

Developing Forward-Looking Metrics and Reporting

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About Us

Both – Business Analysts, U-M Medical School

- Engage in metric and reporting design, econometric and financial modeling, design ad hoc and standardized reporting describing the Medical School's research enterprise

Jeff – MBA w/Emphases in Strategy and Finance,
Ross School of Business

- Formal training in decision support

Mike – Bachelors in Economics, U-M

Outline

What are metrics anyway?

So, what's the problem?

Oh great, a problem, what's the solution?

Case study

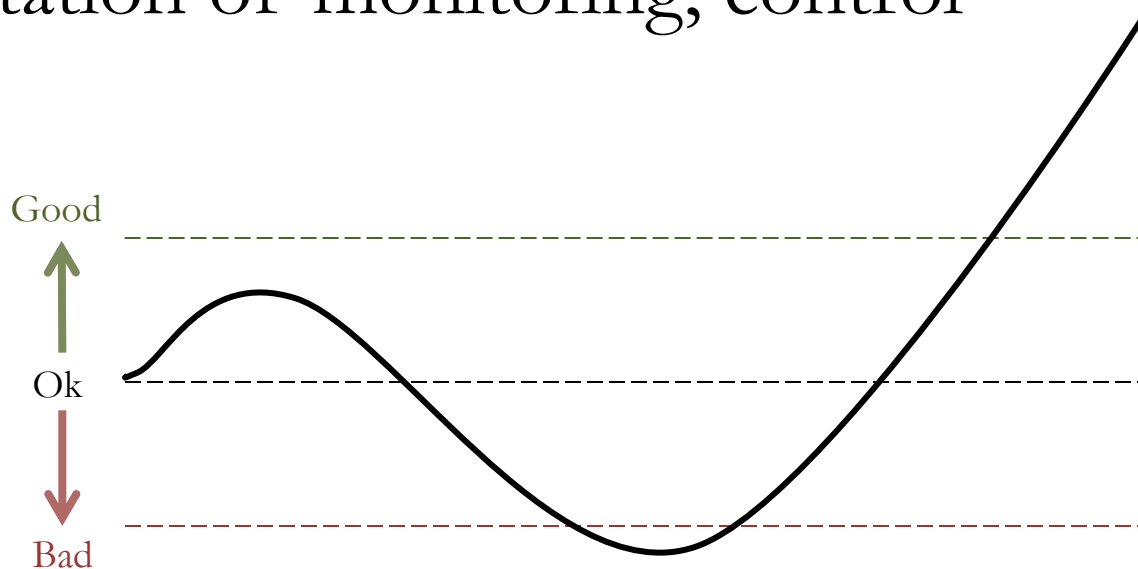
What are metrics?

Quantitative values

Measure, distill real-world

a.k.a. Key Performance Indicators (KPI's),
performance measures, etc.

Connotation of monitoring, control



Why engage in analysis and reporting?

Decision Support!

Ad hoc analysis *explicitly* supports a decision

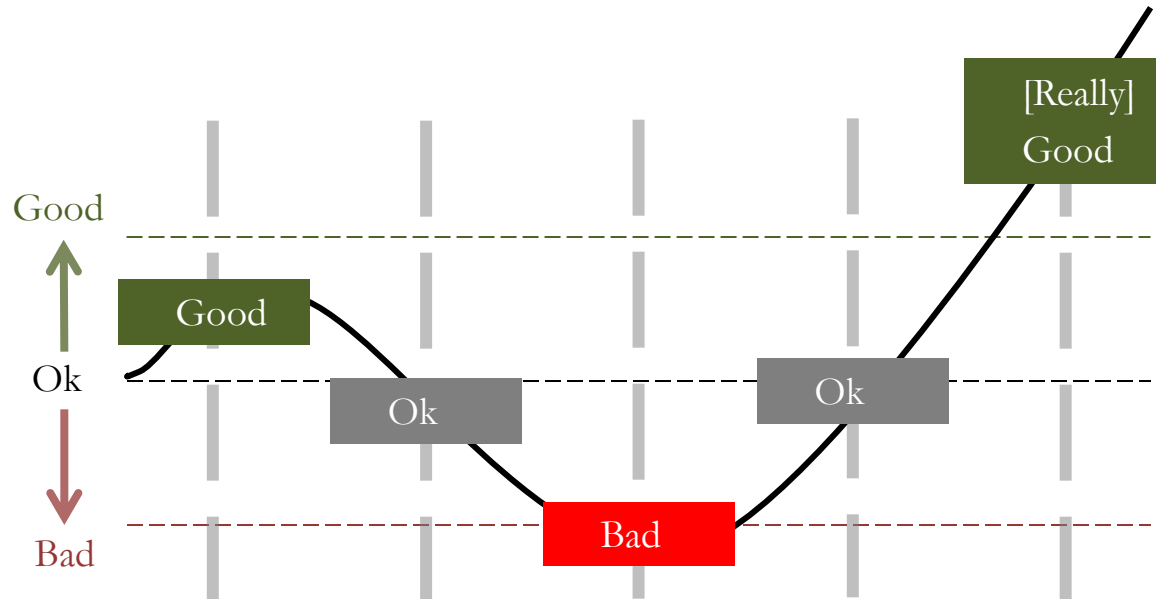
Metrics and reporting often *implicitly* support decisions, specifically:

How are we doing with respect to _____?

Why engage in analysis and reporting?

Metrics and reporting repeatedly draw and refocus managerial attention over time:

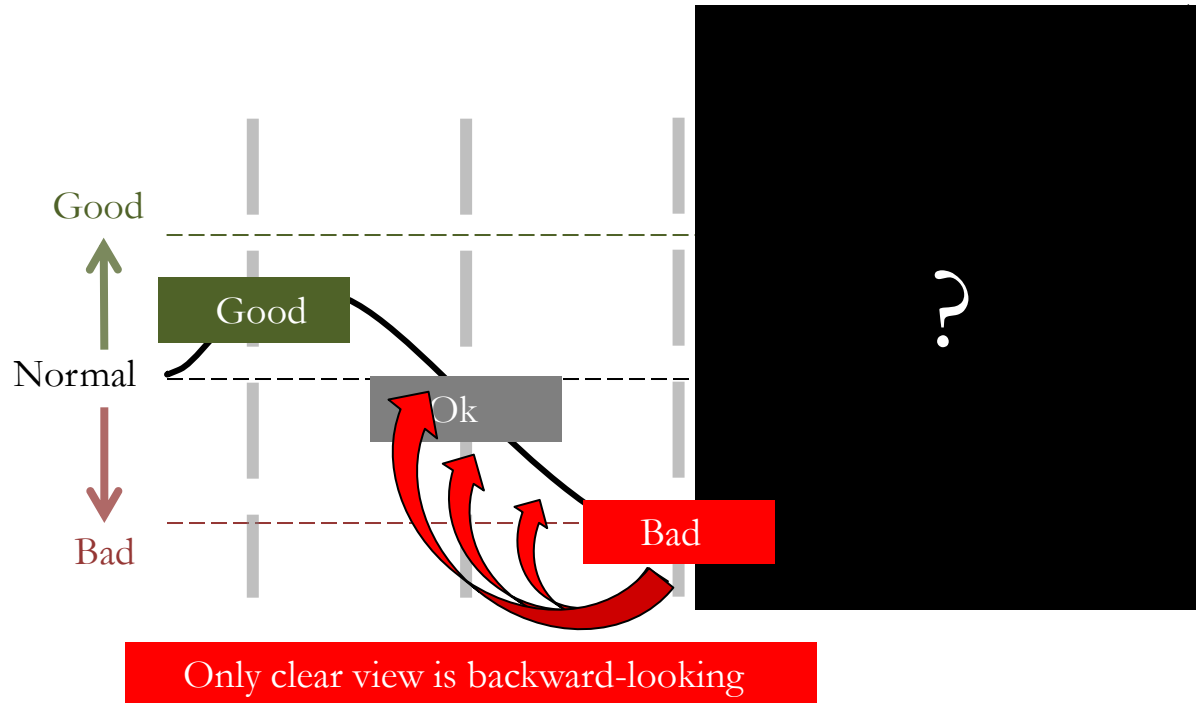
How are we doing with respect to _____?



How much attention do I need to pay to _____?

So, what's the problem?

Most metrics and reporting describe the past or present, so you may miss opportunities for 'course correction' or you may find yourself in trouble before you detect it!



Reporting Maturity

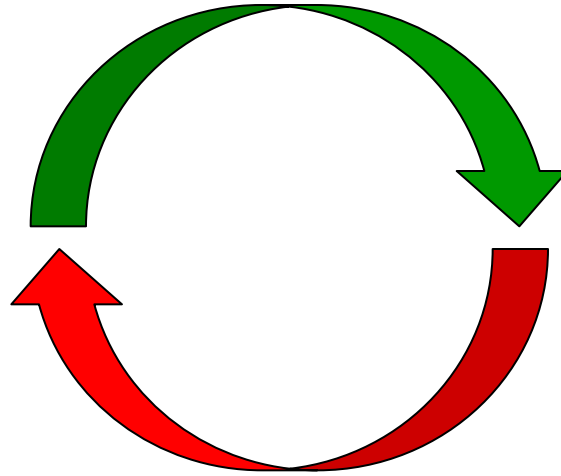
Backward-looking reporting asks “How did we do?”
and might imply corrective action in situations where ‘it pays to correct your mistakes.’

Better reporting provides context about the present and assists in decision support

The best reporting includes forward-looking views that enable proactive decision-making (Decision Support!
Decision Support! D-e-c-i-s-i-o-n S-u-p-p-o-r-t!)

Problem

Every business unit wants to be forward-looking

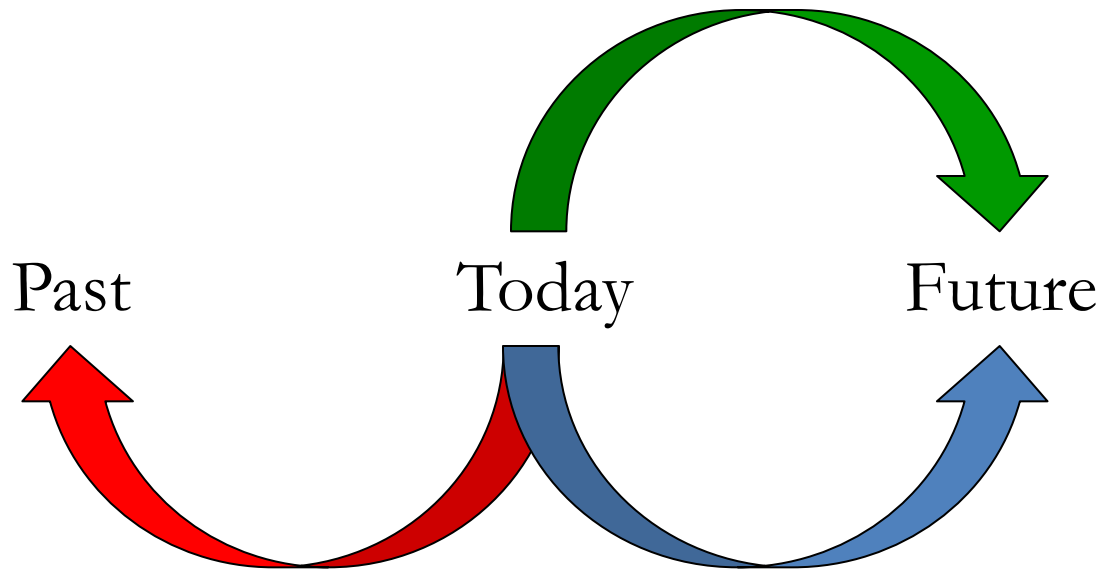


Most reporting only provides a backward-looking view; We only have data about events that have already happened

How do you break out of this cycle?

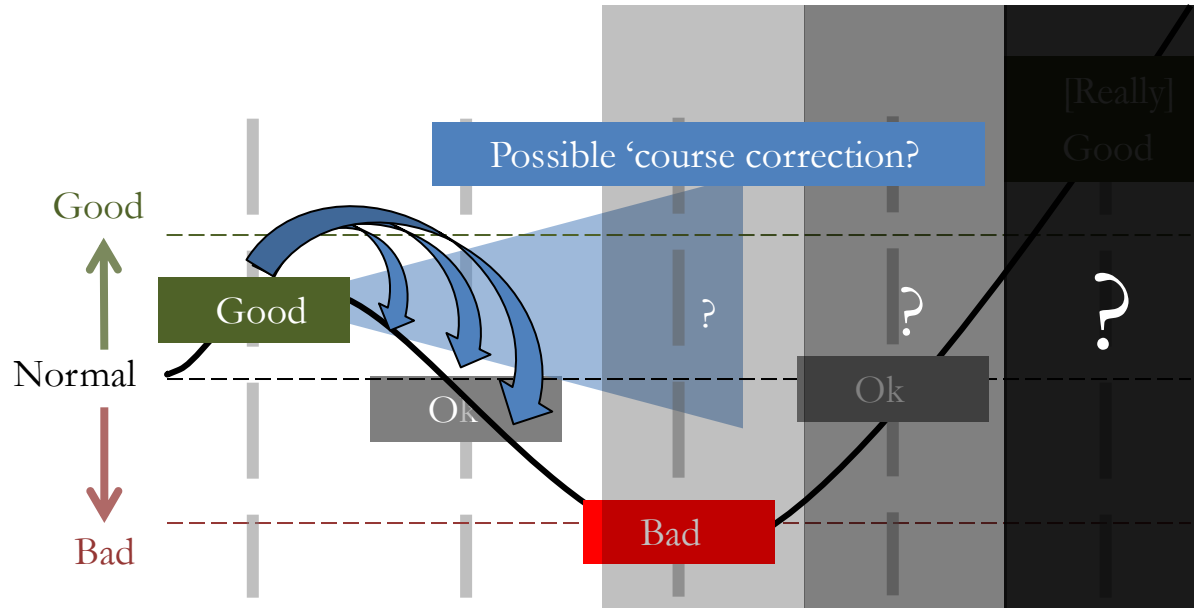
Solution

Breaking out requires creating and developing forward-looking views, using available data to create expectations about the future



Solution

Forward-looking views may allow for 'course correction'



Implementation – How?

Unfortunately, it's not easy, but we hope to make it tractable

It will require sustained commitment across several critical steps in the development life cycle:

Create good metrics

Diagnose 'bad' metrics

Build awareness and acceptance

Standardize and refine

Integrate with existing reporting

Create good metrics

Ask: **What do we want to achieve / reward?**

(Not: What data do we have available?)

Set good goals (a topic unto itself – SMART Framework: Specific, Measurable, Achievable, Relevant, Time-Bound)

Case Study: The Grant Awards ‘Pipeline’

Diagnose ‘bad’ metrics

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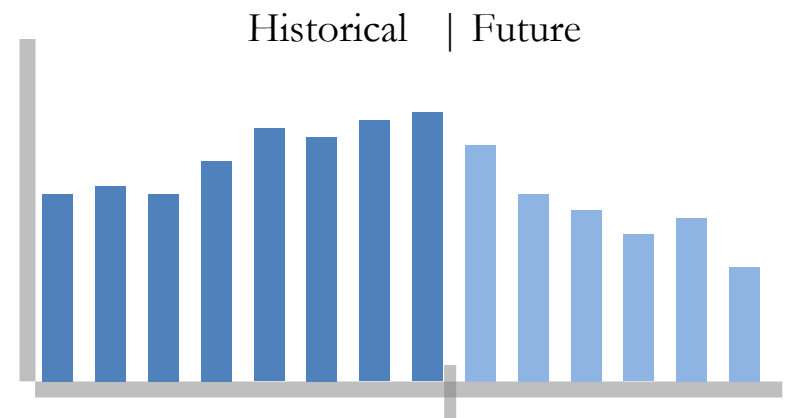
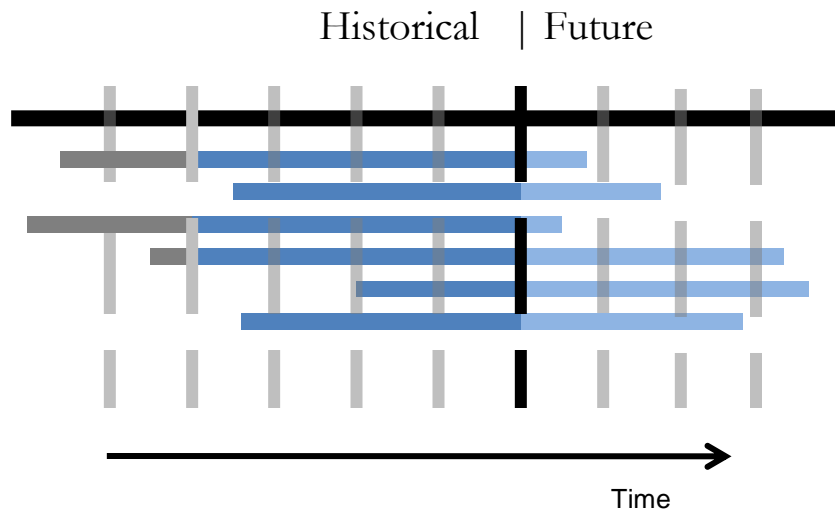
Integrate with existing reporting

Case Study: Grant Awards 'Pipeline'

Designed to be forward-looking view of financial sustainability

Original construction:

All future award commitments for the next fiscal year or multiple years divided by historical commitments



Create good metrics

What do we want to achieve / reward?

Diagnose 'bad' metrics

Test, test, test!

Do the metrics reward desired outcomes?

Are the metrics stable? Balanced?

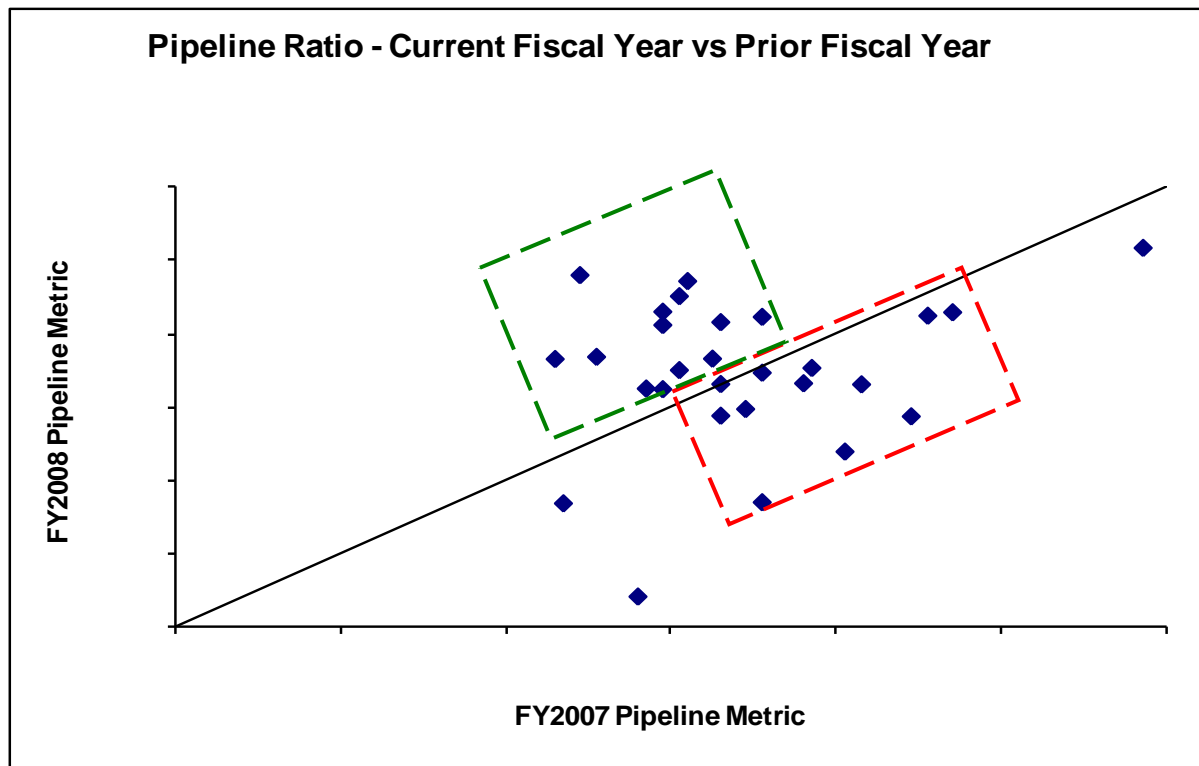
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Case Study: 'Flip-Flop' Pattern

Upon testing, the metric proved to be idiosyncratic – departments tended to meet the goal in alternating 'flip-flop' patterns



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Diagnosis

By stating the goal relative to the prior year, the Pipeline Ratio could reward poor performance in the prior year and punish good performance in the prior year

Mechanics

When a department performs well, the goal for next year becomes more difficult

When a department performs poorly, the goal for next year becomes easier

These effects combine to flip-flop likely payout structures each year (confirmed by statistical testing):



Case Study: Sawtooth Pattern

And there was an additional idiosyncrasy:

Diagnosis

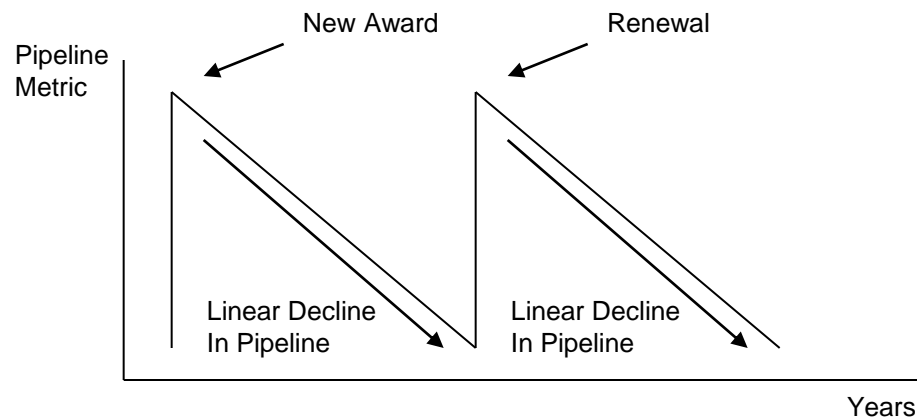
Underlying event patterns will cause the pipeline metric to move in cyclical patterns

Mechanics

Awards are often funded for multiple years, with abrupt endpoints

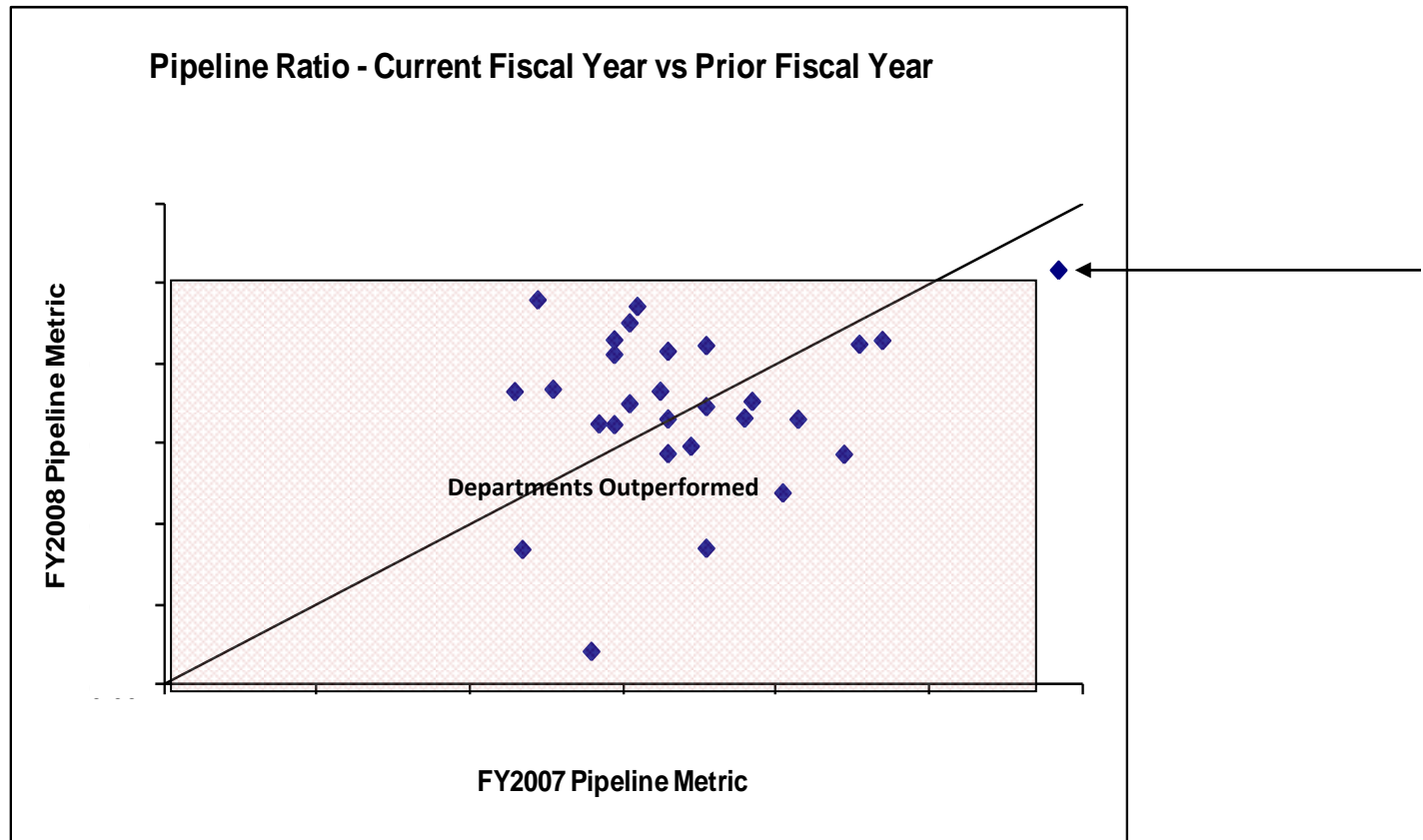
Renewal does not occur until an award is expiring

These effects produce sawtooth patterns in the pipeline metric, with rapid increases driven by large new awards or renewals, followed by gradual decline over the life of the awards:



Case Study: Rewarding Desired Outcomes

Problematically, the highest performing department by absolute measures fell below goal with respect to the ratio:



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Build awareness and acceptance

'Sell' the idea

Standardize and refine

Integrate with existing reporting

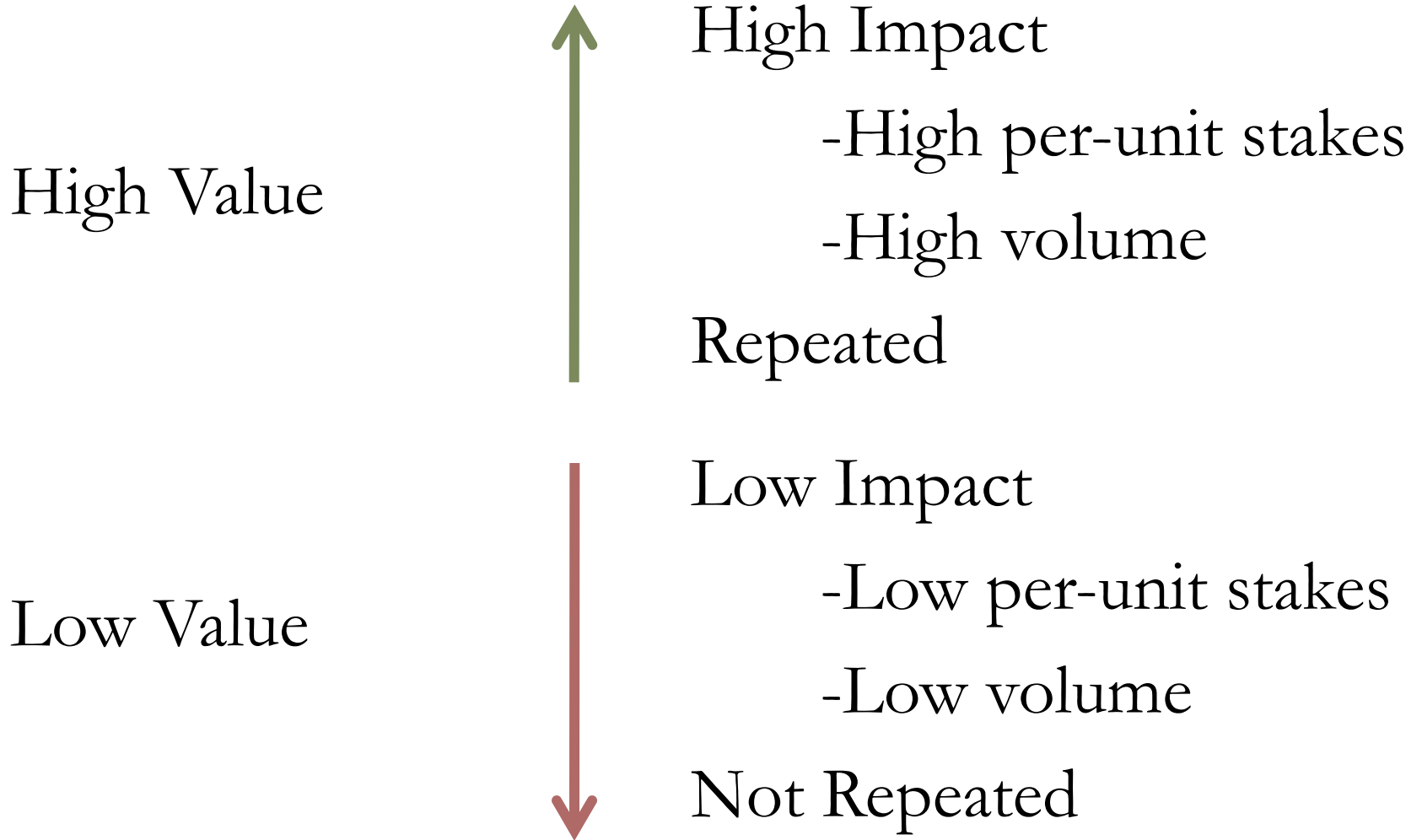
Case Study: 'Selling' a Refined Pipeline

'Sold' by presentation, quasi-white paper

Packaged with a solution – the pipeline metric was refined to:

- Utilize one future year of data to **mitigate** the sawtooth pattern
- Compare this one future year against the same observation one year earlier (to **recognize** single-year growth)
- Balanced** with a longer-term growth measure (to recognize multiple-year growth, mitigating the effect of punishing good historical performance).

How much refinement?



Create good metrics

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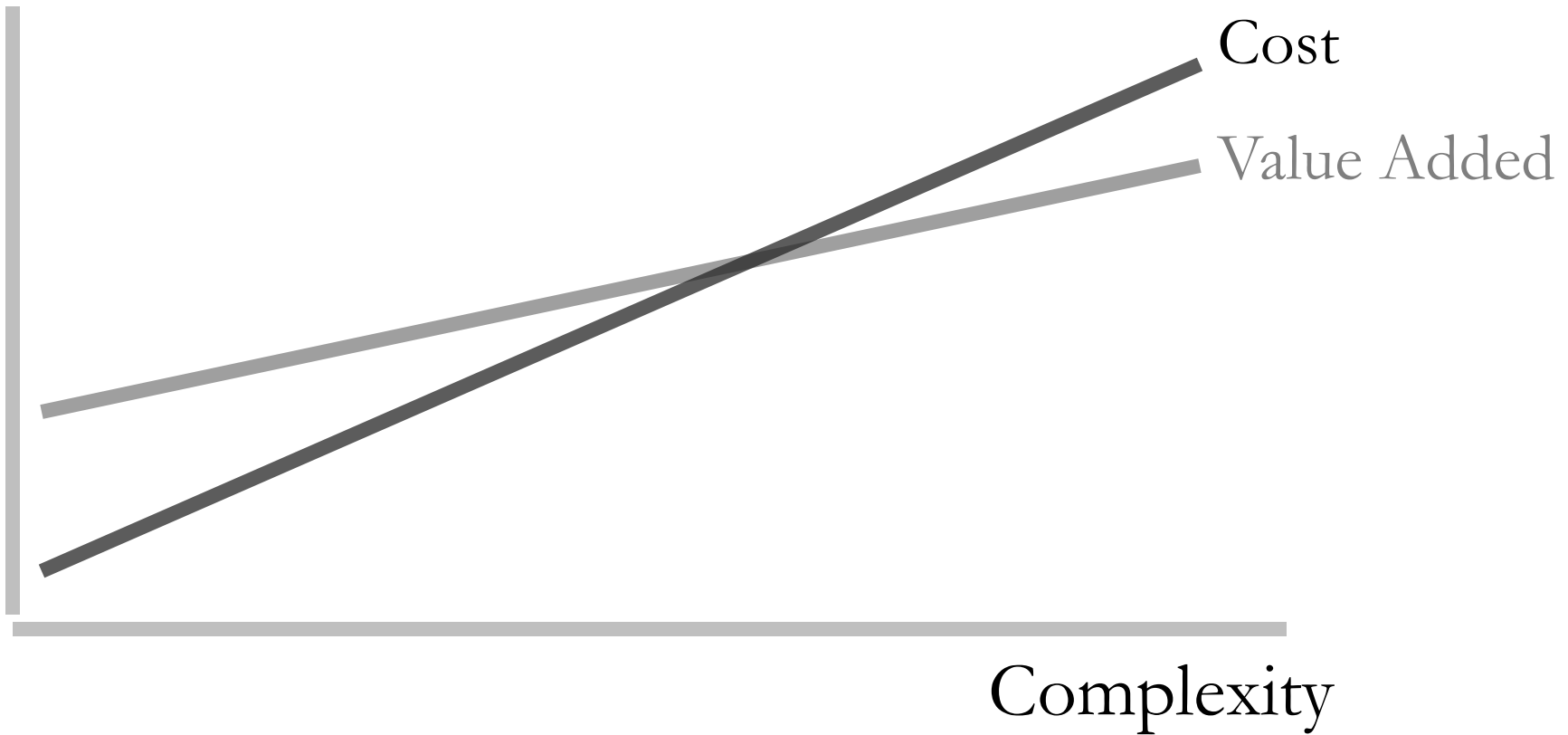
Standardize and refine

Integrate with existing reporting

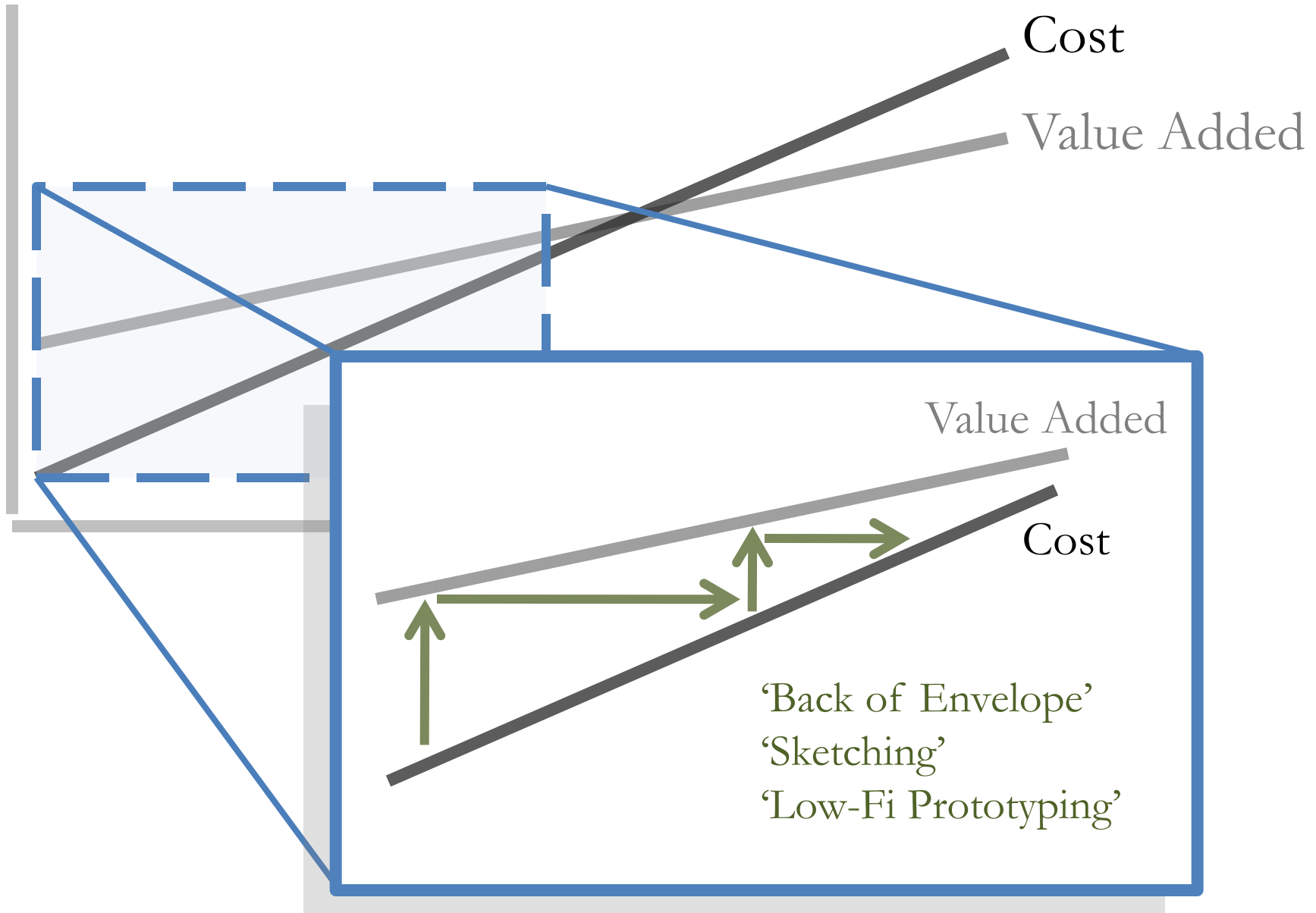
Into existing reporting

Alongside existing reporting

Practical Implementation



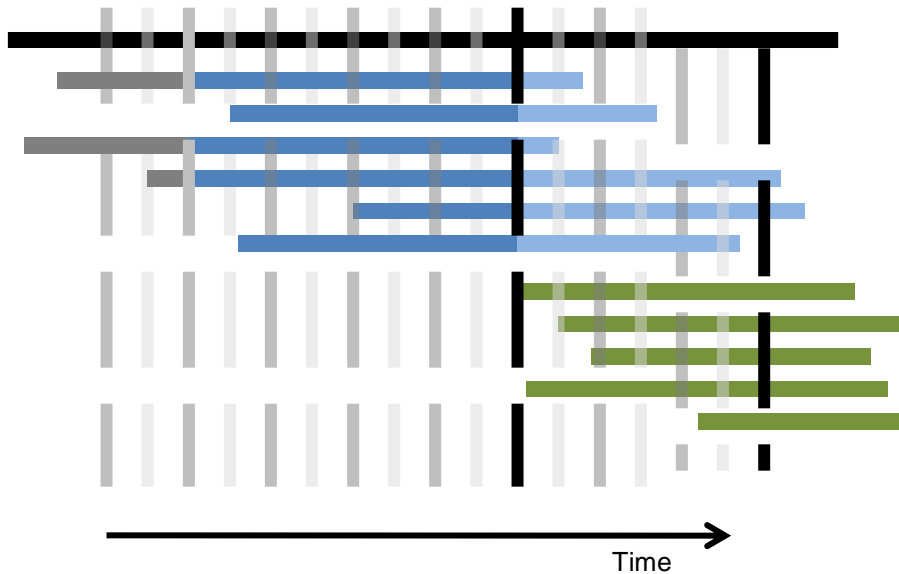
Practical Implementation



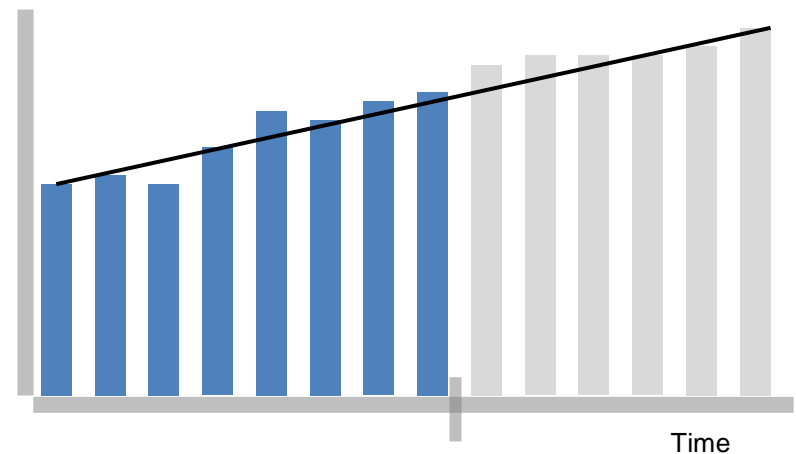
Case Study: Related Metrics and Reporting

Sustained commitment and insights from metric testing, combined with forecasting techniques, awareness-building, refinement, and standardization have led to related new metrics and reporting...

Historical and Probable Future Commitments



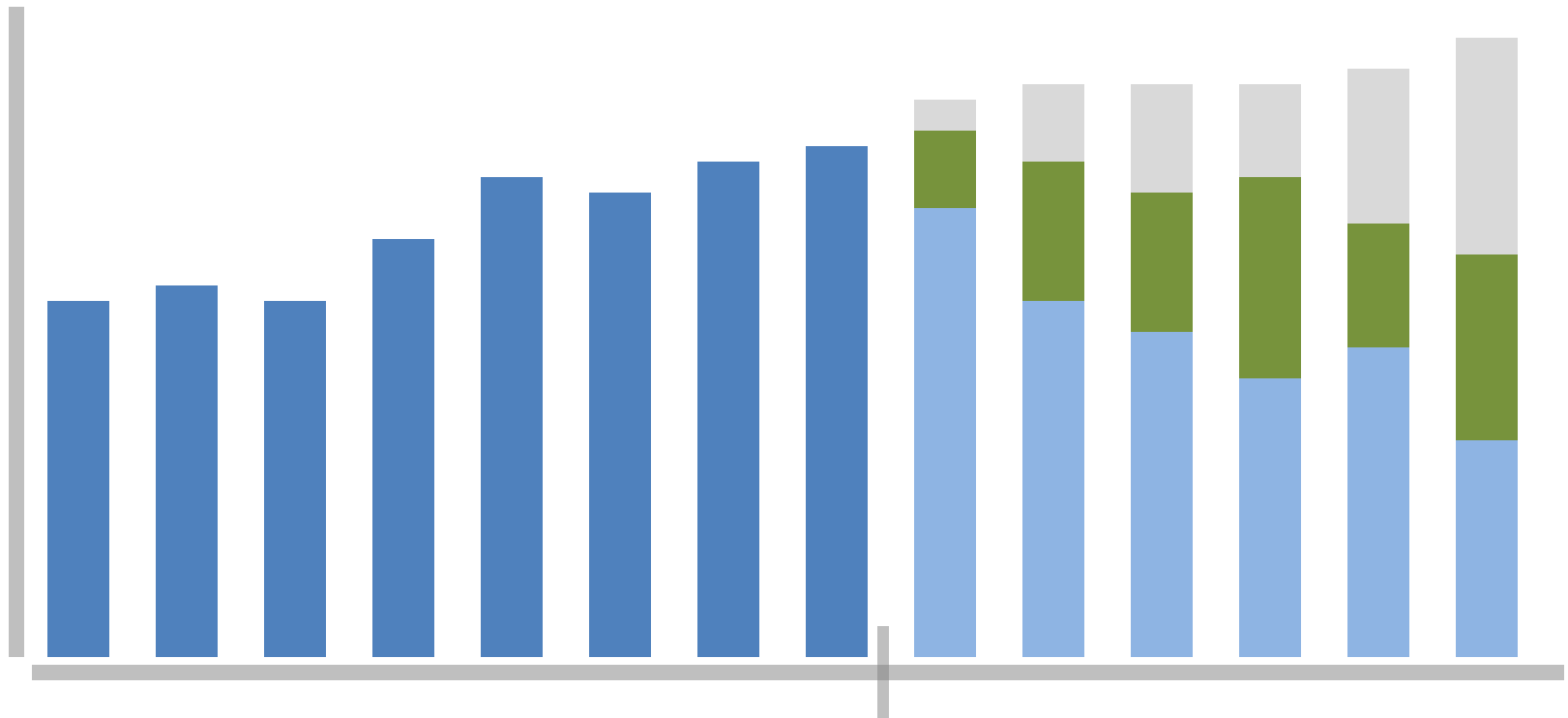
Trend Analysis



Case Study

.... available 'on demand' in a production reporting environment

Historical and Probable Future Commitments with Gap-to-Trend Prescriptive Analysis



Recap

Create good metrics

What do we want to achieve / reward?

Diagnose 'bad' metrics

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Are the metrics stable? Balanced?

Build awareness and acceptance

'Sell' the idea

Standardize and refine

Integrate with existing reporting

Into existing reporting

Alongside existing reporting

Case Study: Future

Continue to advance reporting maturity of additional metrics

Improve visualization tactics to describe uncertainty

Q&A

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Forecasting: <http://jeffhoron.com/2011/02/forecasting/>