Driving Value and Performance in Software Investment

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How do you ***Get Real*** about your software investment?

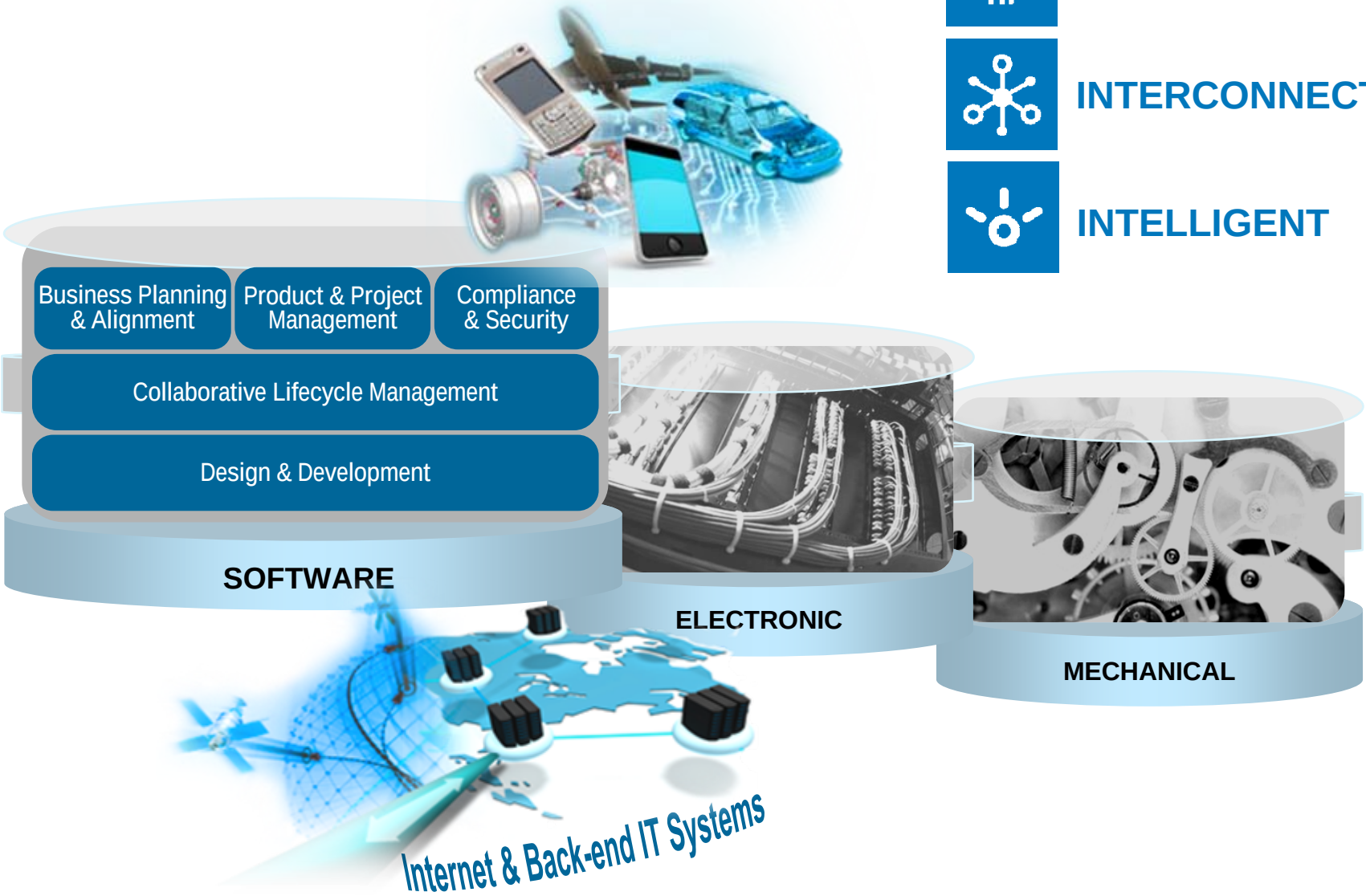
- Are you confident that you are getting ***value*** out of the investments you have made in software delivery?
- How should you optimize investment in future software delivery efforts?

Are you ready for a *smarter* future?

INSTRUMENTED

INTERCONNECTED

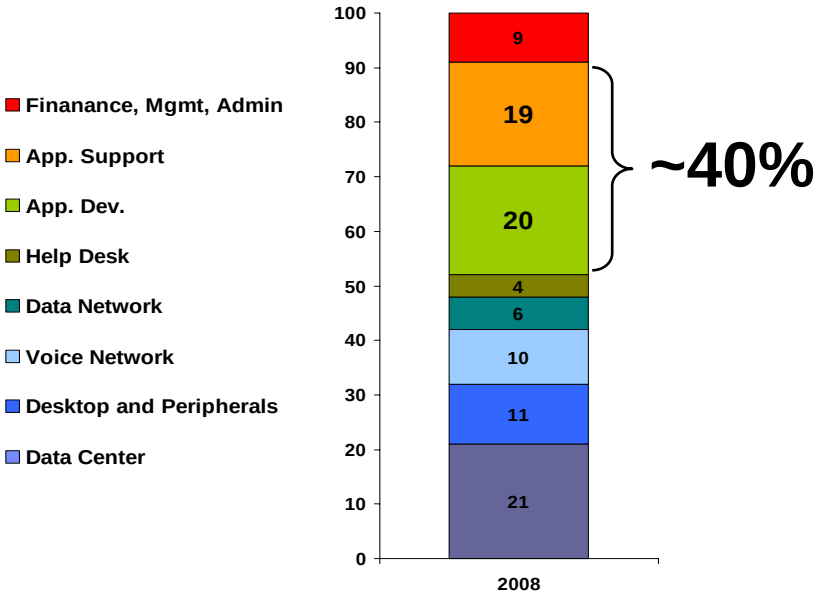
INTELLIGENT



How much do you annually spend on software delivery?

- For traditional IT organizations, nearly ***40%*** of total spending is for application development and support

Historical IT Spending by Technology Tower



Source: Gartner, "IT Spending and Staffing Report, 2009", Michael Smith, Kurt Potter, 27 January 2009

- For systems organizations, such as aerospace and defense, software content continues to increase *significantly* over time

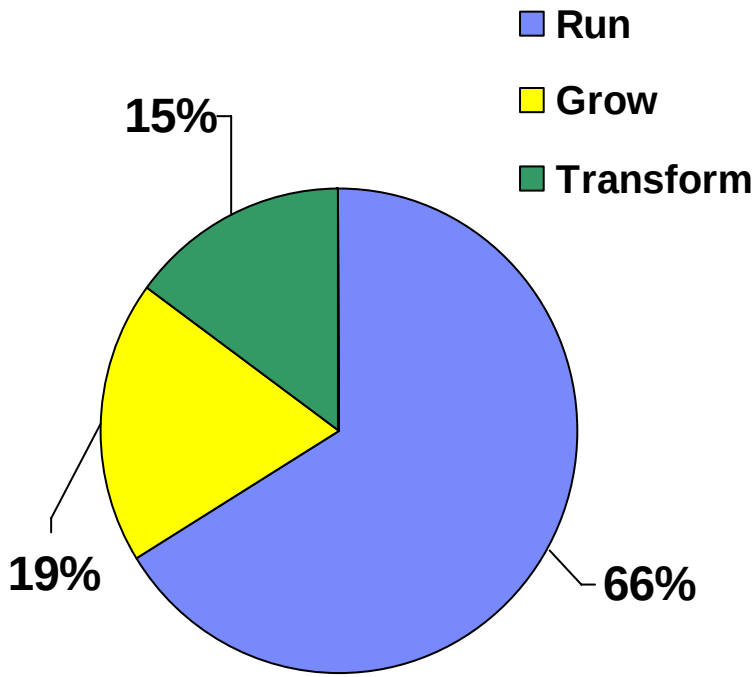
Platform	Year	Percent of Specification Requirements Requiring Software Control
F-4	1960	8%
A-7	1964	10%
F-111	1970	20%
F-15	1975	35%
F-16	1982	45%
B-2	1990	65%
F-22	2000	80%

Source: The Australian Software Acquisition Management Course, Defense Systems Management College, March 2000

Much of your investment is trapped in running the business

- ***66%*** of typical spending is dedicated to running the existing business
- Gartner estimates only ***15%*** of a company's annual investment is for ***transformational*** initiatives
- How can you optimize spending to ***increase the value and performance*** of your investments?

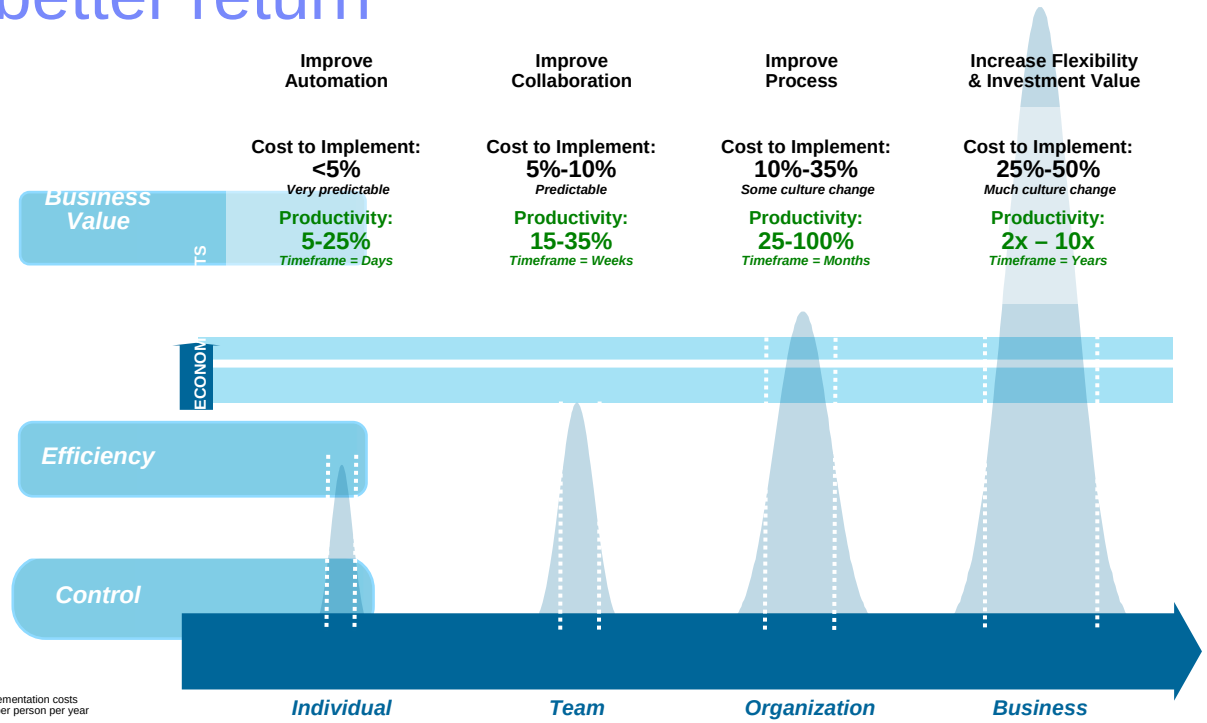
2009 Estimated Run-, Grow-, and Transform-the-Business IT Spending

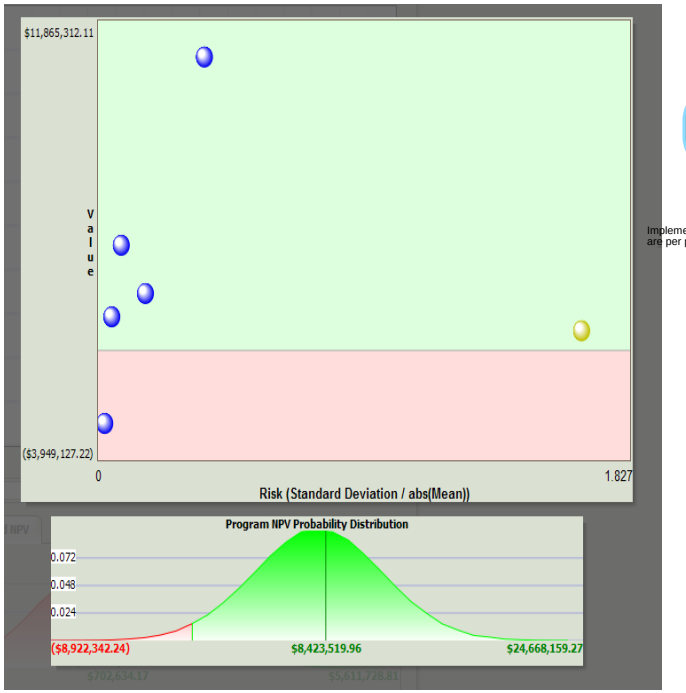


Source: Gartner, "IT Spending and Staffing Report, 2009", Michael Smith, Kurt Potter, 27 January 2009

Two ways to drive a better return

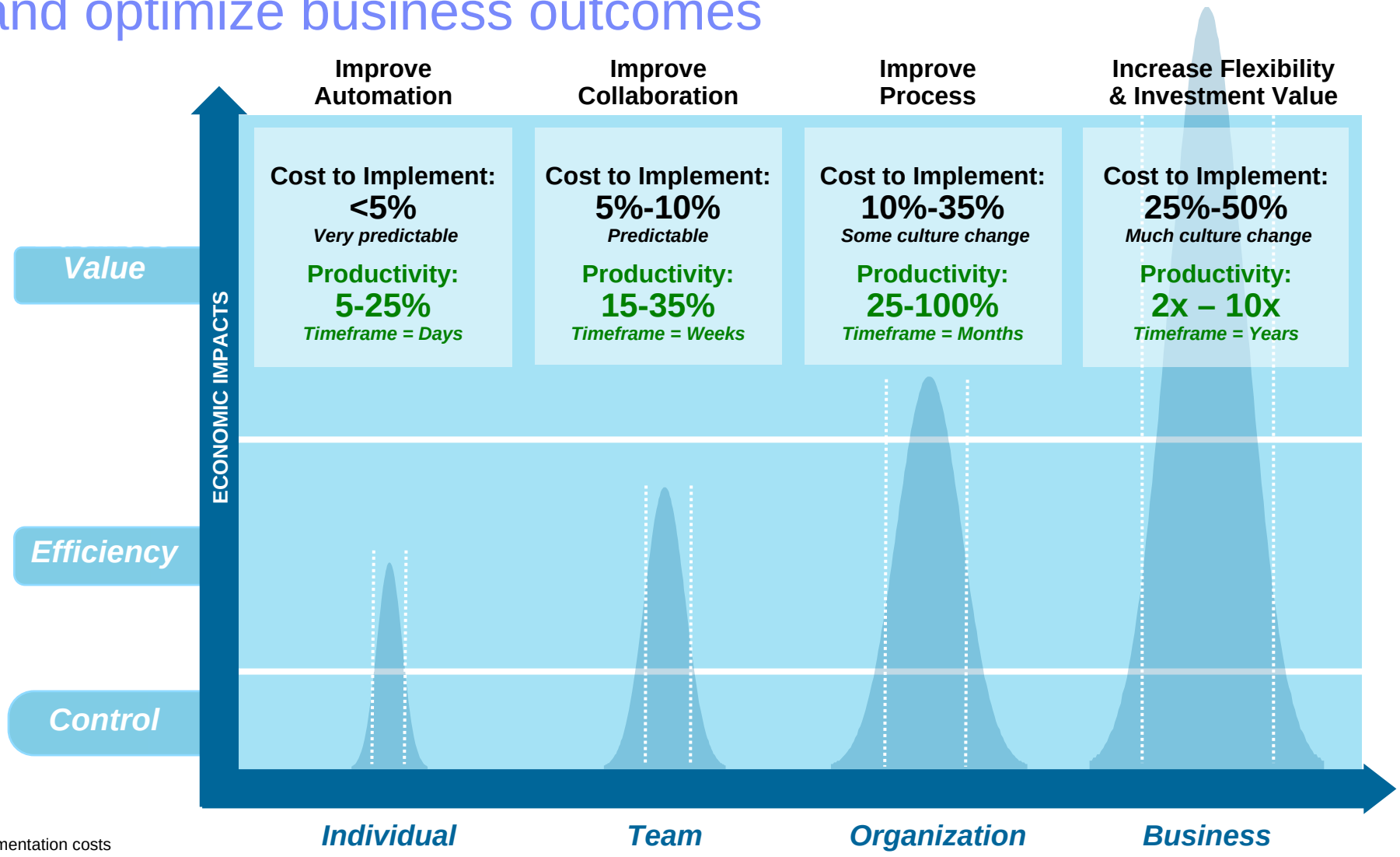
Manage costs by improving productivity





Manage value by investing resources effectively

Invest across the spectrum of improvement to manage risks and optimize business outcomes



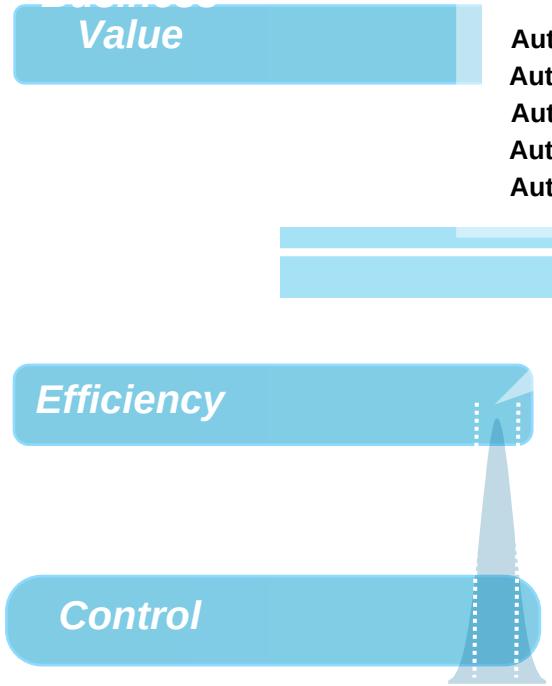
Implementation costs are per person per year

Improve automation to increase productivity by 5%-25%

Implement tools to integrate workflows at low cost and with quick payoffs

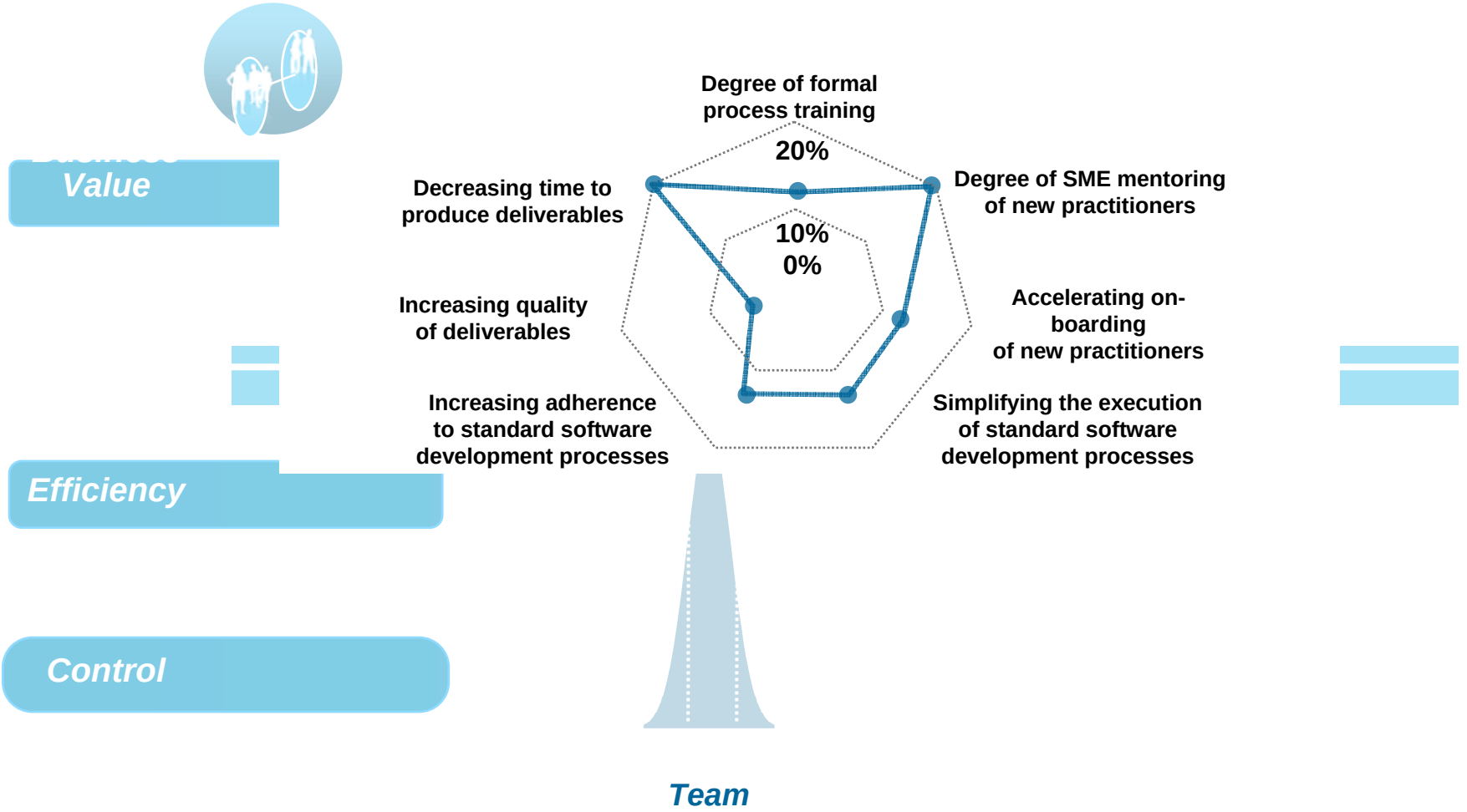
Percentage of Reduction in Software Delivery Lifecycle

	< 50 people Days	<500 people Weeks	> 500 people Months
Automating Code Review	2%	2%	2%
Automating Builds	4%	4%	3%
Automating Manual Tests	20%	14%	8%
Automating Metrics Collection and Reporting	2%	2%	2%
Automating Test Setup	4%	4%	4%



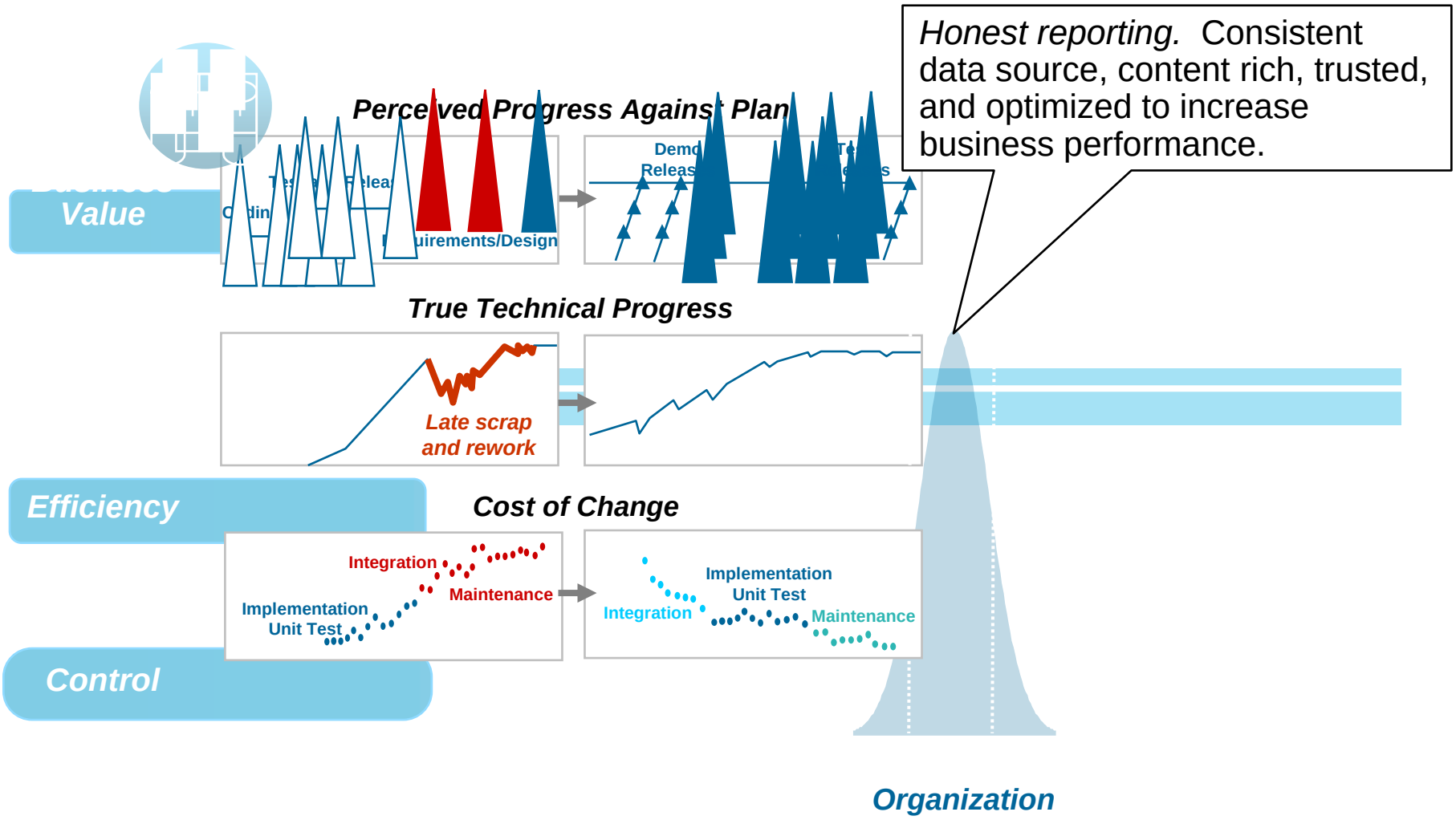
Improve collaboration to increase productivity by 15%-35%

Implement tools and to leverage skills and improve teamwork



Improve process to increase productivity by 25%-100%

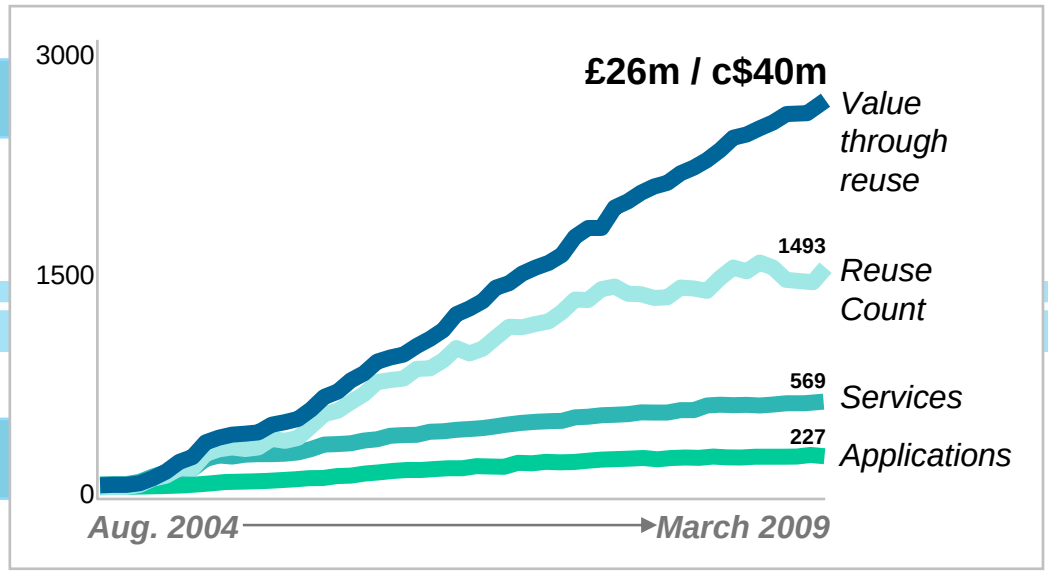
Implement iterative / adaptive processes



Increase flexibility and value to deliver 2x – 10x productivity

Implement an enterprise architecture and reusable Web services

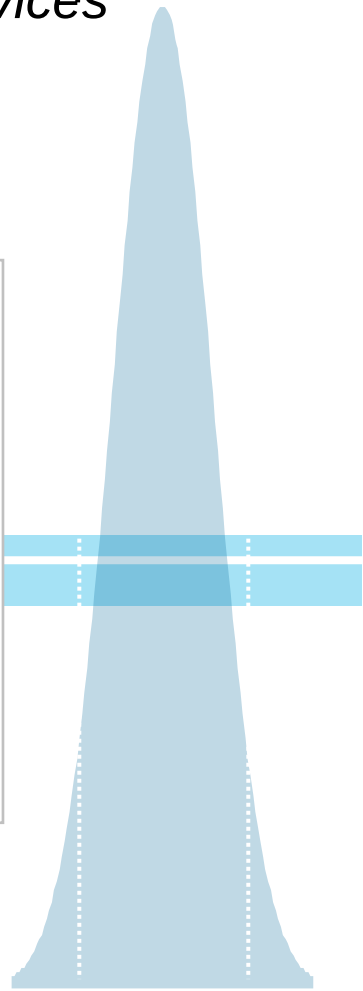
SOA Reuse Savings $40 million over four years



Value

Efficiency

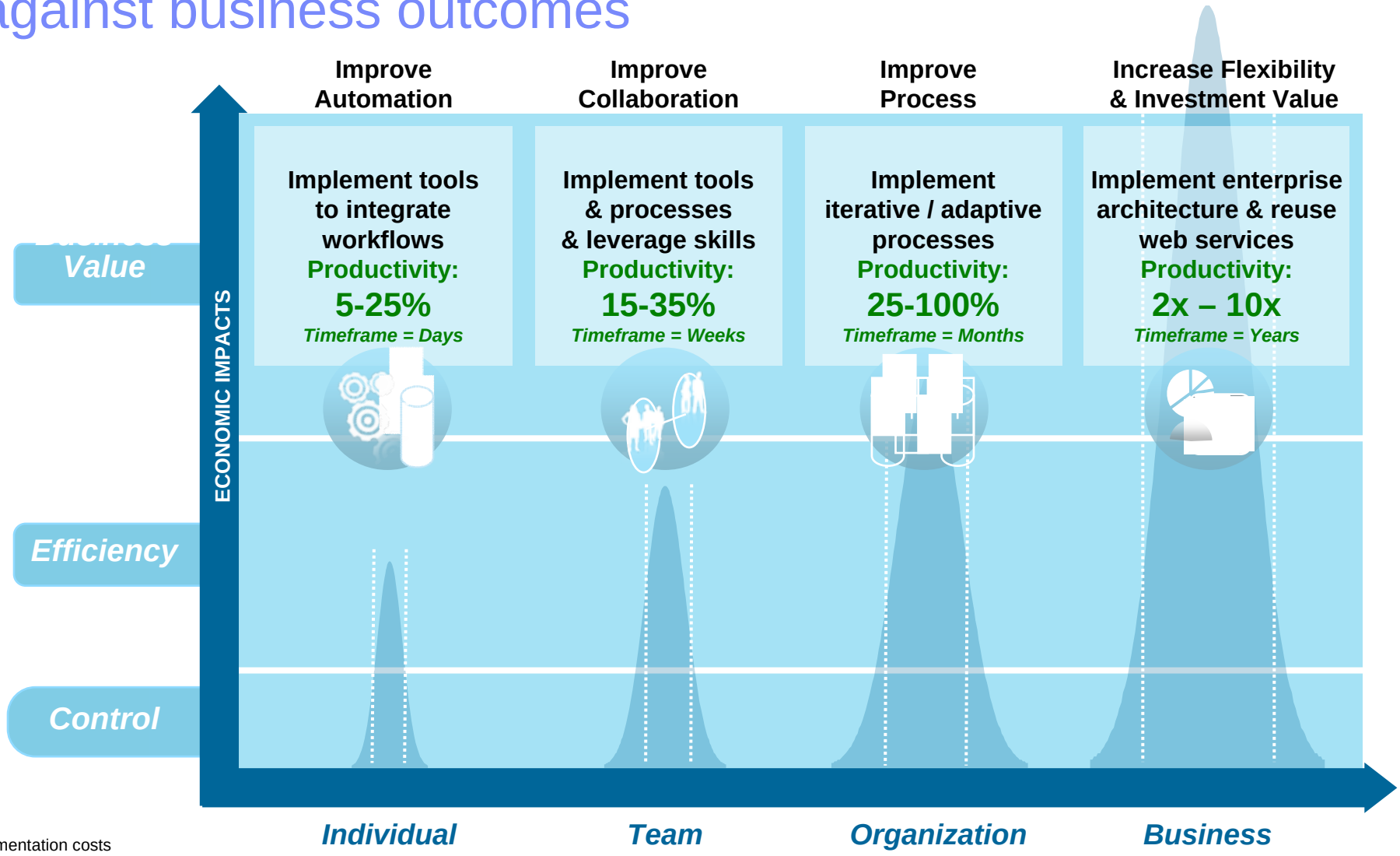
Control



Business

Source: Standard Life Inc. from 2009 Impact Conference.

Achieve continuous improvement by measuring cost against business outcomes



Implementation costs are per person per year

Software engineering metrics must align with desired business outcomes

Control

- Address the risks of development
  - Perceived quality
  - Scope uncertainty
  - Security failure
  - Failing an audit

Efficiency

- Address development as a cost center
  - Productivity
  - Software engineering base quality
  - Process agility
  - Global collaboration platform

Value

- Address development as a value creation center
  - Foster innovation and reuse across organizational and geographical boundaries
  - Enterprise application modernization
  - Speed merger and acquisition absorption
  - Reduce traditional development in favor of smart package software integration and SOA

Drive Cost Reduction and Business Transformation through Measured Capability Improvement Framework

Empower teams to measure, manage, and incrementally improve their software delivery capability

- **MCIF** is a phased approach that helps teams
  - Adopt an incremental, measured approach to transformation
  - Focus on the core practices that matter most
  - Accelerate adoption through out-of-the-box assets
  - Articulate capability improvements in terms of business value
  - Support any method optimized for Agile practices

However, continuous process improvement is impossible without honest measures and governed controls

*"2/3 of executives make more than half of their decisions based on **'gut feel'** rather than verifiable information"*

*"**77%** of managers are aware of **bad decisions** made due to lack of access to accurate information"*

*"Poor decisions have generated **revenue 75% or more below expectations**"*

Lack of timely information and in-context insight

Disparate data sources, formats, and definitions

Lack of relevant, timely actionable information

Inability to baseline and benchmark status and progress

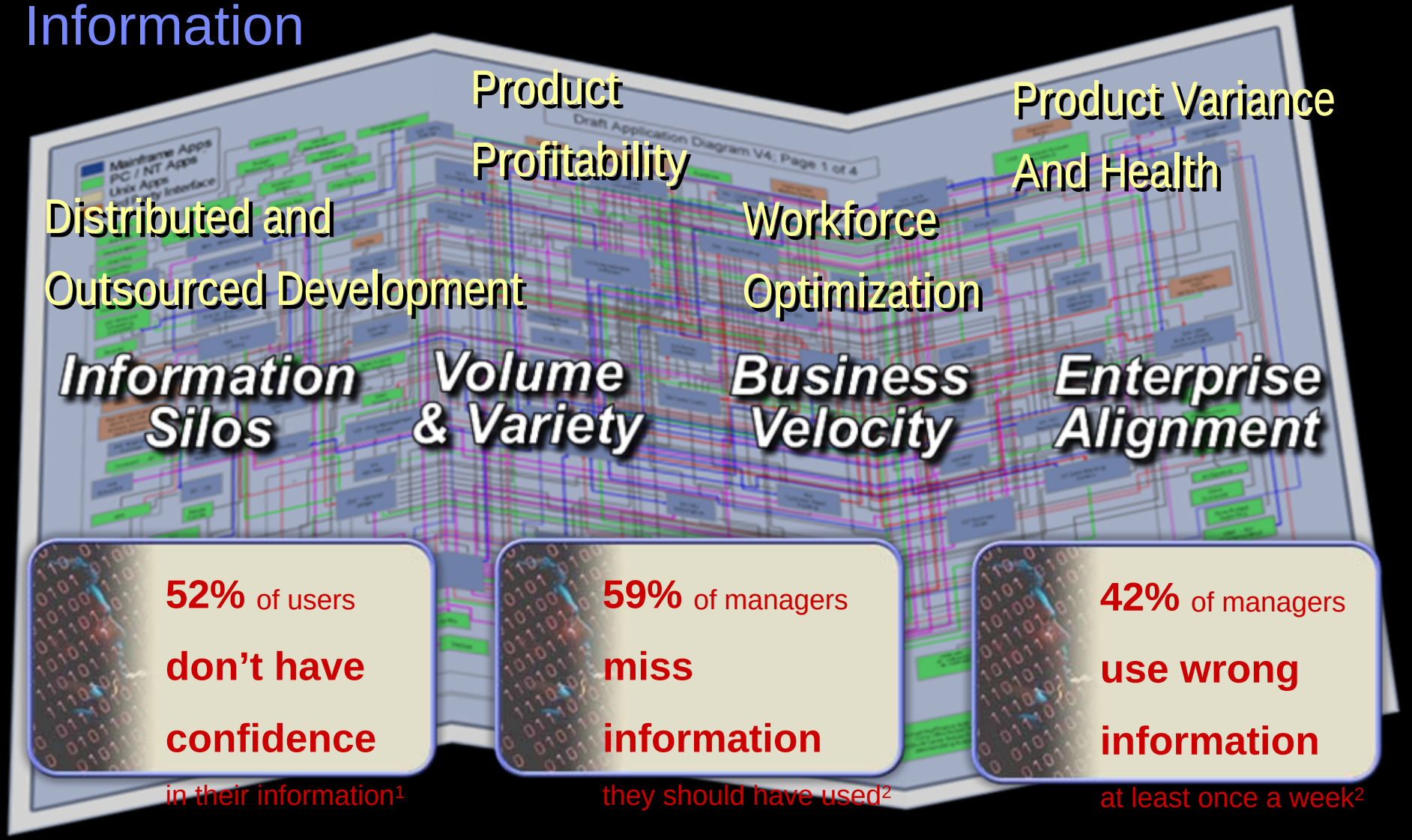
Inability to measure and assess unobtrusively

Transform From Cost Center to Business Value Driver

[3] IBM Global CFO Study, 2006

We Need Effective Information From Proper Metrics Communicated Back to the Business

Challenge: Contradictions Result From the Quest for Information



The State of Software Measurement - Today

Fortune 500 companies with productivity measures:	30%
Fortune 500 companies with quality measures:	45%
Fortune 500 companies with complete measures:	15%
Fortune 500 companies with missing measures:	85%
Number of software measurement personnel:	5,500
Number of software projects measured:	160,000
Number of software projects not measured:	50,000,000

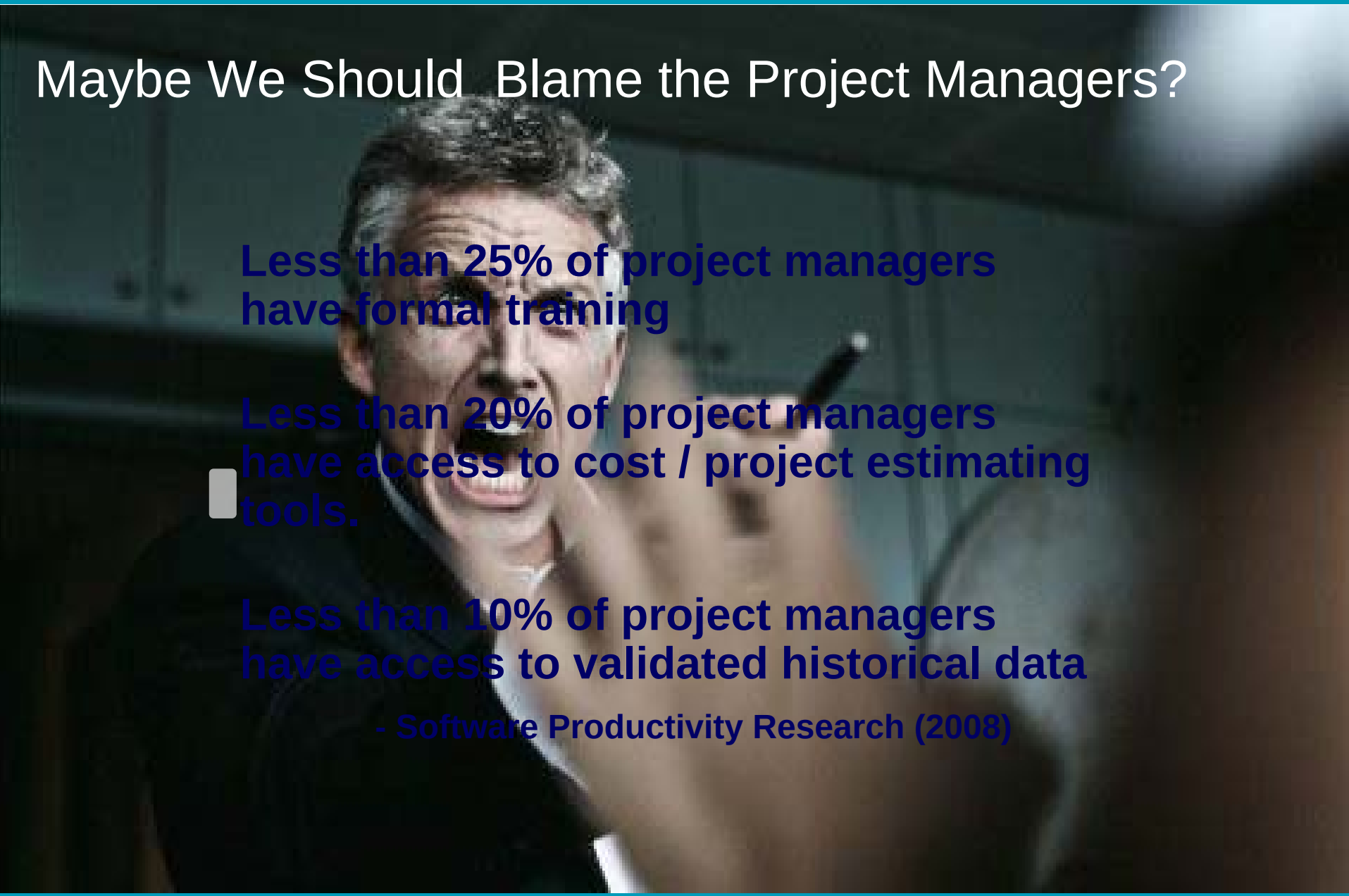
- Capers Jones

Is the State of Measuring REALLY the problem?

Companies that measure:		Companies that don't:	
On-time projects:	75%	On-time projects:	45%
Late projects:	20%	Late projects:	40%
Cancelled projects:	5%	Cancelled projects:	15%
Defect removal:	> 95%	Defect removal:	Unknown
Cost estimates:	Accurate	Cost estimates:	Optimistic
User satisfaction:	High	User satisfaction:	Low
Software status:	High	Software status:	Low
Staff morale:	High	Staff morale:	Low

- Software Productivity Research (2007)

Maybe We Should Blame the Project Managers?



Less than 25% of project managers have formal training

Less than 20% of project managers have access to cost / project estimating tools.

Less than 10% of project managers have access to validated historical data

- Software Productivity Research (2008)

How about “lesser known” Metrics?

- WSR (Work-to-Sleep Ratio)
- DODO (Days On per Day Off)
- HBT (Handbasket Temperature)
- GALB (Going-Away-Lunch Budget) or GAAB (Going Away-Alcohol-Budget)
- Dilbert Barometer
- The Laugh Meter

- Martin L. Shoemaker

Beware of Hazardous Metrics

Cost per Defect (Penalizes quality)

Lines of Code (Ambiguous)

Cost per Line of Code (Penalizes new languages)

Lines of Code per Month (Ignores non-code work)

Staff Work Hours per month (Ignores non-work tasks)

Industry averages (Vague and ambiguous)

- Capers Jones

Measurements must be SMART (Simple, Measurable, Actionable, Realistic, and Timely)

Software engineering metrics that measure absolutes can provide the wrong incentives to your team

Then How Do We Succeed Using Measurement?

Fill in the blank. “The measurement _____.”

…is **meaningful** and potentially **benefits** the customer, manager and performer.

…supports a **direct link** between assessments and quantitative data.

…explains **why projects vary** and by how much.

…is supported by **automation**.

…**supports multiple kinds** of software, metrics, activities and deliverables.

…demonstrates **quantifiable correlation** between process perturbations and business performance (e.g. it is as accurate as financial data)

…is a **natural by-product** of the process (no night job).

“Organizations exercising world-class performance management practices enjoy market returns of 2.4 times that of typical companies”

BusinessWeek Study:
The Payoff of Pervasive Performance Management

Executive

Achieve Profit	Market Share	Business Alignment	Quality
Headcount	Time to Market	Readiness	Renewals
Revenue	Performance	Feedback	Defects
Expense	Enablement	Satisfaction	Consumability
Products	Productivity	Deployment	Calls

Success can only come from a tight linkage from the development and delivery process to the business.

Business Objectives

Management

Project Schedule	Requirements Churn	Continuous Integration
Code Coverage	Tests Passed/Failed	Tests per Build
		Code Growth
Defect Density	Tests for Requirements	Defect Priority

Like an annual report synthesizes the state of the overall business....a development report needs to do the same....

Operational Objectives

Development

agile test driven development change management iterative change set bill of materials VELOCITY dashboard WORK ITEM code scan test script requirements project schedule team meeting chat waterfall UNIT TEST

Communicate the relative facts to give all stakeholders insight as to the health of this critical part of their business.

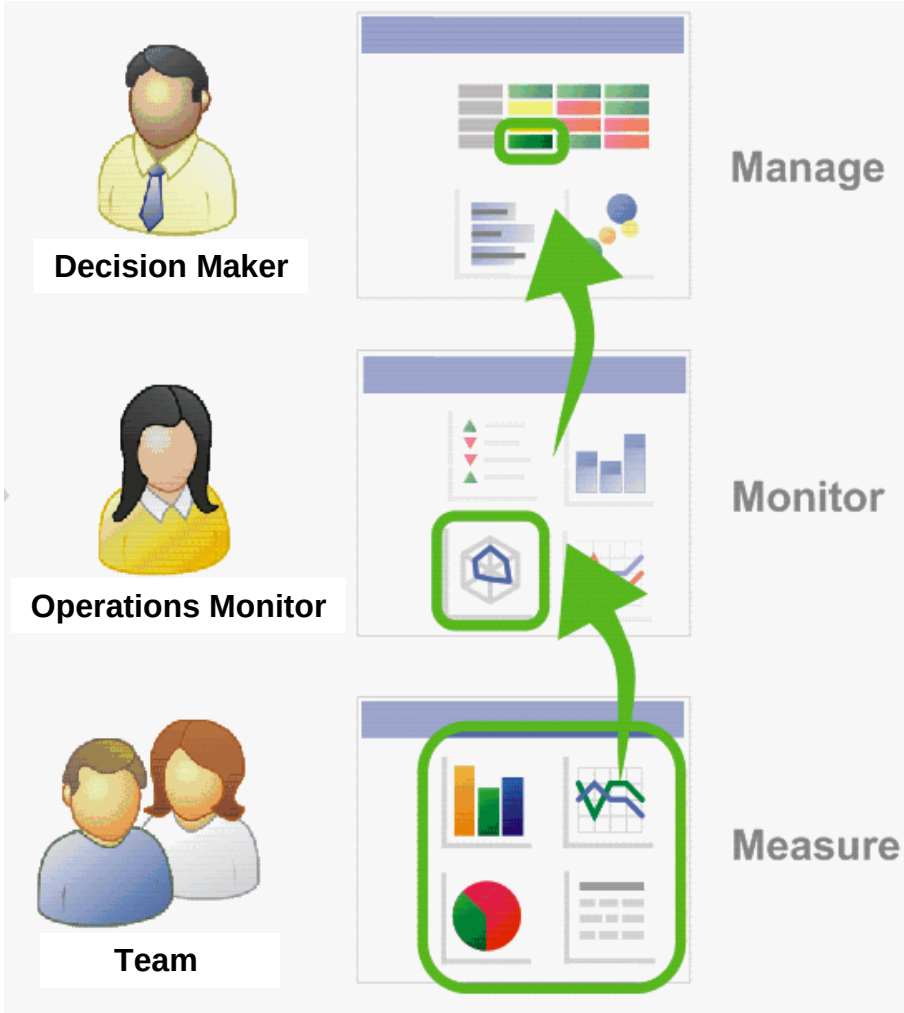
Processes & Practices

Artifacts

requirement build definition defect TEST CASE deploy image change set bill of materials STREAM custom dashboards design model WORKSPACE Eclipse plug-ins test script SNAPSHOT development assets Demo image

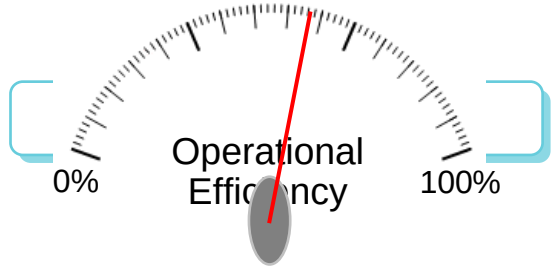
To achieve the right measures, a control framework enables each organization to drive to desired business outcomes

- Decision maker sets and manages business objectives
  - Reduce costs
  - Increase market share
  - Improve customer satisfaction
- Monitor drives operational performance initiatives aligned with business objectives
  - Manage and optimize resources
  - Develop transparently
  - Implement test driven development
- Team executes practices mapped to operational objectives
  - Build management and health
  - Automated testing
  - Iteration velocity
  - Requirements traceability

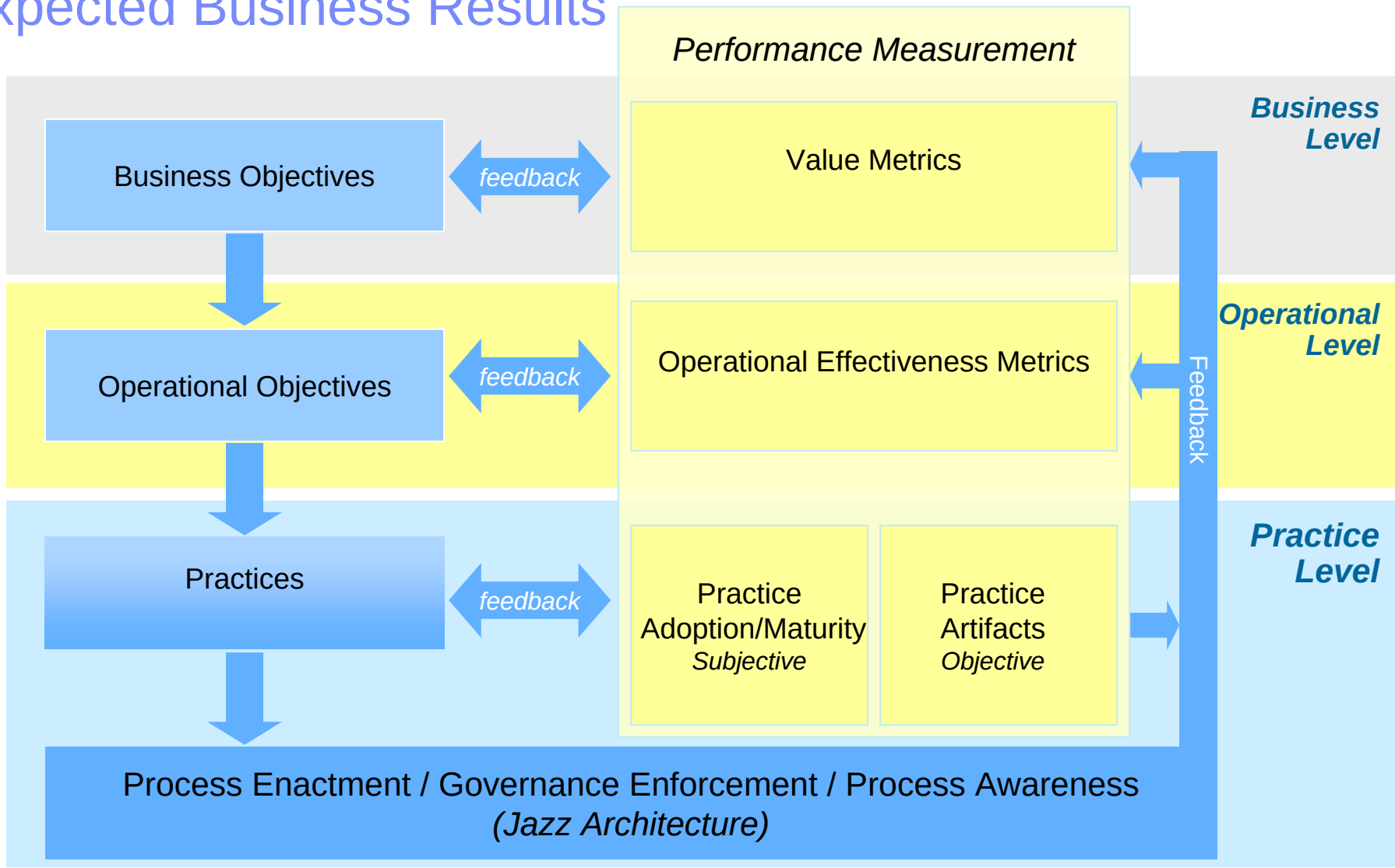


The measures need to be established at the business, operational, and practice levels

- Business value
  - Return on Investment (ROI)
  - Return on Assets (ROA)
  - Profit
  - …
- Operational objectives
  - Productivity
  - Time to market
  - Quality
  - Predictability
  - …
- Practice-based control measures
  - Test Management: Defect density, test coverage
  - Iterative Development: Velocity, iteration burn down
  - Continuous integration: Build stability, build frequency
  - …



Bottom Line: You Need a Control Framework to Manage to Expected Business Results



Four fundamentals for implementing a control framework

1. **System definition**: A discriminating ALM system for linking, tracing and accessing information across your SDLC.
2. **Best practices**: Best practices for monitoring, measuring and reporting throughout the enterprise
3. **Interpretation**: A capability to interpret your measures correctly and accurately the health of your development practices
4. **Operations**: Guidance to define the right actions, workflows and policies to improve your measured results and be compliant

A Discriminating System

Lets You Measure, Assess and Improve Information Blindspots

Improving

Where You Should Be!

Assessing

Where You Are
- Productivity Rates
- Quality Levels

Why You Are
- Process Assess
- Product Health

Quantitative and Qualitative Data

Information Gaps

Change & Configuration Management

Rational Definition & Management

Quality Management

Build & Release Management

Architecture Management

Security & Compliance

Software Lifecycle Artifacts

Project Data

Headcount & Financials

Sales & Pipeline

Customer Support

Manual Data

3rd Party Data Artifacts

Defining a best practice…

"The likelihood of delivering a product on time, within budget, with acceptable revenue or benefits and an acceptable level of support costs."

- The definition points us to what we need to project
  - Time to complete
  - Cost to complete
  - Expected revenue/benefits
  - Expected support and ownership costs
- The other indicators (expected effort, probability of on-time completion and percent complete) can be driven from these

And more specifically…

The indicators that impact **time to complete** –

- Critical situations
- Defect density/severity analysis
- Defect repair latency
- Build health
- Velocity
- IPD timeliness
- Iteration status
- Variance in time-to-complete estimates by task

The indicators that impact **expected revenue / benefits** –

- Benefits of requirements
- Benefits of demonstrable capabilities by iteration (Iteration status)
- Benefits of RFE 30/90-day SLA

The indicators that impact **cost to complete** –

- Staffing actuals vs. plan (is also an indicator of project size)
- Capital expense actuals vs. plan
- Earned value

The indicators that impact **expected support and ownership costs** –

- APAR backlog
- RFE 30/90-day SLA
- Build health
- Time-to-resolution for internally-found defects and APARs

Best Practice Interpretation: Project Health

Metric	Weight	Source	Measure
Defect Backlog	10	Change Mgmt	3 Months
Enhancement SLA	10	RFE Website	60 Days
Cost of Support	10	Analysis	25% Total
Critical Situations	05	Support DB	<1 Month
Defect Density	10	Analysis	By component
Defect Repair Latency	05	Support DB	By product maturity
Build Health	10	Analysis	90% Clean
Project Velocity	10	SCM Tool	Better than Average
Staffing Actuals	10	Financials	10% Variance
Process Timeliness	05	Process DB	<10% off plan
Milestone Status	10	Agile Planner	90% of plan
Severity Analysis	05	Analysis	Depends on timeframe

Project Health

Rational Executive Dashboard

REST Open Services / ODBC / XML

Quantitative and Qualitative Data

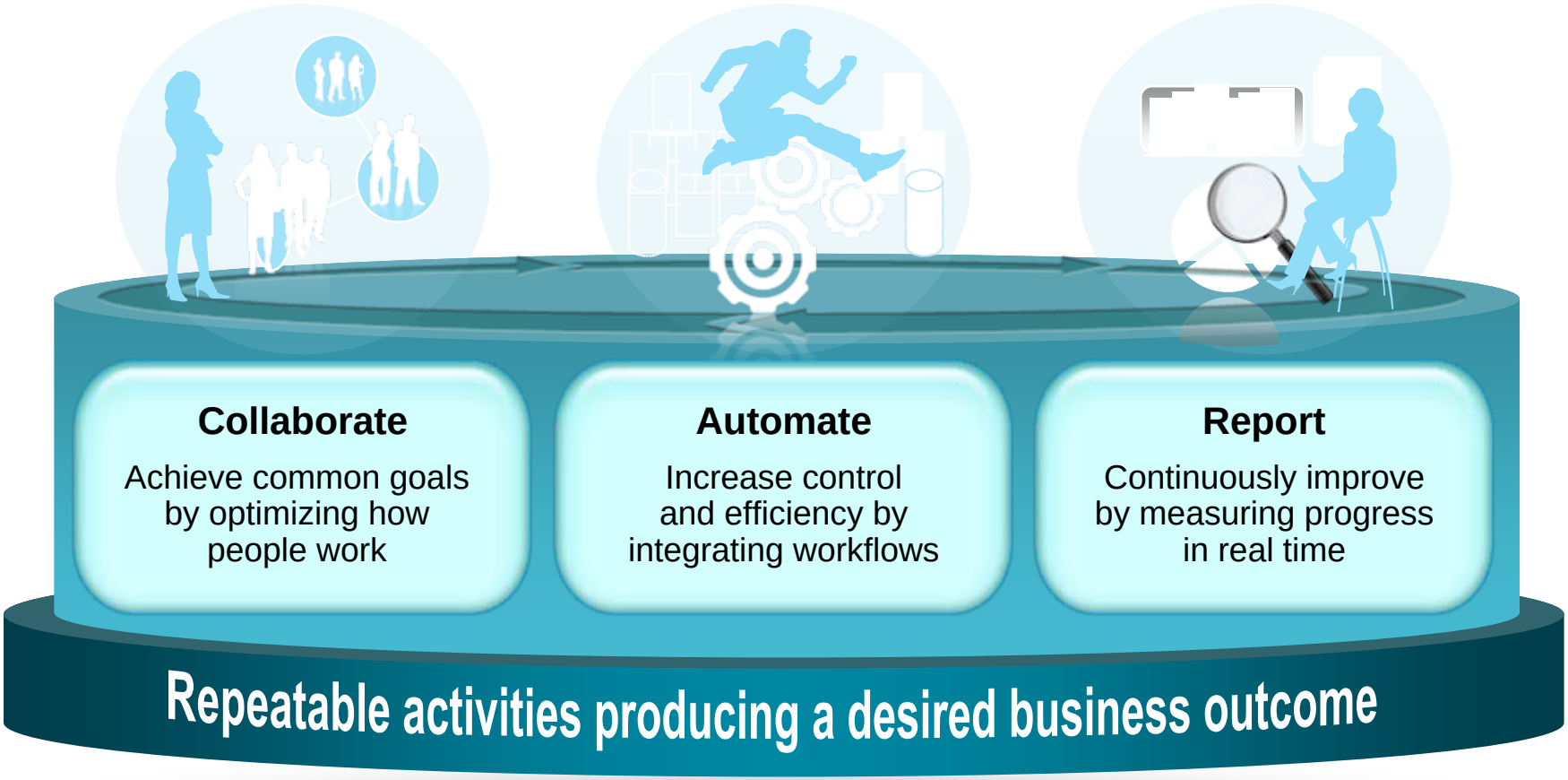
Rational ClearQuest | Rational Requirements Composer | Rational Team Concert | Rational Quality Manager | Rational Test Manager | Rational Requisite Pro | Rational ClearCase

Rational Data Sources

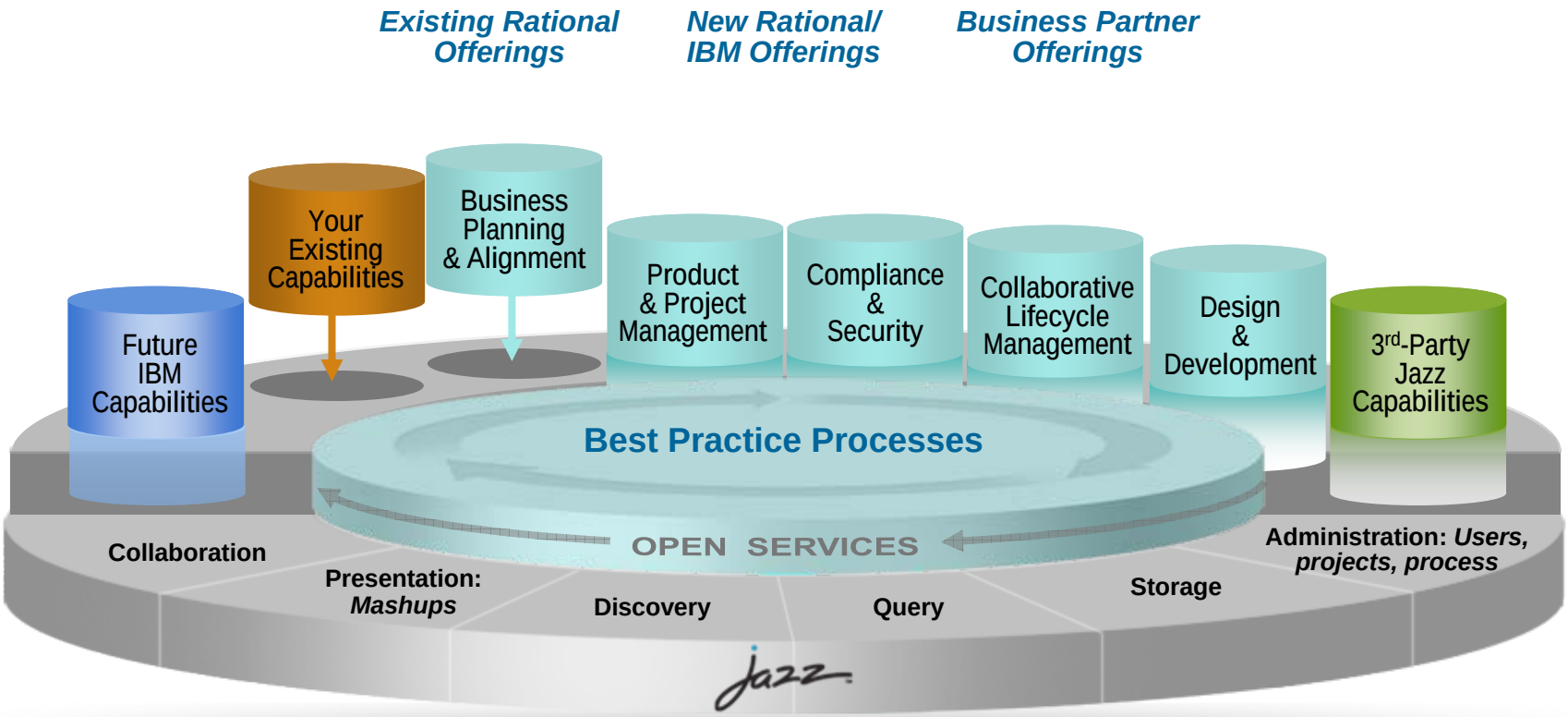
Project Data | Headcount & Financials | Sales & Pipeline | Customer Support | Manual Data

3rd Party Data Sources

Now that we see how to measure software investment, the benefits of a software delivery platform becomes clear



Rational delivers the Jazz platform to enable the business process of software and systems delivery




Questions