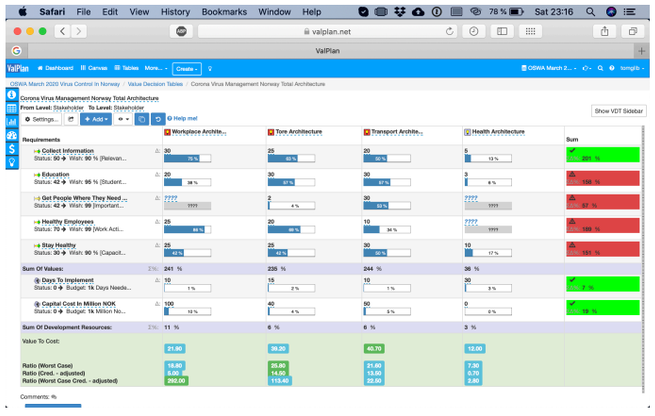


Figure 3.1.12 A

IE can be used for a wide variety of purposes including:

1. Evaluating a single design idea. How good is the idea for us?
2. Comparing two or more design ideas to find a winner, or set of winners. Hint: Use IE, if you want to set up an argument against a prevailing popular, but weak design idea!
3. Gaining an architectural overview of the impact of all the design ideas on all the objectives and budgets. Are there any negative side effects? What is the cumulative effect?
4. Obtaining systems engineering views of specific components, or specific performance aspects. For example: Are we going to achieve the reliability levels?
5. Analyzing risk: evaluating a design with regard to 'worst case' uncertainty and minimum credibility.
6. Planning evolutionary project delivery steps with regard to performance, value, benefits and cost.
7. Monitoring, for project management accounting purposes, the progress of individual evolutionary project delivery steps and, the progress to date compared against the requirement specification or management objectives.
8. Predicting future costs, project timescales and performance levels.
9. Understanding organizational responsibility in terms of performance and budgets by organizational function.*
10. Achieving rigorous quality control of a design specification prior to management reviews and approval.
11. Presenting ideas to committees, management boards, senior managers, review boards and customers for approval.
12. Identifying which parts of the design are the weakest (risk analysis). Hint: If there are no obvious alternative design ideas, any 'weak links' should be tried out earliest, in case they do not work well (risk management). This impacts scheduling.
13. Enabling configuration management of design, design changes, and change consequences.
14. Permitting delegation of decision-making to teams. People can achieve better internal progress control using IE, than they can from repeatedly making progress reports to others, and acting on others' feedback.
15. Presenting overviews of very large, complex projects and systems by using hierarchical IE tables. Aim for a one page top-level IE view for senior management.
16. Enabling cross-organizational co-operation by presenting overviews of how the design ideas of different projects contribute towards corporate objectives. Any common and conflicting design ideas can be identified. Hint: This is important from a customer viewpoint; different projects might well be delivering to the same customer interface.
17. Controlling the design process. You can see what you need, and see if your idea has it by using an IE table. For example, which design idea contributes best to achieving usability? Which one costs too much?
18. Strengthening design. You can see where your design ideas are failing to impact sufficiently on the objectives; and this can provoke thought to discover new design ideas or modify existing ones.
19. Helping informal reasoning and discussion of ideas by providing a framework model in our minds of how the design is connected to the requirements.
20. Strengthening the specified requirements. Sometimes, you can identify a design idea, which has a great deal of popular support, but doesn't appear to impact your requirements. You should investigate the likely impacts of the design idea with a view to identifying additional stakeholder requirements. This may provide the underlying reason for the popular support. You might also identify additional types of stakeholders.

*Note: * In 1992, Steve Poppe pioneered this use at executive level while at British Telecom, North America.*

Figure 9.2
Purposes for the use of Impact Estimation. IE can have a wide variety of uses for a systems

Oh yes, 'Planning Brexit', too (true!)

Or at least making it clear that it was no simple matter.

3.1.16 Estimating Future Levels of Value Quantities. Principles of IET.

1. THINK: Impact Estimation (IE) makes us think, research, and present; much more objectively and clearly, about any type of *means* (strategies, options, designs, architecture, solutions).

2. QUANTIFY-V **X** QUANTIFY-S: IE combines two major quantification ideas: the *quantification of all critical stakeholder* ***values***, and the *quantification the* ***impact of solution attributes****, on those stakeholder values*.

3. OVERVIEW: IE being completely numeric, means that we can compute a number of interesting 'overview numbers', such as the *overall values for costs with regard to risks*, and the *safety margins for the overall set of ideas*.

4. RISKS: The IE Table allows us to specify risks, see risks, cumulate overall risks, and to prioritize; *based on* risks.

5. CREDIBILITY: the detailed collection of *Evidence* for an estimate, and the *source* of the evidence, can be turned into a *Credibility number*. This makes us able to see *how risky* it is to believe the evaluations of the IE model. We can even, for example, look at the *average credibility rating* for 100 or more cells on a 10x10 table.

6. AUDIT: any type of audit, review, or Quality Control, of any plan, is structurally made much-easier, by organizing the plan into an Impact Estimation Table (IET).

7. PRIORITY: The IET gives us a systematic set of data for *initially*, and then *iteratively*, **prioritizing** the agile *implementation* of sub-solutions, based on their cost-effectiveness, and risks. No *fixed subjective* weights!

8. LEVELS: You can model 'any size of *complexity* of system', using a hierarchical set of IE Tables. Usually starting at the top with about 10x10, or a page, then decomposing values, and strategies, as needed, for detail.

9. An IE Table can be used as a project **budget**, and then measurement of values and costs delivered incrementally can be used as the **'accounting system'** for progress of the project.

10. AI: the structure, defined concepts, and quantification in an IE Table, and in Planguage, is a basis for *artificial intelligence* of many sorts, for example *automated design* or architecture; and automated Quality Control.

    This was conceptually pioneered, with still-working apps, by Lech Krzanik, Aspect Engine, on an Apple II in Forth, for his PhD, in late 1970's [B15, 1988]. We think we are ready to move forward on this, with the advent of AI, Big Data, Internet, ValPlan and GraphMetrix tools.

IET Principles Version 010621 © T Gilb

3.1.16

The Impact Estimation Principle:

Any solution's effectiveness can be quantified for any critical stakeholder-value quantified-requirements.

We do not need opinions.
We do not need soft undefined values.
We do not need assertions without evidence
We do not need suggested solutions without responsible people.
We *can* think like engineers about *large complex systems,* who *must* use *engineering thinking* to avoid failure.

4.0 Rounding off for QUANTeers.

This is the end of the book

(24 August 2020, Major edit 040621).

It is sufficient for purpose. Any further extension or improvement needs to be driven by demand.

I am always happy to get feedback from readers, and especially about your experiences using the ideas here. If anybody has some serious improvement suggestions, let me know too. tom@Gilb.com

I would welcome translations in whole or part.

Happy to talk with potential publishers or distribution channels.

Until further notice free copies are at (my Dropbox)

https://tinyurl.com/QUANTeer

I would be happy to let it be hosted at a more permanent URL

4.0 Rounding off for QUANTeers. What you can do today and this week

Well, what now?

1. TRY: there are a large number of semi-independent tools here. You do not need anyone's permission to try them out, even at work. You do not have to fully understand or master, or adopt the whole of Planguage. Just take simple steps, get experience and confidence, do more.

2. ANALYZE FIRST: [B13. **PLanalysis**]. You can quite safely observe the flow of talk, plans, slides at work. You can think your own thoughts quietly. Make your own notes. Keep your attention on the fuzzy objectives ('Better Security') and the fuzzy solutions ('We are going to be more agile, so as to be more competitive')

3. EXPERIMENT: Experiment with this privately, at home, rewriting and re-organizing fuzzy stuff, to make clearer stuff, with Scales and Impact Estimations.

4. ALLY: If you have a trusted professional friend at work, or elsewhere, to share your thinking. Ask for advice on what to do *politically* at work.

5. MANAGER: is there a friendly open-minded intelligent manager (no that is not an intentional oxymoron 😇). One who is feeling frustrated, career-threatened by past and potential failures. Ask if they would like some 'ideas that will help communication' about the project. Show your ideas, and offer to work out more detail (on your own time, is a really tempting offer, and shows belief and sincerity). I have found management support essential, and some of these managers are smart enough, and well-educated enough to see the opportunity, and ambitious enough to do something about it.

In the Governeering book (B12. **Governeering**), there are my personal case studies of this. Especially Generals, without having tackle the Defence Minister or Prime Minister/President.

6. TOP TEN ONE PAGE: Offer to draft the top-ten most-critical objectives quantitatively, on a single page, by next week. Well, do it yourself secretly, *before* you offer!

7. TABLE: offer to sketch the top ten objectives, versus the top ten strategies, on a single spreadsheet (or Word/Pages table). Again, do it *before* you offer it. Do some things to 'impress the hell out of them', like evidence and credibility, for the dubious stuff some idiot proposed (like the CEO, if you want to live dangerously).

8. There is plenty more to read, videos to see, courses to go to (paid and free), if you are that type. But r*eal practice* is the best step.

9. One of the smartest creative practical geniuses (FG) I know, told me he had read Competitive Engineering book (B1, free!) Nine times (I didn't believe it at first either). It is like much I write, packed with about 10 ideas per page (500 pages x10 = 5,000 ideas, check it out). So one option is Play It Again Sam. Some give up. Winners Persist.

10. Now maybe you have a *personal* learning and doing style. None of my business. You know how you learn best. I do, I do! One good friend (CD) , the one who does Brexit planning, simply books me for a long breakfast meeting on Saturday, for years, now on Internet Meetings.. Then he does real work with the ideas. Do tell me ideas of how to learn this stuff. Hey put my long videos on, in your sleep, just the sound!

🤩 Have fun!

4.0 Rounding off for QUANTeers. The Quanteer Principles.

The next page is a repeat of the opening Quanteering principles from Part 0.4

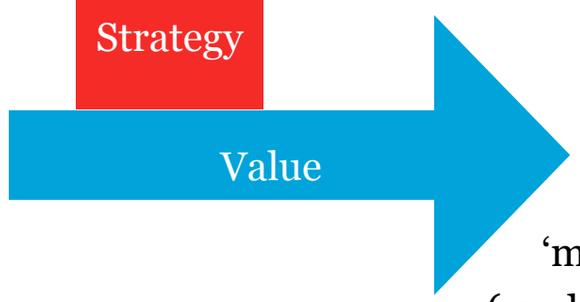
Maybe they are more intelligible for you now?

If you have read this far, please send me an email that you did
tom@gilb.com
Thanks.

First draft 24 August 2020
Major Edit 2 June 2021

An author is always very curious as to what the readers think!

0.4/4.0 Principles of



1. **QUANTIFY ANY VARIABLE**: All variable attributes can be expressed numerically, for greater clarity.

2. **ANY 'QUANT' CAN BE MEASURED**: If you can quantify a system attribute, there is always a set of measuring methods to track change, which are cost effective for your purposes.

3. **TOP CONTROL**: Quantified top-level critical stakeholder objectives, are the definition of success, and of failure; and the primary instrument for managing anything.

4. **OBJECTIVES LEVELS:** There can be many related levels of objectives, some supporting others, and it is important to be clear about these relationships and responsibilities.

5. **MEANS SERVE ENDS**: All specifications, that have as a purpose, to deliver improvements in objectives, are the 'strategies' or 'means', for *those* objectives or 'ends'. There are 2 main kinds, *strategies* (something to do) and *means objectives* (an attribute level to meet, to support a higher one)

6. **STAKEHOLDERS DECIDE:** Stakeholders are the source of all objectives and constraints. They may be wrong, wavering, unclear, and internally inconsistent about these requirements, but they have a right to be subjective ('we want'), yet also responsible for their opinion.

7. **STRATEGY SIDE EFFECTS:** Strategies, all 'means', have a large set of their own attributes (qualities, costs, constraints) which will impact your system; these need to be estimated, measured, and 'monitored for the system lifetime'.

8. **MANY TO MANY**: In any system, no matter size, there is a top-level viewpoint of the top-critical-requirements (objectives and budgets), which are impacted by the strategic architecture (the main means for delivering requirements), and this can always be modeled on a table, and measured on a table. [B1, IET Chapter]

9. **DECOMPOSITION**: all objectives, all resource budgets, and all strategies, can be decomposed by factors of 10x and 100x into prioritizable incremental value-delivery steps; in order to manage the project of 'reaching the goals'. [B2, Decomposition Chapter]

10. **DYNAMIC DESIGN TO ATTRIBUTES**: Iron triangles are false ideas. You can only *roughly* estimate the long-term effects of strategies on requirements (values and costs). But you can choose to prioritize any requirement level, at any incremental step; you can design explicitly to reach any resource requirement or value Goal; and then you can tune your requirements, and above all your strategies, step by step, learning by feedback, so as to generally attain a very high level of value-attributes early, or/and within contractually fixed, costs-and-deadline constraints. [P3.3].

[References]

Many people try to s*ell* you their ideas,
I *give* you ideas that actually have worked well for decades.
See the many quantified named case studies below.
Here is one man who offers his opinion about the methods.

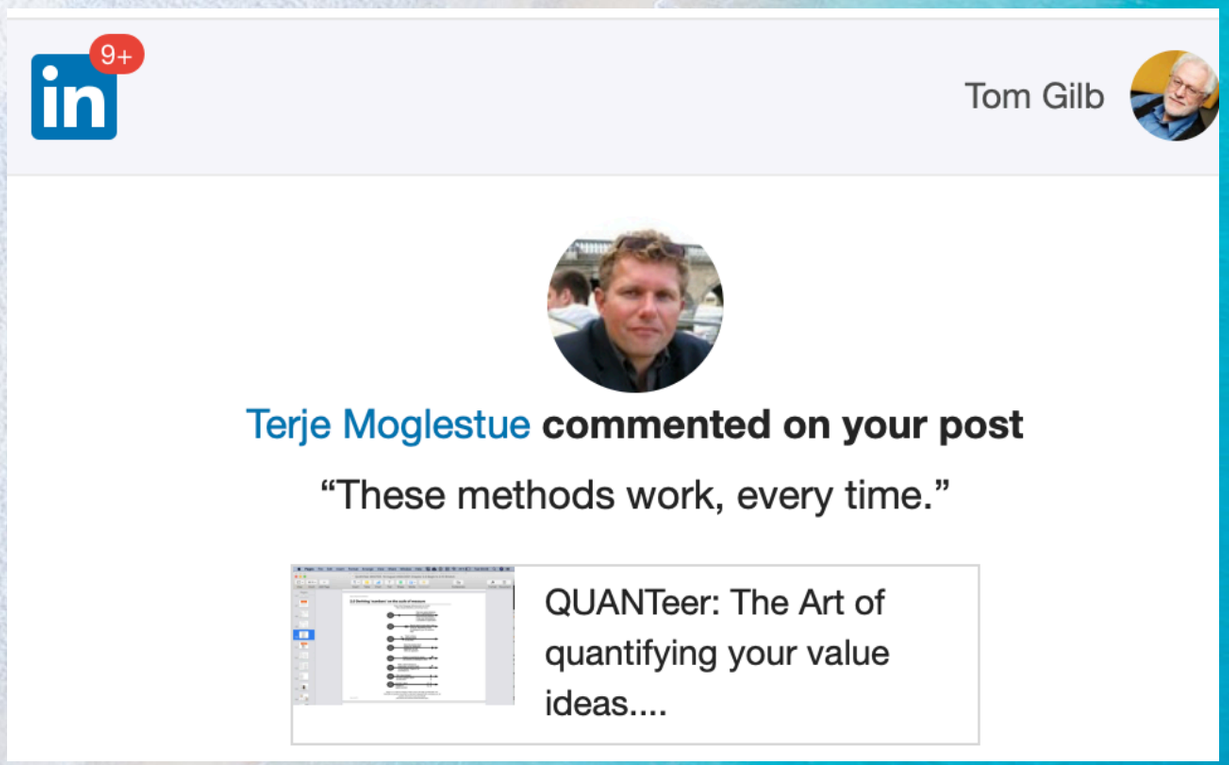


Figure: References Posted 18 August 2020
Terje was a student at a college in Norway I lectured at in 1985.
He is now a top Government Consultant in UK
He says he got his latest assignment by mentioning Gilb Methods in the interview.
(during Covid when jobs were scarce!)

B Gilb Books. Page 1

Main Current Books Written by Tom Gilb. Supports this book with detail.

B1. **Competitive Engineering** (paper or digital 2005).

The **definition of the Planguage**. A Handbook and a Planguage standard.

https://www.gilb.com/p/competitive-engineering (free pdf)

and paper via Amazon (Kindle and paper)

https://www.amazon.com/dp/0750665076/ref=rdr_ext_sb_ti_sims_2

B2. **Value Planning**

"Value Planning. **Practical Tools for Clearer Management Communication"**

Digital Only Book. 2016-2019, 893 pages, €10

https://www.gilb.com/store/2W2zCX6z

This book is aimed at management planning. It is based on the Planguage standards in 'Competitive Engineering' (2005). It contains detailed practical case studies and examples, as well as over 100 basic planning principles.

The 'Technoscopes' book (2018) is a condenses version of this with the 100 principles and some examples o quotes related to the principles.

The 'Vision Engineering' book is. Short (60 pages) top manager oriented overview of the ideas in Value Planning, and it is the front end (the real book) of the Value Planning book.

B2.**Decomposition**: https://tinyurl.com/VPDecomposition

B2. **Prioritization**: https://www.dropbox.com/sh/34llx1a7ckyagxl/AAA0pDzSxN5WmoP9lOKR0Mpca?dl=0

B3.**Vision Engineering**.

"Value Planning: **Top Level Vision Engineering"**

How to communicate critical visions and values quantitatively. Using The Planning Language.

Paid Version via D2D Booksellers 250721

A 64 Page pdf book. Aimed at demonstrating with examples how top management can communicate their 'visions' far more clearly.

B4. LINK TO **5 NEW DIGITAL BOOKS (B5 to B9)** WRITTEN SUMMER 2019, see also Videos and Slides, same title

See leanpub.com. Tom Gilb

B5. **Value Requirements** book

B6. **Value Design,** Book. July 2019

B7. **Value Management,** book August 2019

B8. **Value Agile ,** _ 2019

B9. **Sustainability Planning,** https://tinyurl.com/UNGoalsGilb, 2019

BOOK, See slides **[P2.2]** http://concepts.gilb.com/dl977

B10. **Books written Summer 2020.** https://www.dropbox.com/sh/tj1p6a3omlg9hx3/AABXuj_YnUmAFeRWOpGVvQtla?dl=0,

B11 **KEN: Knowledge Edu-Neering booklet**

https://leanpub.com/KENGilb, 2020, **CC.**

B12. **Governeering: Government Systems Engineering Planning**: https://leanpub.com/Governeering, 2020

B13. **PLanalysis: A booklet with advice on how to analyze plans, and make them better,** 2020, https://leanpub.com/PLanalysisFree

B14. **QUANTeer: The Art of quantifying your value ideas** (this book), 2020,

https://leanpub.com/Quanteer

B15. SEA. Systems Engineering Architecture, see leanpub.com/SEA. ?

The 2018 5 Books, & Older Gilb Books

G11. **Technoscopes**, 2018

Technoscopes:

Tools for understanding complex projects

https://www.gilb.com/store/Pd4tqL8s

Price €14B12. **Clear Communication**, 2018

G13. **Innovative Creativity**, 2018

'INNOVATIVE CREATIVITY' 124 pages €14

https://www.gilb.com/store/QMMQhn2g

G14. **100 Practical Planning Principles**, 2018

Based on the same 100 **Value Planning** sub-sections and principles.

100 Practical Planning Principles. Booklet €14

https://www.gilb.com/store/4vRbzX6X

G15. **PoSEM** 1988, **Principles of Software Engineering Management**, 1988, Pearson.

Chapter 15 Deeper Perspectives on Evolutionary Delivery, www.gilb.com/dl561,

Whole Book (Paper) https://www.amazon.com/Principles-Software-Engineering-Management-Gilb/dp/0201192462

G16. **Software Inspection**, 1993,

https://www.amazon.com/Software-Inspection-Tom-Gilb/dp/0201631814

G17. **CLEAR COMMUNICATION Booklet**

"Principles of Clear Communication"

By Tom Gilb

DIGITAL BOOKLET €14

Published 31 August 2018

https://www.gilb.com/store/oJCCxtsM

G18: **Software Metrics**, 1976-7,

Gilb Tom. Software metrics. *Studentlitteratur AB Sweden*, 1976., Tom Gilb. *Software metrics*. Winthrop, 1977. (USA Hardcover). The term **Software Metrics** was coined by me here.

G19. **Life Design**, 2018

LIFE DESIGN Booklet €14

https://www.gilb.com/store/kCBGcG6L

P Papers by Gilb and others

Free Downloadable Papers

P1. 'Agile Project Startup Week', gilb.com/dl568

P2. **Confirmit Case** .http://www.gilb.com/DL32, 'FROM WATERFALL TO… BY TROND AND TOM GILB

P3.1 Walston, C.E. and Felix, C.P. (1977) **A Method of Programming Measurement and Estimation.** IBM Systems Journal, 16, 54-73. http://dx.doi.org/10.1147/sj.161.0054, $33 Paywall or IEEE., I have a paper copy of this. Tom Gilb, and some of their original data collection schemes they gave me.

P3.2 **'Cleanroom Method',** developed by IBM's Harlan Mills (IBM SJ No. 4/1980)http://trace.tennessee.edu/cgi/viewcontent.cgi?article=1004&context=utk_harlan

P3.3 Robert E. Quinnan, **'Software Engineering Management Practices' (Part V),** IBM Systems Journal, Vol. 19, No. 4, 1980, pp. 466~77, https://trace.tennessee.edu/cgi/viewcontent.cgi?article=1004&context=utk_harlan (Quinnan is at end Part 5)

See also [S7] **Technoscopes: Meet the Challenge of Engineering Complexity**, http://concepts.gilb.com/dl968 for Quinnan slides as used in Fig 3.2.4

P4. **Full Planguage Concept Glossary,** http://www.gilb.com/dl830

See also [B1] Glossary, and GILB.COM SITE GLOSSARY, http://concepts.gilb.com/A?structure=Glossary&page_ref_id=126

the digital glossary by Kai and company, and ValPlan.net, or other variations of glossary info.

P5. **Agile Specification QC**, in Testing Experience 2009, by Tom Gilb, http://www.gilb.com/DL264

P6. **Estimation: A Paradigm Shift Toward Dynamic Design-to Cost and Radical Management**

Volume 13 Issue 2 of SQP journal - the March 2011 version. http://www.gilb.com/DL460

P7. **Planguage Rules Collection from CE Boo**k.docx,, http://www.gilb.com/dl829, 23 pages., See similar set S3

P8. by Tom Gilb & Kai Gilb, 2018
"All critical outcome value objectives can be quantified and must be."https://medium.com/@kaigilb/principle-quantify-objectives-319a0b9a1f59

P9. **Quantifying Security: How to specify security requirements in a quantified way**. by Tom Gilb, http://www.gilb.com/dl40

P10. **Basic Principles of Security Engineering.**, http://concepts.gilb.com/dl948, 2019, 2 Pages 10 principles.

P11. **How problems with Quality Function Deployment's** (QFD's) House of Quality (HoQ) can be addressed by **applying some concepts of Impact Estimation (IE)**, http://www.gilb.com/DL119

P12. **Plicons: A Graphic Planning Language for Systems Engineering,** (Plicons Paper), http://www.gilb.com/DL37

P13. "**A Critical Review of Definition of Goals**" , in (Norway, in English), Prosjektledelse 1/2020, http://concepts.gilb.com/dl973, and Widmans Paper I criticize, https://view.joomag.com/prosjektledelse-prosjektledelse-nr-4-2019/02662870015730385 89?short

P14. Gilb "**Beyond Scaling: Scale-free Principles for Agile Value Delivery - Agile Engineering",** http://www.gilb.com/dl865 (Paper), (Jan 8 2016). This paper contains considerable detailed systemic explanation as to why the Planguage methods are 'Scale Free'. See Scaling papers S13.

S Slides by Gilb, Free Downloadable

Free Downloadable Slides

S1: PPPP: **Proper Public Planning Principles:** 'Engineering Society', Responsibly

SLIDES = http://concepts.gilb.com/dl980 (pdf) https://tinyurl.com/PPPPslides

Video = https://youtu.be/mIaVLHvQOp0

S2: 'An Agile Project Startup Week'. http://www.gilb.com/dl812

S3. **QC for Design Design Rules from Competitive Engineering** MASTER.key.pdf GilbFest Slides 2015,

http://concepts.gilb.com/dl84, See similar set P7

S4. Most of videos (see below) have a link to their slide set on slide 1.

S5.**"Estimation: A Paradigm Shift Toward Dynamic Design-to Cost and Radical Management"**

Slides made for BCS SPA June 1 2011. http://www.gilb.com/DL470

S6. **IBM FSD MIlls and Quinnan Slides**. http://concepts.gilb.com/dl896 (see also P3.1 to .3)

S7. **Technoscopes: Meet the Challenge of Engineering Complexity**

SLIDES= http://concepts.gilb.com/dl968. (Several IBM Cleanroom and Quinnan slides here)

VIDEO = https://www.youtube.com/watch?v=920rCFYW3ZQ&list=PLKBhokJ0qd3_wlvr0j85YhmNfNj8ZJ8M-&index=2&t=0s

S8.1 **Using 'Evo' to Rapidly deliver measurable improvements to Aircraft Design Engineering Drawing QC"**

Douglas Aircraft 16 Slides (illustrations missing) Based on cut from paper DL254

http://www.gilb.com/DL253

S8.2 DAC Case Paper

"Using 'Evo' to Rapidly deliver measurable improvements to Aircraft Design Engineering Drawing QC"

McDonnell Douglas Aircraft

Gilb Experience Paper for INCOSE 2002

http://www.gilb.com/DL254

Boeing data is also here and in slides.

(the slides in DL253 are derived from this paper)

S8.3 **"Real Case Aircraft Company Top Level Decision Making for CAD CAM Support Systems"**

FOR McDonnell Douglas Aircraft

Gilb Experience SLIDES (14)

NICE SET WITH ILLUSTRATIONS

http://www.gilb.com/DL255

A good example of analysis of management BS

into Planguage. Reference from Harris for Productivity of Gilb methods.

S8.4 **Boeing Slides, '787'**

March 2008 from Tom and Kai presentation, not sure if on gilb.com, can be supplied by author..
Boeing, Renton studied application of my Inspection methods deeply, and adopted them.

S9. **SERIOUS VALUES CANNOT BE B**S**** , Quantifying AI Transparency,**

and UN Sustainability:

http://concepts.gilb.com/dl962, Aim2North Conf. 7Nov2019, Slides

Podcast video 24 minutes before the lecture, https://www.youtube.com/watch?v=J70zf1gF2b8

S10. **What is Wrong with Balanced Scorecard,** slides, http://concepts.gilb.com/dl135, See https://bscdesigner.com/

S11. **10 Suggested Principles for Human Factors Systems Engineering,** http://concepts.gilb.com/dl911, [V14]
Keynote at WUD (Worldwide Usability Day), Silesia, Katowice Poland, 9 Dec. 2017

S12. **ICL CASE Study** from (International Computers Limited), BCS June 12 Lecture 2015, Slides, http://www.gilb.com/dl846

S13. Gilb**. "SCALE-FREE: Practical Scaling Methods for Industrial Systems Engineering"**, lecture slides, http://concepts.gilb.com/dl892, 2016, Considerable citation of Intel experience with Planguage method, by Erik Simmons. Scalability Metrics: and An Engineering Structure, and Principles, for an Agile World for June 5 2018 DND/SINTEF Conference, http://concepts.gilb.com/dl930. See Scaling paper P14.

V Video Talks or Courses by Gilb

Videos with Free Links

V1. PPPP. **Proper Public Planning Principles:** 'Engineering Society', Responsibly

SLIDES = http://concepts.gilb.com/dl980 (pdf, 230620 VERSION). Origin of much of this book.

Video (90 min.BCS Lecture, 23 June 2020) = https://youtu.be/mIaVLHvQOp0

V2. SP. **Sustainability Planning**

https://tinyurl.com/UNGoalsGilbVideo

V3. SA. **Sustainability and AI.** Video Podcast 24 mins., Oslo 2019 Aim

https://www.youtube.com/watch?v=J70zf1gF2b8

V4. **Technoscopes** BCS SPA 2020

https://www.youtube.com/watch?v=920rCFYW3ZQ&list=PLKBhokJ0qd3_wlvr0j85YhmNfNj8ZJ8M-&index=2&t=0s

V5. VA. **Value Agile** Video. https://lnkd.in/dkyJpMZ

V6. VR. **Value Requirements** video 22 April 2020, 3 hours.

https://www.youtube.com/watch?v=ZHrwQtG6IMw&list=PLKBhokJ0qd3_wlvr0j85YhmNfNj8ZJ8M-

V7. VD. Video **Value Design**, May 2020,

https://www.youtube.com/watch?v=y_FaiH5jt6E&list=PLKBhokJ0qd3_wlvr0j85YhmNfNj8ZJ8M-&index=4&t=0s

V8. VM. **Value Management** 2.5 hours, 13 May 2020, BCS https://www.youtube.com/watch?v=mr9gUFWj4Jg

V9. QQ. **Quantify the un-quantifiable: Tom Gilb at TEDxTrondheim** **17 minutes.**

V10. **Generic** Gilb Videos. Search browser for 'Tom Gilb Videos', and hit the 'Videos' selection too.

V11. **gilb.com** has a large selection of videos, free and paid courses. https://www.gilb.com/blog?tag=video

V12. **In Projects, why do Managers Bullshit about their Critical Values?**, https://youtu.be/fFWpxrwvPw8, 42 mins

V13. 2019 WUD Keynote, **"DOOMSDAY: Is the world doomed because we cannot express our Sustainability and AI Goals clearly?",** slides: http://concepts.gilb.com/dl964, 23Nov 2019, #WUDSilesia, VIDEO= **https://youtu.be/BUXVJgWJSMI**

V14. **Tom Gilb: 10 Suggested Principles for Human Factors Systems Engineering,** lecture from WUD Silesia conference 42 m, https://youtu.be/TlDCwmVgDJQ, [S11]

S Slides by Gilb, Free Downloadable

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S3. **QC for Design Design Rules from Competitive Engineering** MASTER.key.pdf GilbFest Slides 2015,

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S10. **What is Wrong with Balanced Scorecard,** slides, http://concepts.gilb.com/dl135, See https://bscdesigner.com/

S11. **10 Suggested Principles for Human Factors Systems Engineering,** http://concepts.gilb.com/dl911, [V14]
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S12. **ICL CASE Study** from (International Computers Limited), BCS June 12 Lecture 2015, Slides, http://www.gilb.com/dl846

S13. Gilb**. "SCALE-FREE: Practical Scaling Methods for Industrial Systems Engineering"**, lecture slides, http://concepts.gilb.com/dl892, 2016, Considerable citation of Intel experience with Planguage method, by Erik Simmons. Scalability Metrics: and An Engineering Structure, and Principles, for an Agile World for June 5 2018 DND/SINTEF Conference, http://concepts.gilb.com/dl930. See Scaling paper P14.

Sources of plans, used as examples

PL1.1 **NHS PLANS,** EASY READ VERSION https://www.longtermplan.nhs.uk/wp-content/uploads/2019/01/easy-read-long-term-plan-v2.pdf

PL1.2 **NHS PLANS,** FULL PLAN: https://www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf

PL1.3. **NHS PLANS,** TWO PAGE SUMMARY: https://www.longtermplan.nhs.uk/wp-content/uploads/2019/01/the-nhs-long-term-plan-summary.pdf

PL2.1 **UN Sustainability Goals,** https://www.un.org/sustainabledevelopment/economic-growth/

PL2.2 **Sustainability Planning** slides, Gilb, http://concepts.gilb.com/dl977, see [V2] video.

PL2.3 SustainableDevelopment.UN.org,

PL2.4 **UN Goal 1 Poverty**. https://sdgs.un.org/goals/goal1

PL3. And also ref.S8.3 **"Real Case Aircraft Company Top Level Decision Making for CAD CAM Support Systems"**

FOR McDonnell Douglas Aircraft

Gilb Experience SLIDES (14)

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into Planguage. Reference from Harris for Productivity of Gilb methods.

R Other References

R.Intel: R1. INTEL 2011 AND 2013. Practical industrial cases. SQC and Planguage
https://selab.fbk.eu/re11_download/industry/Terzakis.pdf (Slides and experiences)

R.ValPlan: R2. VALPLAN INFO
https://www.gilb.com/valplan, actual app is at ValPlan.net
I should declare a personal interest in this company.
1. Based on my ideas [B1]. 2. Our company is marketing it.
Richard Smith, UK, is our developer/designer hero building it.

R.GraphMetrix: R3. GraphMetrix.com
I should declare a personal interest in this company.
(Advisory Board, Investor, Using my Ideas [B1].)

R.Eggplant: David Chapman, https://meaningness.com/eggplant/rationality
I know there is something here related to my ideas, but I am just figuring it out.
150820. #problemsolving #metarationality. In any case deep mind-blowing ideas.

R.LandingZones: Erik Simmons, BEST PRACTICES WHITE PAPER , Landing Zones, Available by email request from Construx. CONSTRUX.COM 2020, Version 1.3, August 2020, See also: http://wirfs-brock.com/blog/2011/07/20/introducing-landing-zones/

END OF BOOK