Walking with Giants: a Research Odyssey

Deming Lecture, July 2019

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Firstly …

- I thank the Deming Lecturer Committee for according me this honour, and for the opportunity to talk about a class of problems that I've been exploring for nearly 30 years.
- And I'd like to introduce you to some remarkable people I've met on the way.
- Several of them are not longer with us, so I want to document something of their contributions because I had a unique opportunity to learn from them.
- I trust that you find their stories and their contributions as interesting as I have. (Some stories may need to be deferred to Q&A after the presentation, in the interests of time.)

The Odyssey

- Origins
- Meanderings
- The climb
- Exploring the plateau
- *But where's the Statistics in all this?*
- Completing a loop

Research origins

- W Edwards Deming suddenly became a public figure in 1980 … at the age of 80!
- On June 24, 1980, Lloyd Dobyns presented a program on NBC News entitled *If Japan can ... Why can't we?*, about the reasons why Japan was a manufacturing powerhouse and the USA was struggling.
- It featured WED.
- The program is credited with starting the so-called “Quality revolution” in the USA and elsewhere.

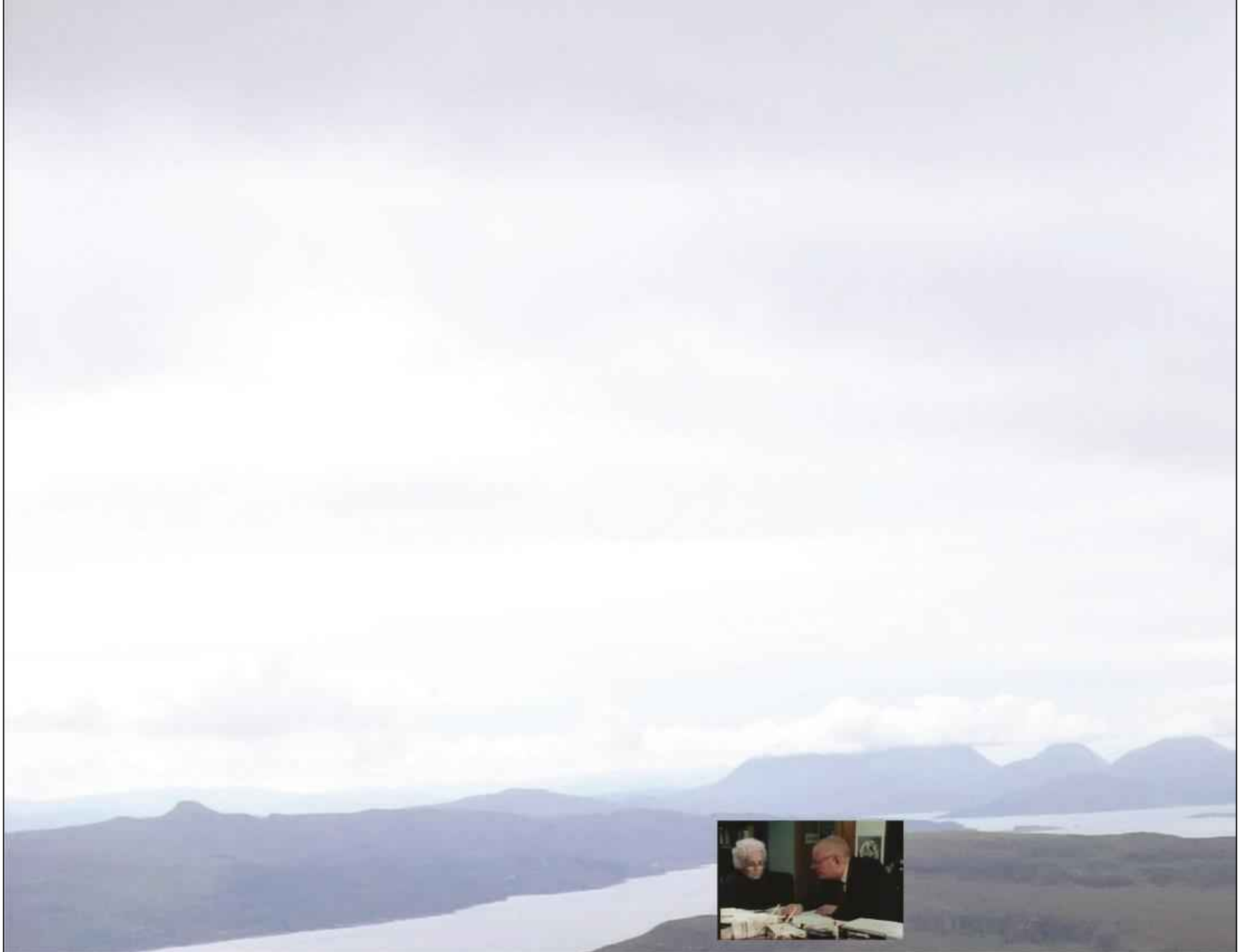

1900 – 1993

Research origins (1991)

- WED started running 4-day workshops around the world.
- I'd just become leader of a CSIRO research group doing a lot of work in Quality Improvement and Quality Management.
- As part of learning something about how to manage, I attended WED's 1991 workshop in Sydney.
- WED made an intriguing assertion:

"The #3 person in a company should be a statistician."

Q1: What would such a person be doing?



Getting started with Quality Management (1992)

- Deming had been hired in late 1979 by Nashua's Chief Executive, William E. Conway*, to help Nashua introduce Statistical Process Control (SPC) …

* Bill Conway features in the TV program (Part 4)

Bill Conway was the first CEO of a Fortune 500 company to apply Deming's thinking to his business.

He took Nashua Corporation from a $100M company to a $1B company in 10 years, through a relentless focus on identifying and minimizing *Waste*, *in all its forms*.

Deming had talked about *Waste* in the NBC program, possibly suggesting to Conway the idea of a focus on *Waste* as the key driver of improvement throughout Nashua.

Getting started with Quality Management (1992)

- In his 4-day workshops, Deming simply espoused Principles: he himself had never been in line management, *and he provided no advice about how to get started*.
  (The same applied to a stream of Deming-inspired "Quality gurus" who subsequently gave workshops in Australia.)
- In 1992, Bill Conway visited Australia to give workshops on his approach. *An engineer, he did have an implementation plan,* which was based on identifying and eliminating **Waste** in all its possible senses.
- My research group adopted Conway's approach to Quality Management, with significant success*.

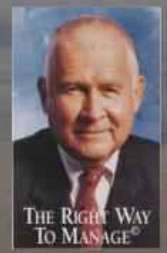
 * As did the ASA Office, some years later! Ray Waller may remember this.

[Aside: What *is* QM, or TQM?]

- TQM (Total Quality Management) is a much misunderstood – indeed abused – term.
- A TQM system is a system for how to manage an enterprise that comprises*
  - principles
  - frameworks
  - a plan for implementation
- The Quality principles are, by and large, now well understood and accepted.
- The frameworks and methods of implementation may well vary, especially with the passage of time.

However, this general approach to management remains relevant.

* See *e.g.* Vogel (1993), Fisher & Nair (2009)


The Right Way
To Manage©

Then we had our QM approach assessed …

- After 18 months, we had our approach to managing ourselves evaluated against the Australian Quality Awards* criteria by a team led by Norbert Vogel.

* Similar to the Baldrige Awards criteria

Norbert Vogel is a world-leading figure in the evolution of Quality Management, particularly in the development of Business Excellence Frameworks and Assessment processes.

Vogel (1993) provides a very clear and practical view of Quality Management and its continuing relevance.

Norbert arranged for **Myron Tribus** to visit Australia in the mid-1980s to initiate the transformation of the Australian steel industry, which was being forced to become competitive on the international market.

Then we had our QM approach assessed …

- We came out worst in the category of *how we used Data and Information to manage ourselves* … a huge embarrassment as several of my colleagues were Evaluators for the AQA process in Australia and this was a key Quality Awards category.
- So, this raised an immediate issue for me: *What sorts of data and information should we be using to manage ourselves*?
- Thinking about this led to

Q2: What should be the content of monthly Board and leadership reports in companies and other enterprises?

The Odyssey

- Origins
- Meanderings
-
-
-
-

Initial exploration (1993)

Q1: If the #3 person in a company is a statistician, what should such a person be doing?

Q2: What should be the content of monthly Board and leadership reports in companies and other enterprises?

1. What's already been published in the leadership and management literature that might provide advice about Q2?

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2. What's available in terms of what might be called a "Performance Measurement System" for enterprises?

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   Answer: Nothing.
2. What's available in terms of what might be called a "Performance Measurement System" for enterprises?
   Answer: Nothing.

Shades of Earl Butz!

1994: much largely unproductive churn

1. Measurements need to relate to processes, so we started to list and document all our processes … which led to a bucket-of-worms tangle of processes.

2. Aha … I stumbled on the concept of Core Business Processes, which at least provides some organisation for the worms.

3. And yet … I had no sense of where this was heading … *e.g. what should be the purpose of a Performance Measurement System*?

   ["If we knew what we were doing, it wouldn't be called 'research' would it?" … possibly Albert Einstein]

4. I needed someone wise to talk to … so back to Norbert.

The Odyssey

- Origins
- Meanderings
- The climb
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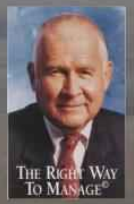

The Right Way
To Manage©

The concept of Value Added

- In his overseas journeys exploring best management practices in steel companies, Norbert had encountered Richard Normann.

Richard Normann was a visionary Swedish management consultant and researcher early in the development of theories of service management and interactive strategy.

He introduced fundamental concepts that became commonplace –

Moments of Truth
Customer Value Added
…

Richard worked at a very strategic level with AT&T, the airline company SAS, and others, transforming their business models (*Co-production of Value*[26]…).

The concept of Value Added

- Normann recognised the importance of *creating superior value for Customers*, beyond what they could get elsewhere.
- However, he did *not* say how this might be defined, let alone measured. That had to wait for a few years.
- Meanwhile, it seemed natural to ask which other groups of people might be important to a company, and to apply the same concept to them.
- The obvious so-called "stakeholder" groups were its People, its Partners, the wider Community, and … its **Owners**.


The Right Way
To Manage

The concept of Alignment (1994 – 5)

1. Where to next?
   - I have a notion of *Adding Value for Stakeholder Groups*
   - I **don't** know what I mean by "Value" … let alone how to "add Value" … let alone how to **measure** it.
2. Back to Norbert. He said I should talk to Myron Tribus.

Myron Tribus was an American engineer, bureaucrat, inventor, management expert, historian, scholar and educator and life-long learner, and a long-time member and Fellow of the ASA.

He knew Deming well; his Center for Advanced Engineering Study at MIT published WED's *Out of the Crisis*.

He found practical language and actions to implement WED's theory.

He devised the basic criteria that now underpin the Baldrige Awards and other similar Business Excellence frameworks.

* Stories about Myron … see later
* More information: Fisher & Vogel (2017)

The concept of Alignment (1994 – 5)

1. Visited Myron (then in Fremont, Ca.). No answers, just questions (*typical Myron!*).
2. In a subsequent email message, he sent me what I now call the Tribus Paradigm, a way to think about what to measure that emphasizes the critical importance of Alignment …

A paradigm for measurement

- What products or services are produced and for whom?
- How will ‘quality’, or ‘excellence’ of the product or service be assessed and how can this be measured?
- Which processes produce these products and services?
- What has to be measured to forecast whether a satisfactory level of quality will be attained?

… after Myron Tribus

Implications of the Tribus Paradigm

1. The starting point for Performance Measurement for an enterprise is outside the enterprise, with the ultimate impact on stakeholders:
   - What does it mean to be successful with Owners, Customers, People, Partners, and the Community?
   - How can this be measured?

   Note that these are lag indicators.

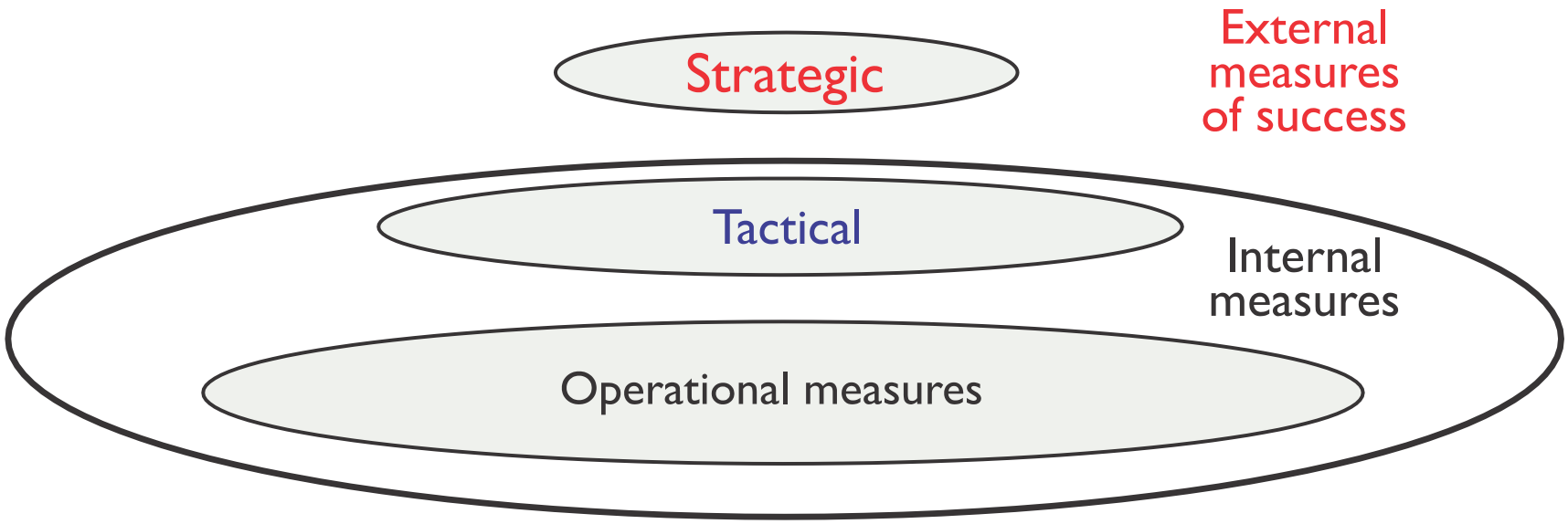
2. Inside the enterprise, we need ***lead indicators of success***.
3. Thus a Structure for performance measurements starts to emerge, with three different Zones of Measurement …

A Structure for Performance Measures

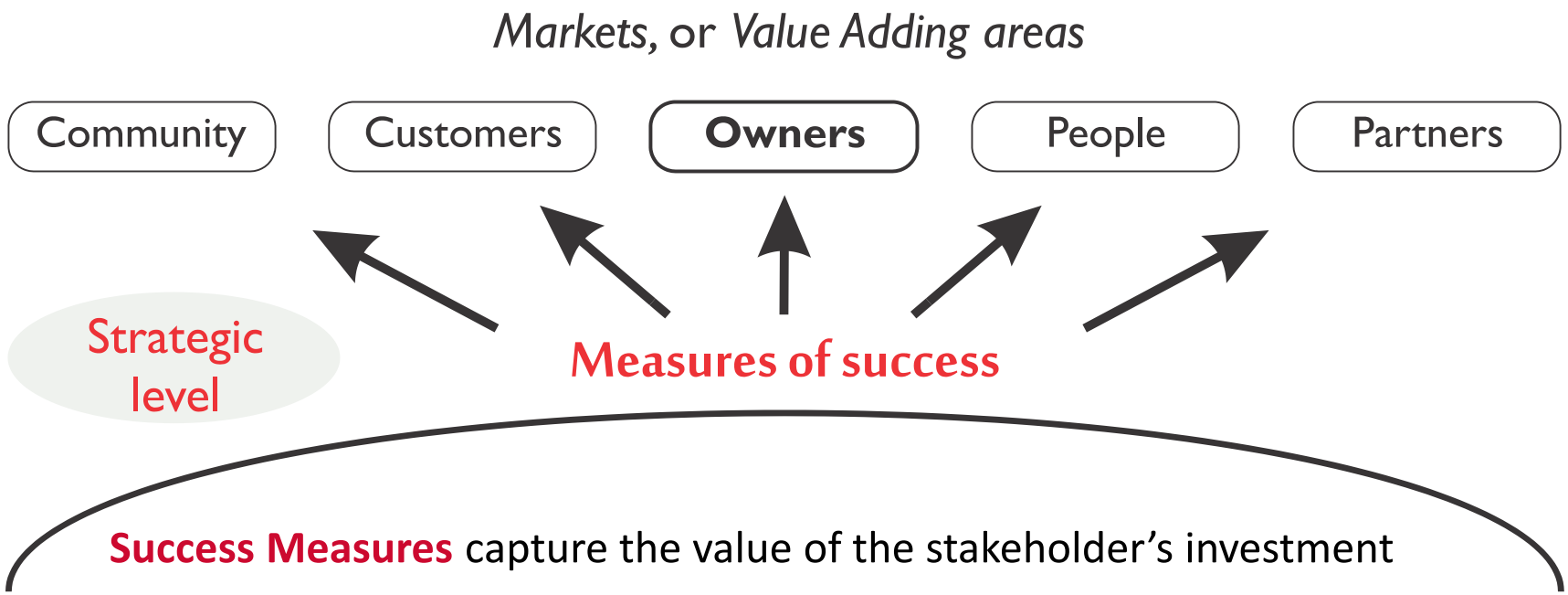
- Strategic level – stakeholder groups, where Success is measured
- Tactical level – top level of measurement inside the enterprise, lead indicators of Success
- Operational level – all the usual metrics for monitoring, controlling and improving the processes that deliver products and services to customers

… which we can represent in a simple diagram:

Zones of measurement



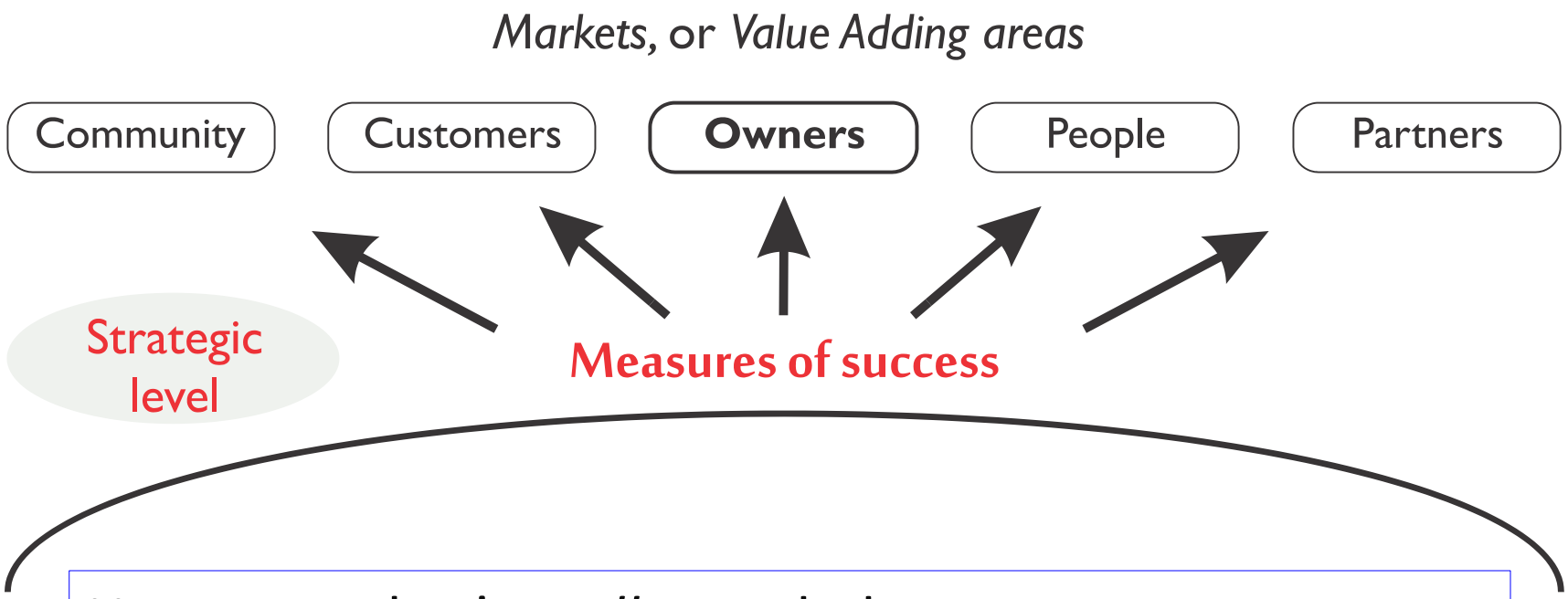
Strategic measures



Success Measures capture the value of the stakeholder's investment (resources, money, labour, …) in your enterprise, *compared with an alternative investment*

Need to win in *all* markets to ensure long-term sustainable success, by offering *superior value* in each market

Strategic measures

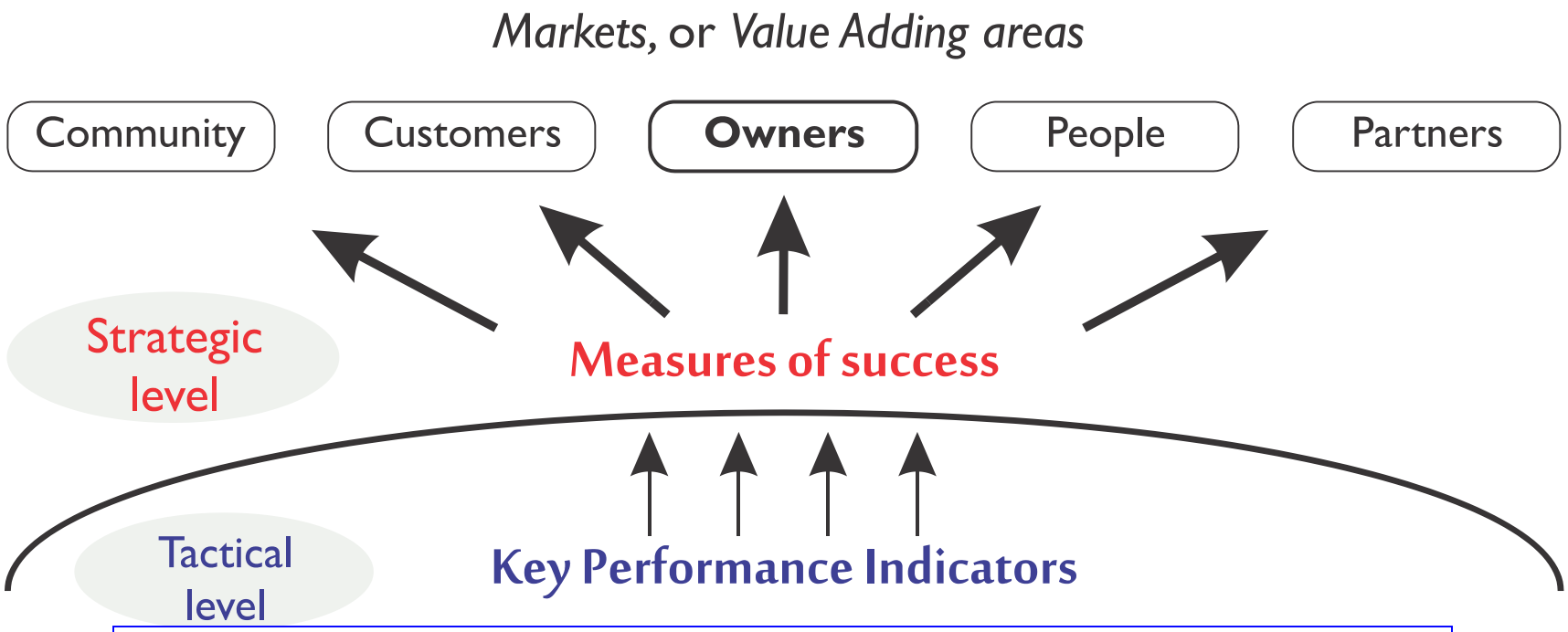


However, what's *really* needed are …

*… measures that **predict the consequences***

of actions you propose to take …

Tactical measures

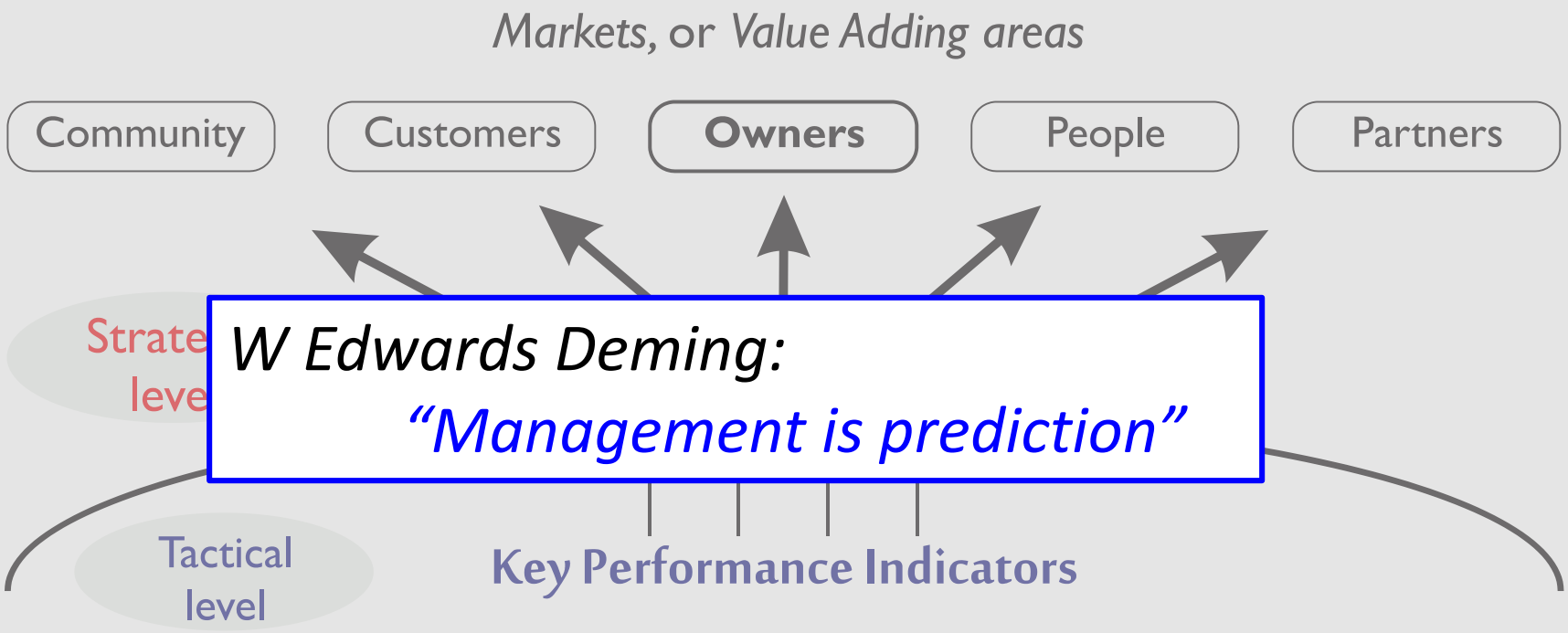


KPIs are a set of organisational-level measures used by the leadership to help manage the organisation.

They are lead indicators of Success Measures.

** WED**

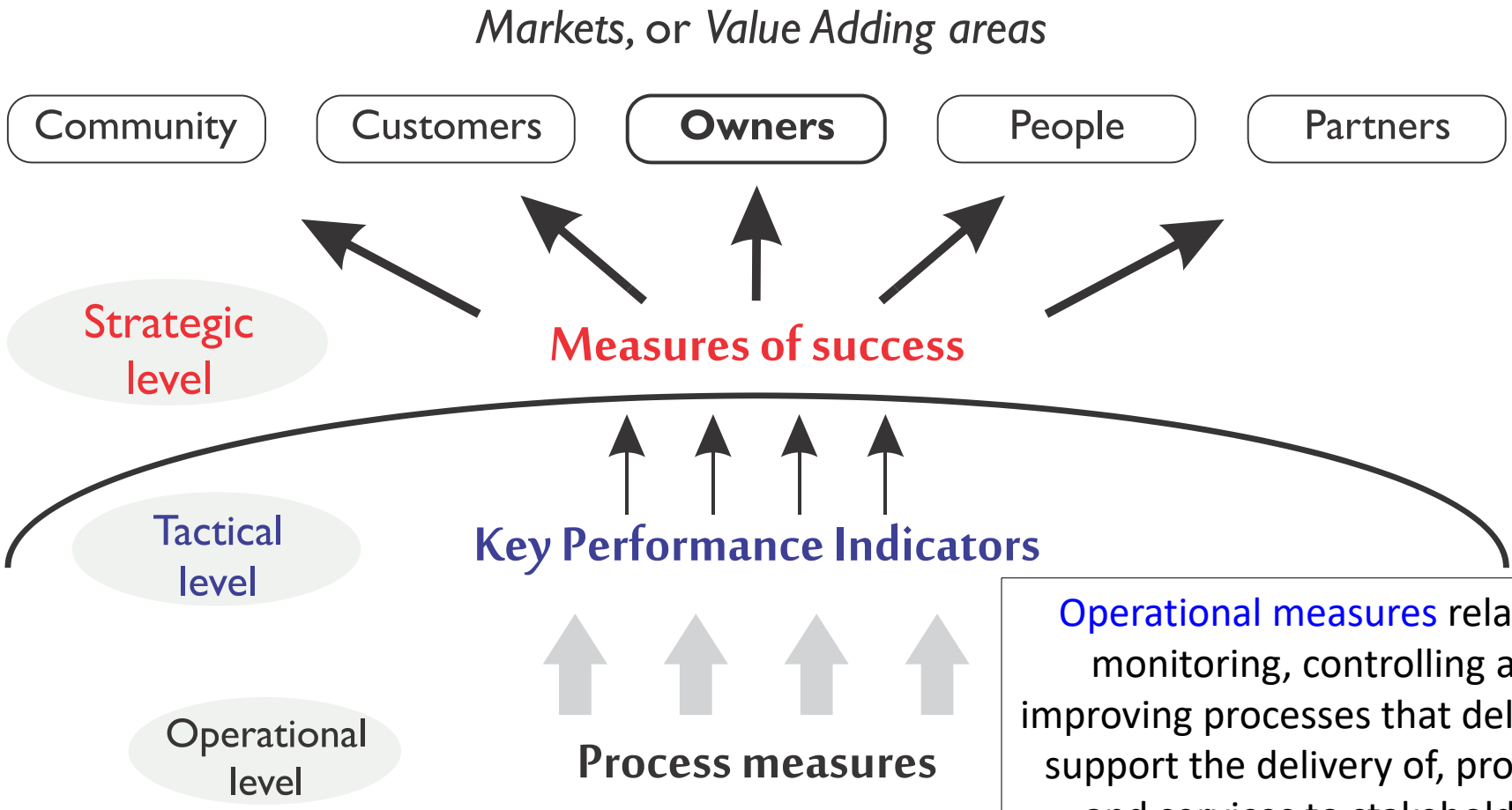
Tactical measures



Key Performance Indicators comprise a set of organisational-level measures used by the Executive to help manage the organisation.

They are lead indicators of Success Measures.

Operational measures



Operational measures relate to monitoring, controlling and improving processes that deliver, or support the delivery of, products and services to stakeholders

Accountability and Responsibility (1995)

1. With this structure established, back to see Myron to ask more questions about measurement.
2. He referred me to Yoshikazu Tsuda, in Japan.

Yoshikazu Tsuda is a Total Quality Management (TQM) consultant and retired Professor of Statistics at Rikkyo University in Tokyo.

He is renowned for his penetrating questioning on his "Quality visits".

In recent times, he has been successful in assisting a number of major Indian companies to win the Deming Prize.

Accountability and Responsibility (1995)

1. Tsuda interrogated me about my understanding of the distinction between Accountability and Responsibility.
2. Managers need to report measurements that relate to their areas of Accountability.
3. This distinction is not well understood in English, let alone in French, Spanish or Korean, in none of which languages a word* for Accountability even exists.

* But there is in Japanese! … see later.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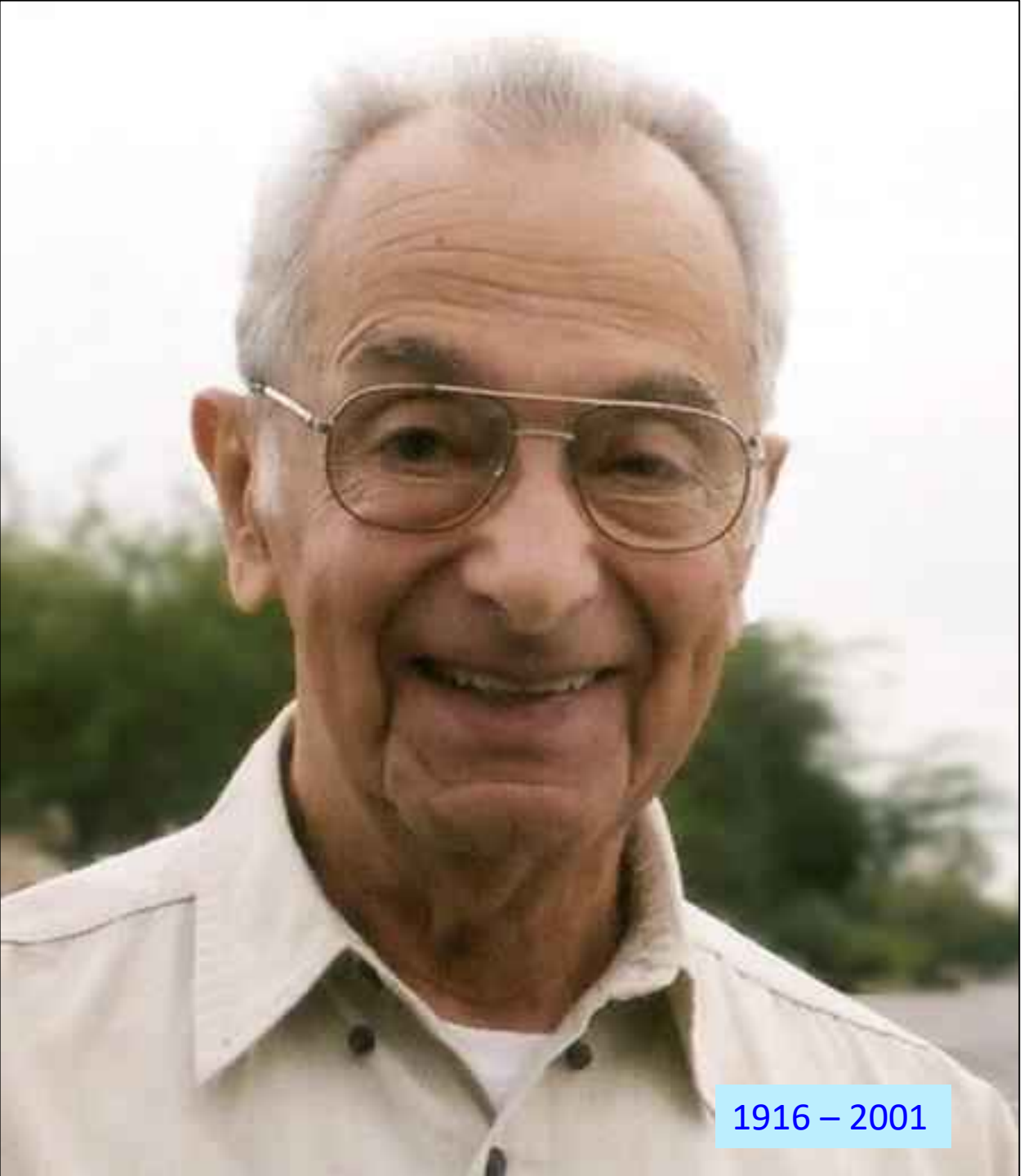
Quality Management in Japan (1995)

1. Myron also told me about an event to be held in December that year at the Japanese Embassy in London, a one-day meeting entitled

   "Who really introduced Quality Management to Japan?"

   and managed to secure me an invitation.

2. This is where I first met Homer Sarasohn, and saw a copy of the manual *The Fundamentals of Industrial Management* that he wrote in one month with Charles Protzman, and then used to teach Quality Management to Japanese industry leaders **in 1948 and 1949.**



Homer Sarasohn was a radio-engineer who was working on rapid-prototyping of radio transmission equipment at the end of WW2 when he was summoned to Japan by General Douglas MacArthur.

The extraordinary story of how, in 1948 at the age of 32, he came to teach Quality Management to Japanese industry leaders is related in an interview with Myron Tribus; see also Fisher (2009).

Around 1990, Deming wrote to Sarasohn acknowledging Homer's prior contribution to teaching the Japanese how to manage.

* Stories about Homer … see later

Interactions with Homer

1. The 1995 Workshop and *The Fundamentals of Industrial Management*
   - Ken Hopper's copy was on display, only two others were known to exist (HMS and Yale Library).
   - I borrowed Homer's copy to have it retyped, and learnt much from reading it. Over 70 years ago, he had recognized the fundamental error* in thinking that the purpose of a company is to generate profits for its shareholders ...

* An error that persists to this days, in some of the world's largest corporations, *e.g.* the recent Australian Royal Commission into Financial Misconduct in the Financial Services Sector

Homer's opening words from the Manual

"Why does any company exist? …

Many people would probably answer these questions by saying that **the purpose of a company is to make a profit**.

But such a statement is not a complete idea, nor is it a satisfactory answer because it does not clearly state the objective of the company, the principal goal that the company management is to strive for.

A company's objective should be stated in a way which will not permit of any uncertainty as to its real fundamental purpose."

He clearly identified important groups

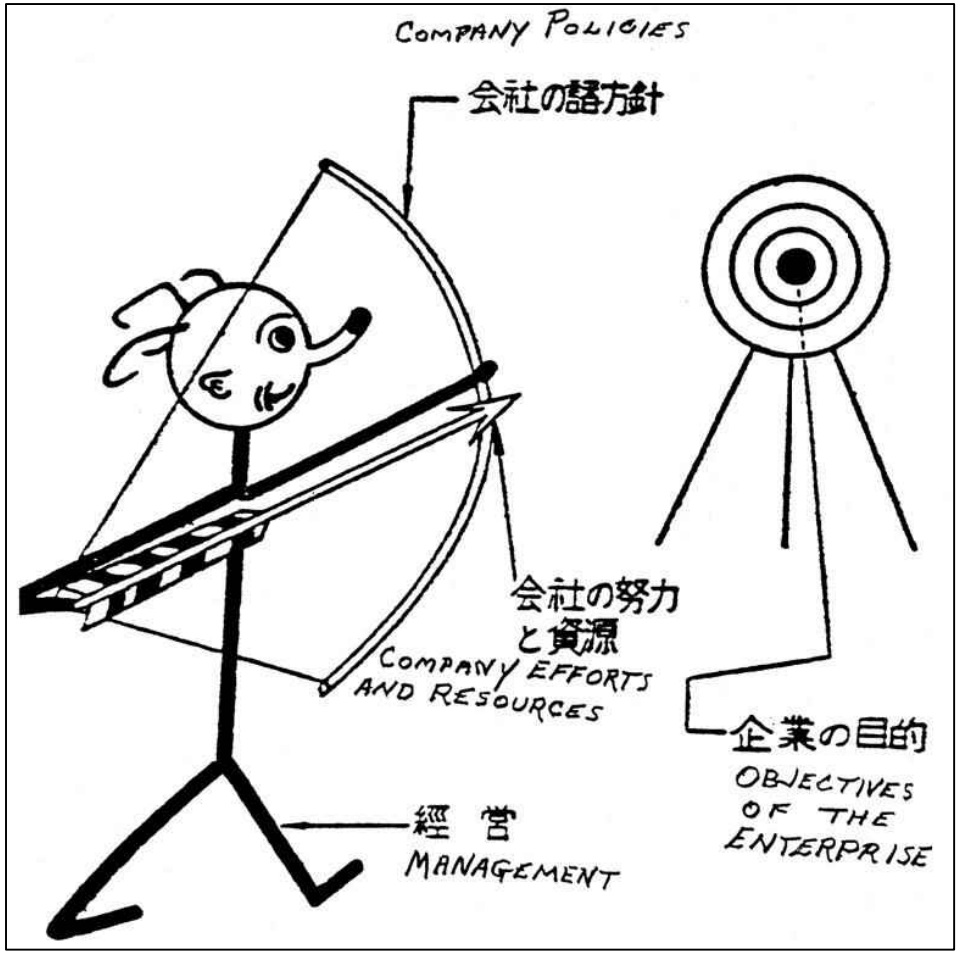
"There is another fault that I would find in such a statement.

It is entirely selfish and one–sided. It ignores entirely the sociologic aspects that should be a part of a company's thinking.

The business enterprise must be founded upon a sense of responsibility to the public and to its employees. Service to its customers, the wellbeing of its employees, good citizenship in the communities in which it operates — these are cardinal principles fundamental to any business.

They provide the platform upon which a profitable company is built."

Homer's Archer captured the focus on purpose



"Making a clear statement of the objective of the enterprise is like providing a target for a man shooting an arrow with a bow …

… The man represents company management … holding a bow which represents company policies … and an arrow which represents the total efforts and resources of the company."

Interactions with Homer

1. The 1995 London Workshop and *The Fundamentals of Industrial Management*
2. *Accountability and Responsibility! – *cf.* my excoriation by Yoshikazu Tsuda for not fully appreciating the distinction in the context of performance measurement – *Homer* and *A & R* …
3. Homer Sarasohn and W Edwards Deming … .

Deming and Sarasohn

1. Opposites in many ways … but **not** in their absolute commitment to Quality and Continuous Improvement
2. Deming very tall, Sarasohn average height
3. In manner, Sarasohn was practical, spoke in a deliberate, matter-of-fact way (*cf.* Tribus interview), with dry sometimes self-deprecating wit.

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3. In manner, Sarasohn was practical, spoke in a deliberate, matter-of-fact way (*cf.* Tribus interview), with dry sometimes self-deprecating wit.

In contrast, the 4-day Deming Workshop was like a religious experience. WED, a lay preacher, intoned in a slow, deep voice, and had some excellent epigrams and other witticisms:

- *The beatings will continue until morale improves.*
- *Why ask the customer what he wants? How would he know?*
- *On one occasion, when I was talking about Deming's Second Law, a man said to me:* "If there's a Second Law, there should be a First Law." *The man was right, there should be a First Law.*

Interactions with Homer

1. The 1995 London Workshop and *The Fundamentals of Industrial Management*
2. Accountability and Responsibility
3. Homer Sarasohn and W Edwards Deming
4. Homer and SPC … *stay tuned for the untold story*!

Clarifying the purpose of the research

I had finally reached a point at which I could answer the question

What do I mean by a Performance Measurement System for an enterprise?

What is a Performance Measurement System?

A Performance Measurement System

1. provides the Board and senior leadership with regular quantitative reports that enable them to be duly diligent in running the enterprise, that is, with reports that are
   - comprehensive
   - capture current performance
   - predict likely future performance
2. provides people at all levels of the enterprise with the quantitative information they need to do their jobs well

Implications for Board / leadership reports

Essentials:

A. Concise overview of health of enterprise

- comprehensive
- captures current performance
- predicts likely future performance

B. Quantitative basis for selecting priorities … *i.e.* ACTIONABLE

- links improvements to business impact

C. Alignment

- of Strategic, Tactical and Operational measures
- of people's work with organisational intent

What's needed to do this?

First requirement:

a way to identify the sorts of data that are needed

Second requirement:

a way of putting the actual measures in place,

and using them to best effect

e.g. by addressing your most pressing business issues: falling market share, high staff turnover, …

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Performance Measurement Framework

e.g. by addressing your most pressing business issues: falling market share, high staff turnover, …

Performance Measurement Framework

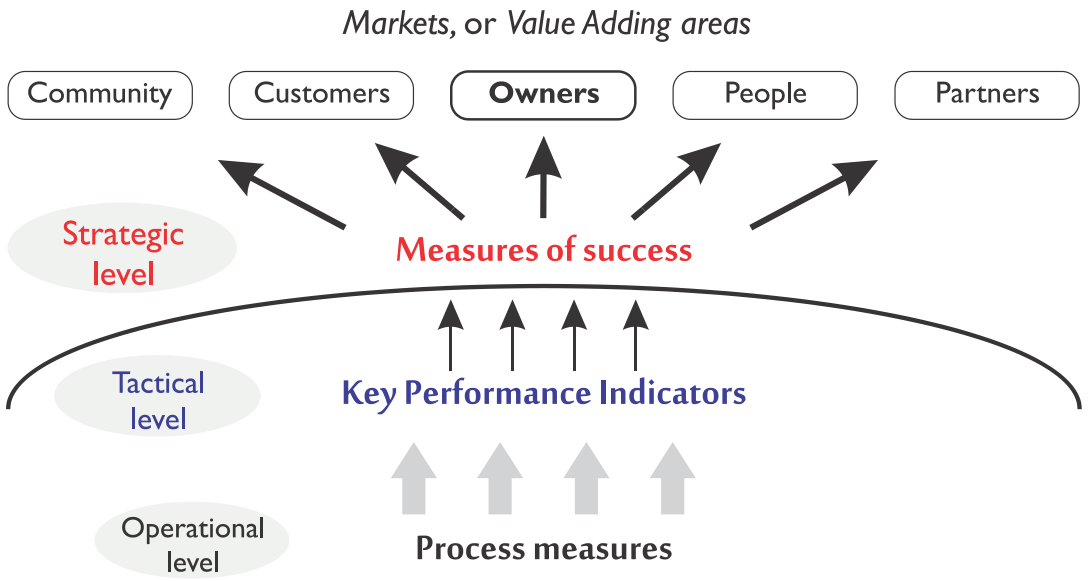
1. Three Principles
    a) Alignment of people's work with enterprise purpose through their Accountabilities and Responsibilities
    b) Process focus
    c) Practicability

Performance Measurement Framework

1. Three Principles
2. Tribus Paradigm
   a) What products or services are produced and for whom?
   b) How will ‘quality’, or ‘excellence’ of the product or service be assessed and how can this be measured?
   c) Which processes produce these products and services?
   d) What has to be measured to forecast whether a satisfactory level of quality will be attained?

Performance Measurement Framework

1. Three Principles
2. Tribus Paradigm
3. Structure for Performance Measures



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What about this bit? – the engine!

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How to define and measure Value?

1. Another lucky break … I was collaborating on a short article with Bill Cleveland, when he suddenly went silent for several months …

Bill Cleveland is very well-known for his fundamental work in statistical modelling and analysis, statistical graphics, *etc.,* and is now a world leader in developing and implementing methods for working with Big Data.

At this time (1997), he'd been pulled off-line by Lucent because their market research reporting had fallen into a state of disrepair.

Bill and his team had to turn their attention to analysing Lucent's regular market research survey data, and reporting the results to Lucent's leadership.

They developed a hierarchical temporal model that explained most of the variability in the data acquired over several survey periods.

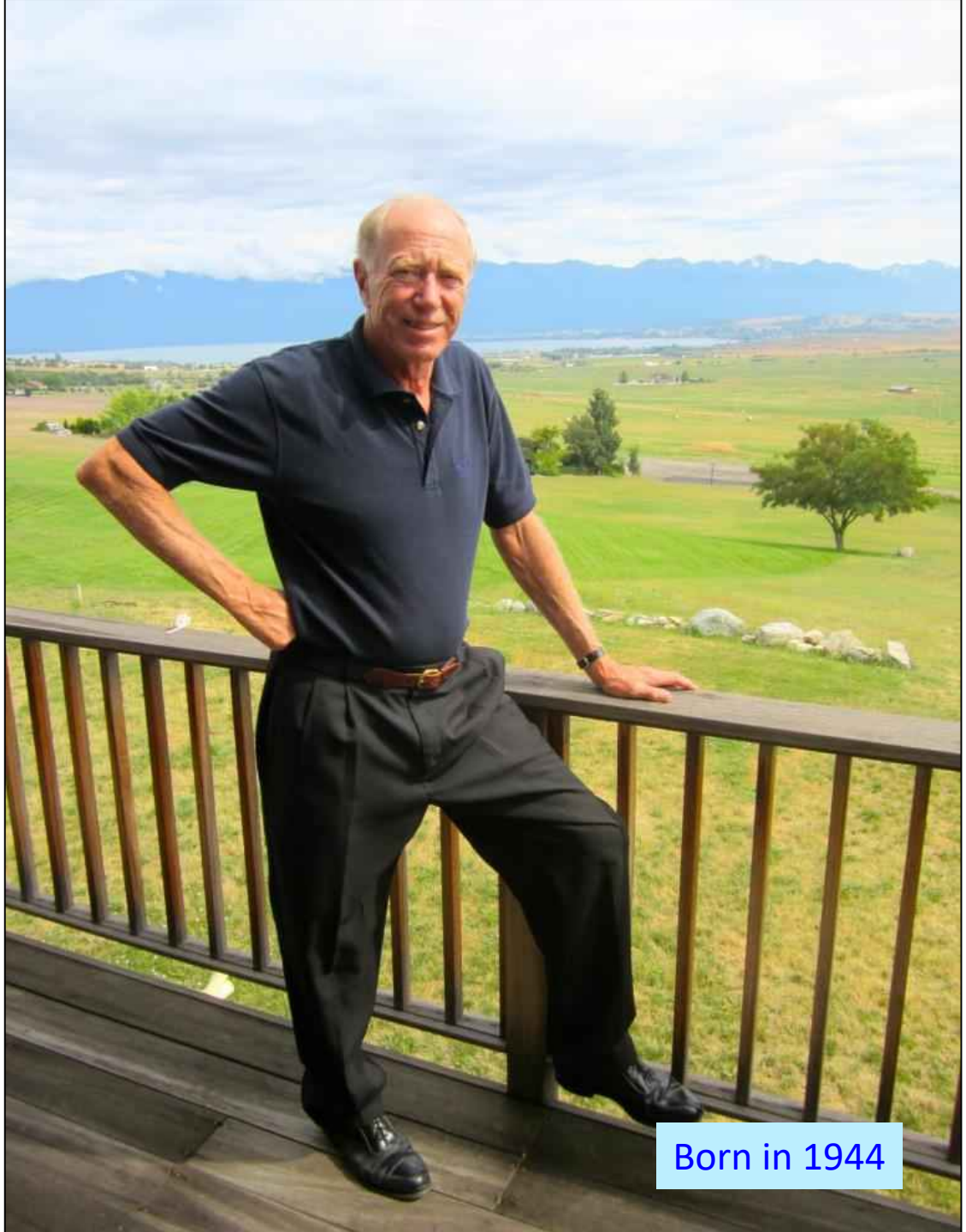
How to define and measure Value?

2. When contacted, Bill told me what had happened, and referred me to a book entitled *Managing Customer Value* by Bradley Gale for a helpful explanation.


THE REAL WAY TO MANAGE

How to define and measure Value?

2. When contacted, Bill told me that what had happened, and referred me to a book entitled *Managing Customer Value* by Brad Gale for a helpful explanation.
3. Bingo! Gale's book provided, albeit in somewhat simplistic form, a process for creating and adding value for Customers …
4. … and within the first few pages, the book mentioned the pioneering work of Ray Kordupleski …



Ray Kordupleski, initially educated as an engineer, had a lengthy career in the telecommunications industry, rising to the position of Customer Satisfaction Director at AT&T in the 1980s.

In response to a business crisis, he led an AT&T-wide team that developed the methodology of **Customer Value Management**, a robust, best-practice process for helping companies gain and sustain competitive advantage.

Since retiring from AT&T he has consulted with firms in the USA, Australia, Brazil, Canada, Chile, England, Finland, France, Hong Kong, India, New Zealand, Norway and Sweden.

His book, *Mastering Customer Value Management*, is the definitive work on the subject.

A fundamental process for managing Value

1. Yet *another* lucky break … I learned that Ray was about to run a two-day course on Customer Value Management (CVM) in Auckland, NZ in October 1997.

2. So, off to Auckland, meet Ray, hear about AT&T's disaster and learn about the CVM process developed in response.

The AT&T story … the year is 1986 …

- 300,000 employees
- 19 business units, 67 Market sectors, 32 countries
- 60,000 people surveyed world-wide, each month
- **95% Customer satisfaction, bonuses paid to managers**

The AT&T story … the year is 1986 …

- 300,000 employees
- 19 business units, 67 Market sectors, 32 countries
- 60,000 people surveyed world-wide, each month
- **95% Customer satisfaction, bonuses paid to managers**

but at the same time …

- **6% drop in market share**
- **1% corresponded to $600,000,000**
- **25,000 staff laid off** (first layoffs in AT&T's history)

Good Isn't Good Enough

The problems …

- *Good* and *Excellent* lumped as *Satisfactory*. *There is no such thing as a satisfied customer*.
- All improvement effort focused on people rating AT&T *Poor* and *Fair* (5%) yet 40% of the largest group (*Good*) were out shopping for an alternative provider.
- They were only comparing the different regions of AT&T with themselves.
- The analysis only focused on **Quality**, ignoring **Price**!

… and the solution

Buried deep in the survey was a question about **Value**, where **Value** is the trade-off between

Quality of Goods or Services received

and

Price Paid.

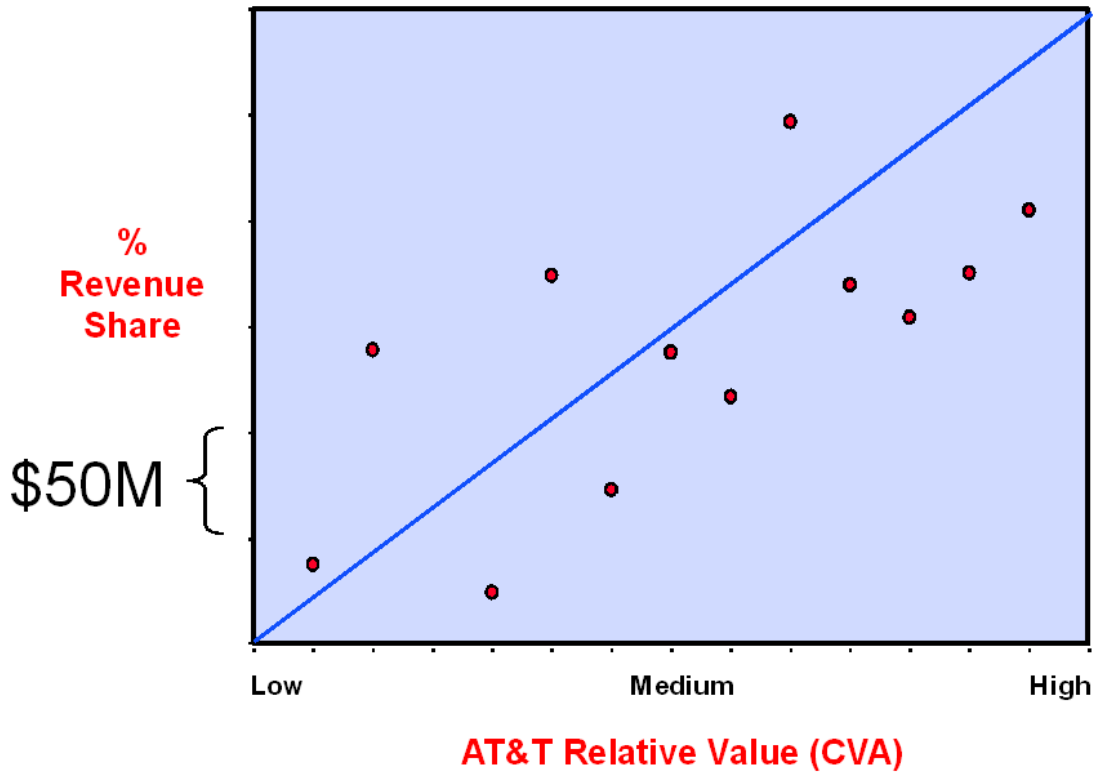
The critical quantity turned out to be **Relative Value**, or **Customer Value Added** (**CVA**) as it is more widely known*:

$$\text{CVA} = \frac{\textbf{Worth of your offer}}{\textbf{Worth of competitive offers}}$$

* Thereby giving meaning to Richard Normann's concept.

Revenue Share to Relative Value

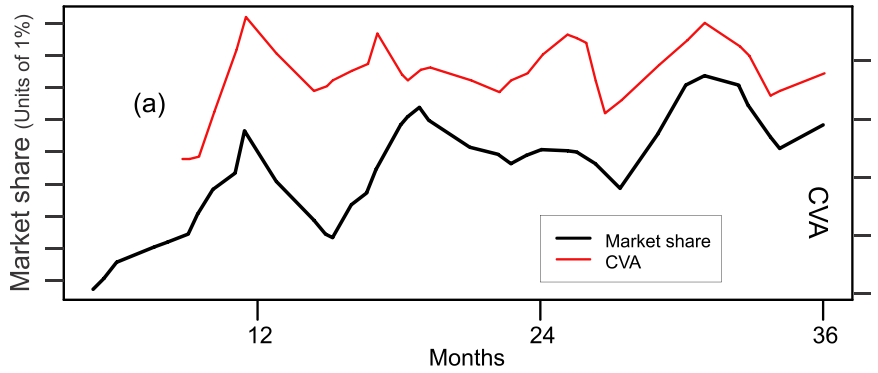
12 Long Distance Telephone Markets



Example due to Ray K.

Market Share (% Sales) and CVA

Communications Equipment



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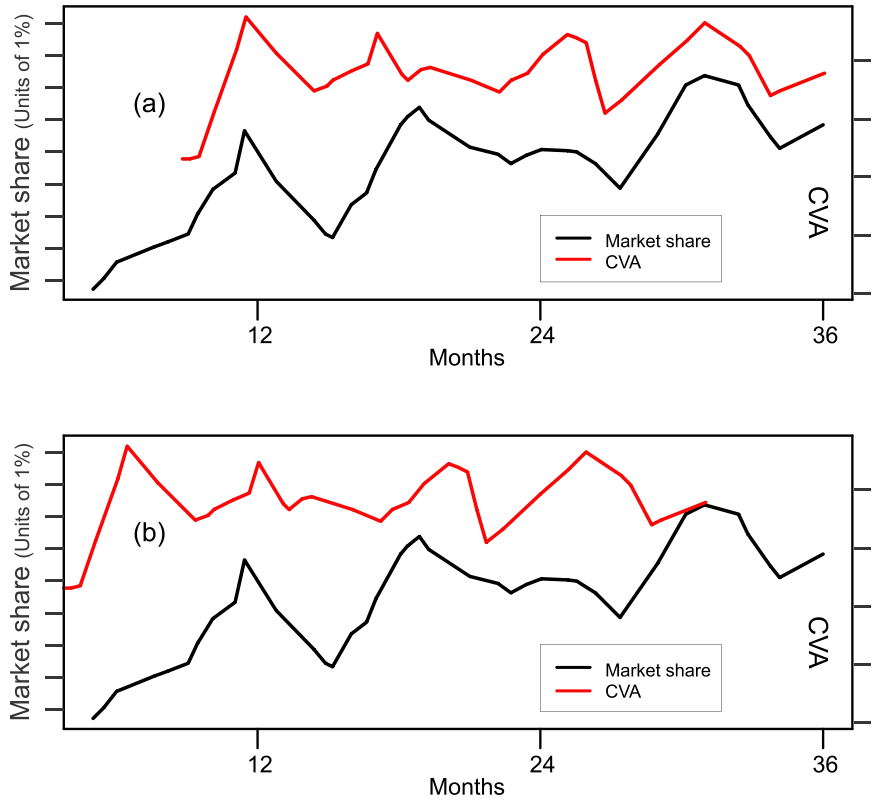


Example due to Ray K.

Lessons Learned . . .

- Good is Bad
- Excellent Value drives Loyalty
- Relative Value drives Market Share
- Loyalty & Relative Value have impact on ROI

Lessons Learned . . .

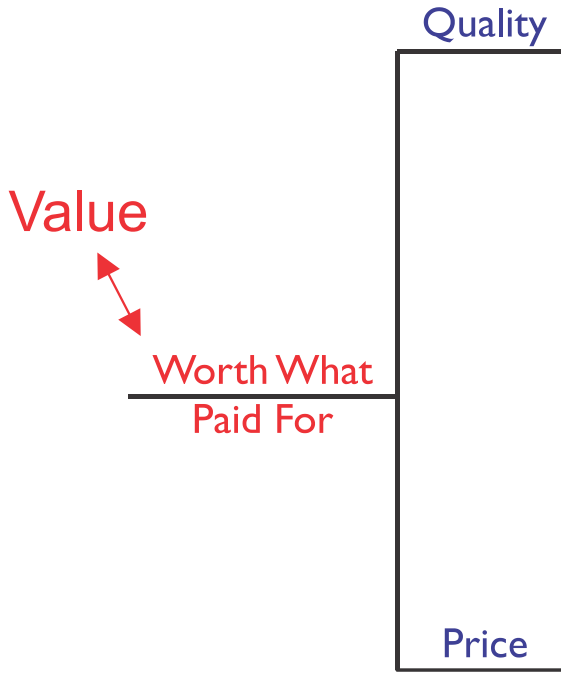
- Good is Bad
- Excellent Value drives Loyalty
- Relative Value drives Market Share
- Loyalty & Relative Value have impact on ROI

*So, how can we **manage Customer Value** (i.e. measure, monitor and improve it)?*

Common example … acquiring and servicing a mortgage …

Identify Value drivers for overall satisfaction

Customer Value tree



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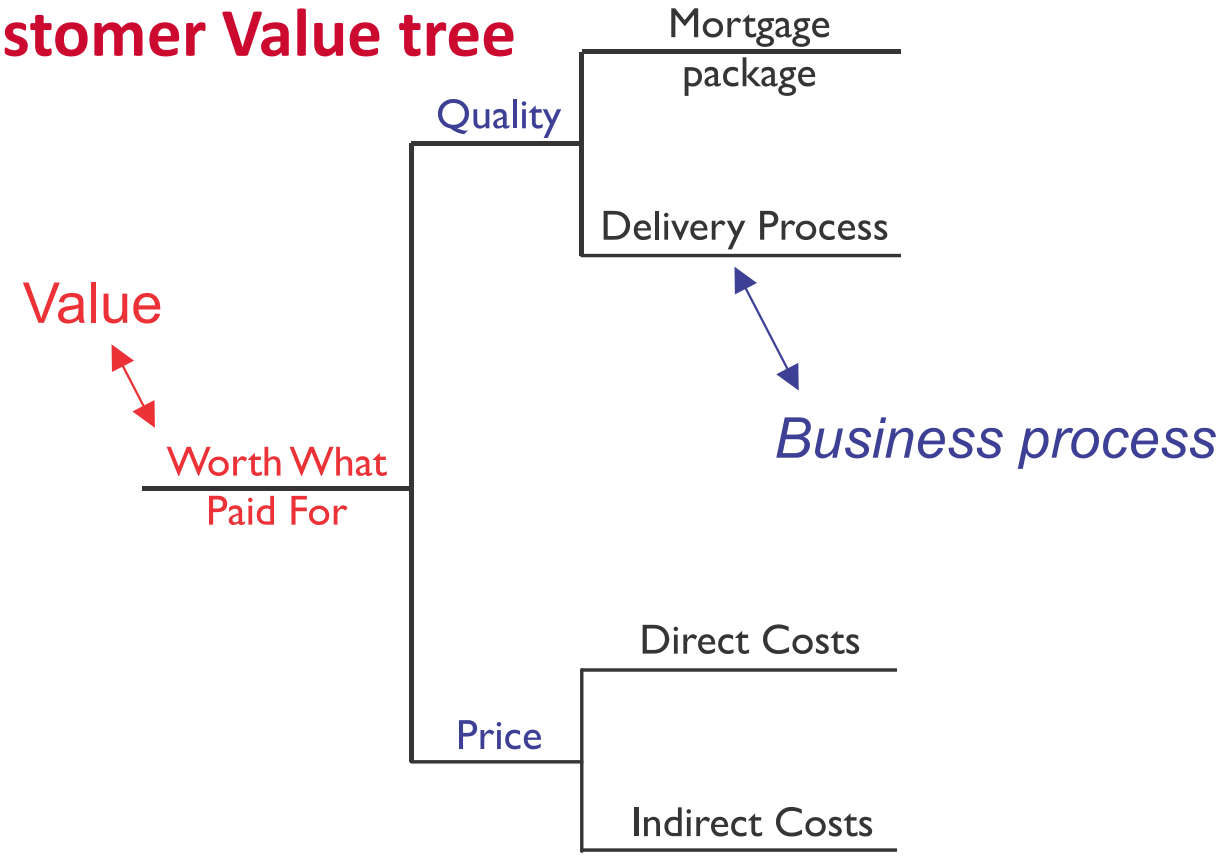
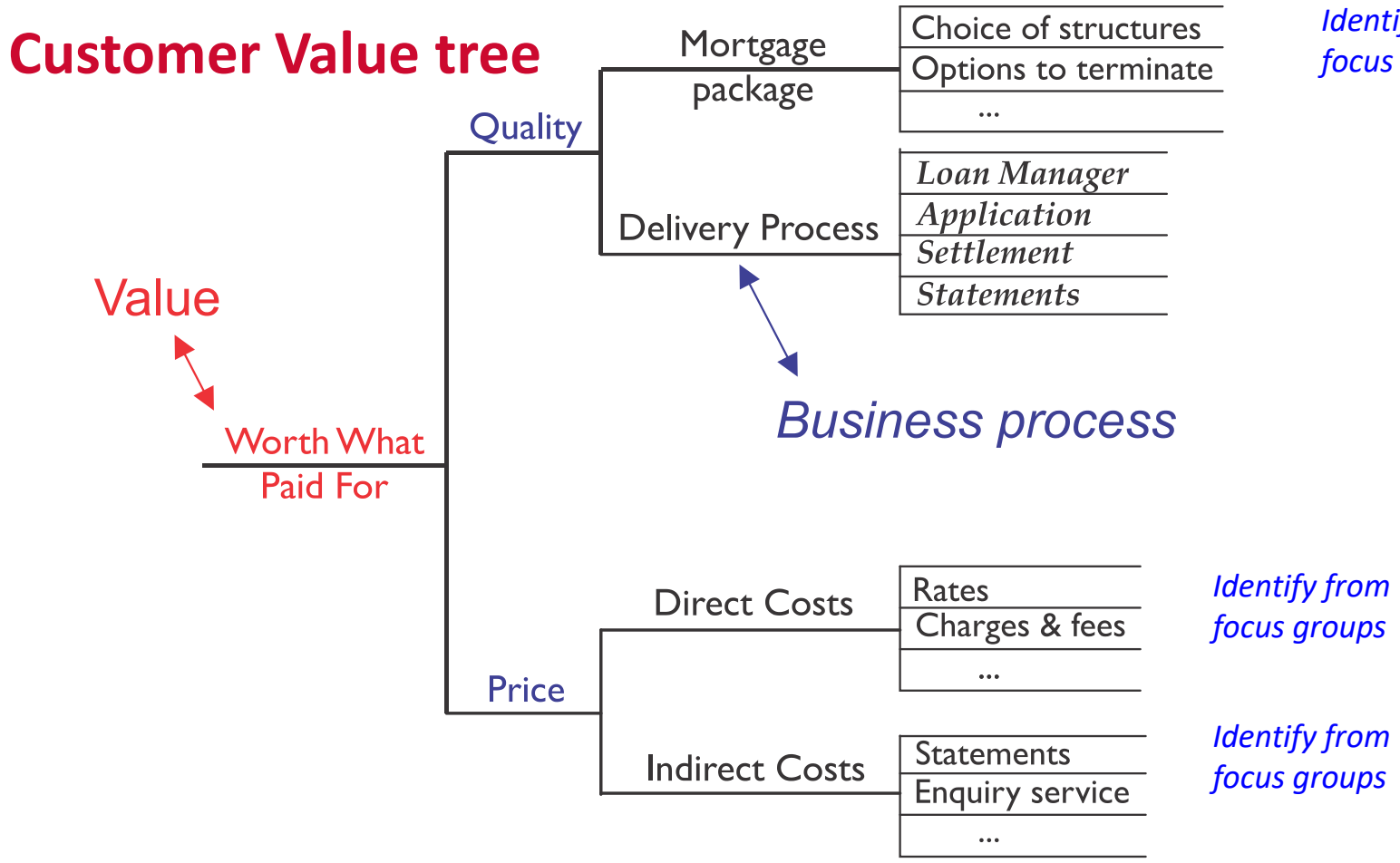
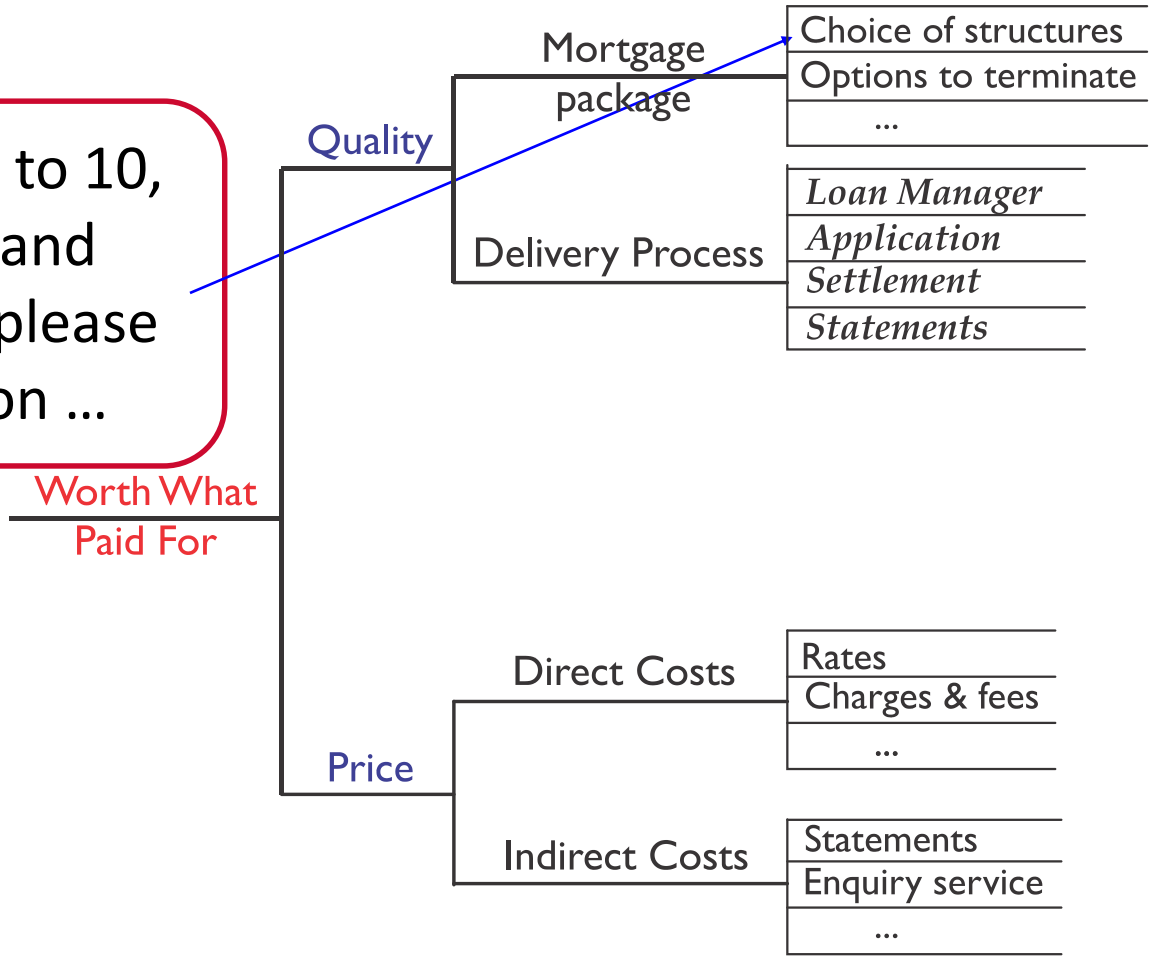


Identify Value drivers for overall satisfaction



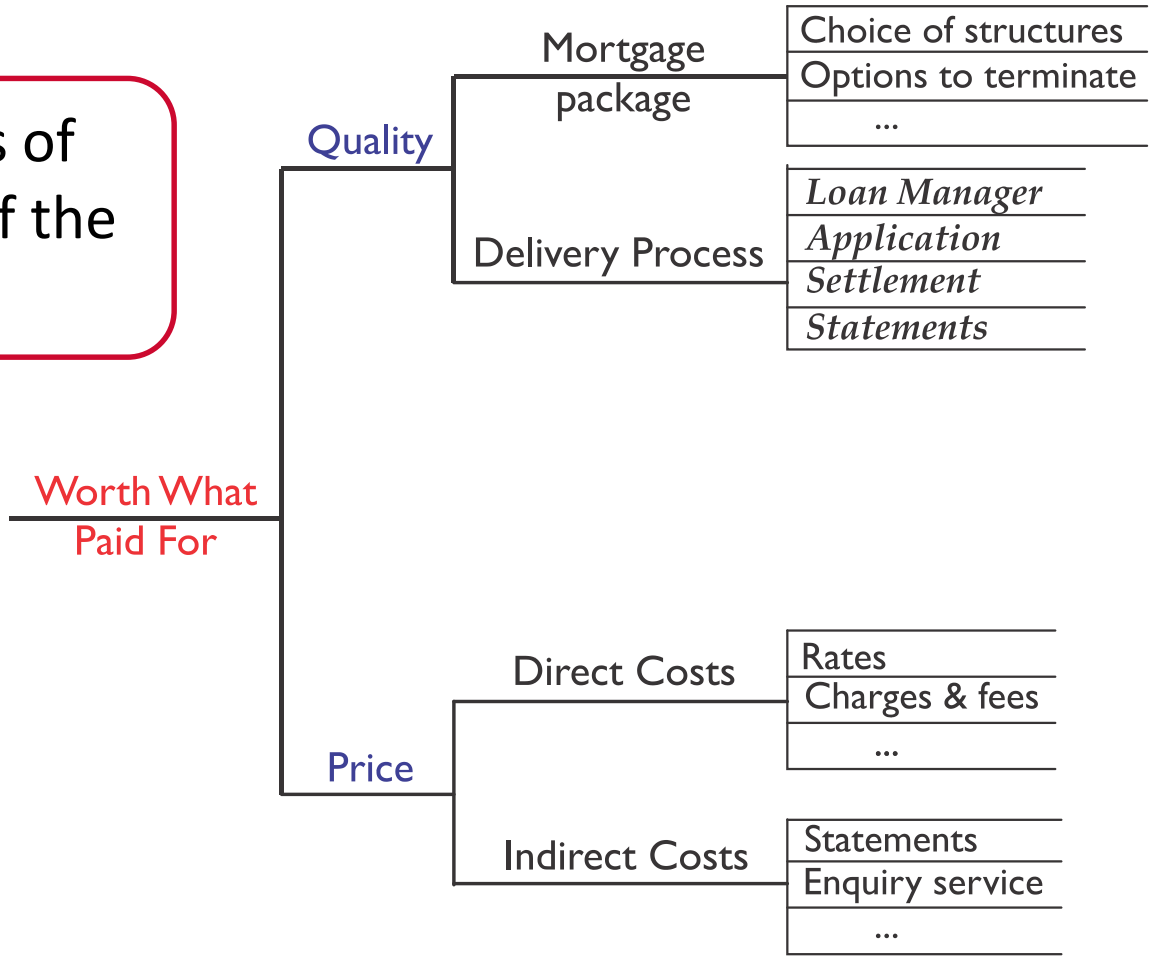
Survey the whole market (Decision-makers)

On a scale of 1 to 10, where 1=*Poor* and 10=*Excellent*, please rate the bank on …

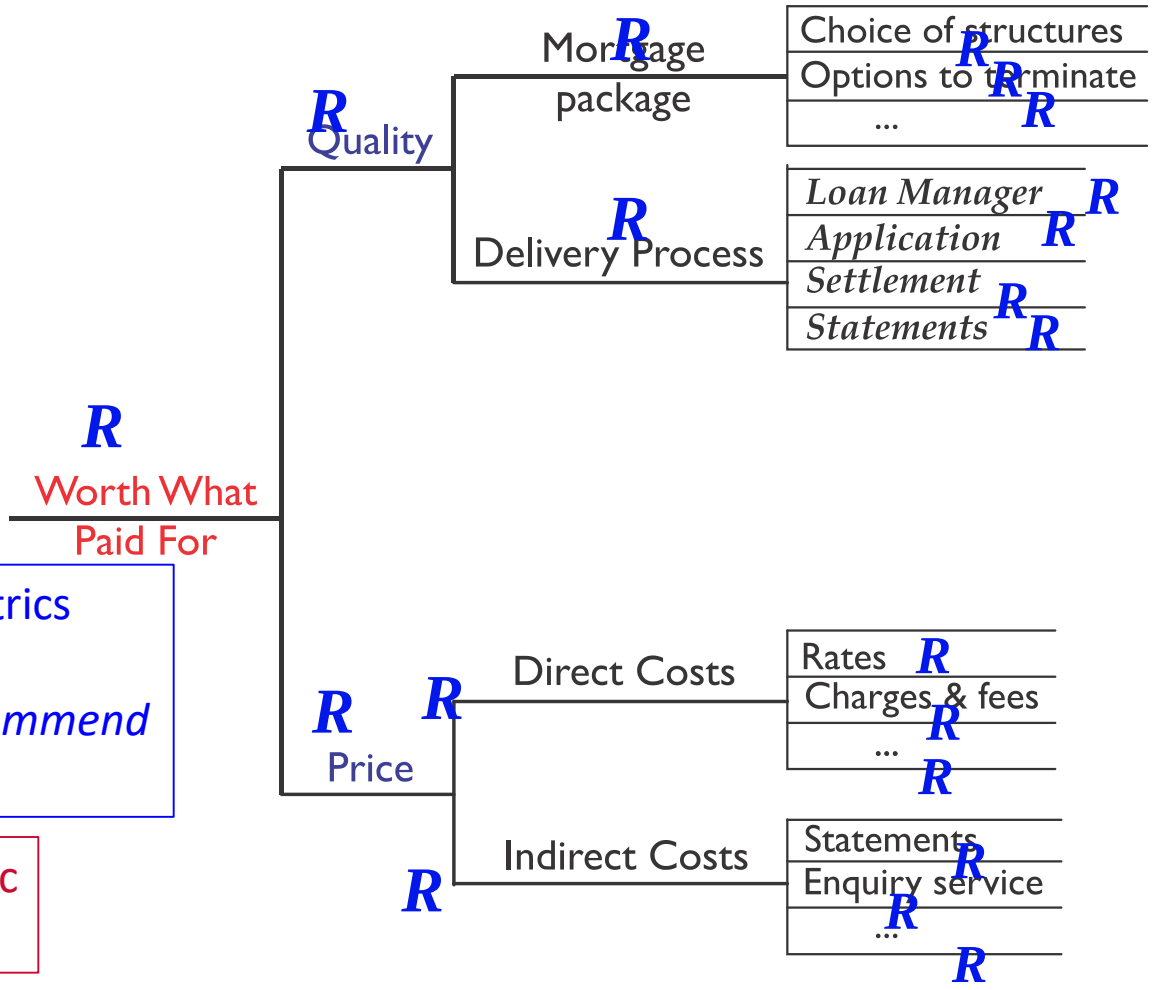


Collect data …

Obtain ratings of each branch of the tree …



… to get structured measurements

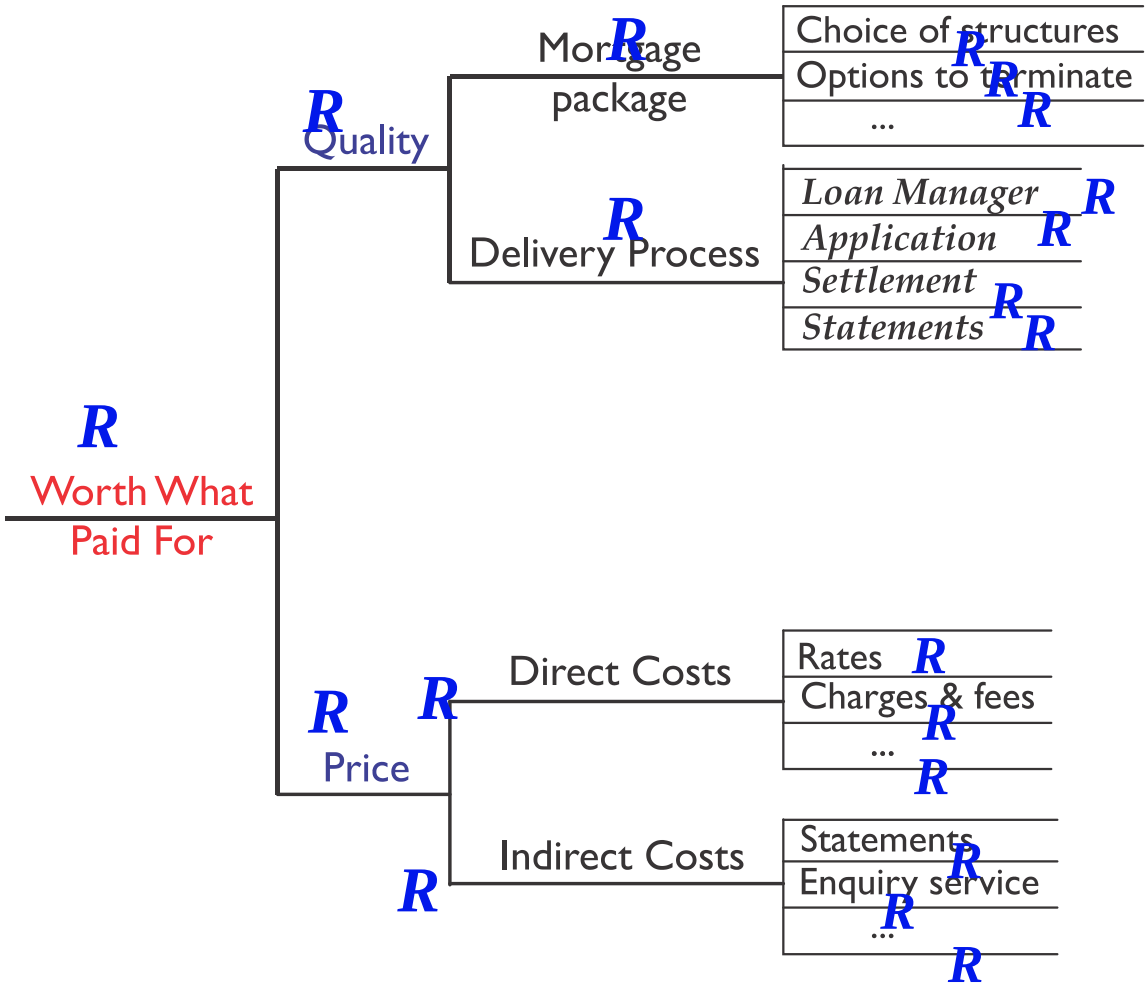


Include Loyalty metrics such as rating of

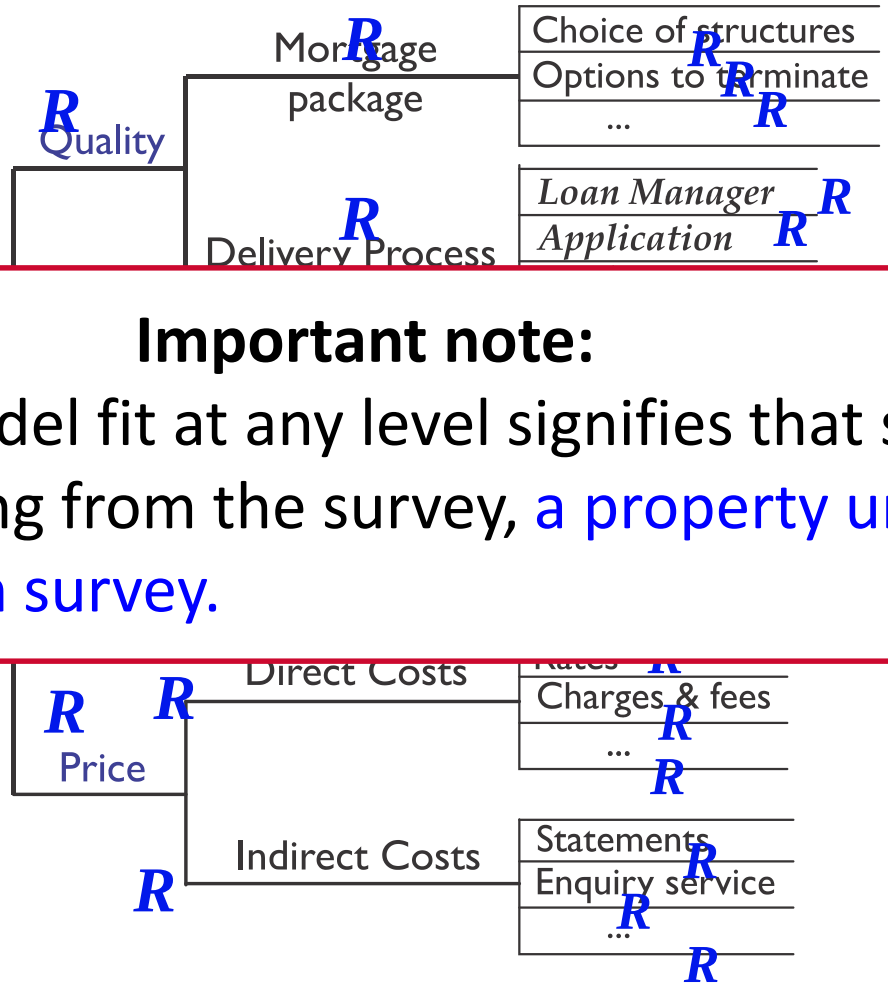
Willingness to recommend this bank to others

Collect demographic info if appropriate

Fit hierarchical statistical models to data …



Fit hierarchical statistical models to data …



Important note:

An inadequate model fit at any level signifies that something important is missing from the survey, a property unique to this form of perception survey.

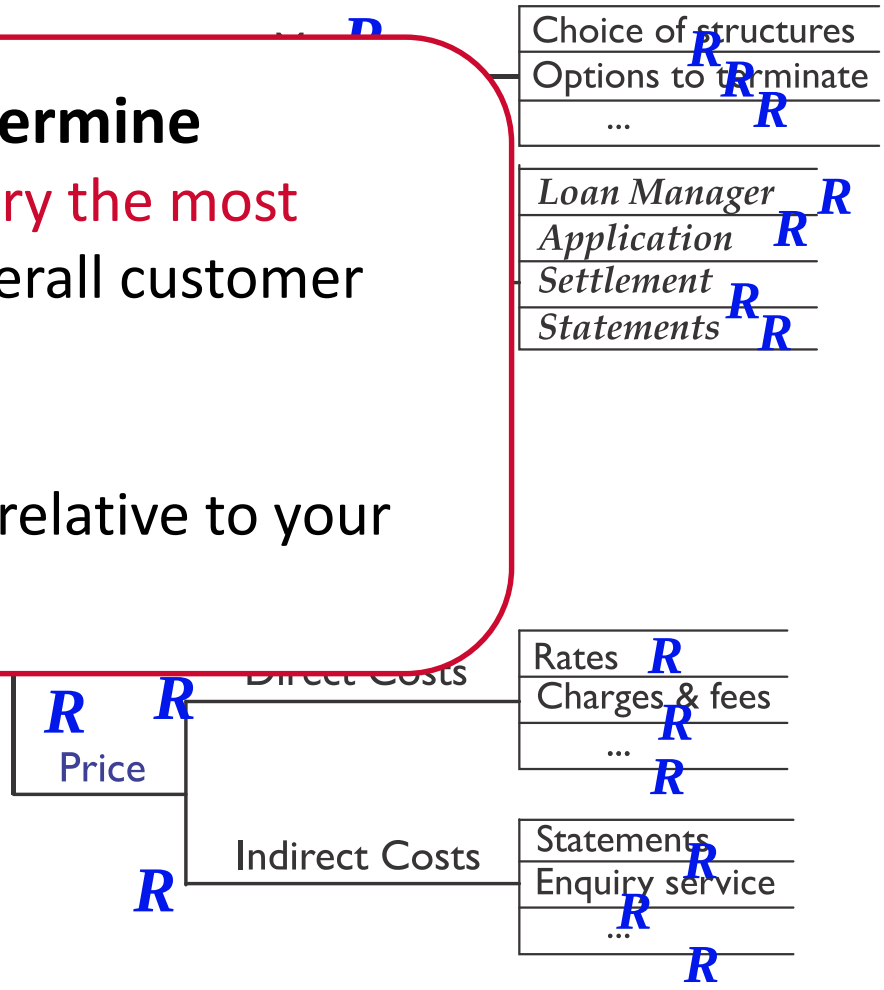
Fit hierarchical statistical models to data …

Analyse the data to determine

- which attributes carry the most weight in driving overall customer satisfaction

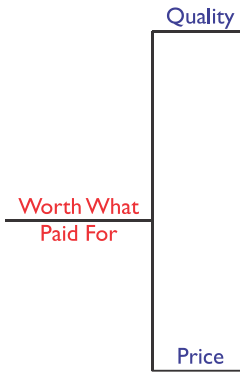
and

- how you are rated relative to your competition



Top-level profile: Value and its drivers

	Impact weight (%)	Your rating	Competitive rating	Relative* rating (%)
Quality	51	7.4	7.7	**96**
Price	32	6.9	6.8	**101**
Value	R^2 = 83%	**7.3**	**7.5**	**97**



*Typically, sample size is sufficient that confidence interval for Relative Rating is ± 2%

Top-level profile: Value and its drivers

	Impact weight (%)	Your rating	Competitive rating	Relative rating (%)
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Price	32	6.9	6.8	**101**
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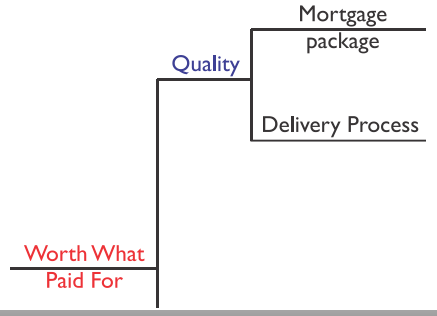
- Carries significant weight in driving overall satisfaction (*Worth What Paid For*)
- You are rated poorly compared with competition
- **Therefore, focus improvement efforts here …**

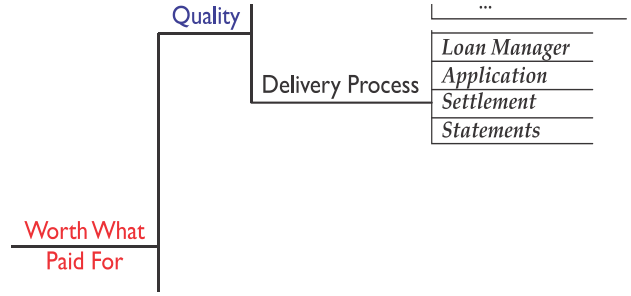
Quality and its drivers

	Impact weight (%)	Your rating	Competitive rating	Relative rating (%)
Mortgage package	30	7.7	7.8	**99**
Delivery process	55	6.8	7.2	**94**
Quality	R^2 = 85%	**7.4**	**7.7**	**96**



Delivery process and its sub-processes

	Impact weight (%)	Your rating	Competitive rating	Relative rating (%)
Loan manager	6	7.7	7.2	**107**
Application	16	7.4	7.3	**101**
Settlement	20	6.7	6.7	**100**
Statements	44	6.0	7.1	**85**
Delivery process	R^2 = 86%	**6.8**	**7.2**	**94**



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Boast about this result!

Delivery process and its sub-processes

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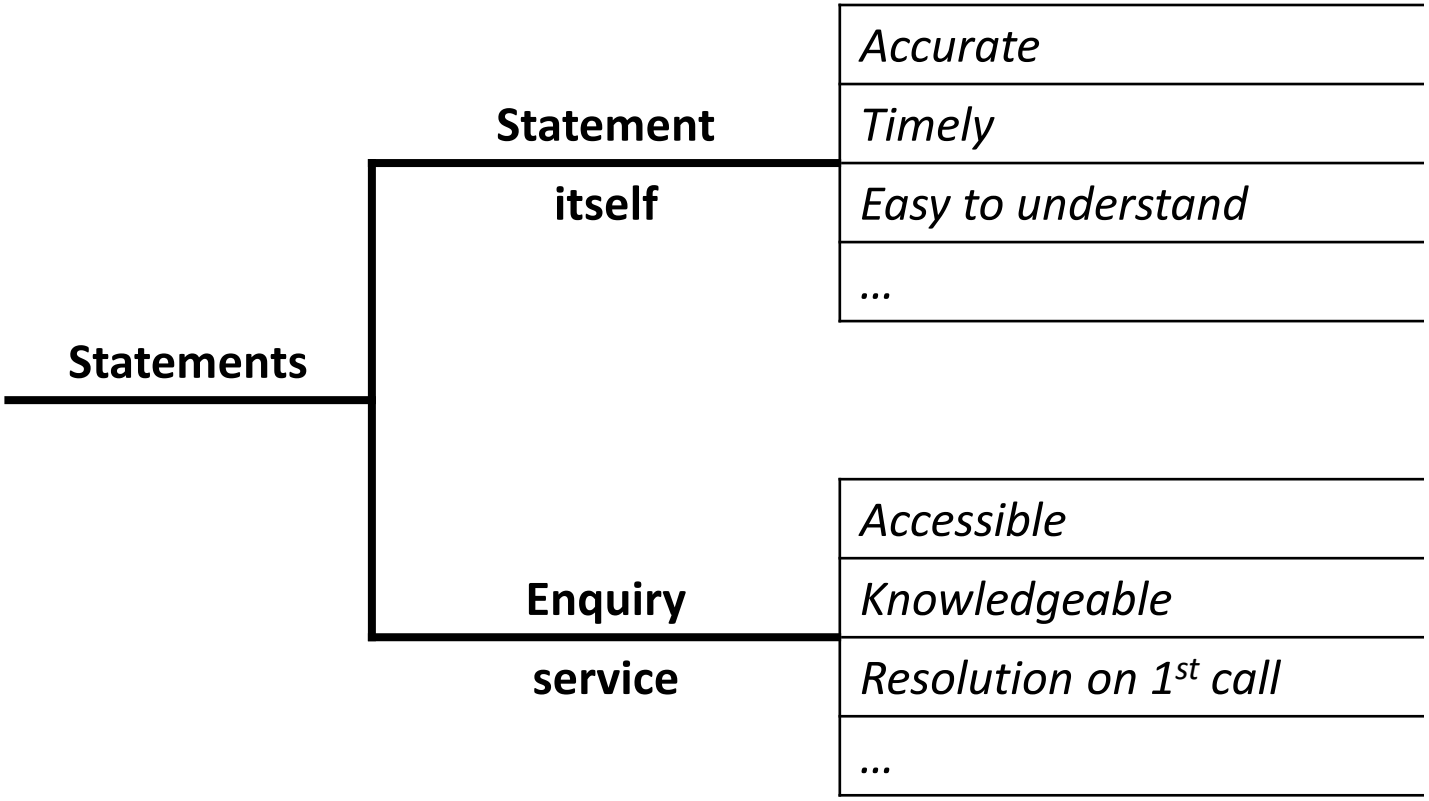
Statements	44	6.0	7.1	**85**
Delivery process	R^2 = 86%	6.8	7.2	**94**

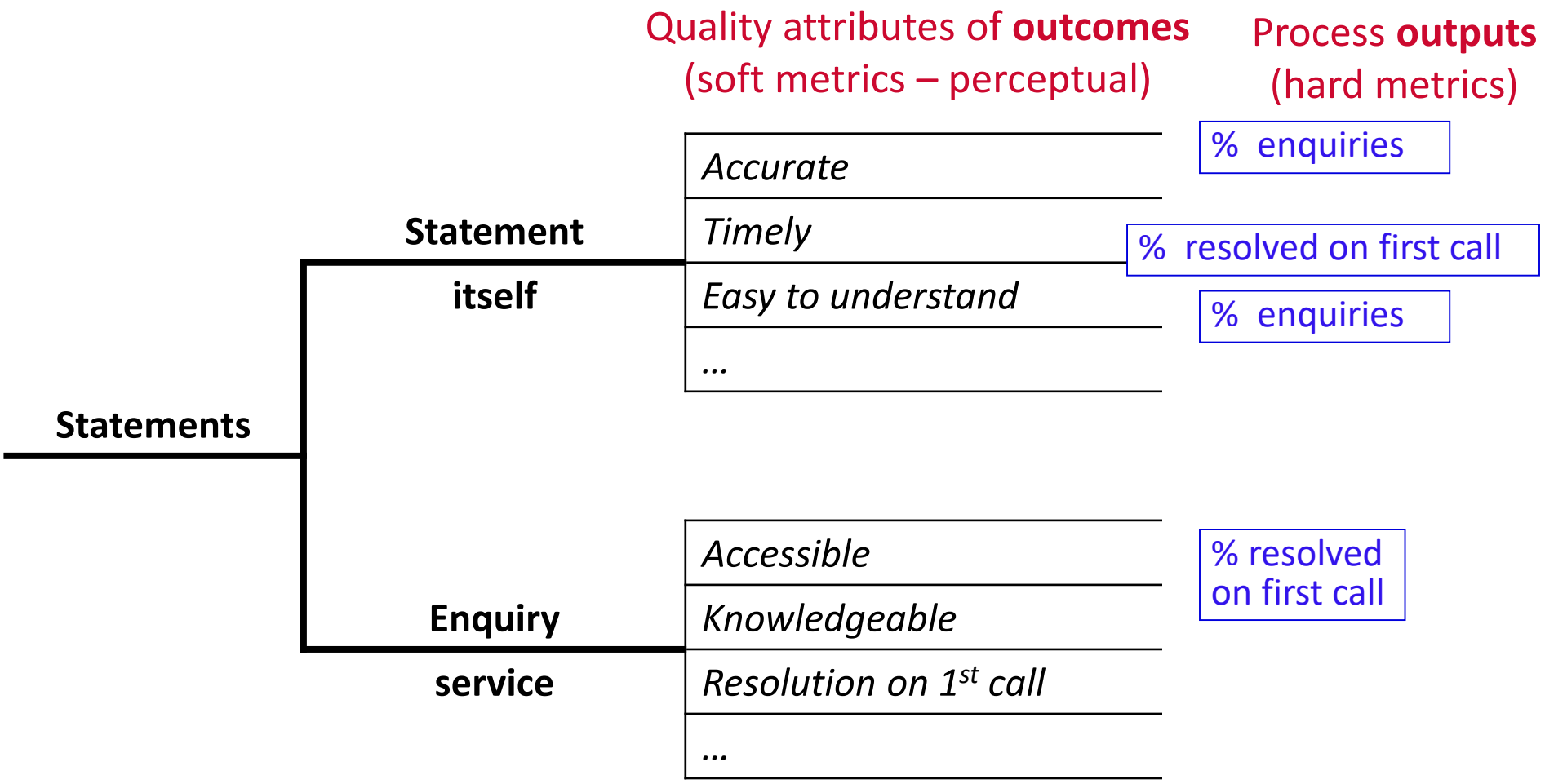
Boast about this result!

Fix this one … your competition is boasting about it!!! … by developing a Transaction survey **focused just on your users** …

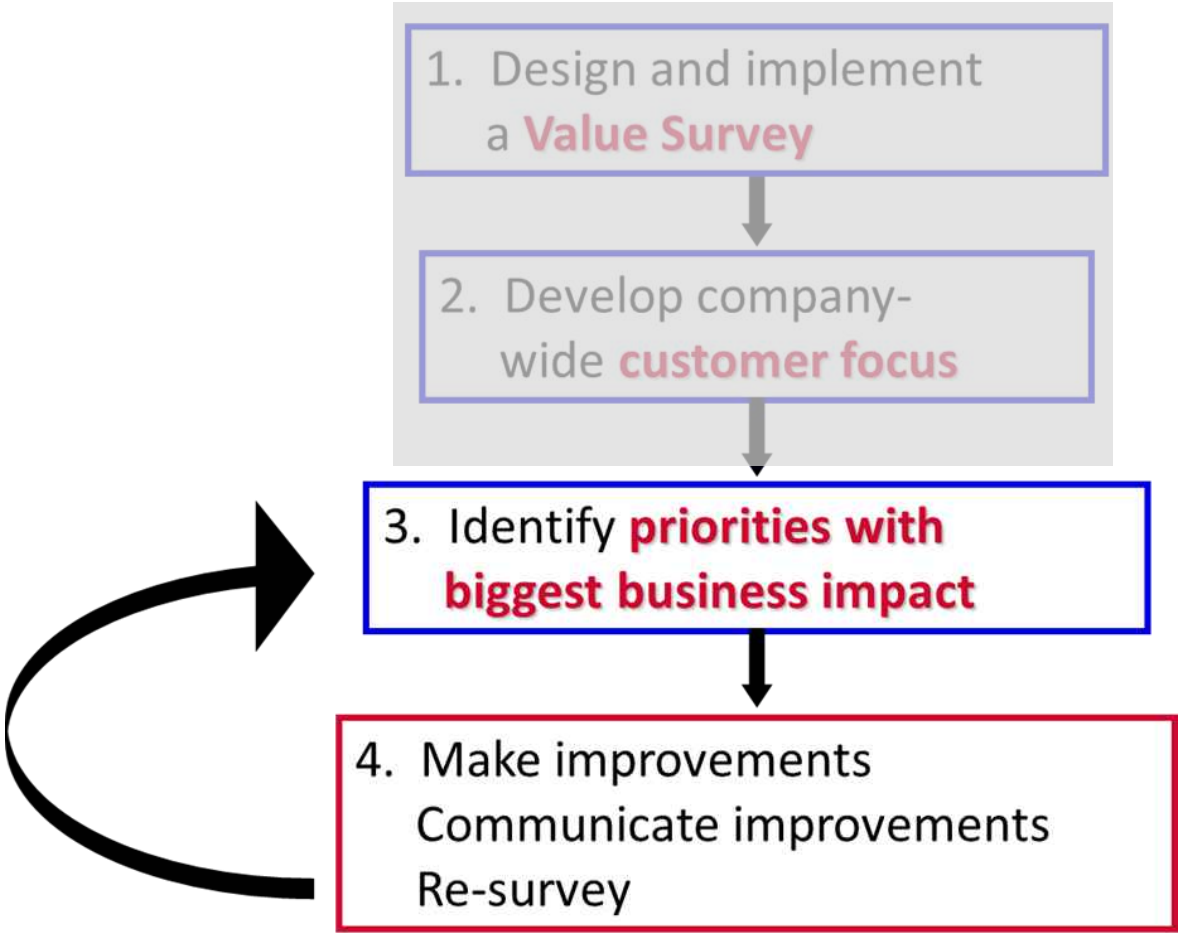
Develop Transaction Survey for your Users .....



… complete the set of metrics …



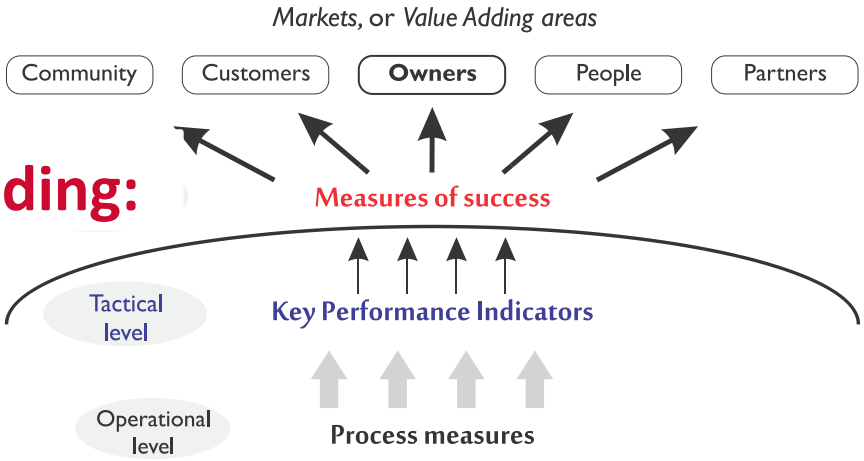
… and continue the improvement cycle



What this process provides for a PM system

Strategic metrics for Customers:

- Relative satisfaction with **Value**
- Relative satisfaction with **Quality**
- Relative satisfaction with **Price**



Tactical metrics for Customers, including:

- Satisfaction with **Value**
- Satisfaction with **Quality**
- Satisfaction with **Price**

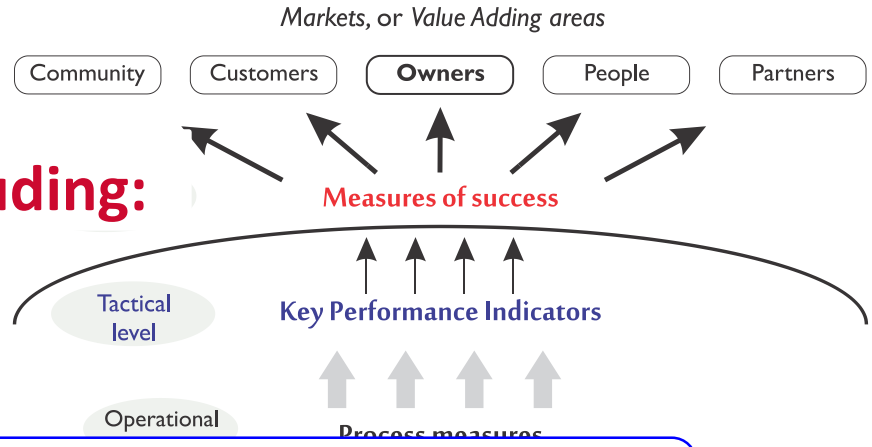
Operational metrics for Customer-related processes:

- Metrics to monitor, control and improve Attribute metrics

What this process provides for a PM system

Strategic metrics for Customers:

- Relative satisfaction with **Value**
- Relative satisfaction with **Quality**
- Relative satisfaction with **Price**



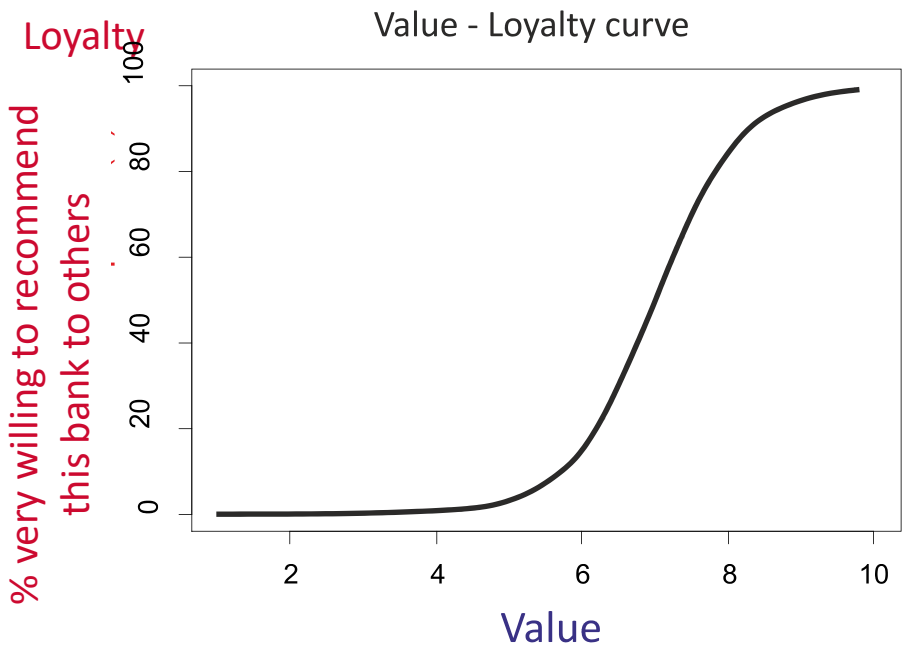
Tactical metrics for Customers, including:

- Satisfaction with **Value**
- Satisfaction with **Quality**
- Satisfaction with **Price**

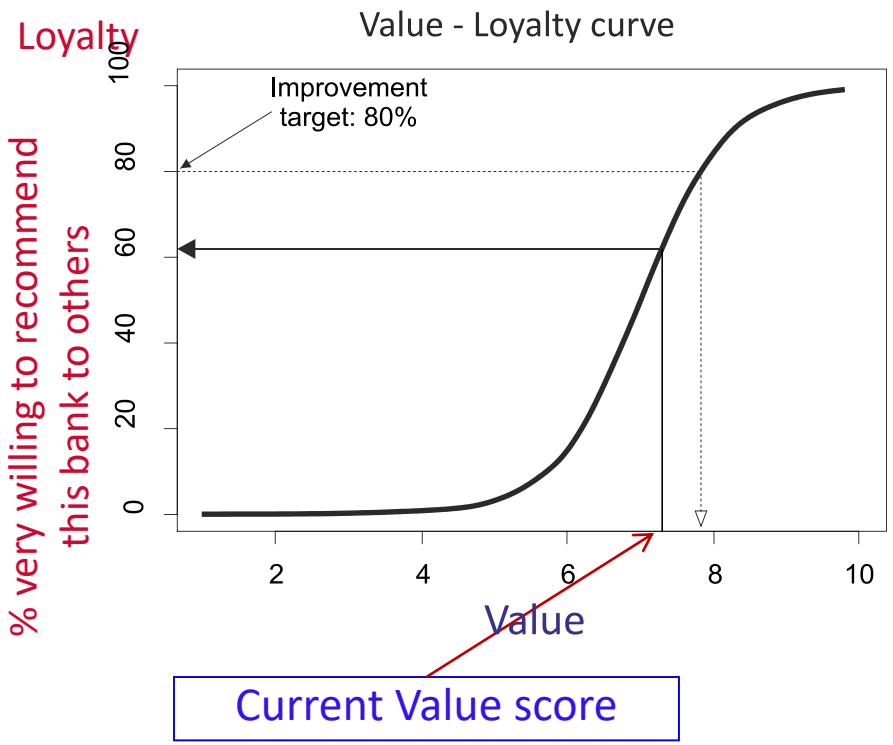
… and links to high-level business drivers …

- Metrics to monitor, control and improve Attribute metrics

Linking Value to Business Impact



(Curve fitted to survey data)



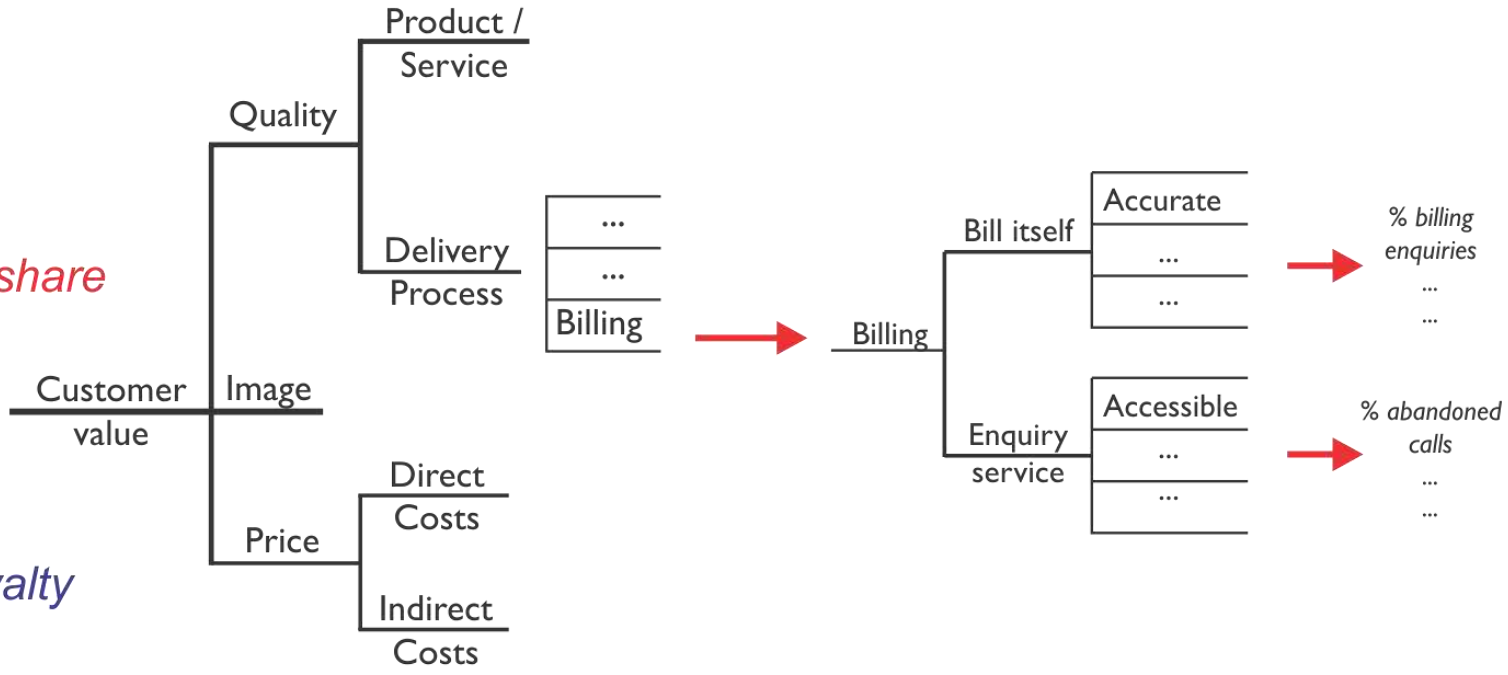
Value Management process: summary

Value survey - Decision-maker
Whole market

Transaction survey - User
Your customers only

Relative Value
lead indicator for *Market share*

Customer Value
lead indicator for *Loyalty*



Identifying and using performance measures

We now have metrics for the **Customer** stakeholder group derived from the process for managing Customer Value:

- **proven process** … used by leading organisations world-wide
- **lead indicators** of business results (ROI, Market share, …)
- **actionable Board and senior executive reports**
- **identifies priorities** with biggest impact on business

What else is needed for the system?

Simplistic thinking about Board report

1. AT&T managed its overall relationship with its **Customers** with just three metrics
   a) *Relative Satisfaction with Value*
   b) *Relative Satisfaction with Quality*
   c) *Relative Satisfaction with Price*
2. Obvious way forward …
   - devise and elaborate a concept of Value for each of the other stakeholder groups
   - apply the same relationship management process to each of these stakeholder groups
   - obtain the leading metrics for these groups

   … and there's the Board report!

[*or something along those lines*]

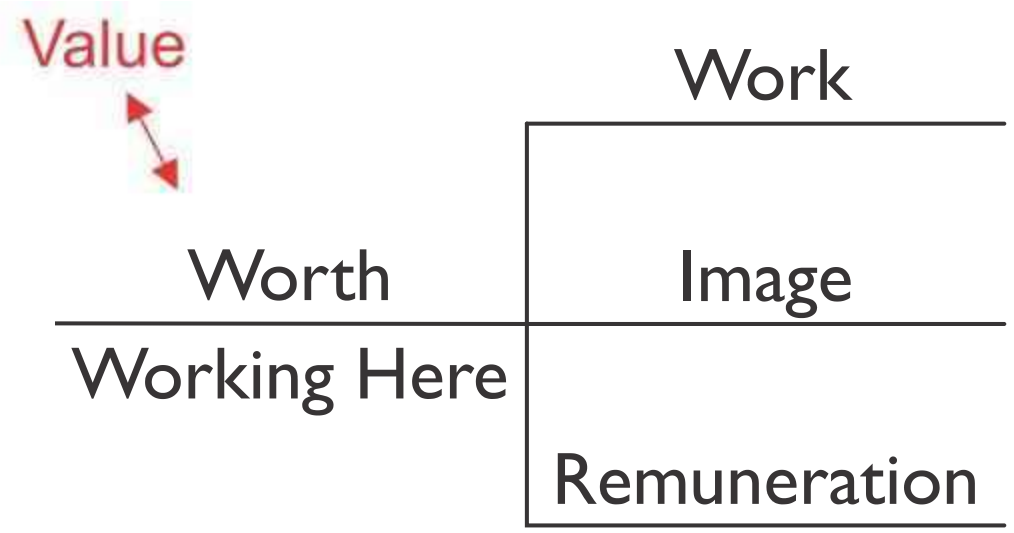
Other key stakeholder groups

Adapt structured approach to managing Value for

- People ..... to increase productivity, reduce unplanned staff turnover, …
- Partners ..... to enhance strategic positioning, …
- Community ..... to build support for presence in area or industry, enhance product acceptance and uptake, …
- Owners ..... to enhance value of investment, manage risk, demonstrate Due Diligence, …

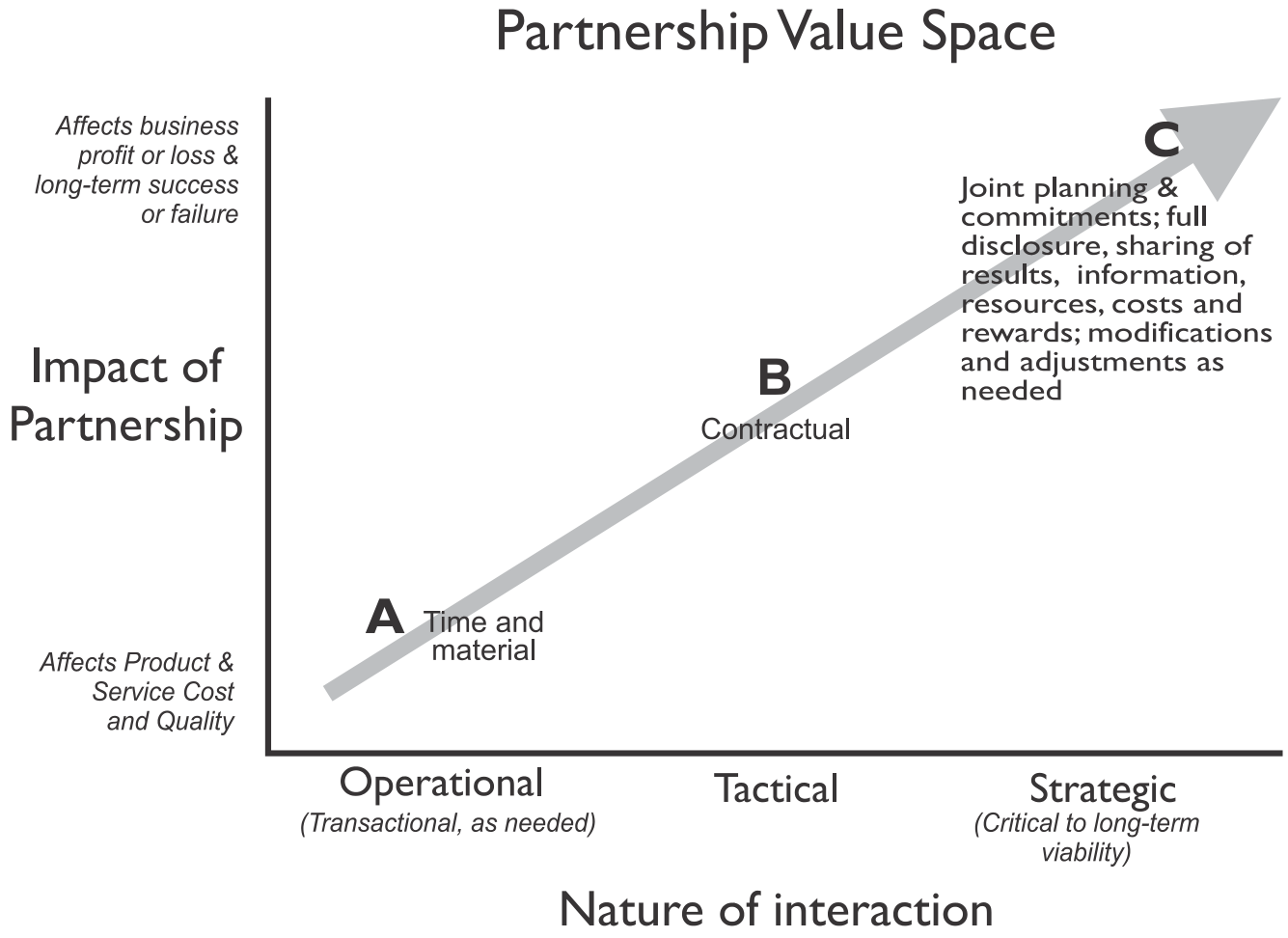
→ overall **Stakeholder Value Management** (SVM) system

People Value tree



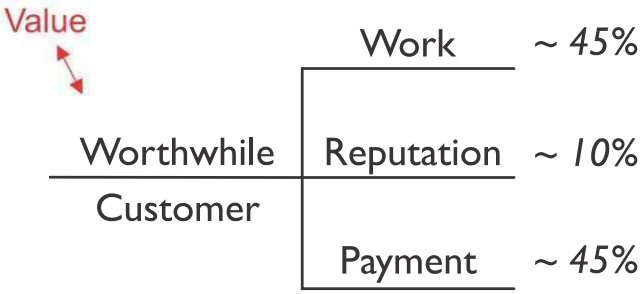
Developed and tested successfully in a variety of academic, business and industry sectors 2001 – present.

Partnership Value space

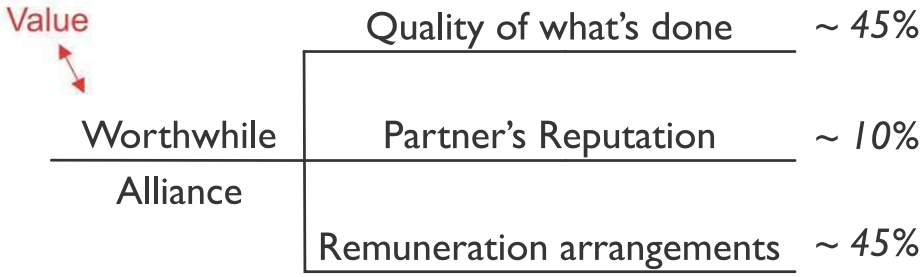


Partnership Value trees

Operational model: Suppliers

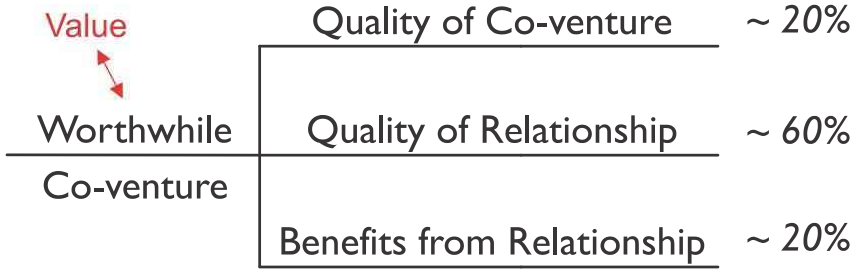


Tactical model: Alliances

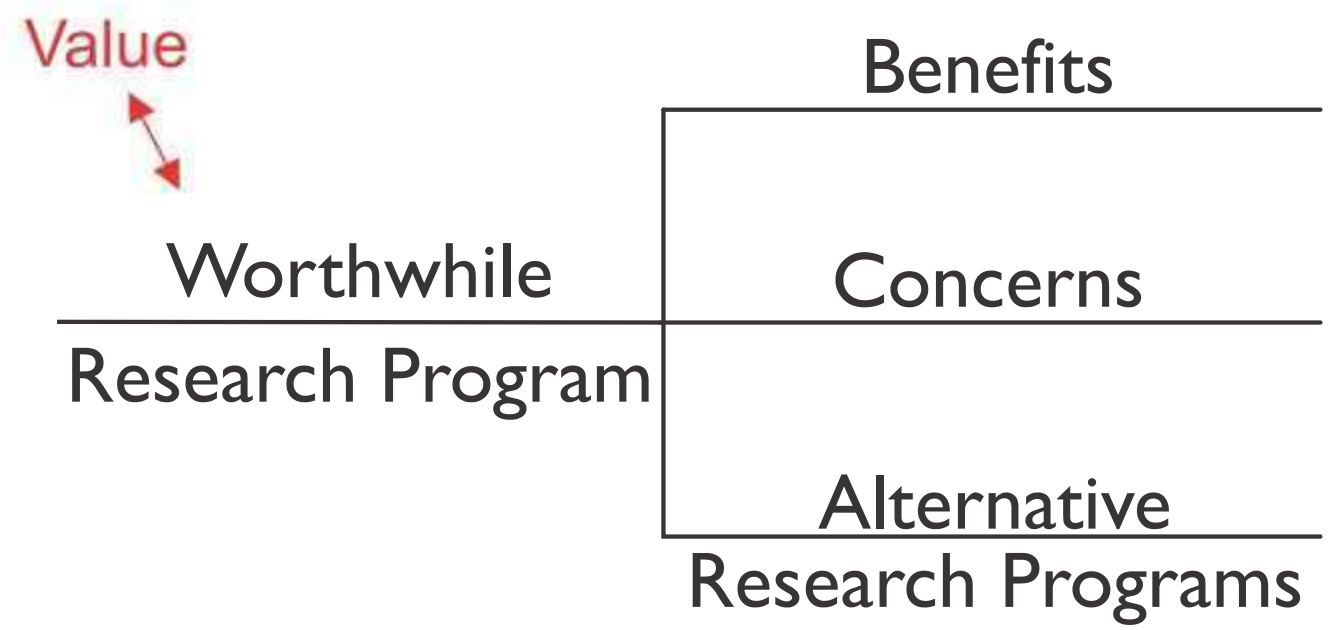


2012 – 2017
Studies with research collaborations that involve several agencies.

Strategic model: Co-ventures



Community Value tree (example)



2004 – 2011. Longitudinal studies with research agencies concerned with developing methods to manage invasive species.

Owners

Adapt structured approach to managing Value for

- People ..... to increase productivity, reduce unplanned staff turnover, …
- Partners ..... to enhance strategic positioning, …
- Community ..... to build support for presence in area or industry, enhance product acceptance and uptake, …
- **Owners ..... to enhance value of investment, manage risk, demonstrate Due Diligence, …**

→ overall **Stakeholder Value Management** (SVM) system

Recall the second question …

Q2: What should be the content of monthly Board and leadership reports in companies and other enterprises?

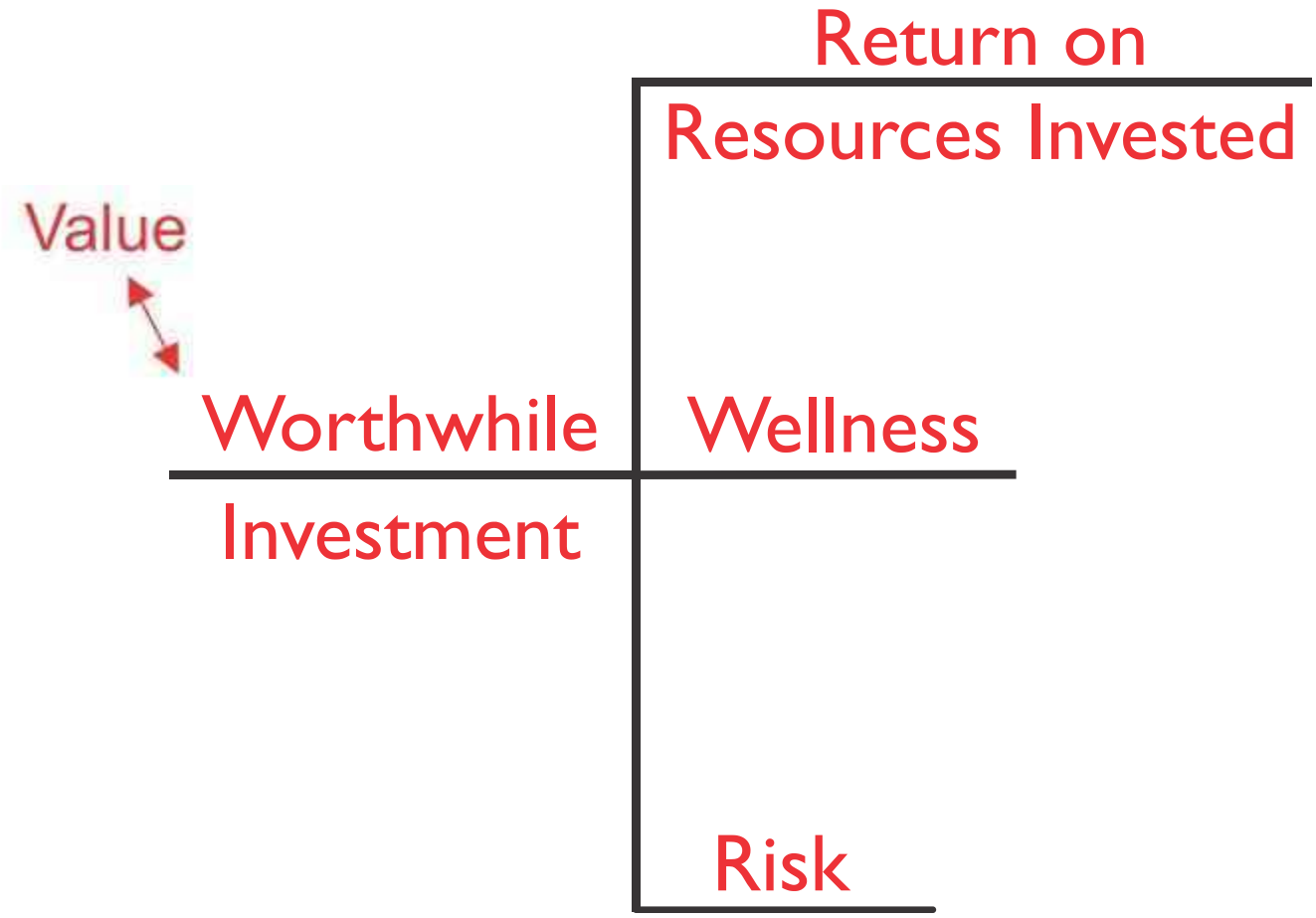
We are seeking a generic quantitative Board report that provides a concise overview of the health of the enterprise, *i.e.* that is

- comprehensive
- captures current performance
- predicts likely future performance

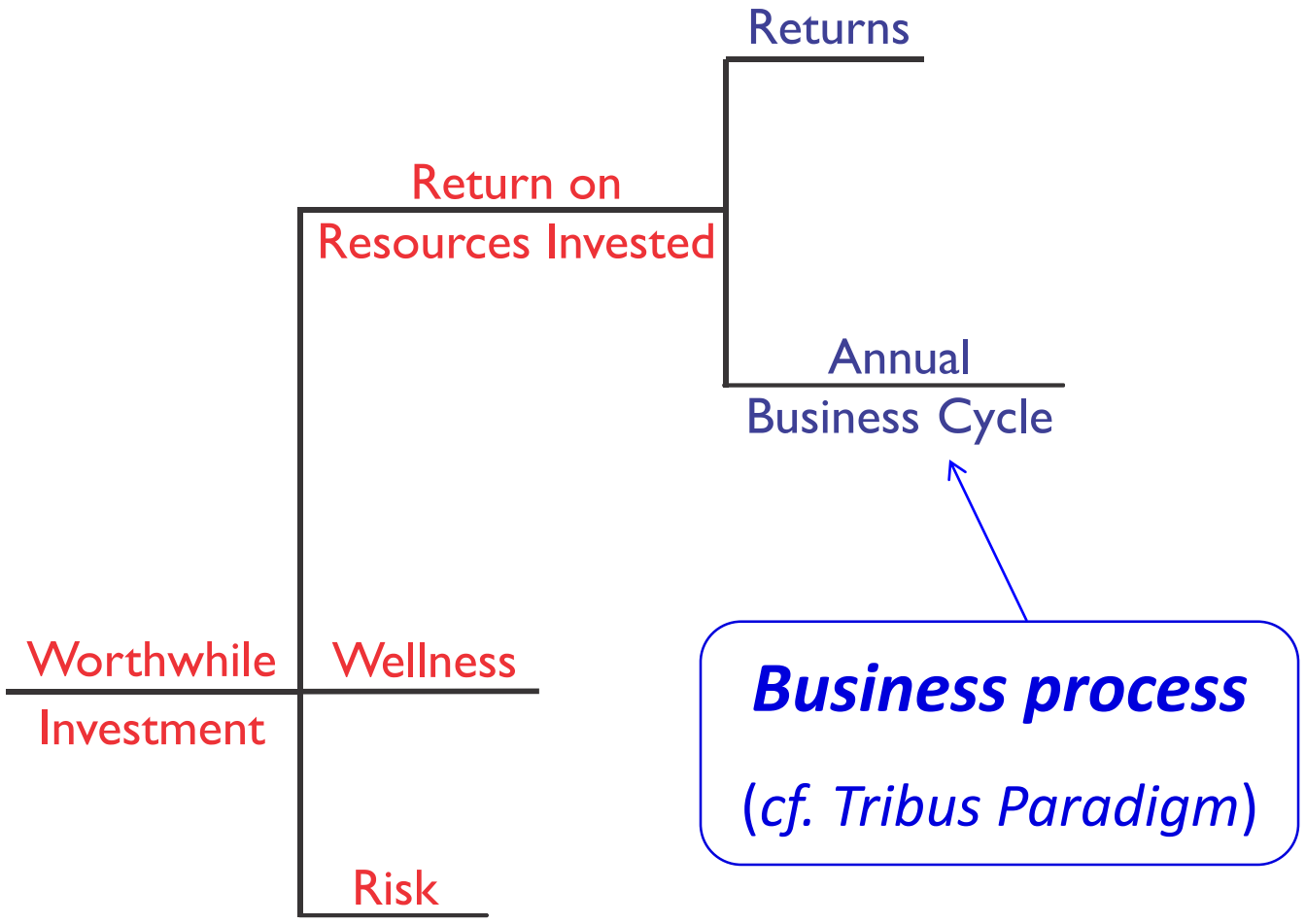
Example: Owner Value for a publicly-listed company …

Who *are* the Owners? The Board, as proxies for the shareholders:

Owner Value Tree



Owner Value Tree



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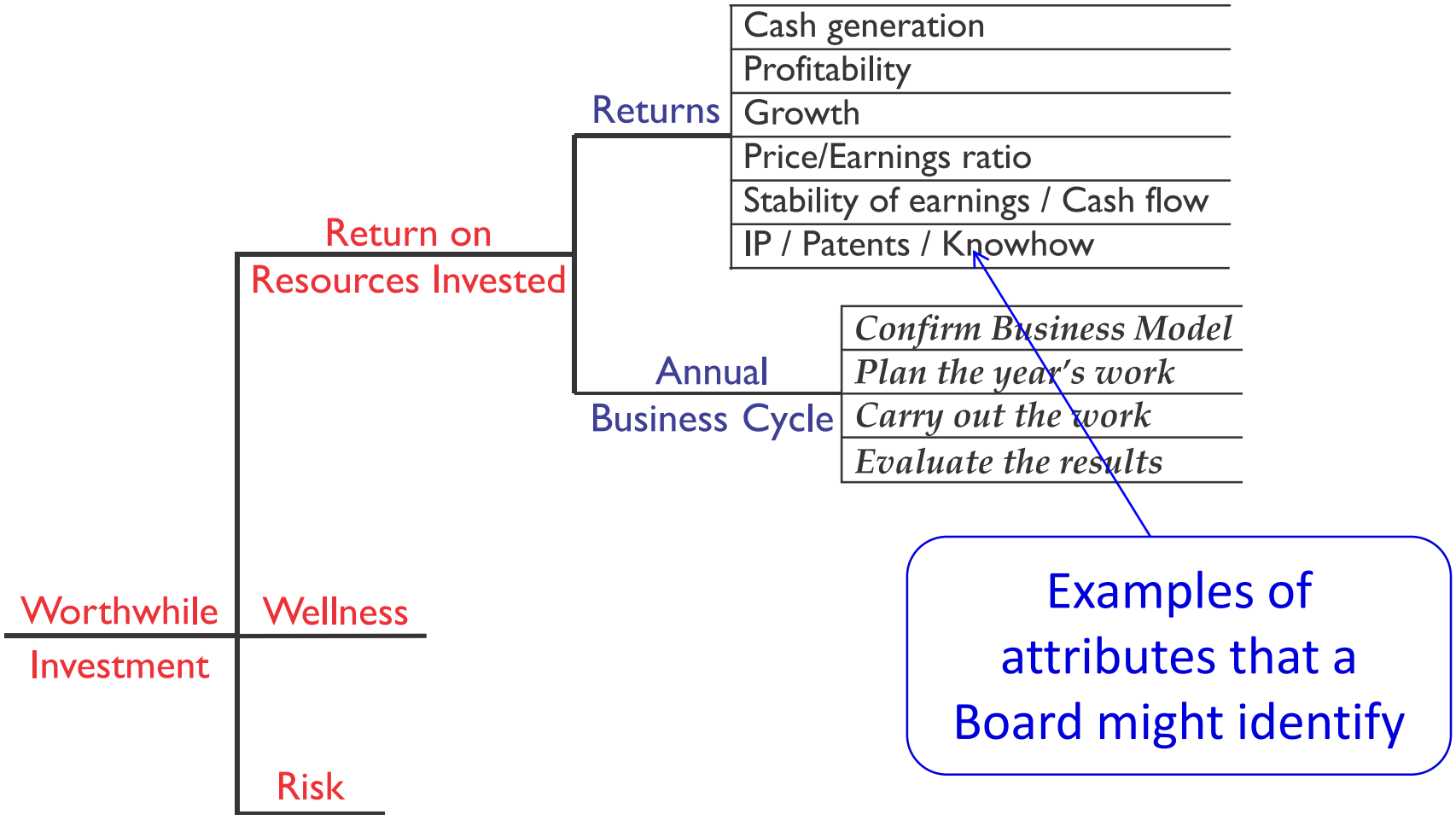

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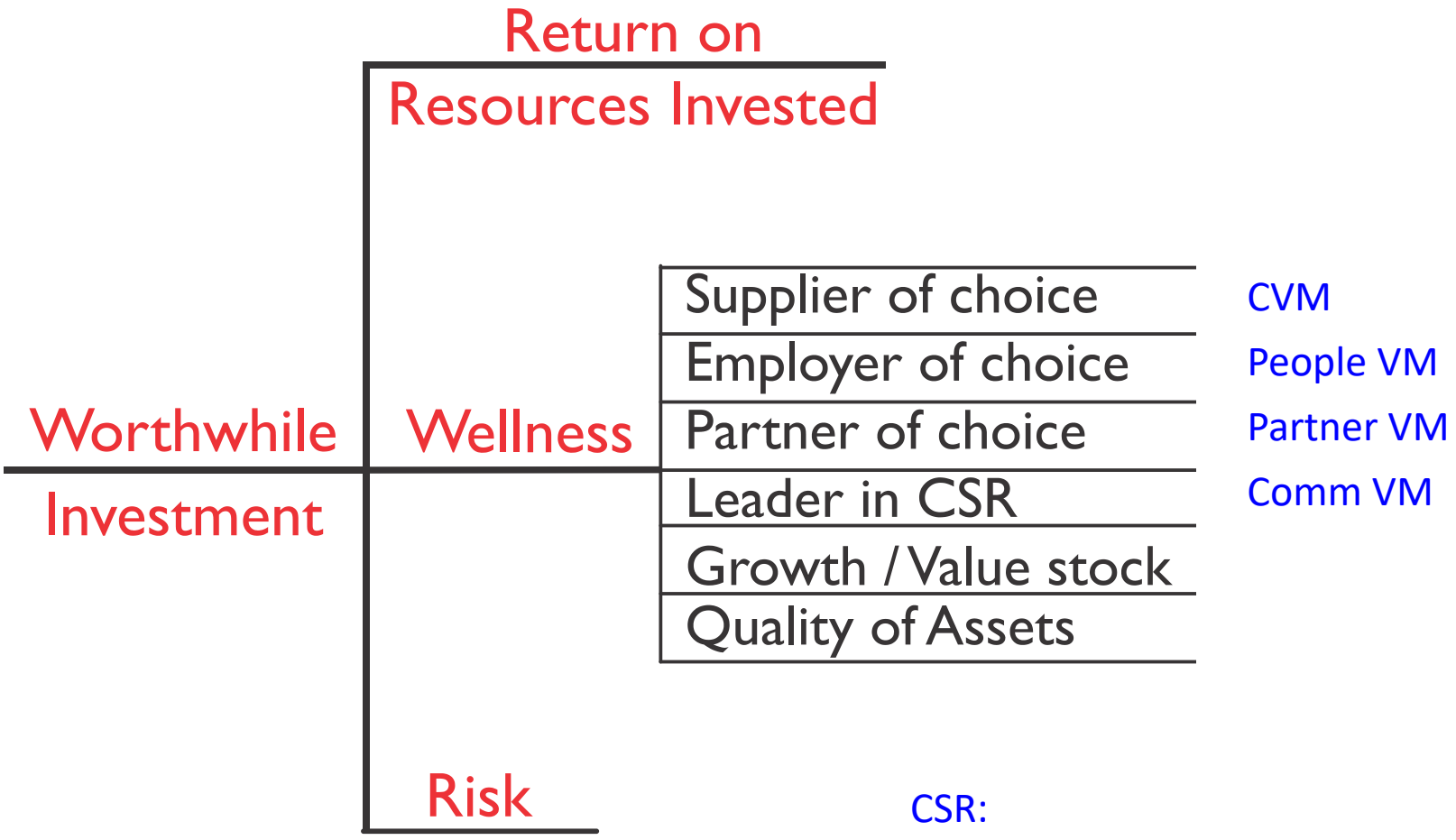
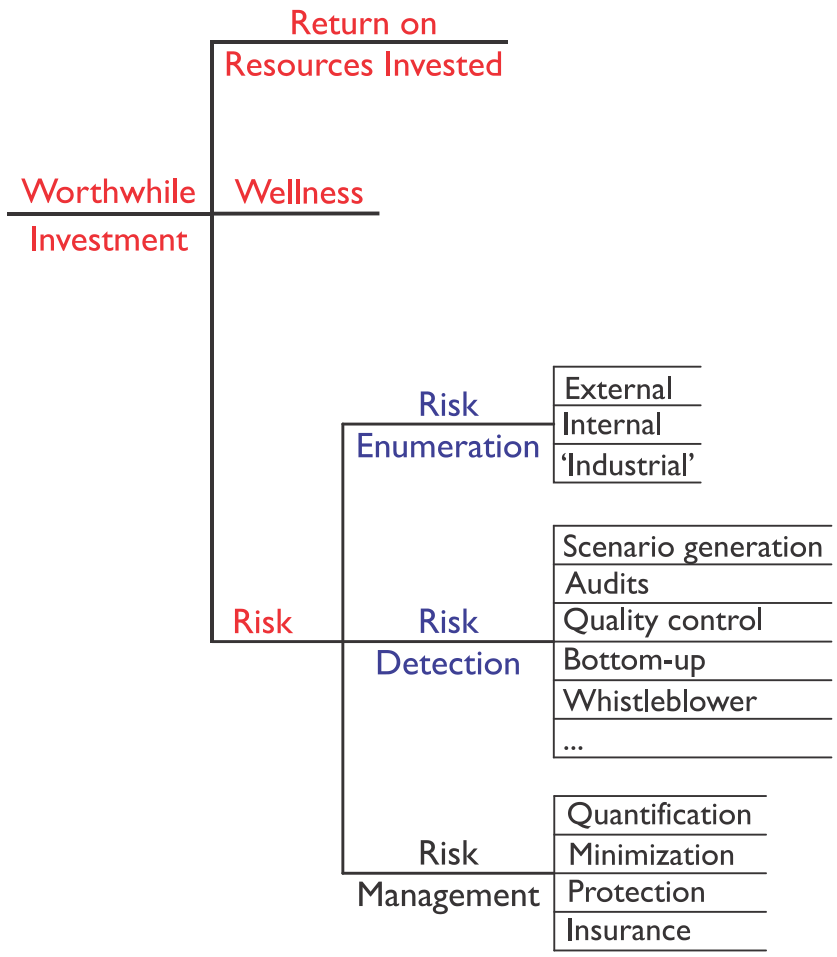


Owner Value Tree



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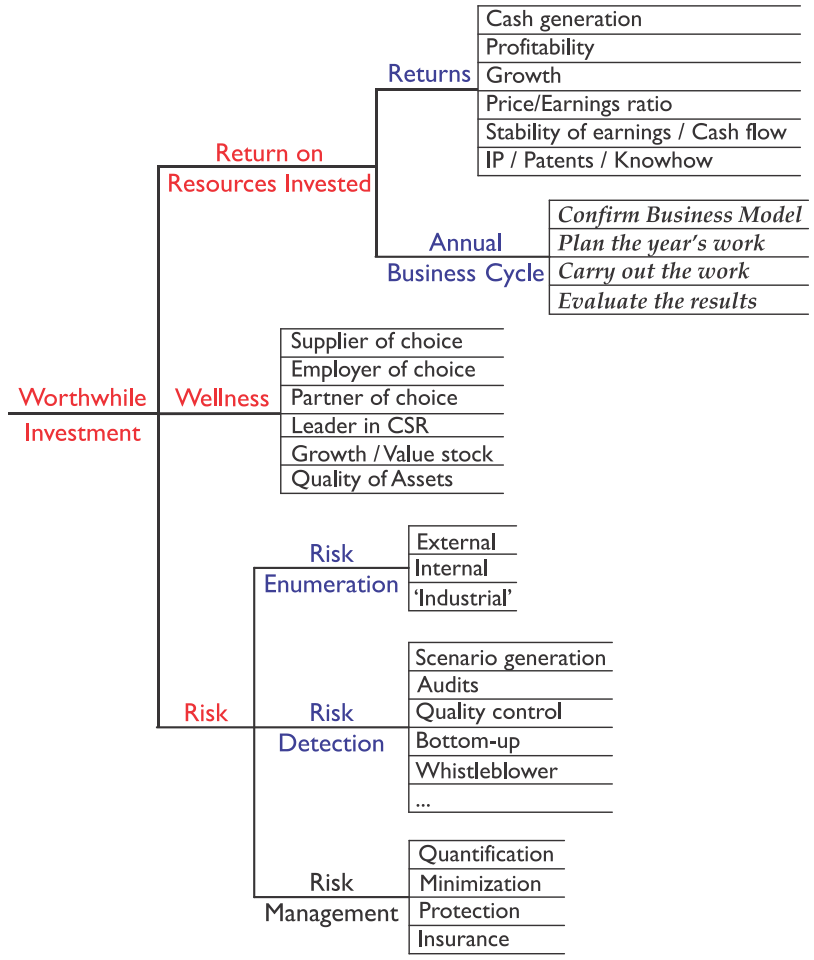
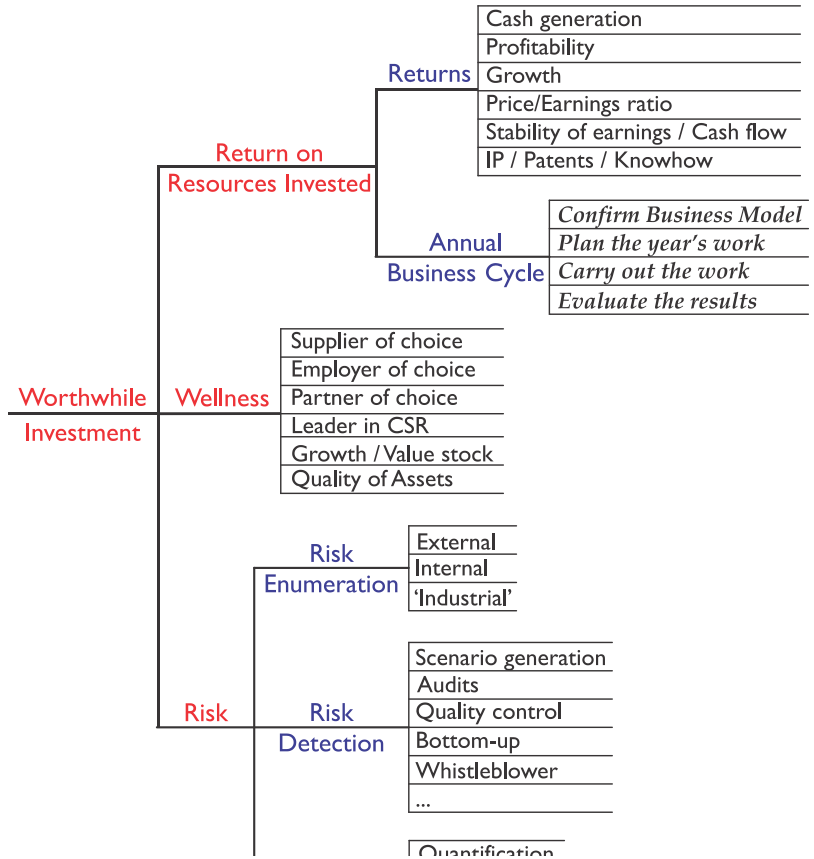
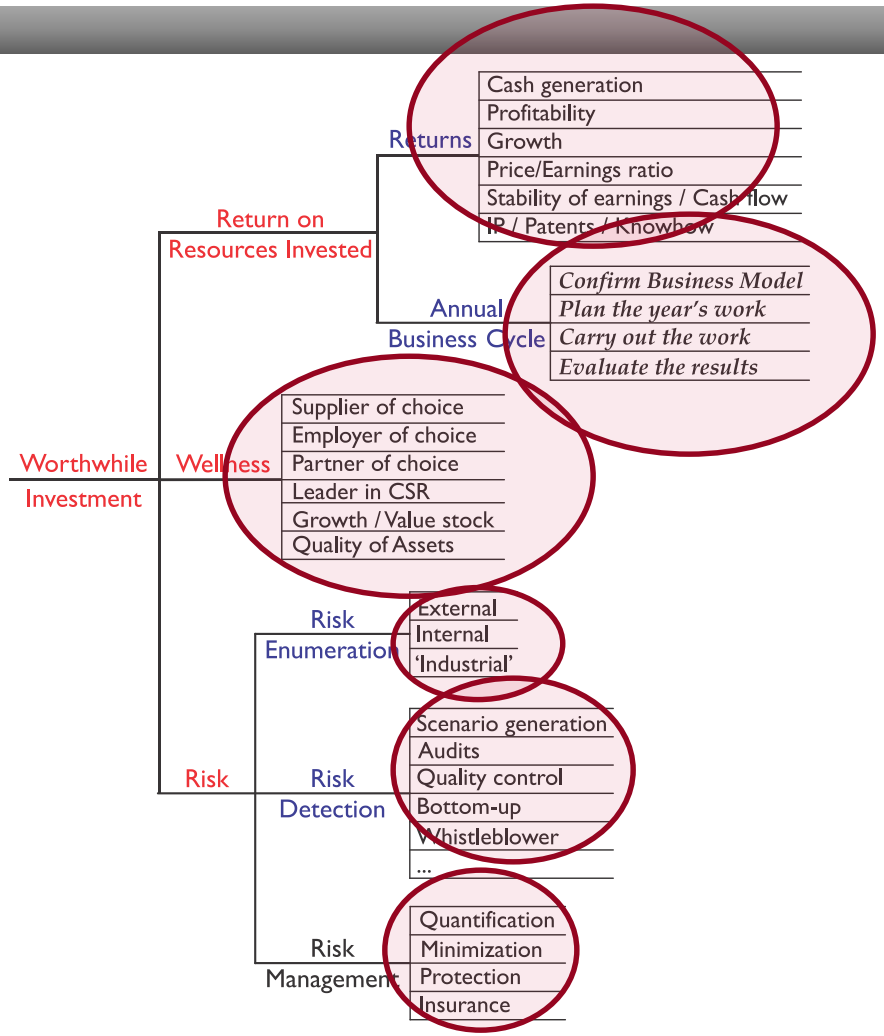


What is the Owner Value tree telling us?

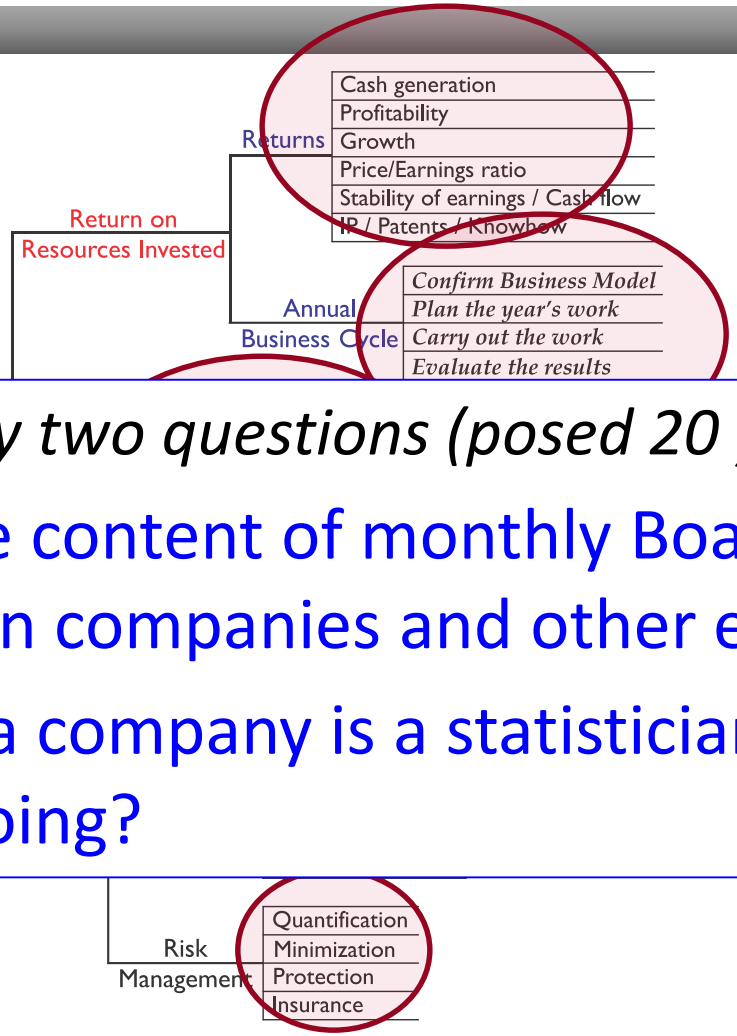


It is answering the question …

… where should monthly reports focus?



… where should monthly reports focus?

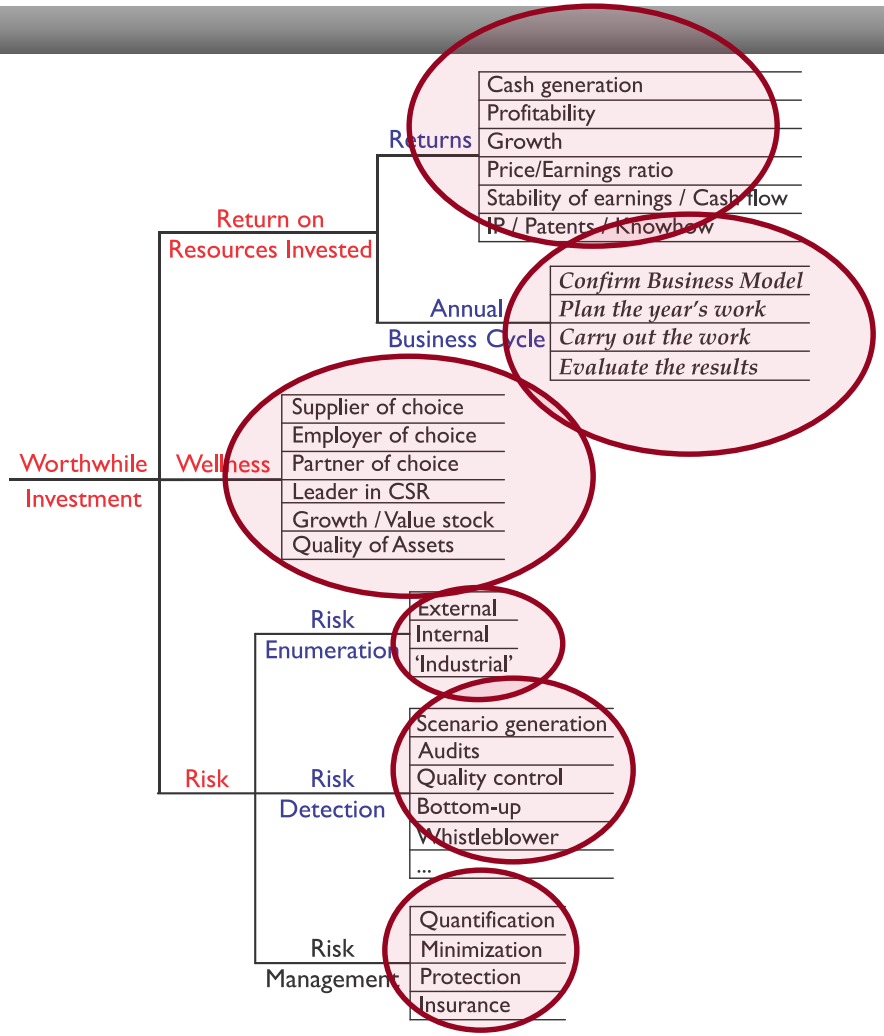


This appears to answer my two questions (posed 20 years earlier):

Q2: What should be the content of monthly Board and leadership reports in companies and other enterprises?

Q1: If the #3 person in a company is a statistician, what should such a person be doing?

… where should monthly reports focus?

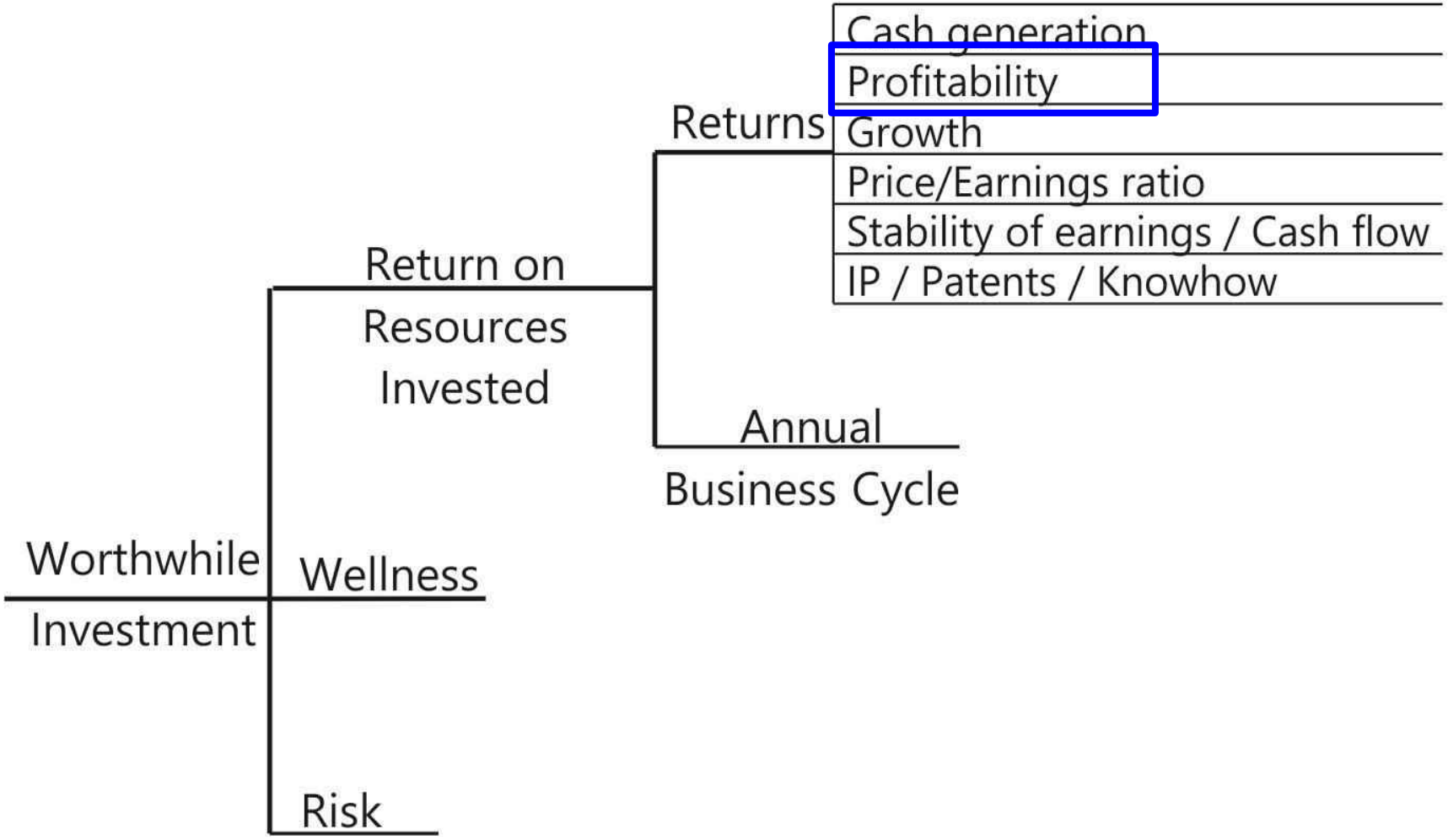


Lead and lag indicators are needed for each of these.

How might the reports be presented?

- **We need**
  - Strategic measures – *Success measures* – where we now?
  - Tactical measures – *KPIs* – where are we heading?
- **We want the reports to be actionable:**
  - Identify the uncertainty in the results
  - Reveal significant trends and changes
  - Provide basis for choosing improvement priorities
  - Allow the user to drill down
  - Draw attention to critical issues

Start with a basic building block for reporting

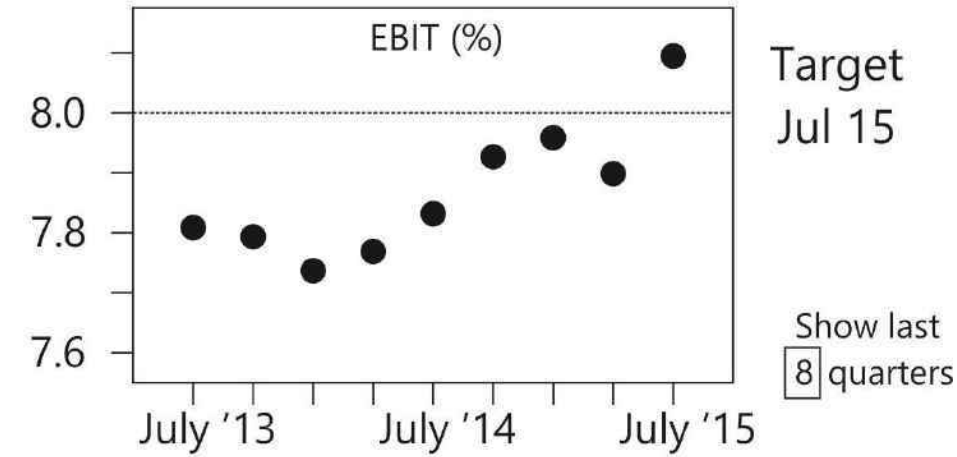


Stakeholder Value report: July 2015

Report level
Group
Business Unit ..
Region ..

Owner Value

Profitability	This quarter	Last quarter	Change
EBIT	**8.1%** ±	7.9%	↑
Return on Equity	**12.2%** ±	12.3%	→
Gross Profit Margin	**39.1%** ±	41.2%	↓
Sales per store	**$0.90M** ±	$0.85M	↑
...	...	...	...



↑ Significant increase since last report
→ No change since last report
↓ Significant decrease since last report

± Precision / accuracy
! Critical risk issue needs to be addressed

Stakeholder Value report: July 2015

Report level: Group | Business Unit ... | Region ...

Owner Value

Profitability	This quarter	Last quarter	Change	
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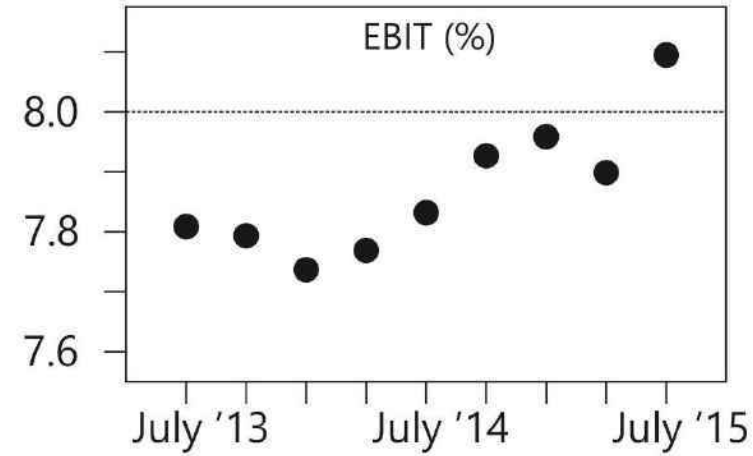
...	...	...	...	



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- Provide basis for choosing improvement priorities
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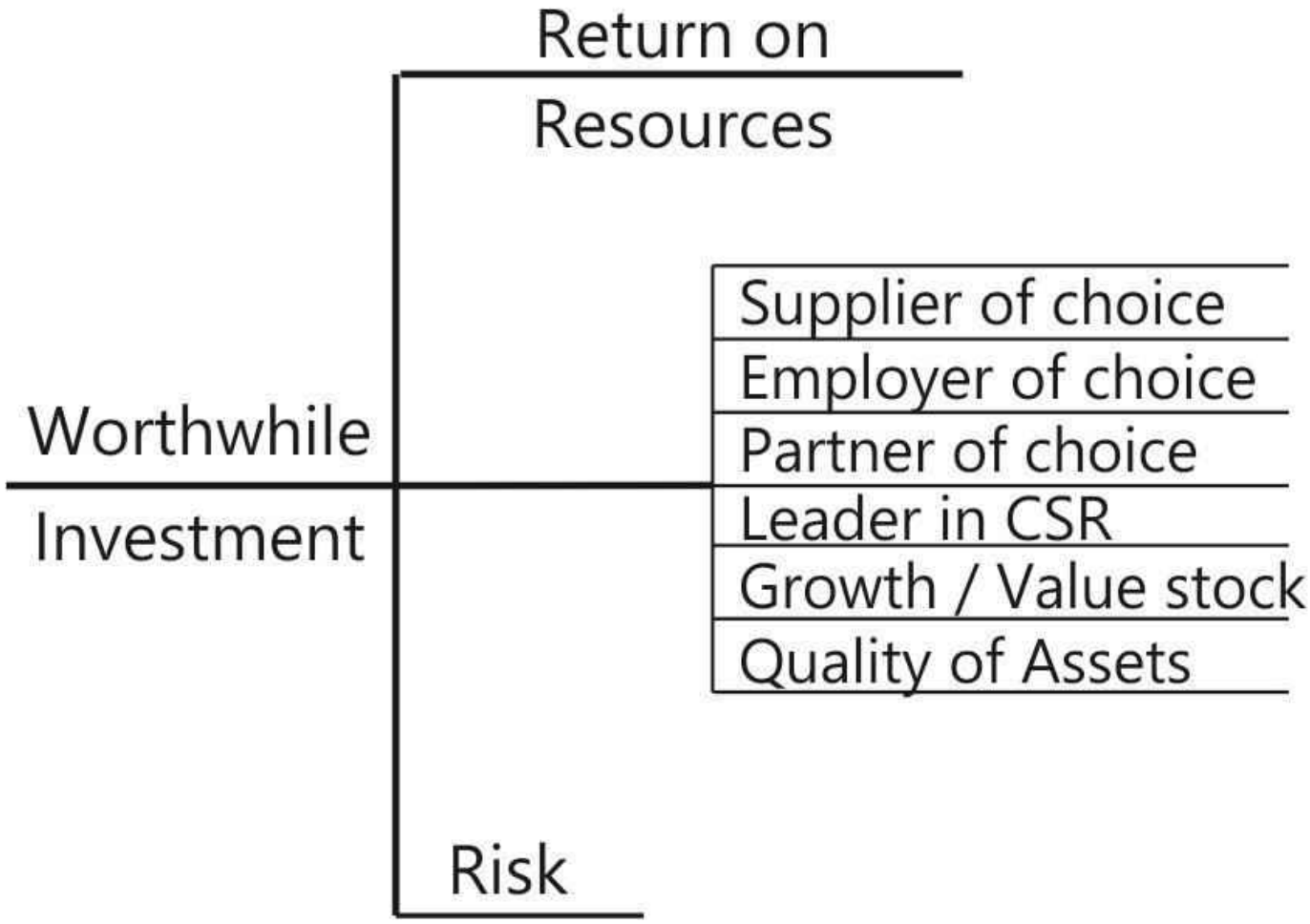
- Draw attention to critical issues

↑ → ↓ Significant decrease since last report

± Precision / accuracy

! Critical risk issue needs to be addressed

Example: Wellness reports



Strategic metrics for Wellness

Customer Value

People Value

Partner Value

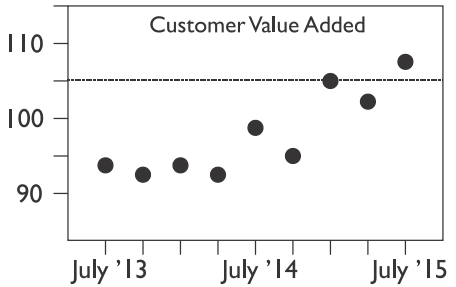
Community Value

etc.

Stakeholder Value report: July 2015

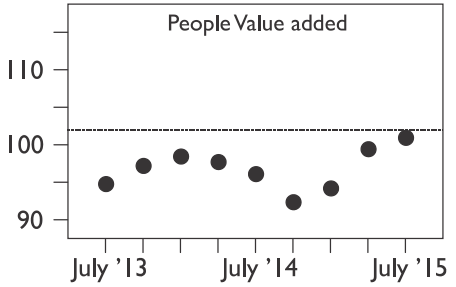
Report level: Group | Business Unit ... | Region ...

	This quarter		Last quarter	Change
Customer Value Added	107	±	105	→
Rel Sat Quality	101	±	106	↓
Rel Sat Image	101	±	97	↑
Rel Sat Price	98	±	94	↑
People Value Added	101	±	99	→
Rel Sat Work	103	±	102	↓
Rel Sat Image	104	±	100	↑
Rel Sat Remuneration	96	±	99	↑
Partner Value Added	99	±	97	→
Rel Sat Quality	102	±	105	↓
Rel Sat Rep./Rel.	94	±	99	↑
Rel Sat Rem. / Benefits	90	±	95	↑
Community Value Added	102	±	100	→
Rel Sat Benefits	102	±	98	↓
Rel Sat Concerns	90	±	98	↑
Rel Sat Investment	99	±	96	↑



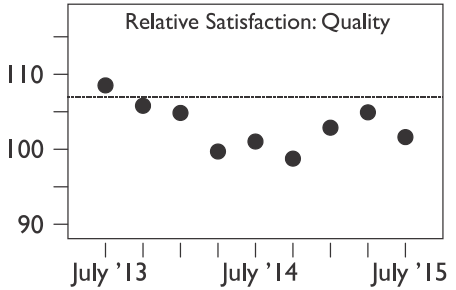
Target Jul 15

Show last 8 quarters



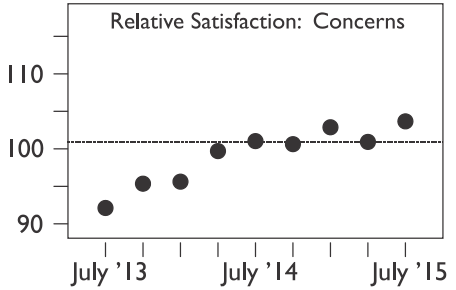
Target

Show last 8 quarters



Target

Show last 8 quarters



Target

Show last 8 quarters

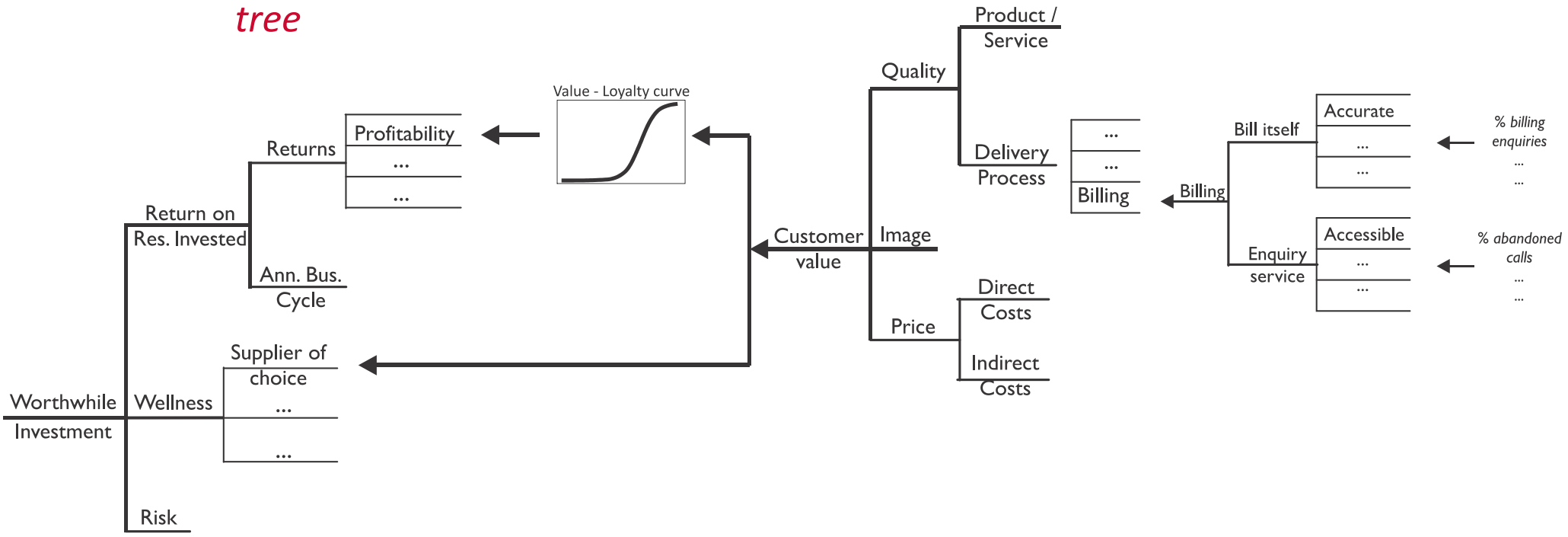
↑ Significant increase since last report
→ No change since last report
↓ Significant decrease since last report

± Precision / accuracy
! Critical risk issue needs to be addressed

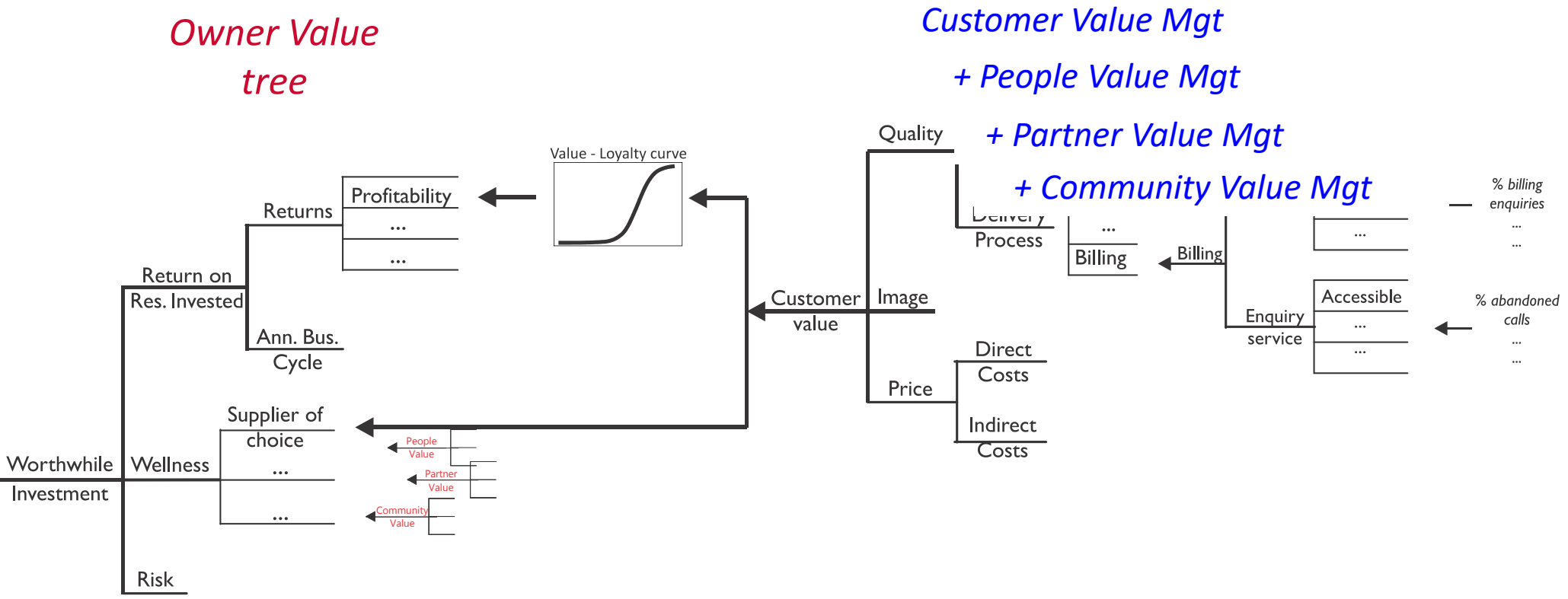
Alignment with Stakeholder Value – CVM

Owner Value tree

Customer Value Management process



Alignment with Stakeholder Value – all



Alignment with Stakeholder Value – all

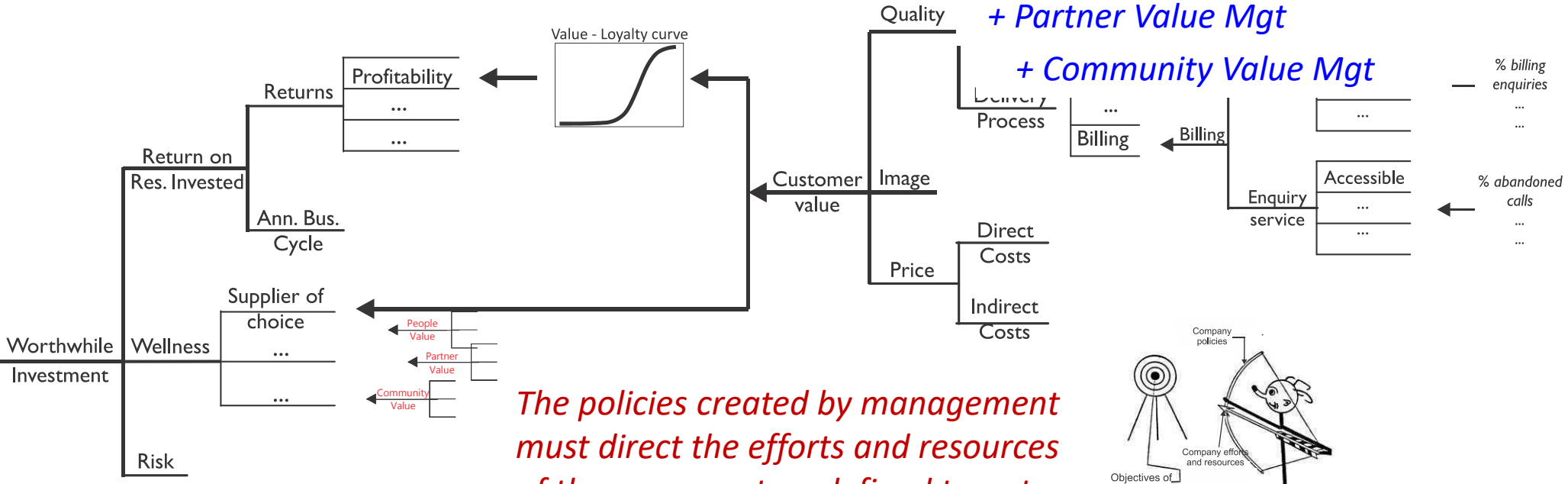
Owner Value tree

Customer Value Mgt

+ People Value Mgt

+ Partner Value Mgt

+ Community Value Mgt



The policies created by management must direct the efforts and resources of the company to a defined target – the fundamental objectives of the enterprise. Homer Sarasohn, 1948.

The Odyssey

- Origins
- Meanderings
- The climb
- Exploring the plateau
-
-

What can we distil from all this?

- It suggests a generic systematic approach to studying problems of performance measurement, based on aligning enterprise activities with stakeholder needs so as to deliver superior outcomes for stakeholders.

- The organising principle of Alignment with stakeholder needs, as set out in the Tribus Paradigm, provides a natural arrangement of outcome, output and in-process measures and clarifies the complementary roles of hard and soft measures (*i.e.* measures of **perception**).

Some areas of application

1. Performance measurement for an enterprise
2. Rating academic institutions
3. Peer reviews
4. Managing Culture / Safety Culture / Risk culture
5. Strategic Planning
6. Implementation of public policy
7. …

1. Performance measurement for an enterprise

- Board and leadership reports
- Performance Measurement System
- Due Diligence
- Assessment of Board Performance
- Low-hanging fruit: setting the record straight about Net Promoter Score (NPS) – Fisher & Kordupleski (2019)
- …

2. Rating academic institutions and research

- Measuring research quality
  - (Warning: there may be several different sorts of customer, each with a very different concept of what constitutes *Quality*)
- Ranking graduate departments
  - Ditto
- Allocating research grants
  - Ditto
- Faculty / Staff / Student satisfaction surveys, …
- …

See RSS Discussion Paper and Fisher (2018).

3. Peer reviews

- National Statistics offices
- External Departmental reviews
- …

4. Managing Culture / Safety Culture / Risk culture

- Informally, Culture is “the way we do things around here”.
- *And culture really matters! …*

Chairman and CEO of IBM …

"Until I came to IBM, I probably would have told you that culture was just one among several important elements in any organization's makeup and success — along with vision, strategy, marketing, financials, and the like...

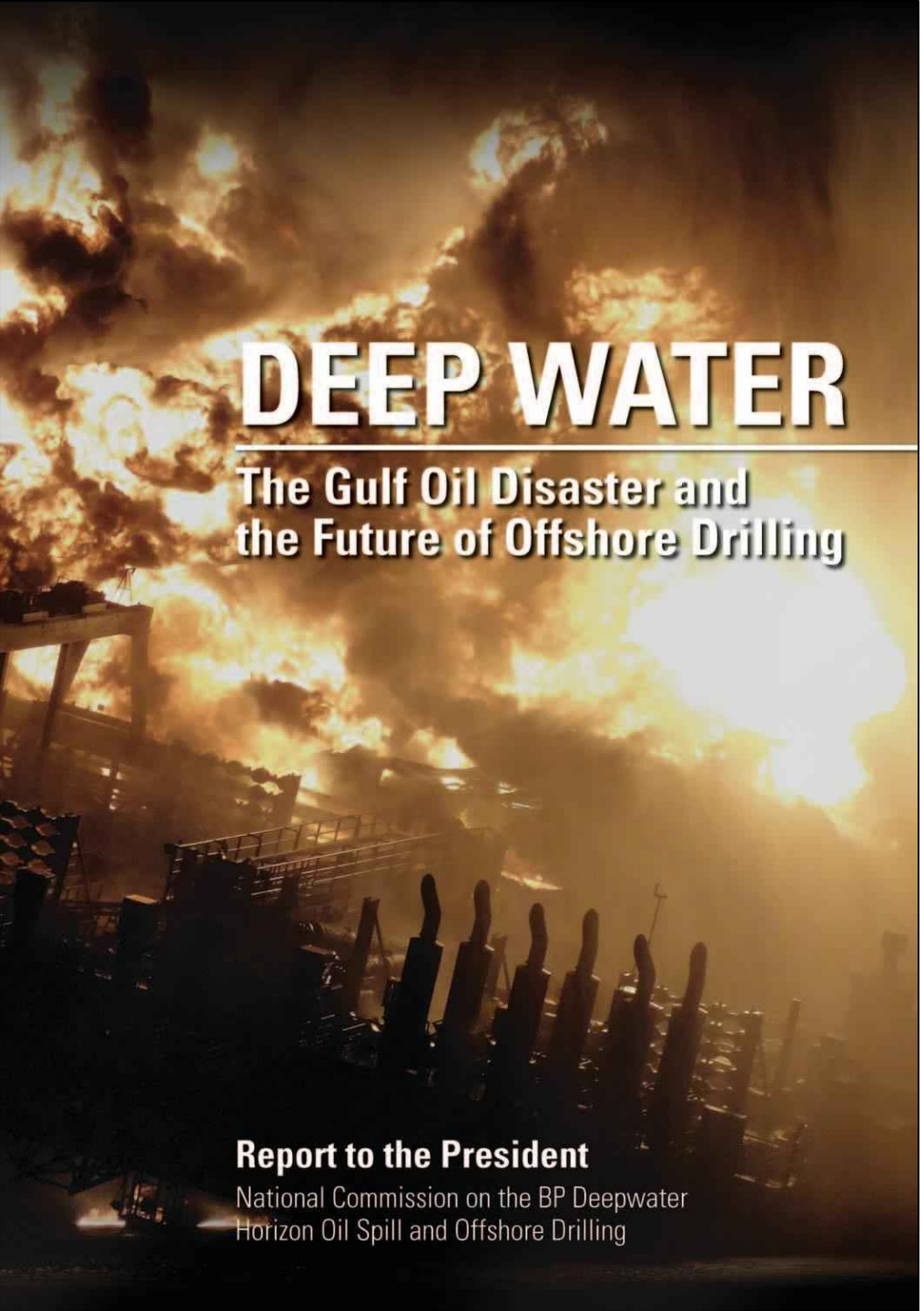
I came to see, in my time at IBM, that culture isn't just one aspect of the game – **it *is* the game**.

In the end, an organization is nothing more than the collective capacity of its people to create value."

Louis V. Gerstner, Jr. (2002),
Who Says Elephants Can't Dance?
New York: HarperCollins

4. Managing Culture / **Safety Culture** / Risk culture

- Safety is a critical issue in many industries, including aviation, health care, building & construction, forestry, mining, fishing, agriculture, nuclear power plants, …
- Almost every formal inquiry into serious safety incidents concludes that **organisational culture** is a significant to major causal factor … *e.g.*
  - **Exxon Valdez** (March 24, 1989)
  - **Space Shuttle Columbia** (February 1, 2003)
  - **Alaska Airlines AS 261** (January 31, 2000)
  - **BP Gulf Disaster** (April 20, 2010) …



"As a result of our investigation, we conclude:

- The explosive loss of the Macondo well could have been prevented.
- The immediate causes of the Macondo well blowout can be traced to a series of identifiable mistakes made by BP, Halliburton, and Transocean that reveal such systematic failures in risk management that they place in doubt the safety culture of the entire industry."
- *etc. etc.*

Safety Statistics and Safety Culture

What's usually reported about Workplace Safety?

- Lost Time Injury Frequency Rate
- # of Class One incidents (*i.e.* deaths)
- Damage to equipment
- Near misses

Safety Statistics and Safety Culture

What's usually reported about Workplace Safety?

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- Damage to equipment
- Near misses

This is all too late! (*) The damage has been done, and the costs in terms of lives, injuries, heart-break, property destruction, resources, money, time, *etc. etc*. have already been incurred.

The focus needs to be upstream, where it's not only vastly cheaper to do things but actually offers some prospect of avoiding all these problems in the first place.

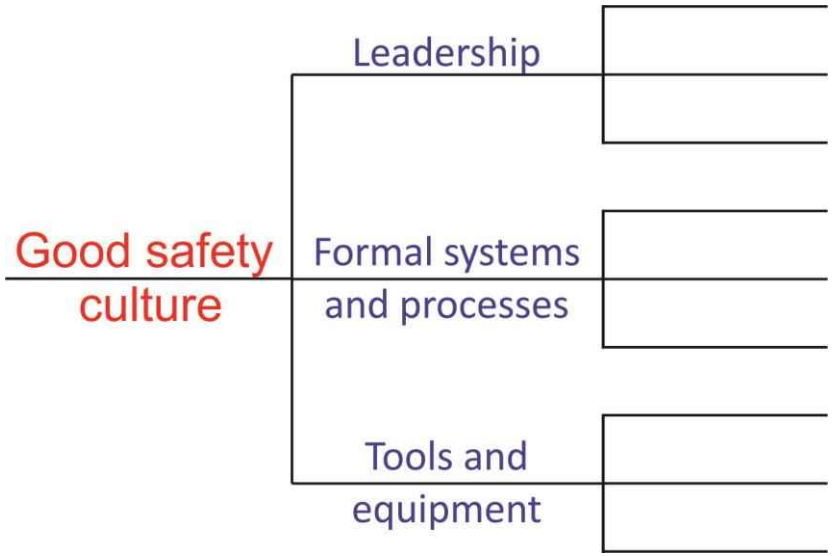
** I wasted years of research time – mine and other people's – working on control charts for safety incidents.*

Managing Safety Culture

- Current commercial approaches are deeply flawed
  - No guarantee that all key factors are being measured
  - Use of Likert scale
  - 'Validation' of results derived from Factor Analysis of survey data
  - No sound basis for setting improvement priorities
  - No clear link to business impact
  - Generally, not thought of as *a process of continuous improvement*
  - …

Managing Safety Culture

- Current commercial approaches are deeply flawed
- New approach: adopt the Alignment way of thinking, based on a Safety Culture tree and an associated continuous improvement process …



Managing Safety Culture

- Current commercial approaches are deeply flawed
- New approach: Adopt the Alignment way of thinking, based on a Safety Culture tree and associated continuous improvement process
- Prospective benefits
  - Safer workplace and happier people
  - Greater productivity
  - Improved recruitment
  - Lower staff turnover
  - Reduced Cost of Claims
  - Cheaper insurance

5. Strategic planning

Follow the Tribus paradigm, *e.g.* for a University Department:

1. Identify stakeholder groups for whom you ***will*** need to create and add value, in order to survive and thrive
   - Research community
   - Faculty & staff
   - Undergraduate, graduate and post-doc students
   - Funding agencies
   - Collaborators
   - Administration!
   - Community – alumni, local community, …
   - …

5. Strategic planning

Follow the Tribus paradigm, *e.g.* for a University Department:

1. Identify stakeholder groups for whom you *will* need to create and add value
2. Develop an understanding of their current and future needs
3. Devise SMART* Strategic Objectives to capture these needs, and strategies to achieve them
4. Measure and monitor progress with Stakeholder Value survey processes

(Such a process has been running throughout the departments and research centers of the CMU Mellon College of Science since 2017. See Fisher 2018.)

* **S**pecific, **M**easurable, **A**chieveable, **R**ealistic, **T**ime-bounded

6. Efficient & effective implementation of public policy

- A new Government program is announced.
- **Question:** What performance measures are in place to ensure that the program will be delivered efficiently and effectively?

6. Efficient & effective implementation of public policy

- This is a 'greenfield' site for statisticians: use of non-financial performance measurements to monitor the delivery of government programs is rudimentary at best … anywhere in the world!
- Two major pieces of work are called for:
  1. development of a general approach to identifying and putting in place what would be, in effect, a web of performance metrics – strategic, tactical and operational; lead and lag.
  2. development of statistical modelling and analysis tools to apply in such situations, always being mindful of the need to provide results in relatively simple and actionable format.

The Odyssey

- Origins
- Meanderings
- The climb
- Exploring the plateau
- But where's the Statistics in all this?
-

But where's the Statistics in all this?

1. **There's an important requirement for Statistical Thinking** … not least, to counter such views as those expressed in a book on *Key Performance Indicators**, that there's no need to distinguish between lead and lag indicators *or, indeed, even to worry about processes*!

* Parmenter, David (2010) *Key Performance Indicators*. Second edition. (!) Hoboken, NJ: John Wiley & Sons.

But where's the Statistics in all this?

2. There's an ongoing need to address technical problems:

- Devising new ways of collecting competitive data
- Making progress with the sorts of sampling issues that have arisen in forecasting the results of the 2016 US Presidential election, the Brexit vote, and the recent Australian Federal elections*
- Modelling Value survey data collected over time (*e.g.* by adapting the Kalman filter to situations where the regression coefficients are all positive)
- Ordered text mining: each text sample has an associated rating
- [… see Fisher 2019]

** Every major polling agency consistently forecast the wrong outcome over several years of fortnightly polling.*

Odyssey

- Origins
- Meanderings
- The climb
- Exploring the plateau
- But where's the Statistics in all this?
- Completing a loop

Deming, Sarasohn, and SQC

- During the latter years of the 1940s, Homer Sarasohn had been under considerable pressure from JUSE* to teach the Japanese about Statistical Quality Control.
- He had resisted, telling JUSE that it was important to understand the context in which to apply SQC, before learning and using it.
- After he and Charles Protzman gave their two courses in Industrial Management (1948 and 1949) to business leaders, Sarasohn started thinking about teaching people SQC.
- Then President Harry Truman reassigned Gen. Douglas MacArthur to Korea (1950), and MacArthur took Homer with him.

* Japanese Union of Scientists and Engineers

Deming, Sarasohn, and SQC – Coda

- After teaching the course in Industrial management, what to do about teaching SQC? Sarasohn contacted Walter Shewhart.
- Shewhart was too busy, so Sarasohn set up a small committee* which ended up approaching Deming.
- Deming, who had visited Japan initially in 1947 to advise on survey methods, then returned in 1950 to teach SQC … and additionally gave his now-famous addresses to business leaders, as described in the NBC program.

* See Fisher 2009

Deming, Sarasohn, and SQC – Coda

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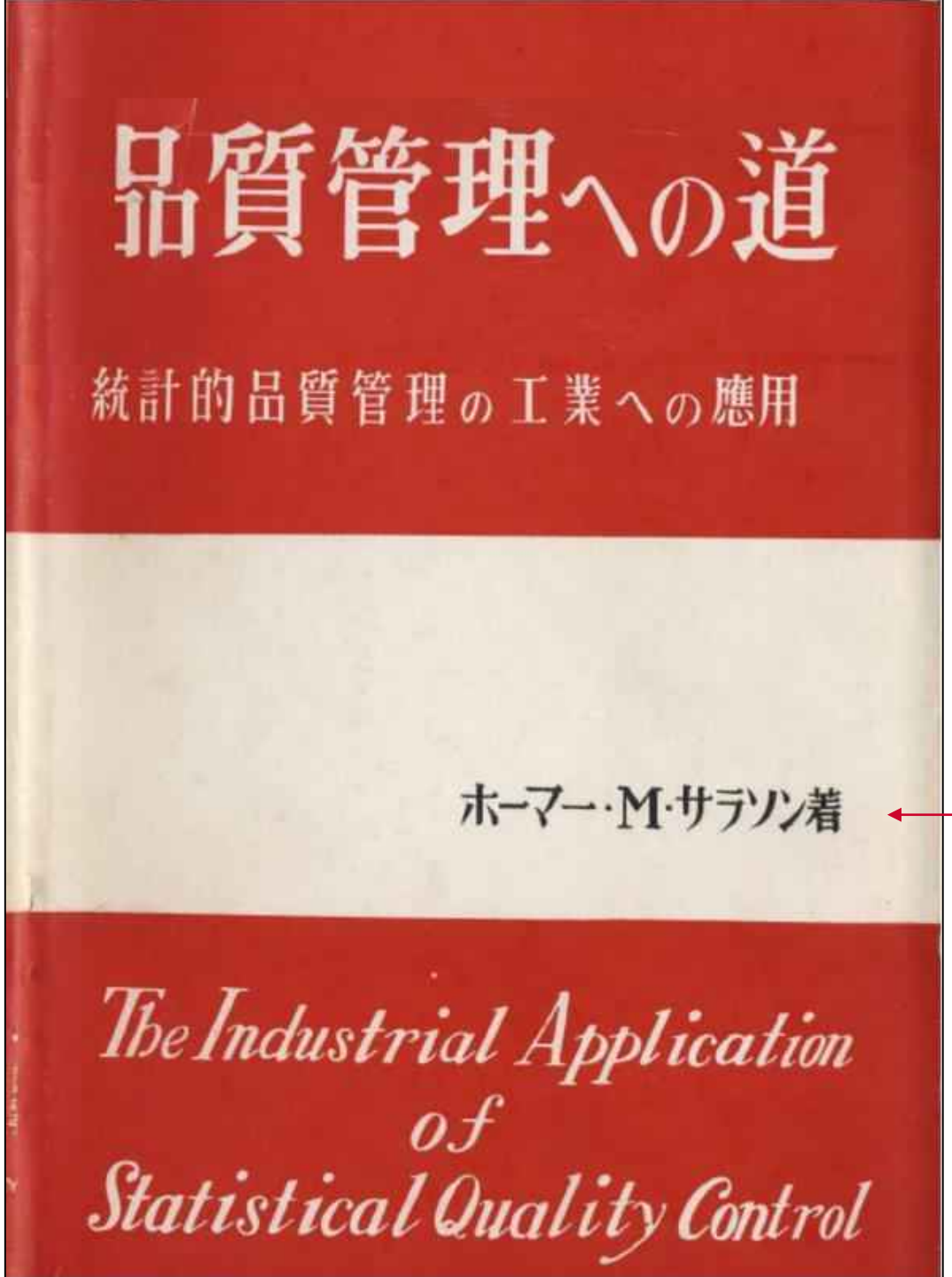
- Deming, who had visited Japan initially in 1947 to advise on survey methods, then returned in 1950 to teach SQC … and additionally gave his now-famous addresses to business leaders, as described in the NBC program.
- End of story? … Not quite! *There is a small but fascinating untold piece of SPC / SQC history!*
- 2008: a package arrives from Lisa Sarasohn (daughter) …

* See Fisher 2009



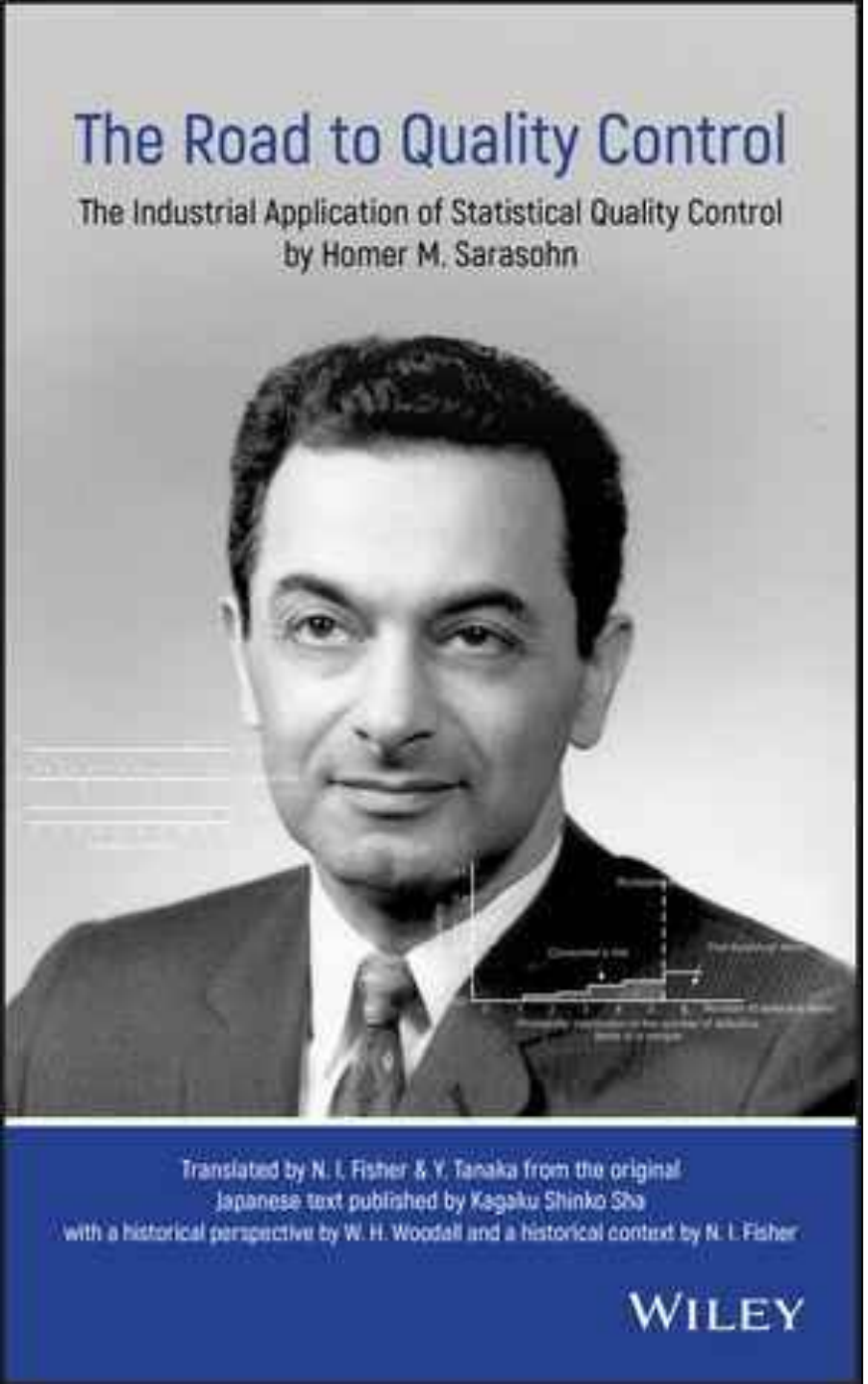
Year of publication : 1951

When written: probably 1949-50

Re-emerged: 2008

After 11 more years …

Japanese script for Homer M. Sarasohn



Year of publication : 1951

When written: probably 1949-50

Re-emerged: 2008

After 11 more years …

Translated into English in collaboration with Yutaka Tanaka, and with a scholarly essay by Bill Woodall (and a reprint of my 2009 article about HMS and the introduction of Quality Management in Japan).

Published by Wiley: 2019

And the final twist …

- The last part of the book translated was the Foreword.
- We had assumed that Homer, who had taught himself Japanese in order to teach his Management course, had written the book in Japanese.

And the final twist …

- The last part of the book translated was the Foreword.
- We had assumed that Homer, who had taught himself Japanese in order to teach his Management course, had written the book in Japanese.
- The Foreword reveals that it was actually translated into Japanese from Homer's original English script by an unknown team.
- So Yutaka and I had, in effect, reverse engineered the book to approximate his original English version (no trace of which appears to exist).
- I feel that Homer would have been amused by the irony.

Final thoughts

- There is a need for systematic approaches to problems of performance measurement that provide the much-needed rigour of statistical thinking and sound statistical practice.
- This lecture purports to present one such approach, based on alignment with stakeholder needs.
- There is scope for statisticians to have very considerable impact on important issues in Board governance, management, assessment, workplace safety, culture, planning, and good government.
- I am very grateful to WED for inspiring me to adopt Quality Management in my research group, and for setting me on a research path that has occupied me for nearly 3 decades.

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Copies of articles, or details of URLs – please contact me (nif@valuemetrics.com.au).

Stories about Homer or Myron – please ask now.

Acknowledgements

- Alan Lee, for many years of collaborative research on aspects of modelling and analysing Stakeholder Value data
- Peter Salmon, for many years of collaborative experimentation with Web survey instruments to provide rich yet non-overpowering surveys to capture informed respondent data
- Ken Hopper and Lisa Sarasohn, for a lot of resource material
- Many clients, who have allowed me to apply my research ideas to their business problems, especially Gary Blair, Mary Ellen Bock, Tim Brown, Rebecca Doerge, Brendan Donohue, Russell Fountain, Peter Gesling, Simon Higman, Lourdes Llorens, Tony Peacock, Tony Press, Stephen Sasse, Lindy Tallis and Dennis Trewin.
- *Wait, there are more …*

Acknowledgements

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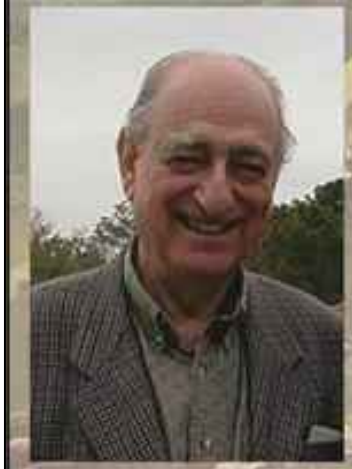
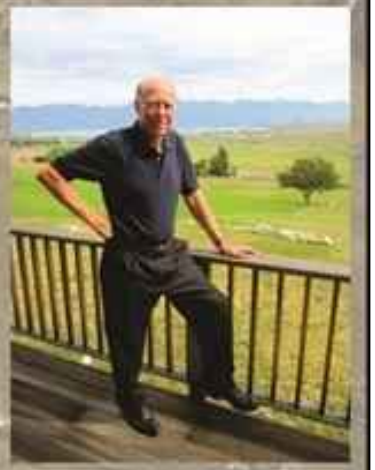
- Yutaka Tanaka and Bill Woodall for their collaboration on Homer Sarasohn's book, and to Alison Oliver (Wiley) for publishing it laid out similarly to the original
- My wife Lila for supporting me in my decision to go freelance 18 years ago in order to continue R&D on these problems
- And of course …

The giants who helped me on my Odyssey






The Isle of Skye
August 2011