How To Achieve Greater ROI, Speed Innovation and Reduce Cost in Your Software Investment

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The Rational Software Conference

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How important is measurement?

Statistical outcomes for projects with strong and weak measurement practices:

	Strong	*Weak*
On-time projects	75%	45%
Late projects	20%	40%
Cancelled projects	5%	15%
Defect removal	95%	< 85%
Resource estimates	Accurate	Optimistic
Client satisfaction	Higher	Lower
Staff morale	Higher	Lower

Fortune 500 firms with productivity measures:	30%
Fortune 500 firms with quality measures:	45%
Fortune 500 firms with complete measures:	15%
Number of software projects measured:	160,000
Number of software projects not measured:	50,000,000

ROI for Software Measurement:

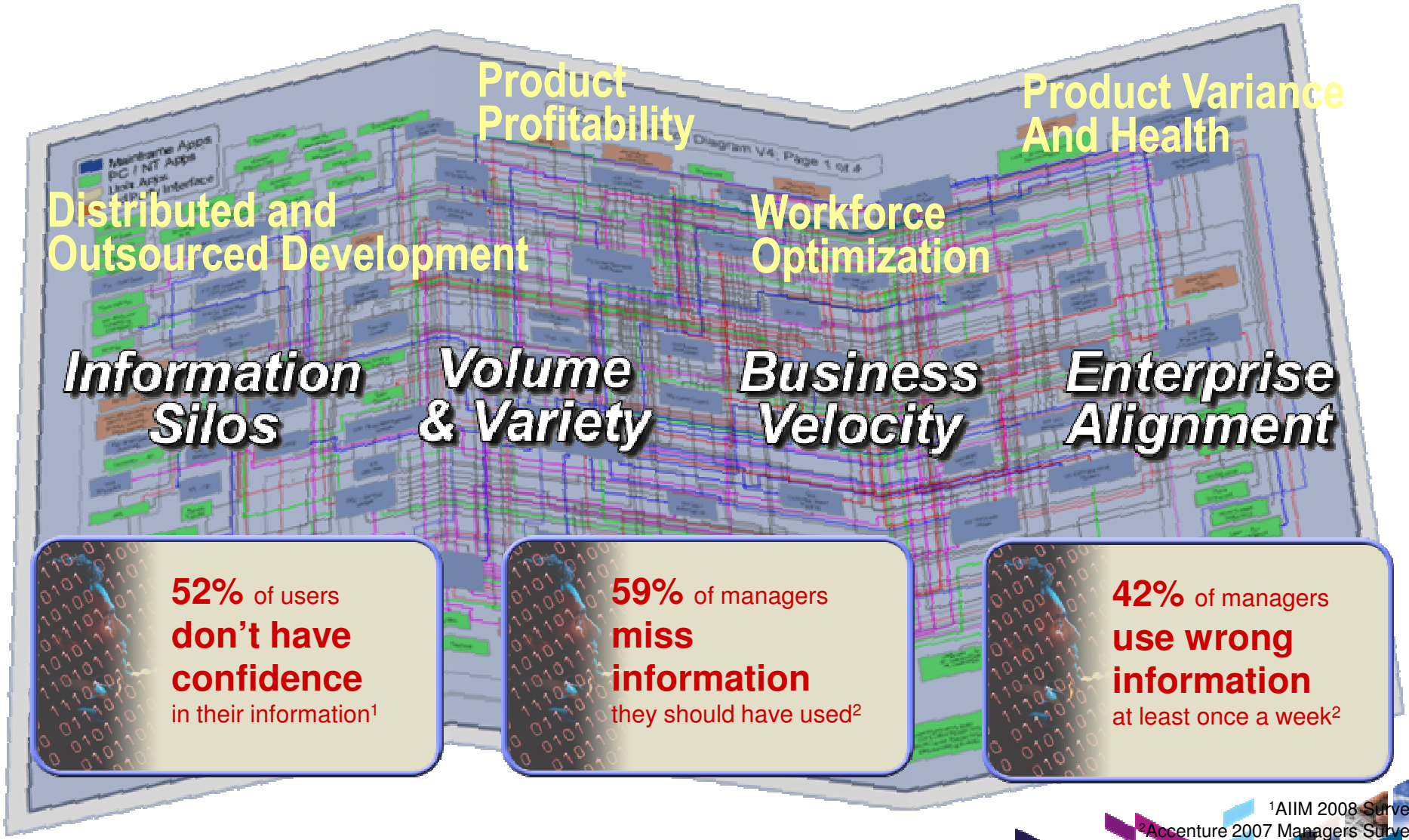
	Cost	*Return*
Year 1	5%	$ 4.5
Year 2	4%	$ 6.25
Year 3	4%	$ 8.75
Year 4	4%	$ 11.50
Year 5	3%	$ 15.00

Top Reasons for Software Litigations:

1.	Unstable, changing requirements	95%
2.	Inadequate quality control and poor quality measures	90%
3.	Inadequate progress tracking	85%
4.	Inadequate cost and schedule estimating	80%
5.	False promises by marketing and sales personnel	80%
6.	Optimistic schedule estimates or arbitrary dates	75%
7.	Informal, unstructured development	70%
8.	Inexperienced clients who can't articulate requirements	60%
9.	Inexperienced project managers	50%
10.	Inadequate tools for quality, static analysis, inspections	55%
11.	Reusing materials filled with bugs	30%
12.	Inexperienced, unqualified software engineering teams	20%

Source: Capers Jones, Measurement, Metrics and Industry Leadership, 2009 and Software Engineering Best Practices, McGraw Hill, 2010

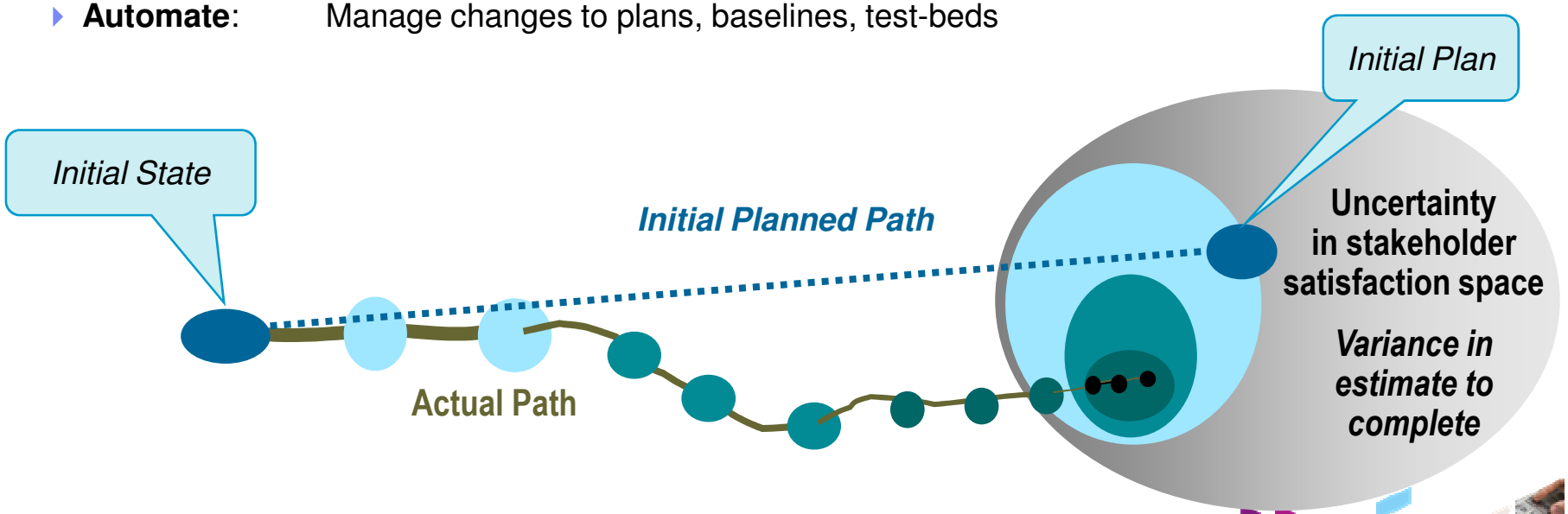
Contradictions arise with the quest for information



[1]AIIM 2008 Survey
[2]Accenture 2007 Managers Survey

Measure and steer: The Key to Agile Project Management

- At onset of program
  - **Report:** Establish estimates/variances of effort, cost, establish initial plan
  - **Collaborate**: Set initial scope and expectations with stakeholders
  - **Automate**: Establish a collaborative development environment
- At each iteration, improve estimates and report
  - **Report**: Values and variances of progress achieved, quality achieved, resources expended
  - **Collaborate**: With stakeholders to refine scope and plans
  - **Automate**: Manage changes to plans, baselines, test-beds



Some Not-so-subtle Observations

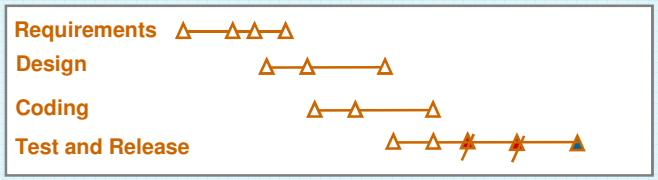
- Most common failure patterns in software delivery:
  - Building a precise specification or plan without a precise understanding
  - Self-inflicting an overly prescriptive process in early (creative) life cycle activities
- Honest results (facts) come from executable software baselines
  - Specs, plans, models, source code and other documents are mostly speculation
  - Measurement needs to assess **progress** and **quality**
- Integration testing precedes unit testing in successful projects
  - Don't invest in unit details until its interface and function are well-established
- *"The later you are in the life cycle the more expensive things are to fix."*
  - A characteristic of traditional engineering governance (PMI, PMBoK) applied to software
- *The later you are in the life cycle the more predictable things are to fix.*
  - The promise of economic governance, effective architecture and agile software delivery

Core metrics for honest progress insight

Conventional Engineering Governance

Modern Economic Governance

Sequence of documents and artifacts



Activity based—document baselines

Planning Progress

Sequence of demonstrable results

Result based --Code and test baselines

Dishonest early optimism

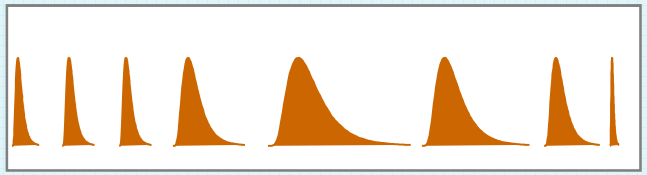
False precision in early artifacts

Technical Progress

Honest earned value

Demonstrated and measured capability/quality

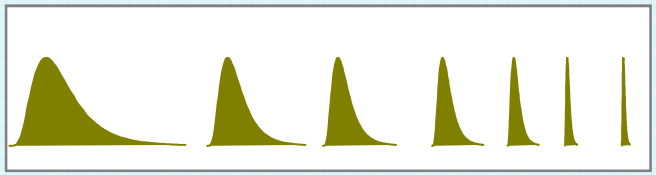
Dishonest early optimism



Postponed understanding of architecturally significant risks

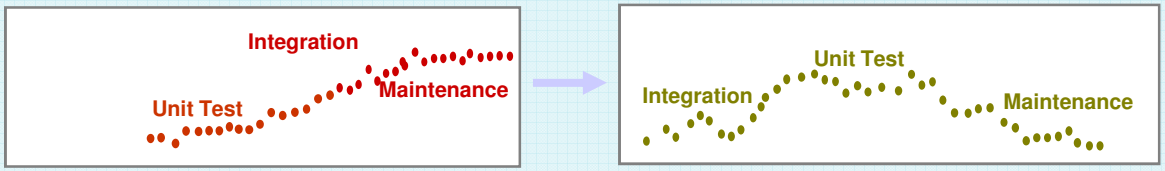
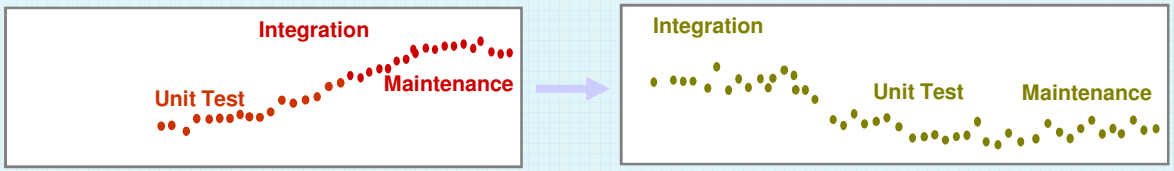
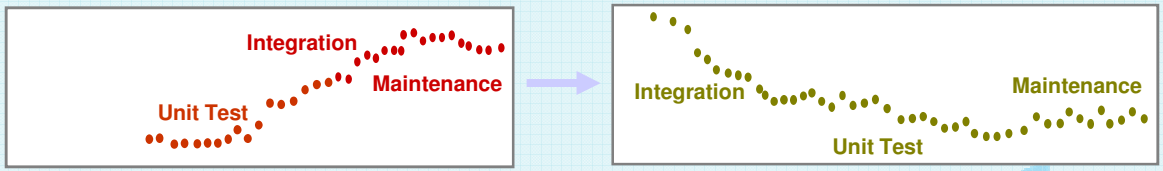
Economic Progress

Honest reduction in uncertainties/risks



Reducing the variance in the estimated cost to complete

Core metrics for honest quality insight

Quality Metric	Conventional Profile	Agile Software Delivery Profile
Defects: ▪ Software changes due to errors	**Maturity (Defect trend over time)** Average number of defects per time period requiring repair	
Scrap: ▪ Extent of software change ▪ How much code needs repair	**Modularity (Scrap trend over time)** Average breakage (lines of code) per baseline change order	
Rework: ▪ Complexity of software change ▪ How difficult is the diagnosis and repair	**Adaptability (Rework trend over time)** Average cost (resources expended) per baseline change order	

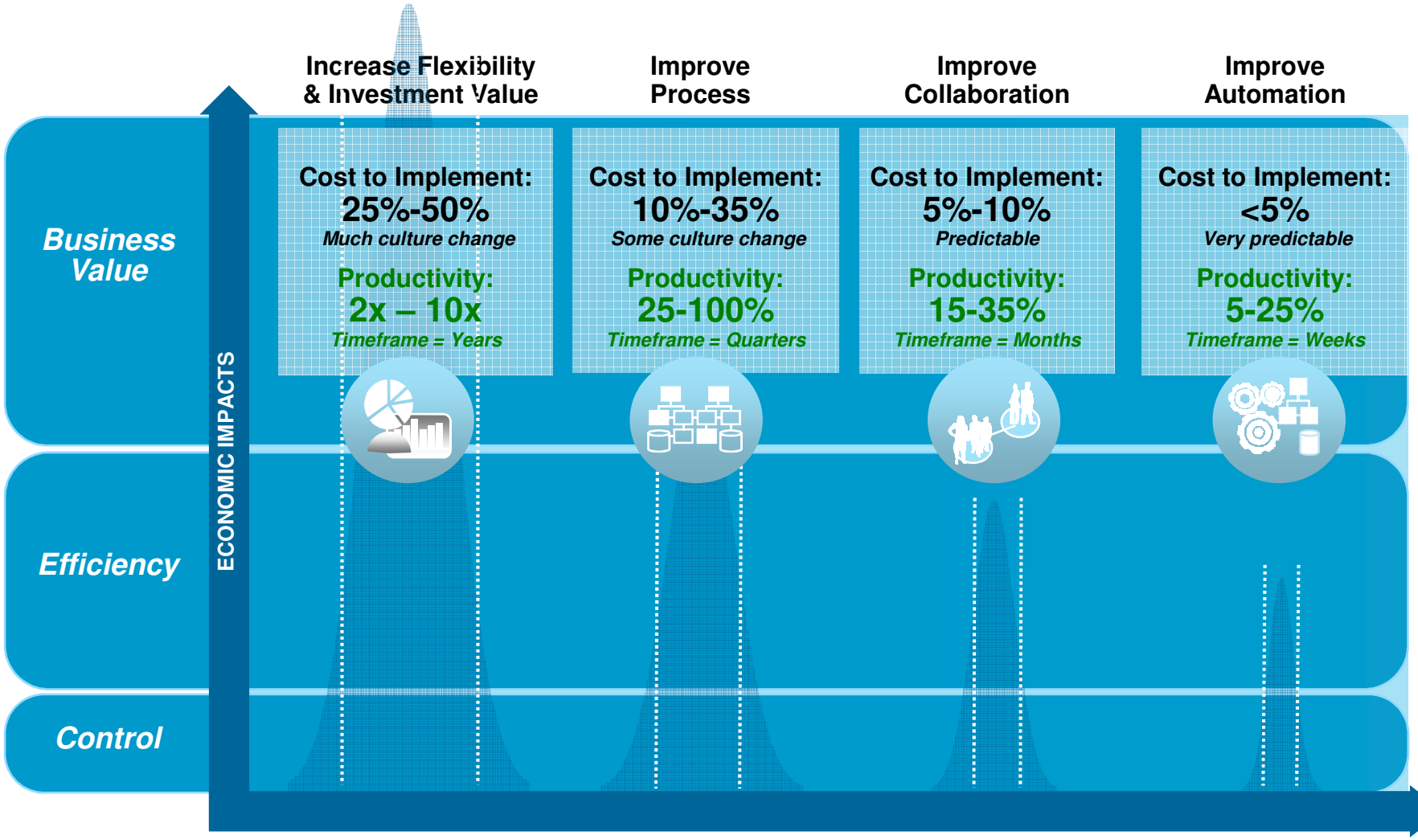
Improving software economics

- Empirical software cost estimation models for:
  - Enterprise modernization, software maintenance
  - New developments, new releases, early prototypes
  - Packaged applications, systems engineering

$$\text{Time or Cost To Build} = (\text{Complexity})^{(\text{Process})} * (\text{Team}) * (\text{Tools})$$

Complexity	Process	Team	Tools
▪ Volume of human generated stuff - KSLOC, FPs, UCs ▪ Quality/performance ▪ Scope	▪ Methods ▪ Maturity ▪ Agility ▪ Precedence	▪ Skills/Experience ▪ Collaboration ▪ Motivation	▪ Automation ▪ Process enactment

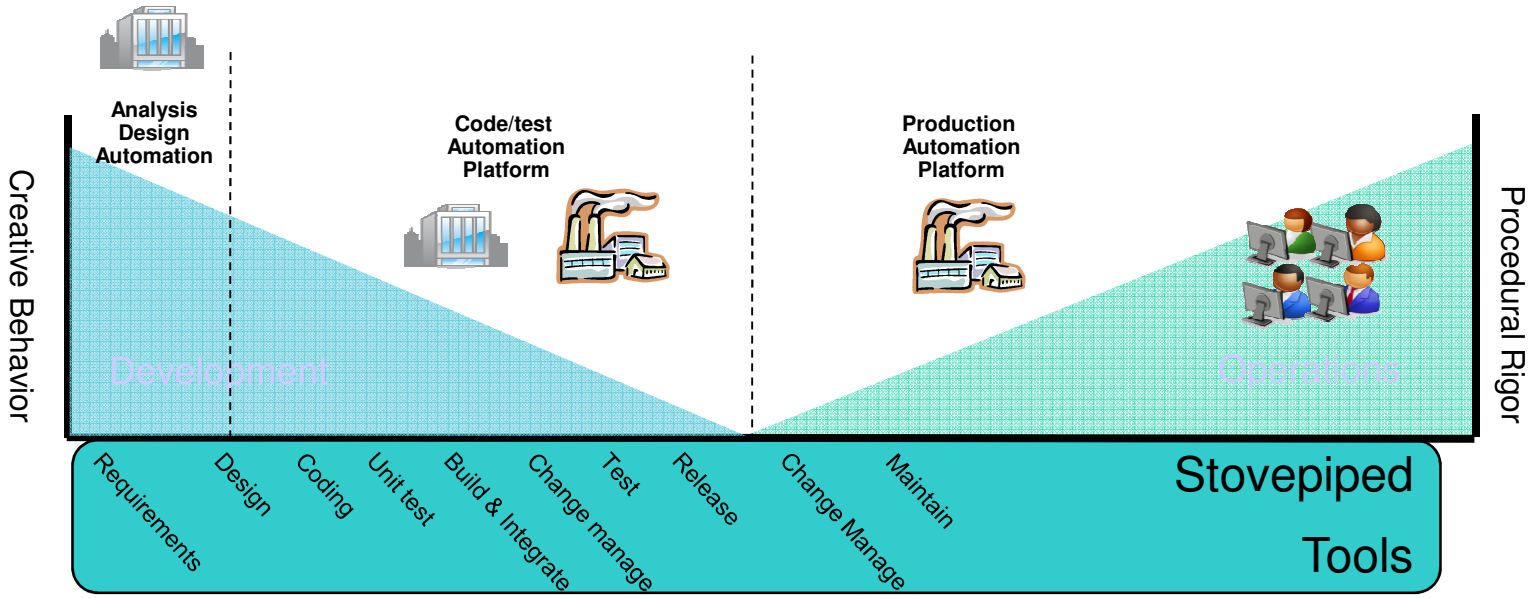
Invest across the spectrum to manage risks and optimize business outcomes



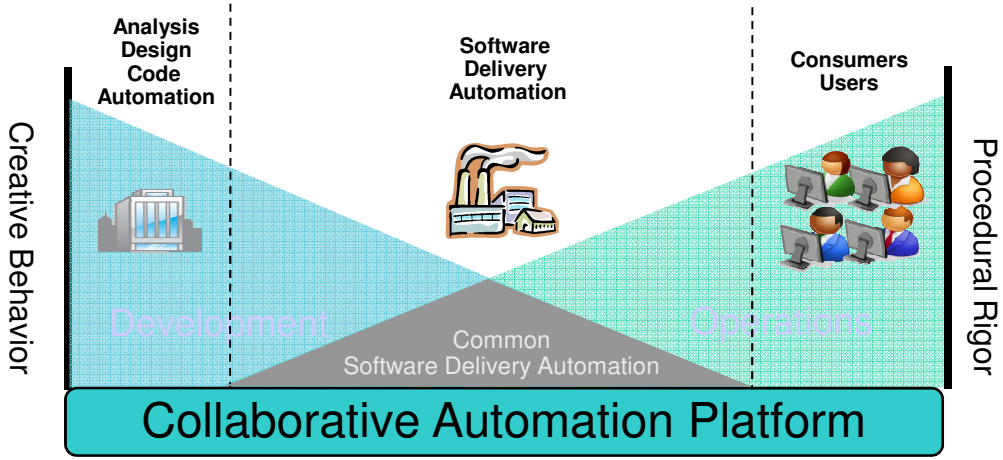
Implementation costs are per person per year

Software delivery automation leverage

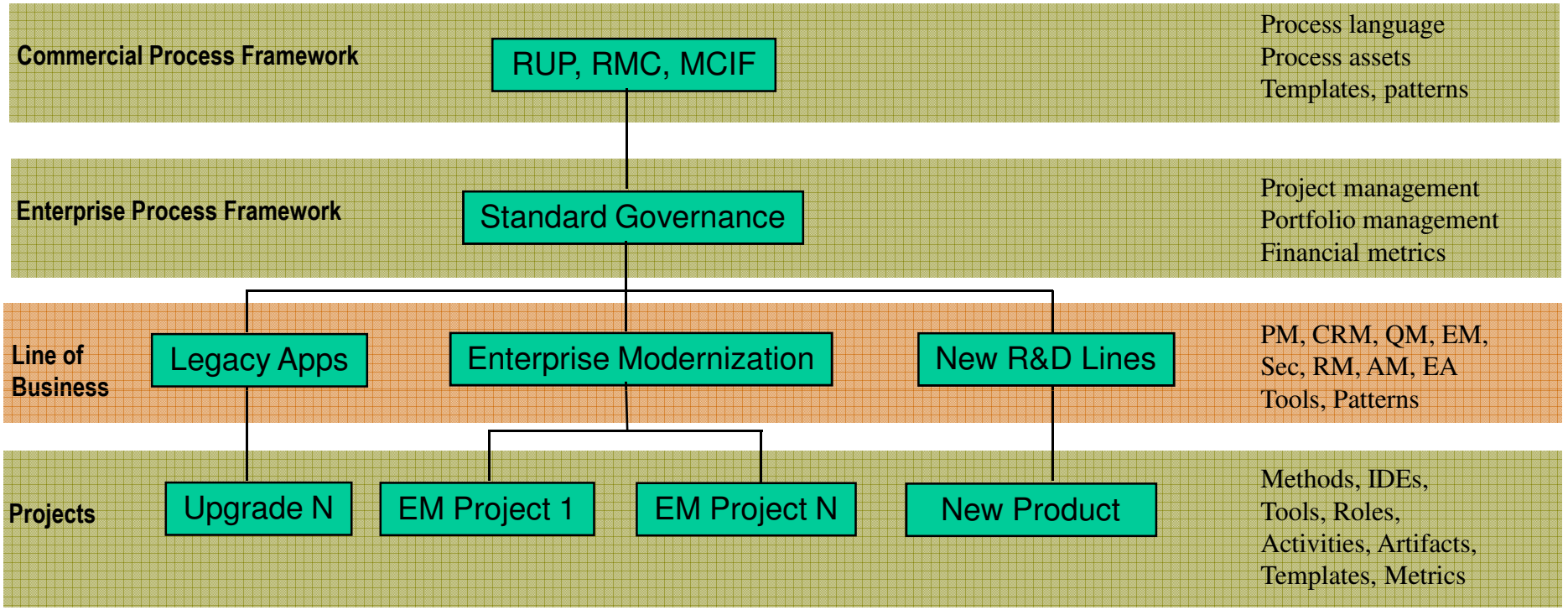
Waterfall
Process
Platform



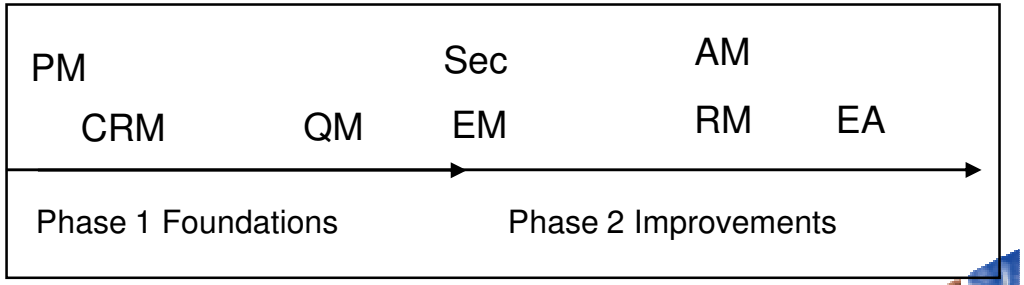
Agile
Delivery
Process
Platform



Organizational Process Frameworks



Recommended deployment sequence of disciplines in larger scale organizational transformations




DEMO

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Rational Insight

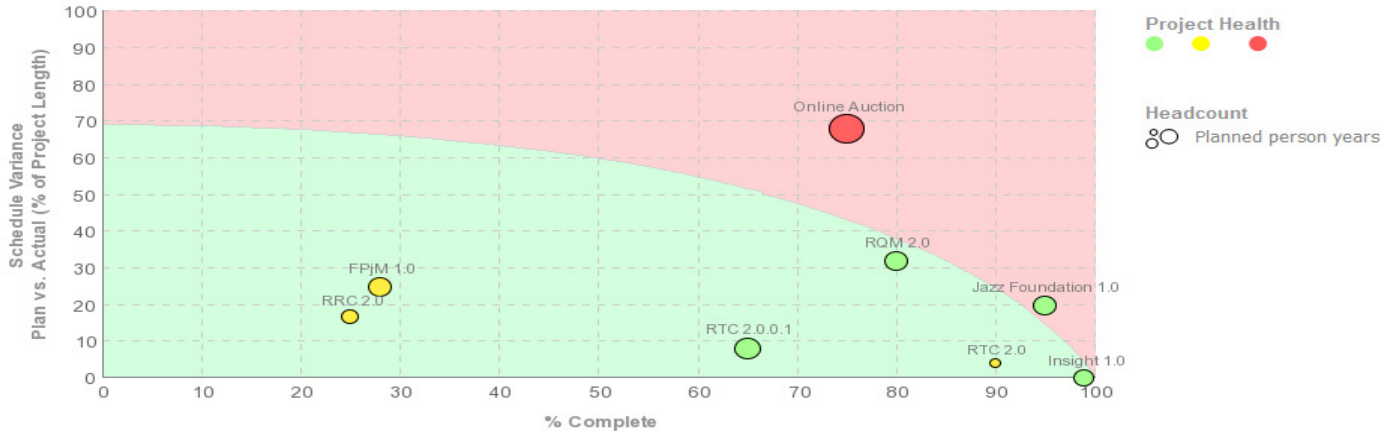
Cognos Viewer - Executive Dashboard Portal

Launch About

Welcome | Executive Dashboard | Project Development Portal | Performance Measurement Practice | Collaborate

- Executive Dashboard
- Headcount
- Improve Project Health
- Achieve Profit Margin Objective
- Improve Market Share

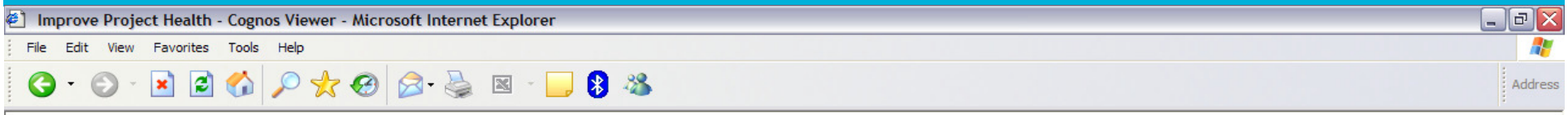
Segment: All Segments



Hide Table

Segment	Product	Revenue Year-To-Date (M)	Revenue % of Plan	Pipeline (M)	Release	eGA Plan	eGA Outlook	eGA Plan-Outlook	Headcount (PY)	Project Health	Overall Profit Margin	Overall Market Share
Application Lifecycle Management (ALM)	Jazz Foundation	75.7 ▼	96% ▼	87.9 ▼	Jazz Foundation 1.0	May 28, 2009	Jun 12, 2009	15 days	52 ◆	71% ◆	◆	▲
					Online Auction	Mar 31, 2009	Jul 7, 2009	98 days	118 ▼	50% ▼	▼	▼
	RTC	115.2 ▲	99% ◆	109.6 ◆	RTC 2.0	Jun 15, 2009	Jun 19, 2009	4 days	12 ◆	90% ◆	◆	▲
					RTC 2.0.0.1	Sep 22, 2009	Sep 30, 2009	8 days	72 ▼	86% ◆	◆	◆
Governance Solution	Focal Point for Project Management	29.1 ◆	93% ◆	84.2 ▲	FPjM 1.0	Oct 15, 2009	Nov 17, 2009	33 days	60 ◆	74% ▲	◆	◆
	Rational Insight	108.7 ▼	98% ▼	162.7 ▼	Insight 1.0	May 26, 2009	May 26, 2009	0 days	40 ◆	83% ▼	▼	◆
Quality Management (QM) Solution	RQM	35.2 ▲	112% ▲	79.6 ▲	RQM 2.0	Jun 15, 2009	Jul 31, 2009	46 days	56 ◆	89% ▲	◆	▲
	RRC	28.1 ◆	83% ▲	45.1 ▼	RRC 2.0	Nov 4, 2009	Nov 24, 2009	20 days	32 ▲	85% ◆	◆	▼

Project Health by Country



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Project Health

Segment: All Segments Product: All Products Release: Online Auction

Segment	Product	Release	Overall Project Health	APAR Backlog	RFE	Support Cost	Critical Situations	Defect Density	Defect Repair Latency	IPD Timelines	Staffing Plan vs. Actual	Build Health	Velocity	Iteration Status
Application Lifecycle Management (ALM)	Jazz Foundation	Online Auction	50%		40%	50%	71%	60%	58%	65%	60%	55%	59%	55%

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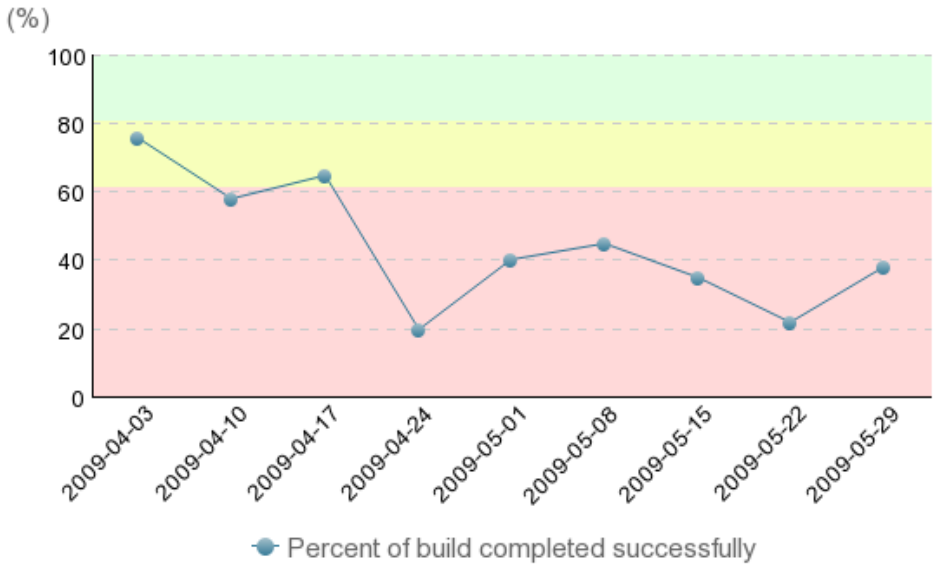
Build Health



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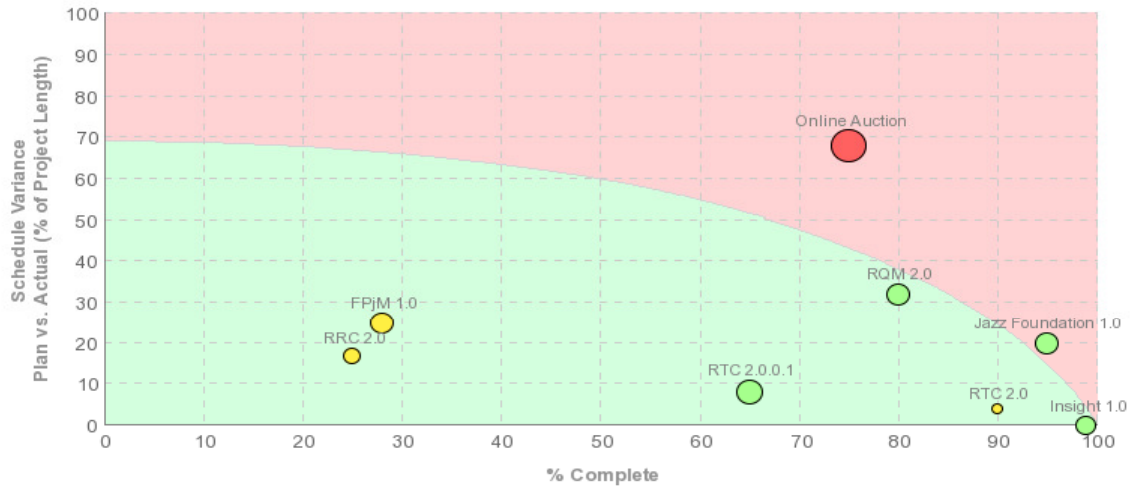

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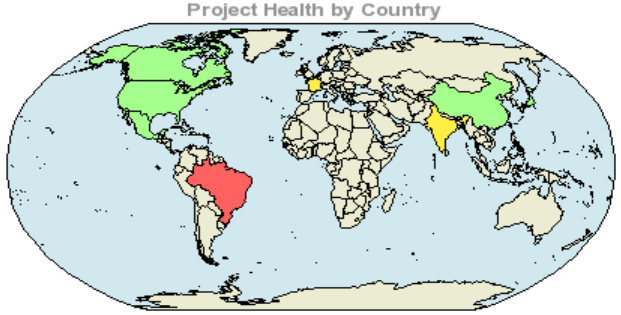
Project Health by Country



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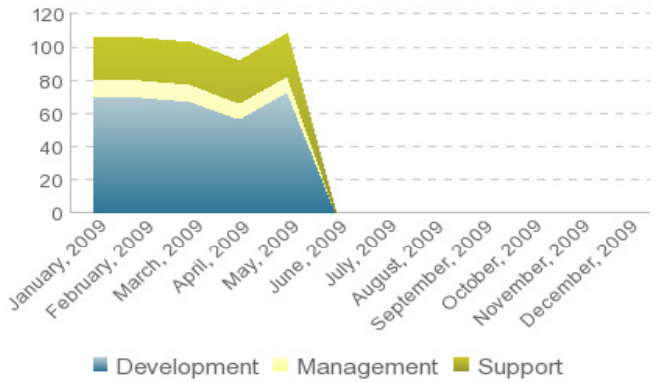
Headcount

Country: Brazil

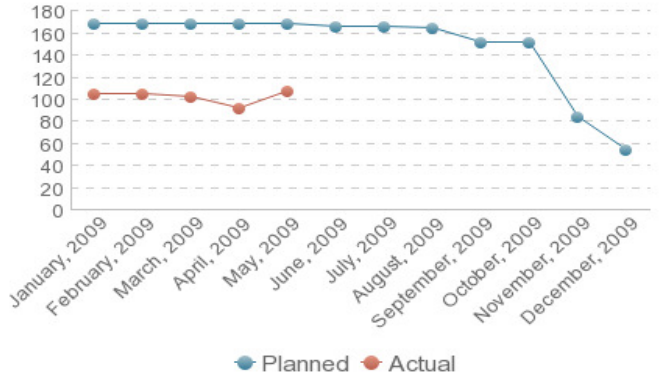
Headcount: Actual Show: All Roles

Person Months



Headcount: Plan vs. Actual

Person Months



Release Information

Segment	Product	Release	Plan eGA	Outlook eGA	% Complete	Schedule Variance %	Actual Headcount YTD	Headcount YTD Variance %	Overall Project Health
Application Lifecycle Management (ALM)	Jazz Foundation	Online Auction	Mar 31, 2009	Jul 7, 2009	75%	68%	363	26%	50%
	RTC	RTC 2.0.0.1	Sep 22, 2009	Sep 30, 2009	65%	8%	128	42%	86%
Quality Management (QM) Solution	RRC	RRC 2.0	Nov 4, 2009	Nov 24, 2009	25%	17%	24	37%	85%

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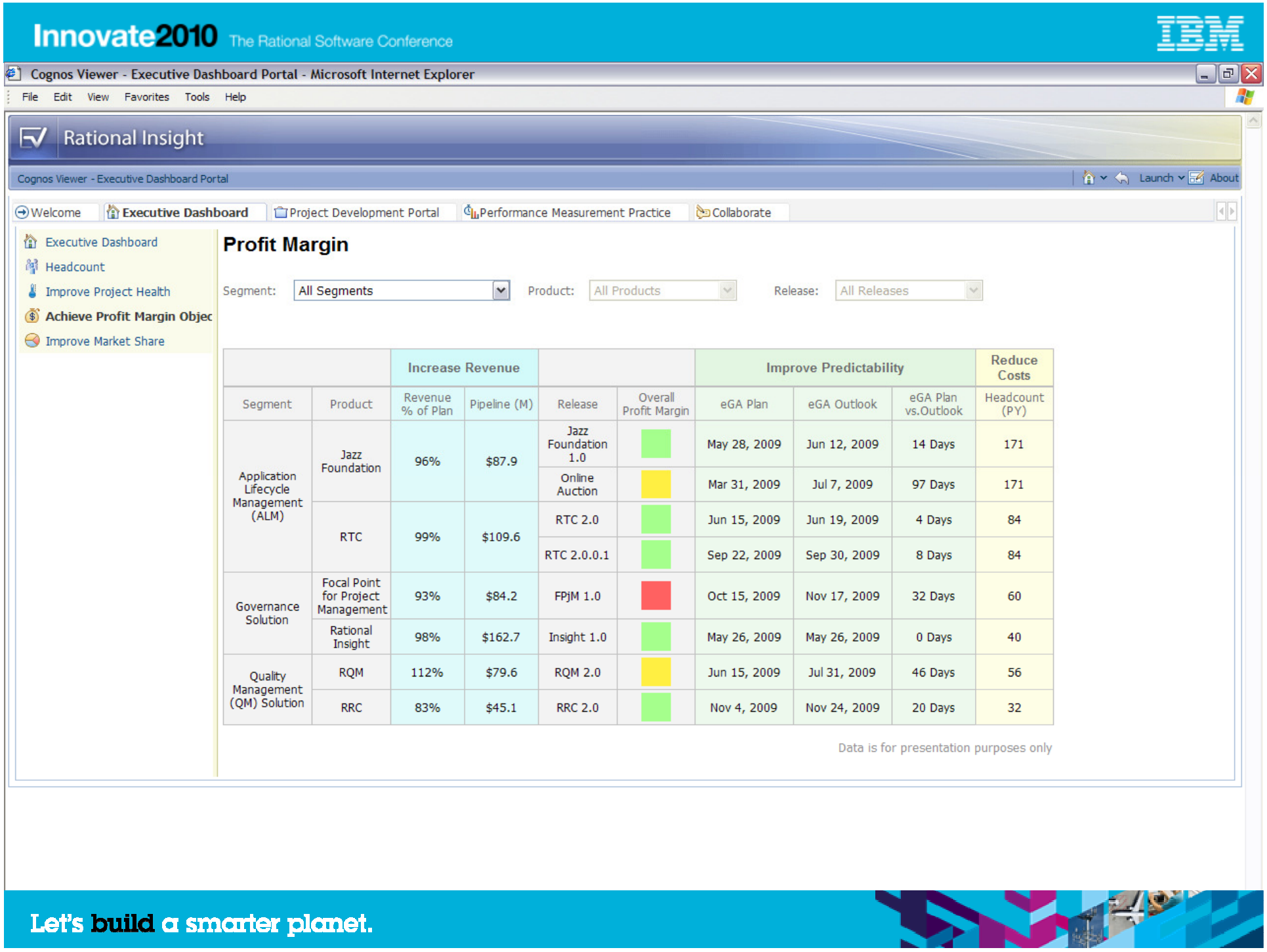

Profit Margin

Segment: All Segments Product: All Products Release: All Releases

		Increase Revenue				Improve Predictability			Reduce Costs
Segment	Product	Revenue % of Plan	Pipeline (M)	Release	Overall Profit Margin	eGA Plan	eGA Outlook	eGA Plan vs.Outlook	Headcount (PY)
Application Lifecycle Management (ALM)	Jazz Foundation	96%	$87.9	Jazz Foundation 1.0		May 28, 2009	Jun 12, 2009	14 Days	171
				Online Auction		Mar 31, 2009	Jul 7, 2009	97 Days	171
	RTC	99%	$109.6	RTC 2.0		Jun 15, 2009	Jun 19, 2009	4 Days	84
				RTC 2.0.0.1		Sep 22, 2009	Sep 30, 2009	8 Days	84
Governance Solution	Focal Point for Project Management	93%	$84.2	FPjM 1.0		Oct 15, 2009	Nov 17, 2009	32 Days	60
	Rational Insight	98%	$162.7	Insight 1.0		May 26, 2009	May 26, 2009	0 Days	40
Quality Management (QM) Solution	RQM	112%	$79.6	RQM 2.0		Jun 15, 2009	Jul 31, 2009	46 Days	56
	RRC	83%	$45.1	RRC 2.0		Nov 4, 2009	Nov 24, 2009	20 Days	32

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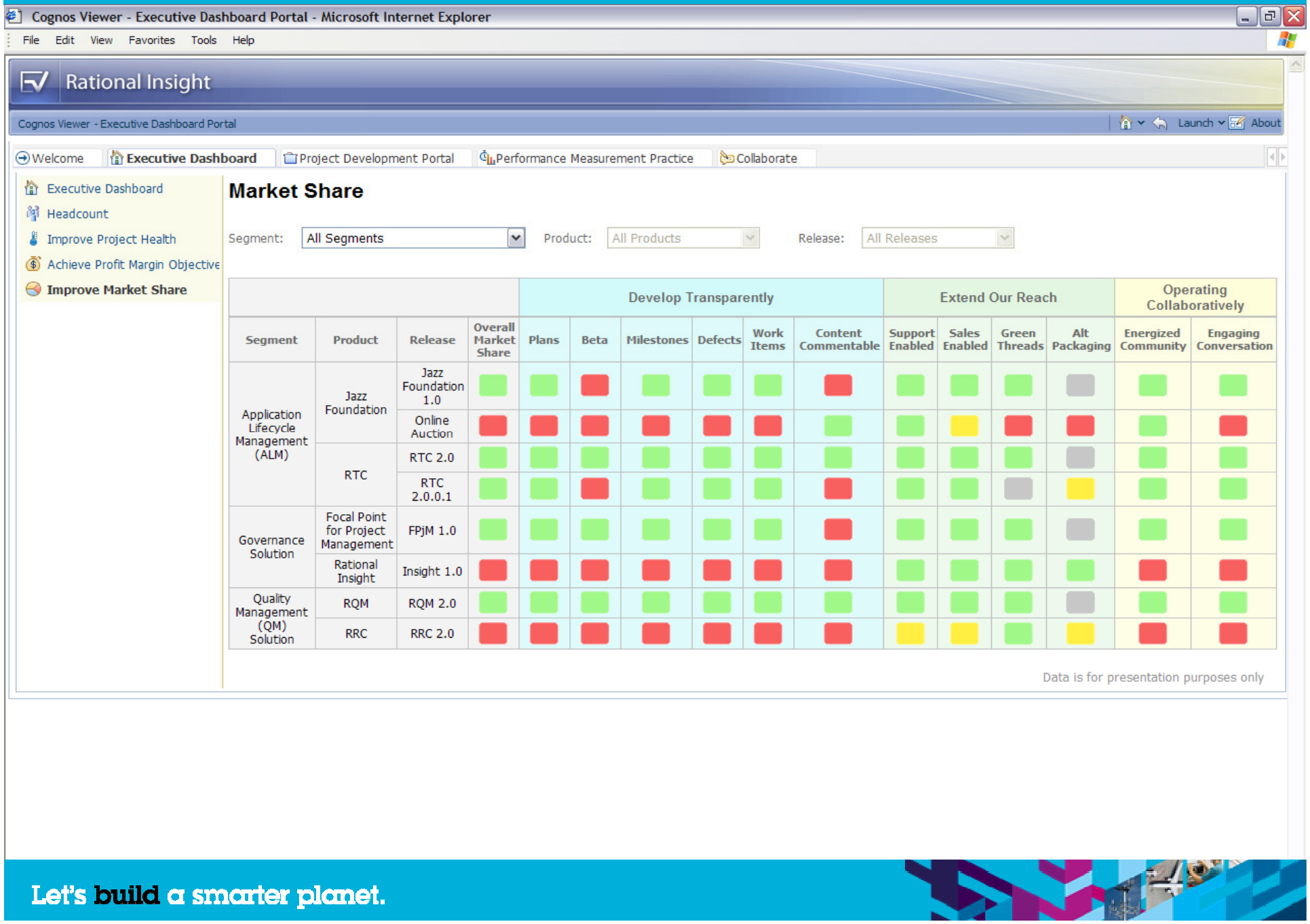

				Develop Transparently						Extend Our Reach				Operating Collaboratively	
Segment	Product	Release	Overall Market Share	Plans	Beta	Milestones	Defects	Work Items	Content Commentable	Support Enabled	Sales Enabled	Green Threads	Alt Packaging	Energized Community	Engaging Conversation
Application Lifecycle Management (ALM)	Jazz Foundation	Jazz Foundation 1.0													
		Online Auction													
	RTC	RTC 2.0													
		RTC 2.0.0.1													
Governance Solution	Focal Point for Project Management	FPjM 1.0													
	Rational Insight	Insight 1.0													
Quality Management (QM) Solution	RQM	RQM 2.0													
	RRC	RRC 2.0													

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