Navigating the Metrics Landscape: An Introductory Literature Guide to Metric Selection, Implementation, & Decision Making

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Navigating your metrics knowledge journey

Finding what you are looking for is often a guessing game, our goal is to provide you with a GPS

Google Scholar BETA

Web Ir

metrics

Results 1 - 10 of about 1,370,000 for metrics

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Metric Selection

- The ½ century long challenge… still studied today
- Mistakes & unintended consequences
  - Sports: We want team play but pay based on individual performance
  - Academics: We want professors to pursue excellence in teaching yet we reward them on publications
- Selection considerations
  - Value of information
  - Relation to value delivery
  - Systematic processes

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3 Categories of Metric Selection Mistakes

Behavioral Effects

Not considering effect on humans

Hard for a team/group to impact

Value Added

Ignoring Something Important

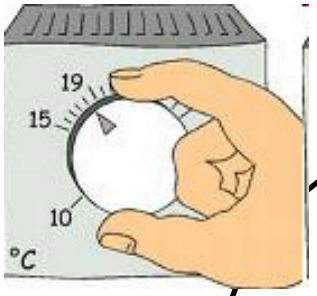
Measuring only part of what matters

Commitment

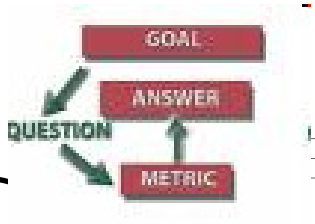
Company boundaries dictate metrics

Not being serious about measurement

4 Metrics Selection Steps



1. Relate Metrics to Value & Supporting Decisions



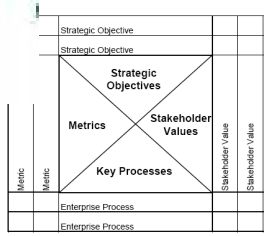
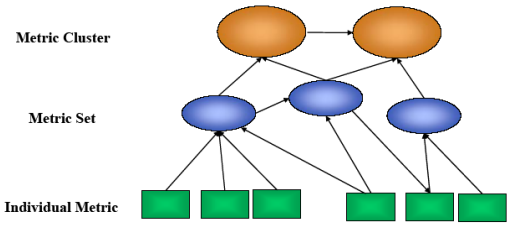


Figure 2.9: Aligning strategic objectives, stakeholder value, key process and measures (adapted from Nightingale, 2003)

2. Identify what you know, need to know, & the value of information

$$RRL = \frac{RE_{BEFORE} - RE_{AFTER}}{\text{RISK REDUCTION COST}}$$

3. Determine how metrics impact behavior & align with organizational levels



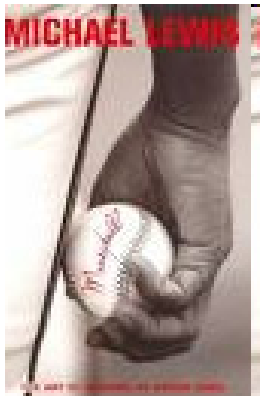
4. Systematic Processes, Feedback & Measurement Friendly Culture

Steps to Metric Selection

Selection → **Implementation** → **Decision Making**

Focus on Value: An Example from Baseball

- How can a team with the lowest budget year after year systematically continue to succeed?
- Move from individual to team metrics
  - What limits potential (value) → outs!
  - What should we emphasize… homers? NO – *not getting out!*



Michael Lewis, Moneyball: The Art of Winning an Unfair Game, 2004

if traditional organizational boundaries and mechanisms do not facilitate value identification, you can't be afraid to go against the grain!!!

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Implementation

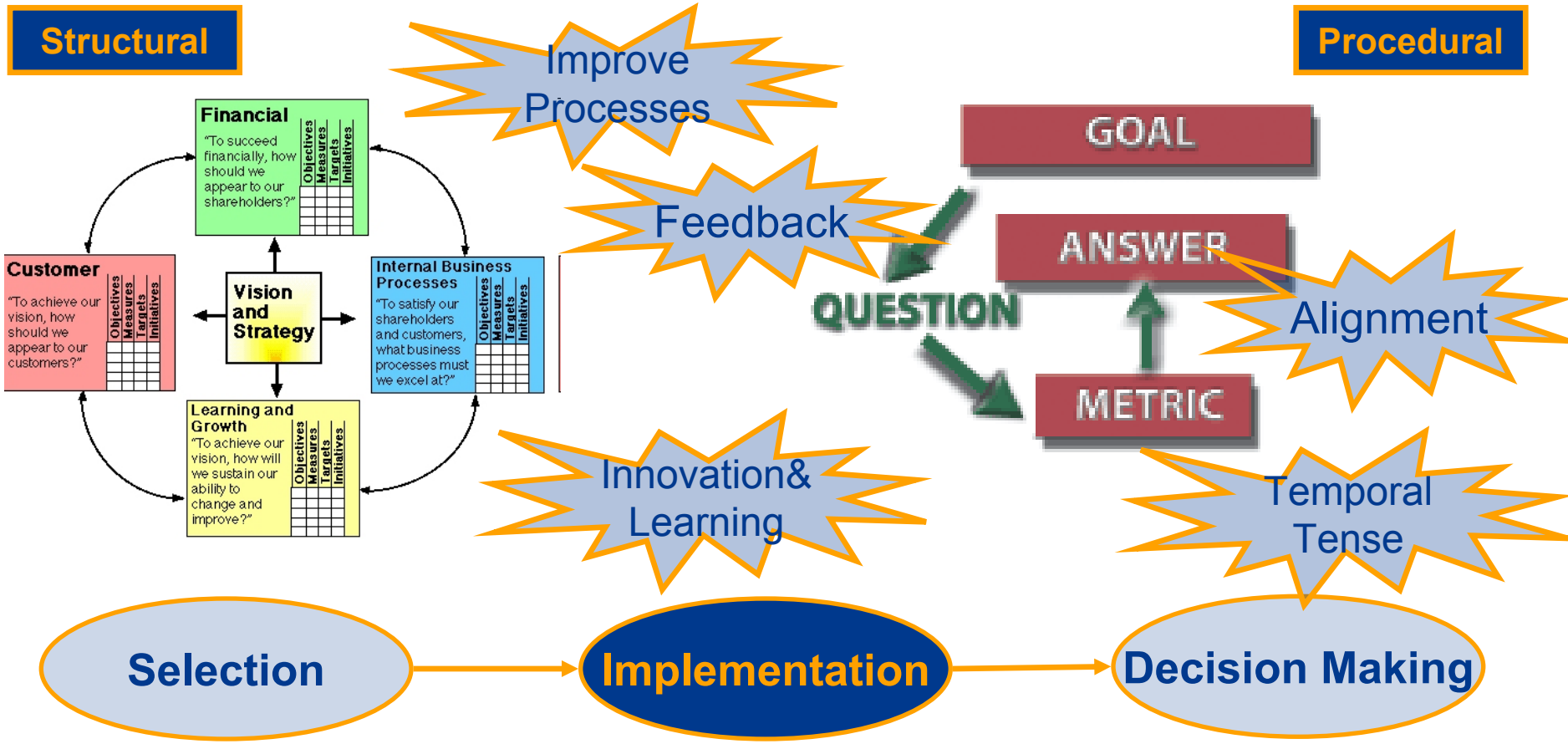
- Why do we have PM systems?
  - Motivate-Monitor-Coordinate-Control-Improve
- Juxtaposition of Approaches
  - "Traditional" financial vs. "contemporary" balanced systems
  - "Structural" vs. "Procedural" Systems
  - "Macro" vs. "Micro" Scale Systems
  - "Universal vs. Contingency"

Case Study Example:
Blackburn, C., and Valerdi, R., "Practical Implementation of an Enterprise Measurement System: From Inception to Transformation," *7th Annual Conference on Systems Engineering Research*, Loughborough, United Kingdom, April 2009.

Some PM Frameworks & Attributes

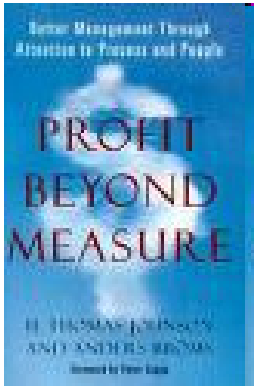
Structural: a typology for performance measure management (balanced scorecard)

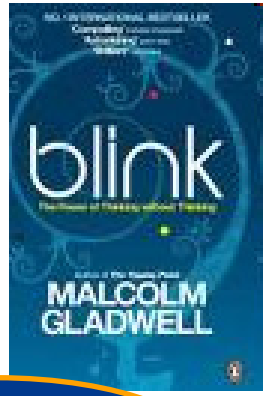
Procedural: step-by-step processes for developing performance measures from strategy (Goal-Question-Metric or Six Sigma's Define, Measure, Analyze, Implement, and Control)



Decision Making

- **Management Trends: MBM → MBR**
  - **Traditional quantitative thinking**
    - **Limits the perception of the decision maker to one dimension**
    - **Organizations are living entities with interactions and relationships that traditional methods cannot quantify**
  - **Decision makers jump to solutions without understanding the causal factors – leading to false positives or negatives**

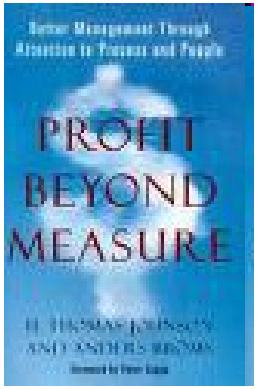


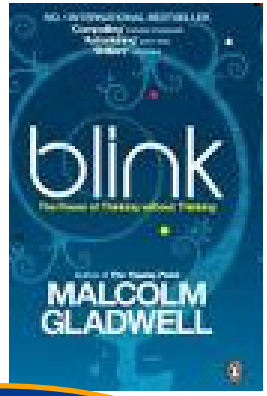


Book References: Gladwell, M., Blink: The Power of Thinking Without Thinking, 2005.
Johnson, H. T. and Broms, A, Profit Beyond Measure, 2000.

Decision Making (Continued)

- **Knowledge Appraisal & Information**
  - Decisions require a few pieces of high quality information
  - Biases
    - Anchoring-Halo/Horns-Bandwagon-Hindsight-Optimism
    - Optimism: Methods to measure, calibrate, and eliminate bias



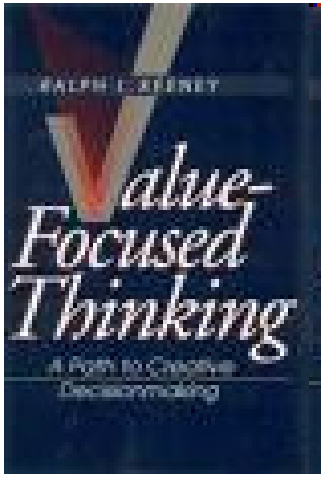


Optimism Investigation Example:

Valerdi, R., and Blackburn, C., "The Human Element of Decision Making in Systems Engineers: A Focus on Optimism," *19th Annual International Symposium of INCOSE,* Singapore, July 2009.

Decision Making

- **Understanding Value**
  - Intuition – Structural Metrics – Analysis of Indicators
  - *"Value-focused thinking involves starting at the best and working to make it a reality. Alternative-focused thinking is starting with what is readily available and taking the best of the lot."*



Ralph Keeney, *Value-Focused Thinking: A Path to Creative Decisionmaking*, 1992.

Value Focused Thinking

1. Recognizing a decision problem
2. Identifying alternatives
3. Specifying values
4. Evaluating alternatives
5. Selecting an alternative

Selection → Implementation → Decision Making

Decision Making: Exploring the Problem Space

- What is the decision this [measurement] is supposed to support?
- What really is the thing being measured?
- Why does this thing matter to the decision being asked?
- What do you know about it now?
- What is the value to measuring it further?

Selection → Implementation → Decision Making

Decision Making: Assessing a Metric or System

- Are the metrics tied to organizational goals?
- Does it identify root causes?
- Does it consider all stakeholders' needs?
- Does it motivate action as intended?
- Does it accurately portray progress?
- Is it easy to use?
- Is the right information delivered at the right time?

Selection → Implementation → Decision Making

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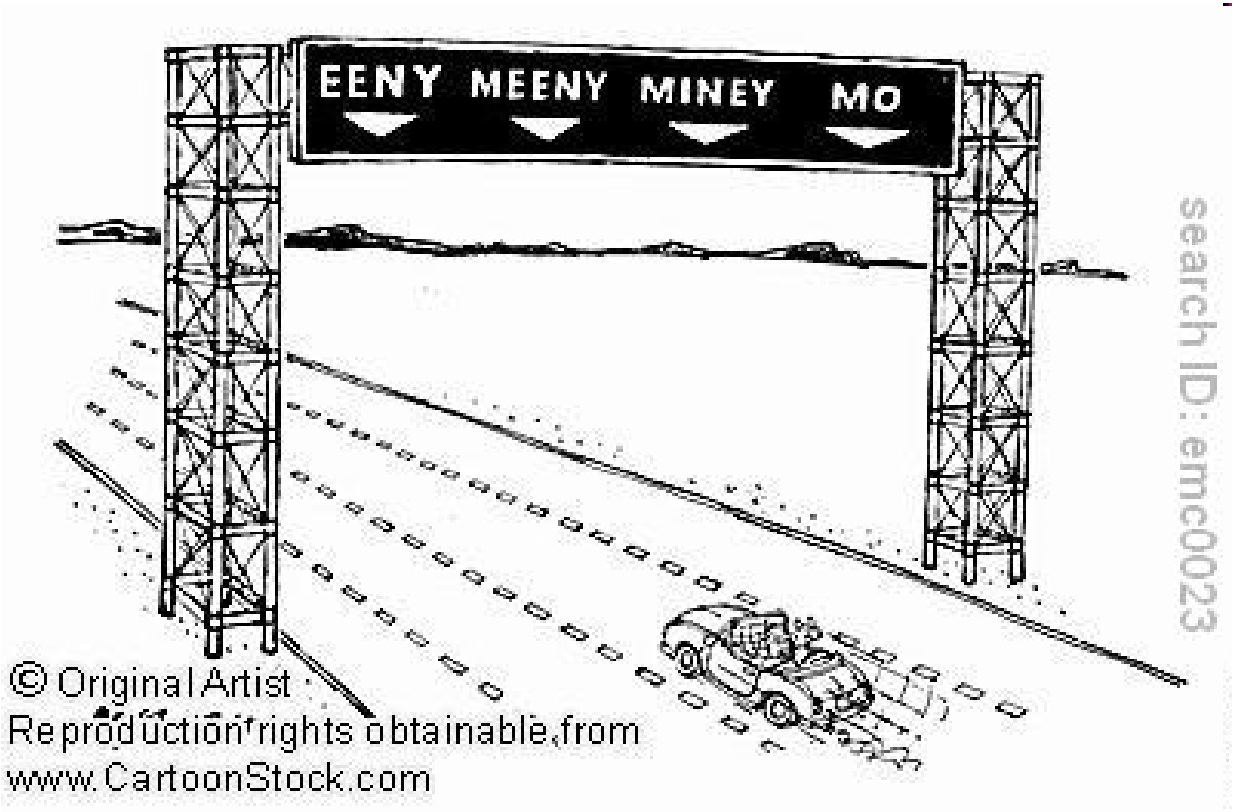
Moving Forward

- **Selection:** Further communicate the value of metric selection & holistic selection methodologies.
- **Implementation:** Does using the right PM drive success, or do successful companies use PMs?
- **Decision Making:** Assess the value of imperfect information and work to eliminate biases.

Questions or Comments?

Hopefully, with our guide, finding what you are looking for will be a little bit less of a guessing game!



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Backup Slides

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The Six Mistakes

1. Not using the right measure (ignoring something important) or choosing metrics that are wrong (i.e. for a phone help service, customers don't just want quick answers, they want accurate ones as well)
2. Having metrics reflect functions as opposed to cross-functional processes
3. Assuming one knows what is important to measure without giving enough thought or using measures that intentionally make you look good
4. Measuring only a part of what matters, measuring from your view rather than the customers, or forgetting your goal [10; and 12]
5. Implementing metrics that focus on short-term results, or that do not give thought to consequences on human behavior and enterprise performance
6. Having metrics that are not actionable or hard for a team/group to impact or collecting too much data

Some PM Frameworks & Attributes

- **Structural:** a typology for performance measure management (think balanced scorecard)
- **Procedural:** step-by-step processes for developing performance measures from strategy (think Goal-Question-Metric)

Table 2 - *Performance Measurement Framework Typology*

Structural	Procedural	Both
Strategic Measurement & Reporting Technique [35]	A Framework for Design & Audit [39]	The Balanced Scorecard [1]
The Performance Prism [36]	A Framework for Factors Affecting Evolution [40]	Extended Enterprise Balanced Scorecard (Structural) and Procedural Frameworks [29]
European Foundation for Quality Management – EFQM [37]	Define-Measure-Analyze-Implement-Control [34]	-
SSM's Measurement Construct [8]	GQM [18]	-
Value Stream Mapping [38]	Steps to Metric Selection	-

Feedback

Alignment

Temporal Tense

Innovation & Learning

Improve Processes

Selection → Implementation → Decision Making

References and how they were used