

Designing for Innovation:

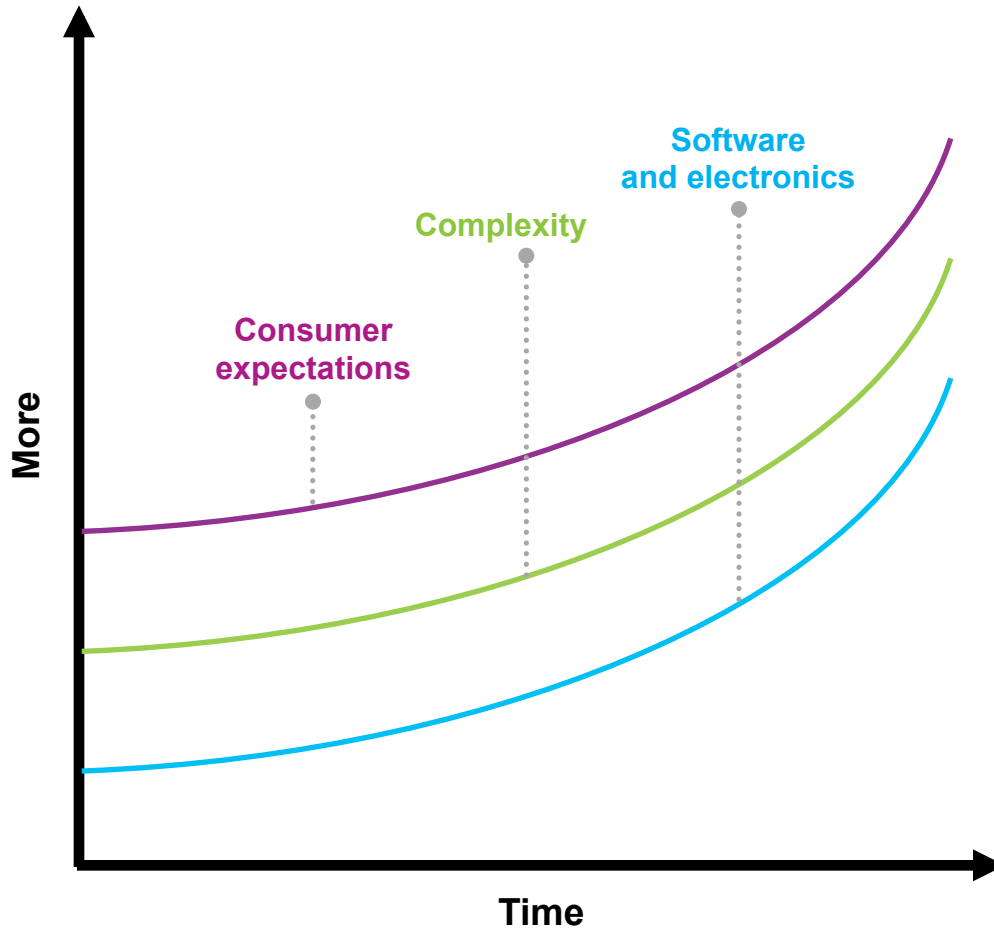
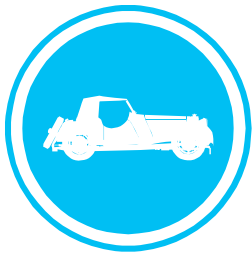
- *Systems Engineering in the Ecosystem*

Brian Dalgetty

Director - Smarter Product Development

IBM Rational Software

The 'make up' of products and systems has changed...





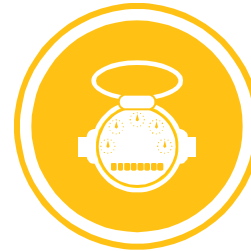
...Led by software-driven innovation

– Manufacturers are struggling to manage the resulting product complexity



Aerospace and defense

Today's F35 has 10 million lines of code on board, twice the amount on the F-22, another stealth fighter.



Energy and utilities

Smart meters for water utilities will lead to \$29.9 million in sales by 2017 compared with \$10.3 million in 2011.



Automotive

Electronics drives 80 percent of the automotive industry's functional innovation — software is the key to most of it.



Telecom

Between 2012 - 2016, mobile data traffic will multiply tenfold, with video content acting as the biggest driver.



Electronics

By 2014, 230 million Smart TVs will be installed with 57 million homes watching web-based streams over broadband.

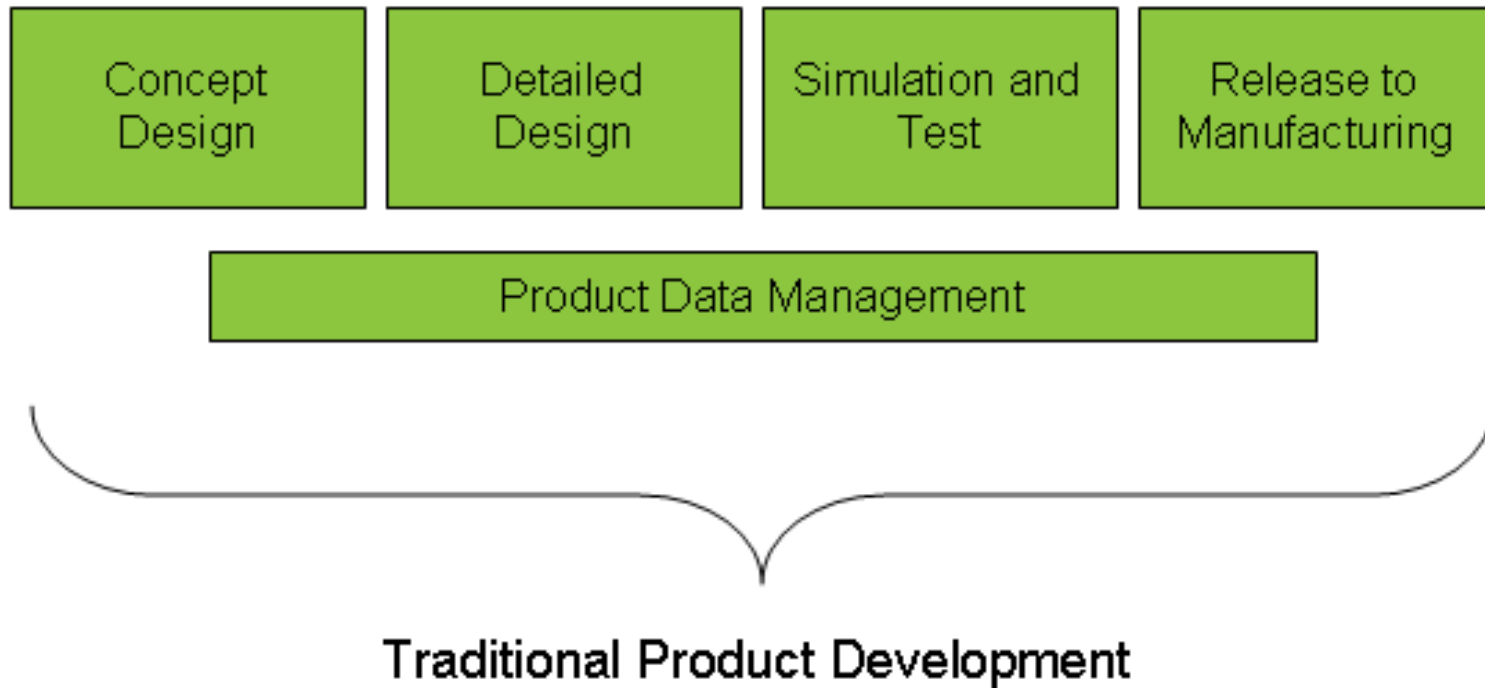


Medical devices

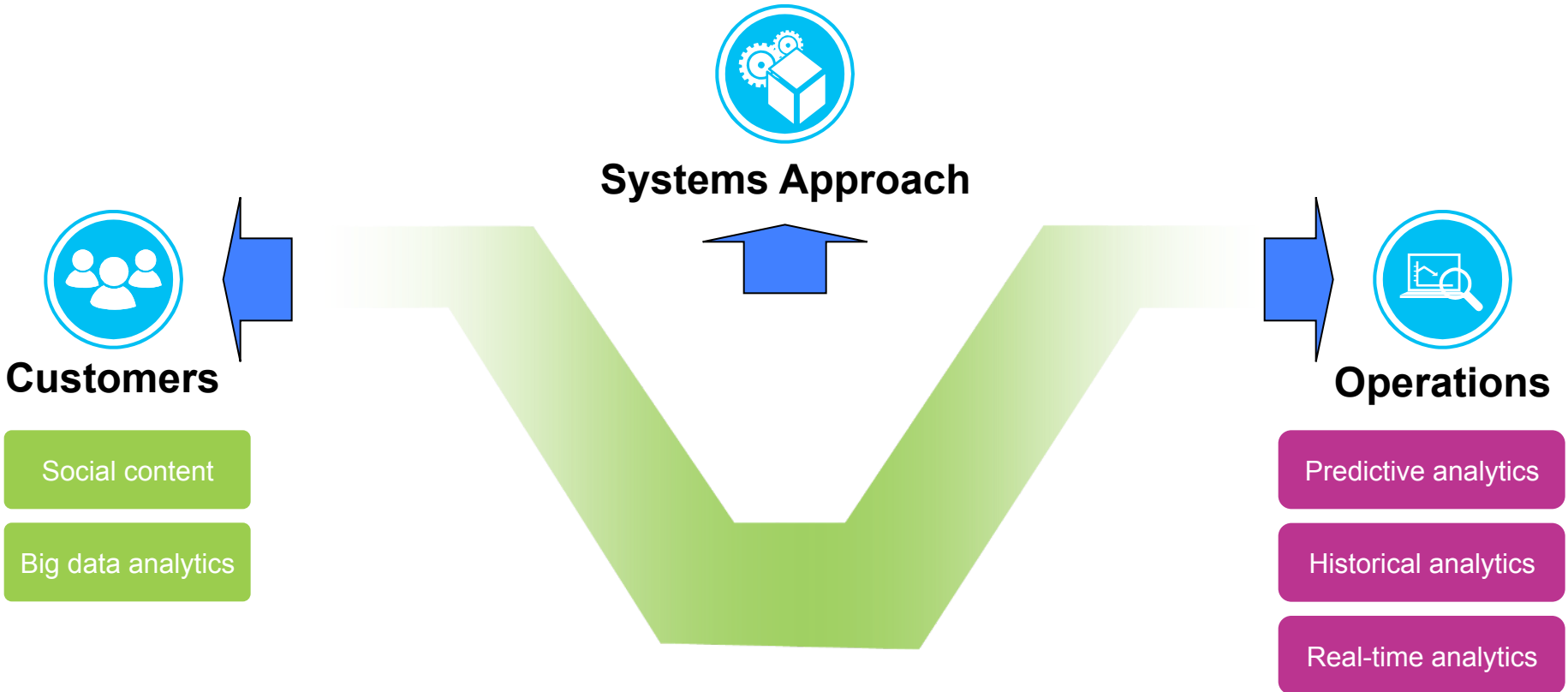
The da Vinci S surgical robotic system:

- 1.4 million lines of code
- Computing power of 7 laptops
- 10,000 individual parts

To create smarter products, we need smarter product development...



We need to look outside our traditional processes for **knowledge**
 ...**knowledge** of how our product functions as a set of interacting systems

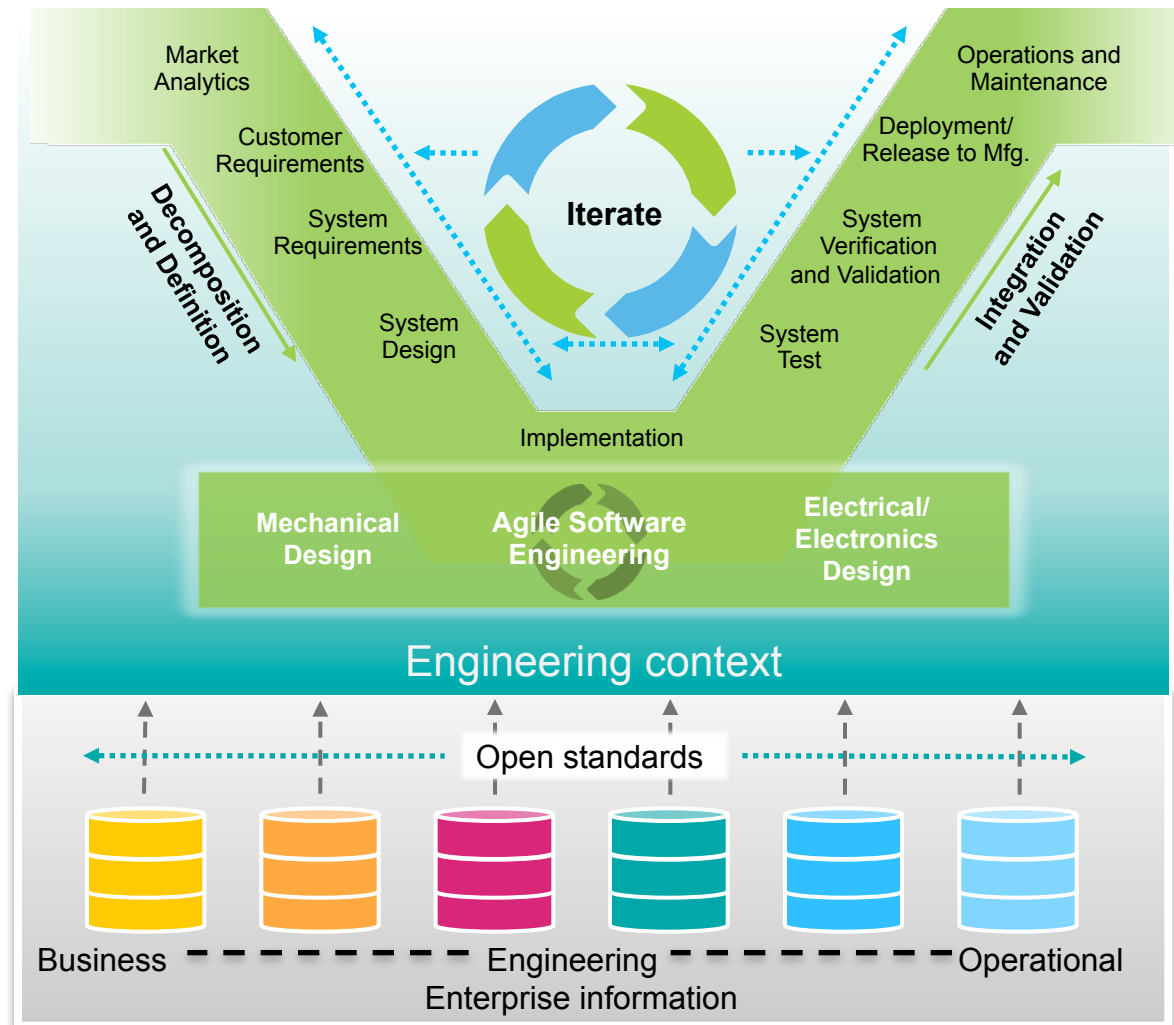


IBM is committed to helping clients turn product development into a competitive advantage with a Systems Approach

- Improve **systems engineering** to **tackle growing product complexity**

- Improve **software development** to **deliver innovation faster**

- With an **open, integrated systems** approach that **enables access to all engineering and related information**



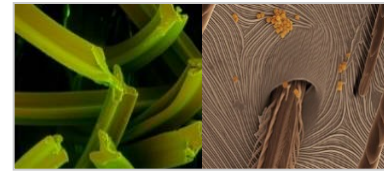
IBM is helping its clients realize their vision...



Nuclear energy



... Delivering transparency in compliance, traceability and change management for innovative nuclear power generation technology



Electronics



... Transforming electron microscope software development with collaborative lifecycle management solution to unite development teams across the globe



Medical devices



... Delivering higher quality medical devices faster with a collaborative, agile development solution



Defense



... Transforming business flexibility through next generation tools and processes to support development teams across the enterprise



Rail



... Delivering new trains faster with demonstrable safety and quality through integrated systems engineering and traceability



Automotive

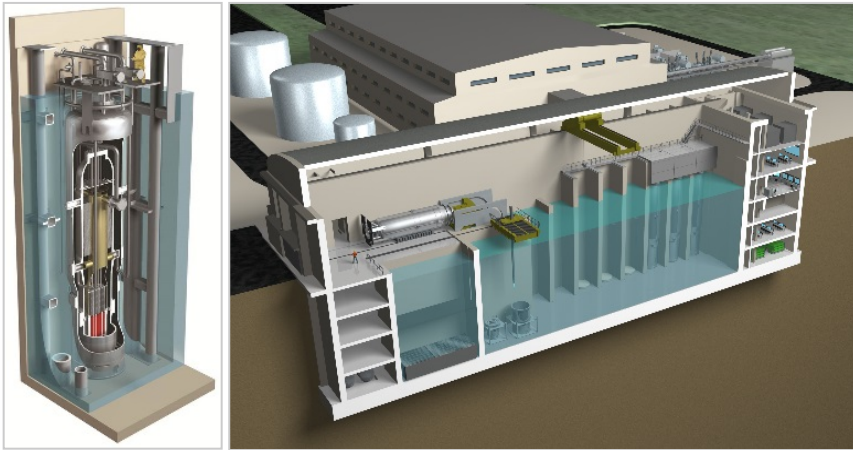


... Cuts software validation time by up to 90 percent by helping developers manage increasingly complex requirements and speed new features to market



Client story – NuScale Power

What if there were a way to deliver cleaner, safer, more accessible power to the world?



Energy demand is increasing across the globe and the world needs cleaner, less expensive, more accessible ways to generate power.

NuScale's objective is to deliver a safer form of power generation that is clean, reliable, and accessible by large and remote populations of people.

NuScale technology delivers economic and technical modularity allowing lower capital spend and operation costs.



Client story – NuScale Power Innovation that matters for the world

Challenge

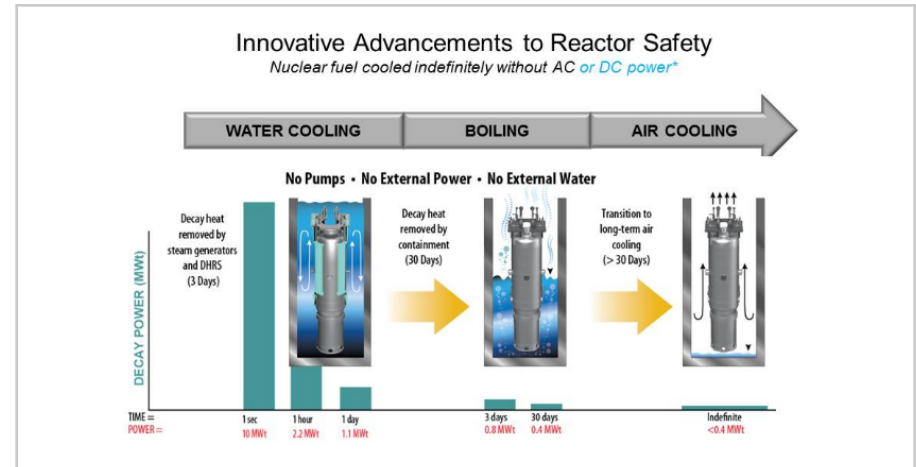
- To deliver NuScale’s technology and mission on safety, integrity, innovation and customer-driven excellence on time, on budget, and accurately.
- Maintain safety for operating conditions with no extra water source, power or manual intervention.

Why IBM?

- NuScale needs to assure the design, integration and validation, and deliver on licensing and regulatory commitments.
- IBM and its Business Partner River North Solutions are delivering integrated requirements management, change management and impact analysis capabilities enabling NuScale to validate compliance through bi-directional traceability.

Solution components

- A cross-lifecycle solution based on Rational DOORS and IBM Rational Publishing Engine delivers transparency through validation, verification, change management, and automated publishing capabilities.



- The NuScale plant, with its innovative design, has achieved the **Triple Crown For Nuclear Plant Safety™**. NuScale’s one-of-a-kind Power Module can safely shut down and self-cool, *indefinitely*, with no operator action, no AC or DC power and no additional water.
- Design averts similar hazards as seen in Fukushima.
- No outages: allows continuous operation while refuelling.
- Chosen as exclusive technology for the Western Initiative for Nuclear (WIN) demonstration plant project.

Jaguar Land Rover cuts software validation time by up to 90 percent

IBM Rational software helps manage near-real-time requirements updates for its developers worldwide

The need:

Jaguar Land Rover plc wanted to implement a standard requirements methodology that would enable it to manage increasingly complex requirements and speed new features to market.

The solution:

The company implemented a suite of IBM® Rational® software to create a new requirements management and modeling system.

The benefits:

- Reduces the time required to fully validate software by up to 90 percent, from six to eight weeks to only three days
- Decreases bug-cause detection time by up to 90 percent, from three days of human intervention to 30 seconds
- Accelerates time to market for in-vehicle entertainment systems and helps increase innovation

Solution components:

- IBM® Rational® ClearCase®
- IBM Rational ClearQuest®
- IBM Rational DOORS®
- IBM Rational Rhapsody®



Working with Engineering Associations to build Ecosystems

- ***Engineering associations play a key role in bringing people together around a common need and interest. They have a big impact on the systems ecosystem***
- ***They set standards, they educate us and the future generation, they connect us and our organizations to the world***
- ***We will hear from several of these organizations on how they are impacting the world and how they can help you and your organization***



IBM Partners with Engineering Associations



Designing for Innovation:

- *The Path Forward*

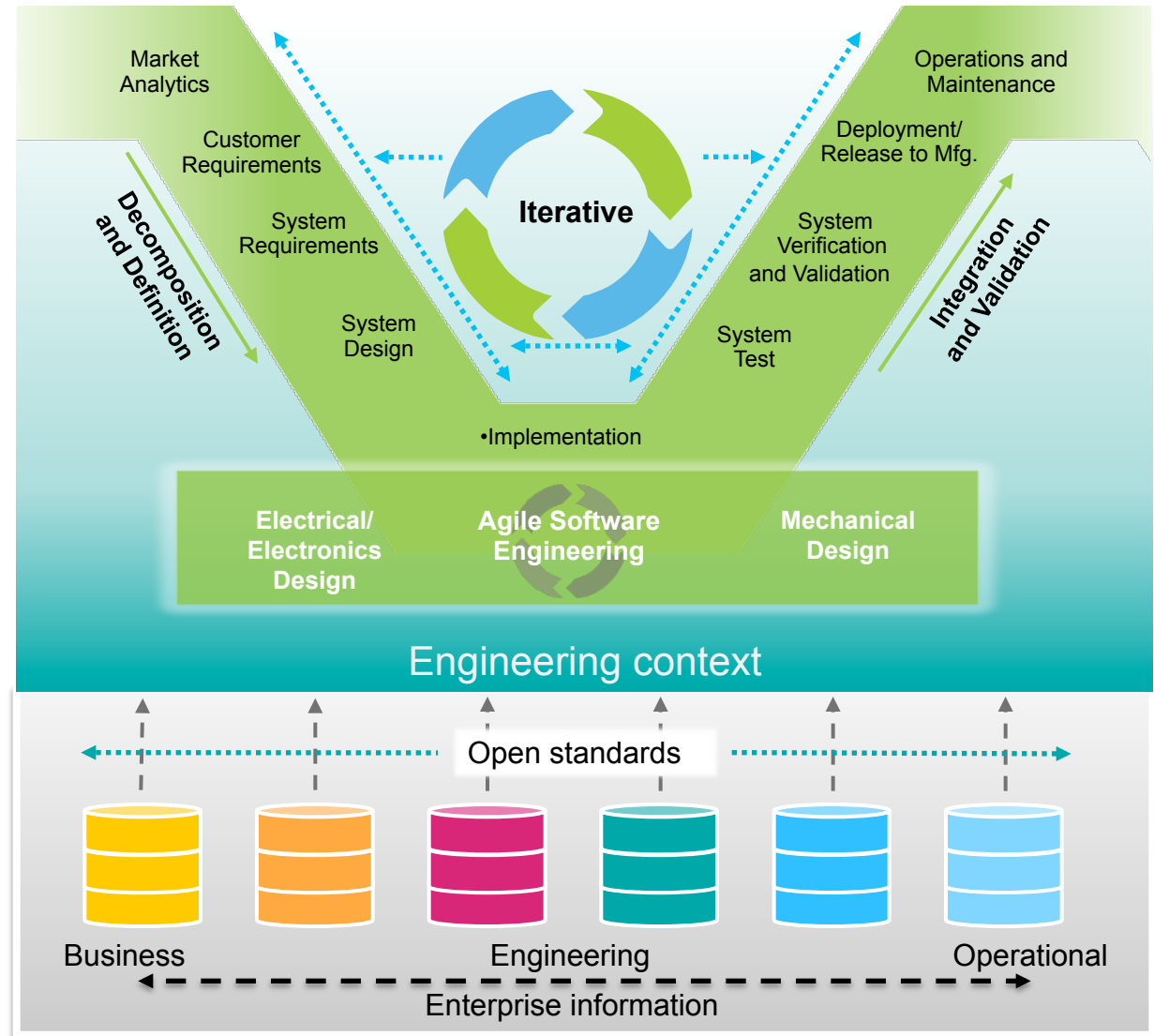
Greg Gorman, ESEP, CPM

Director, Systems Product Management

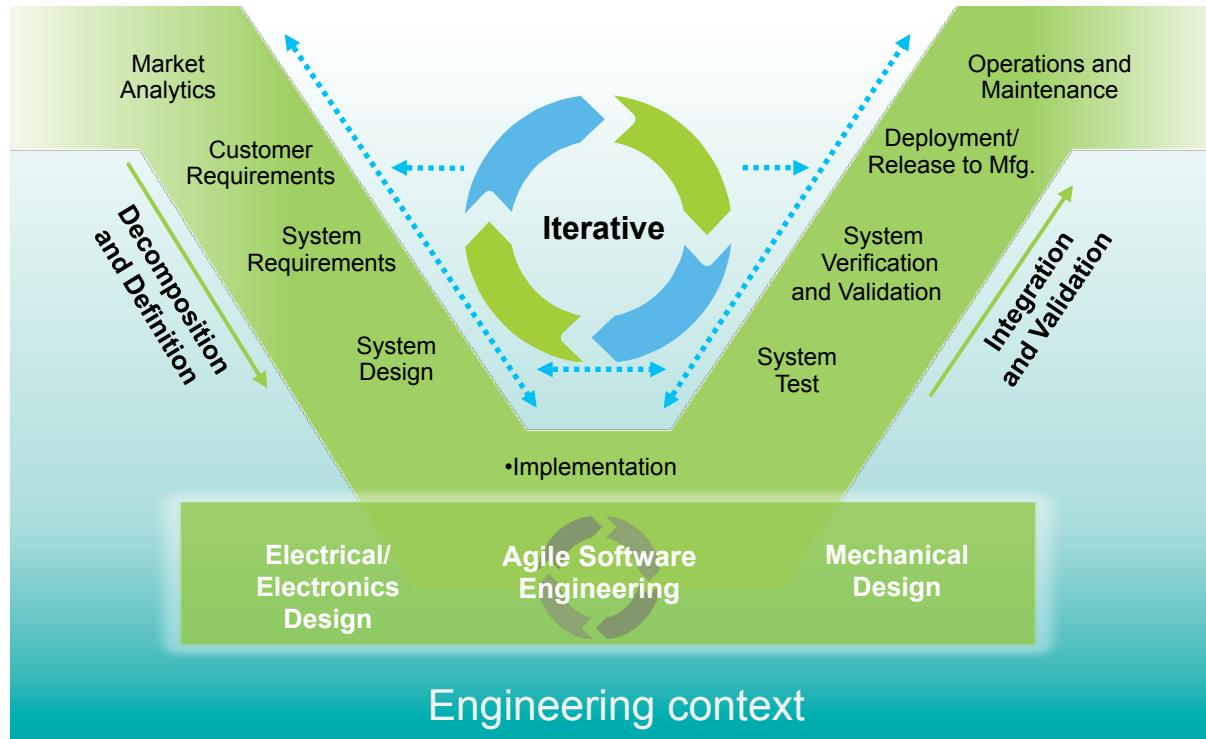
IBM Software, Rational

IBM helps you turn product development into a competitive advantage

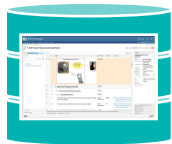
- Improve **systems engineering** to **tackle growing product complexity**
- Improve **software development** to **deliver innovation faster**
- With an **open, integrated systems approach** that **enables access to all engineering and related information**



Improving systems engineering



Requirements management



Analysis, design and prototyping

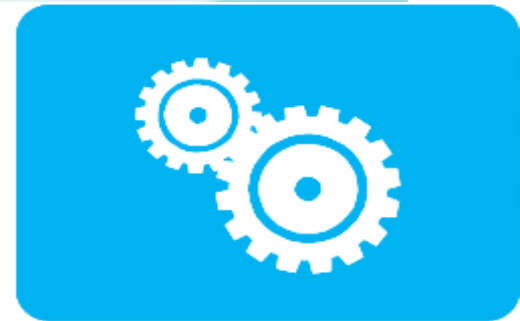
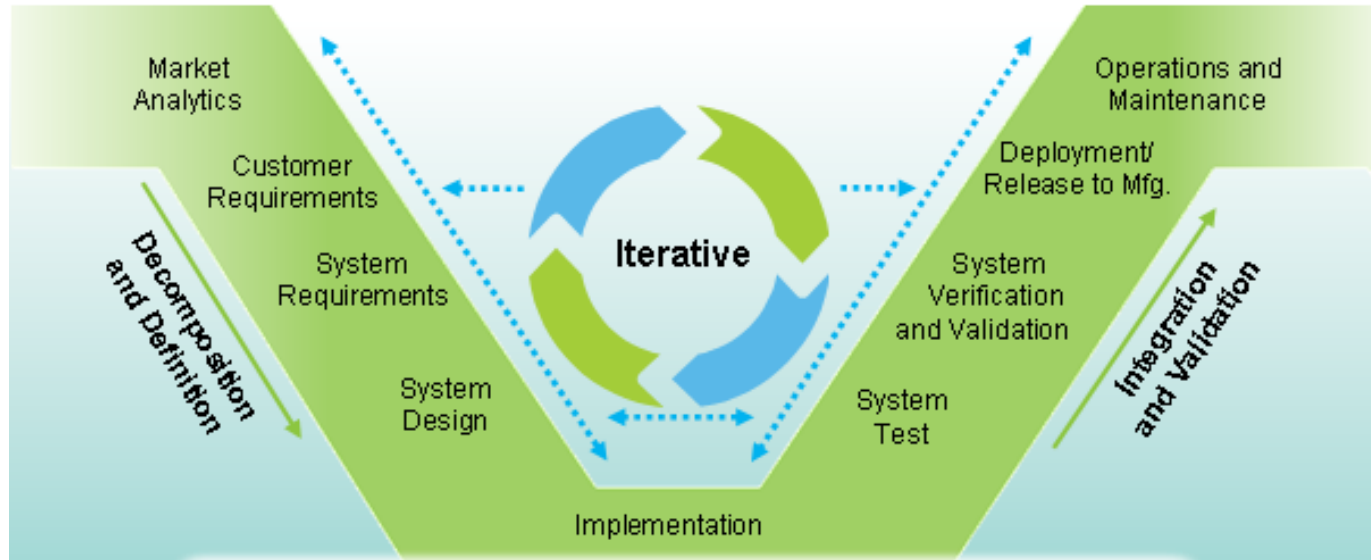


Quality management



Workflow, Planning, Task & Change Management

Improving software development

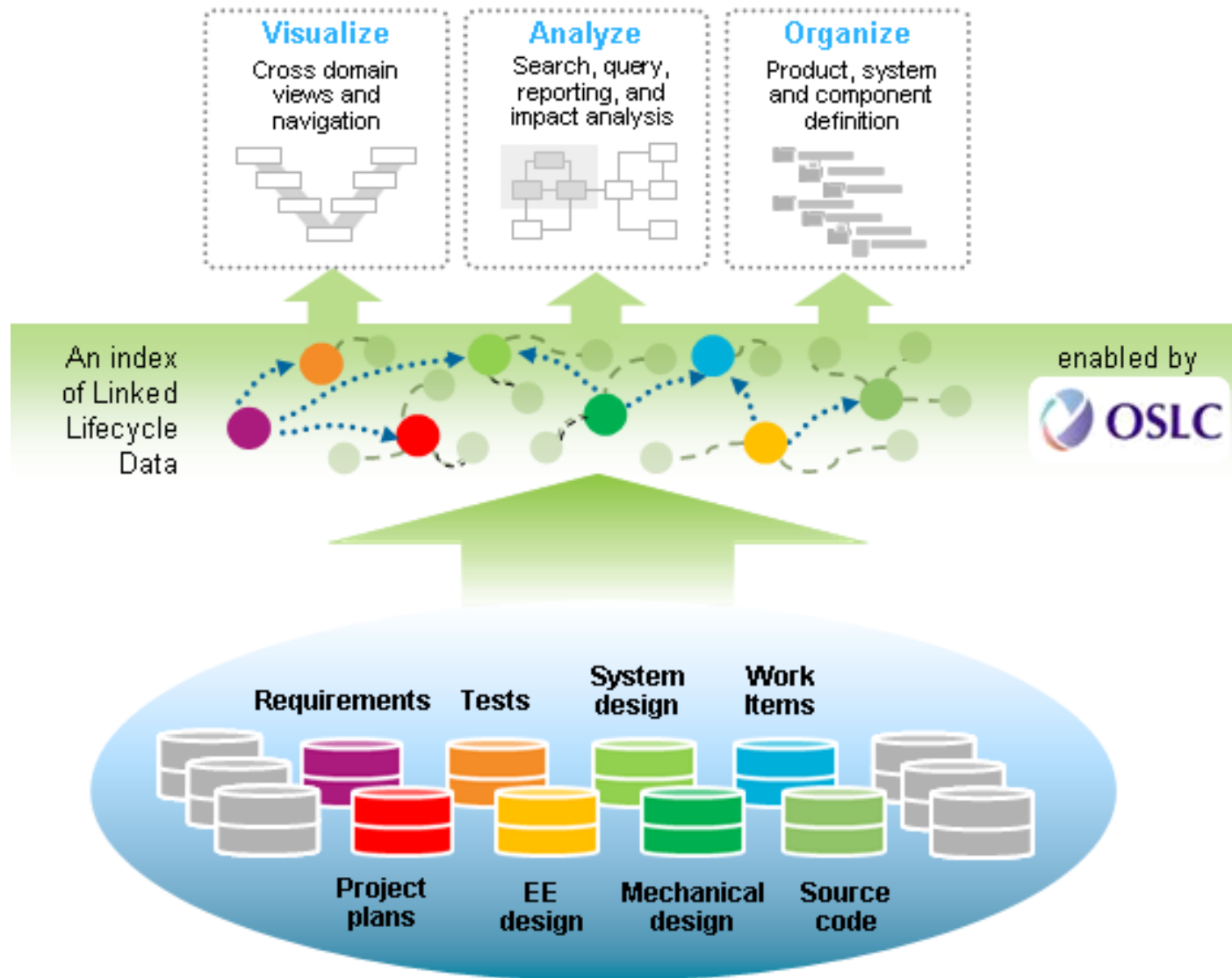


Agility 

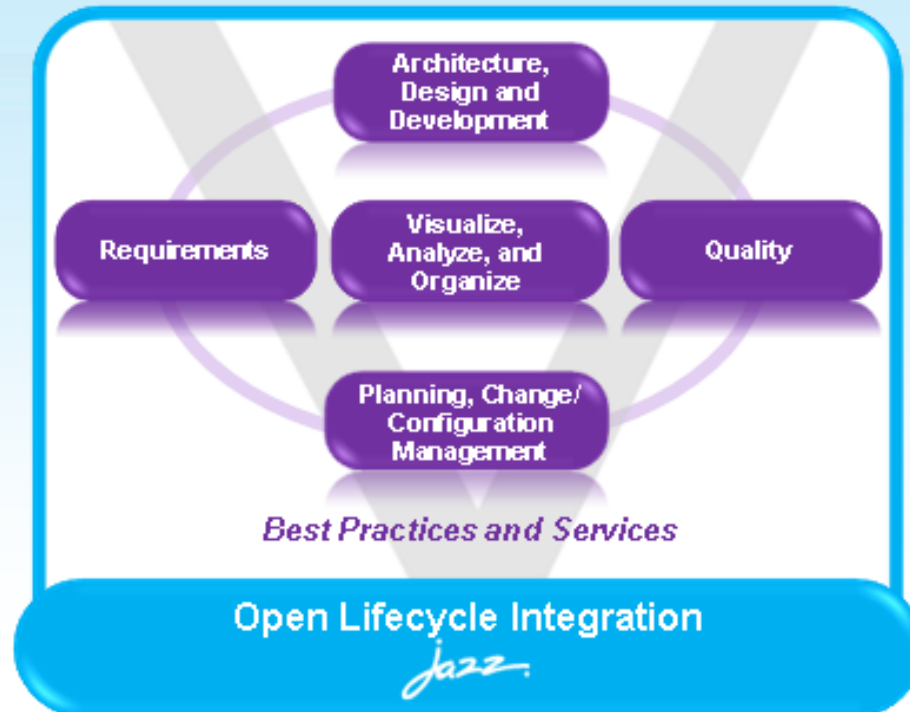
Compliance 

Automation 

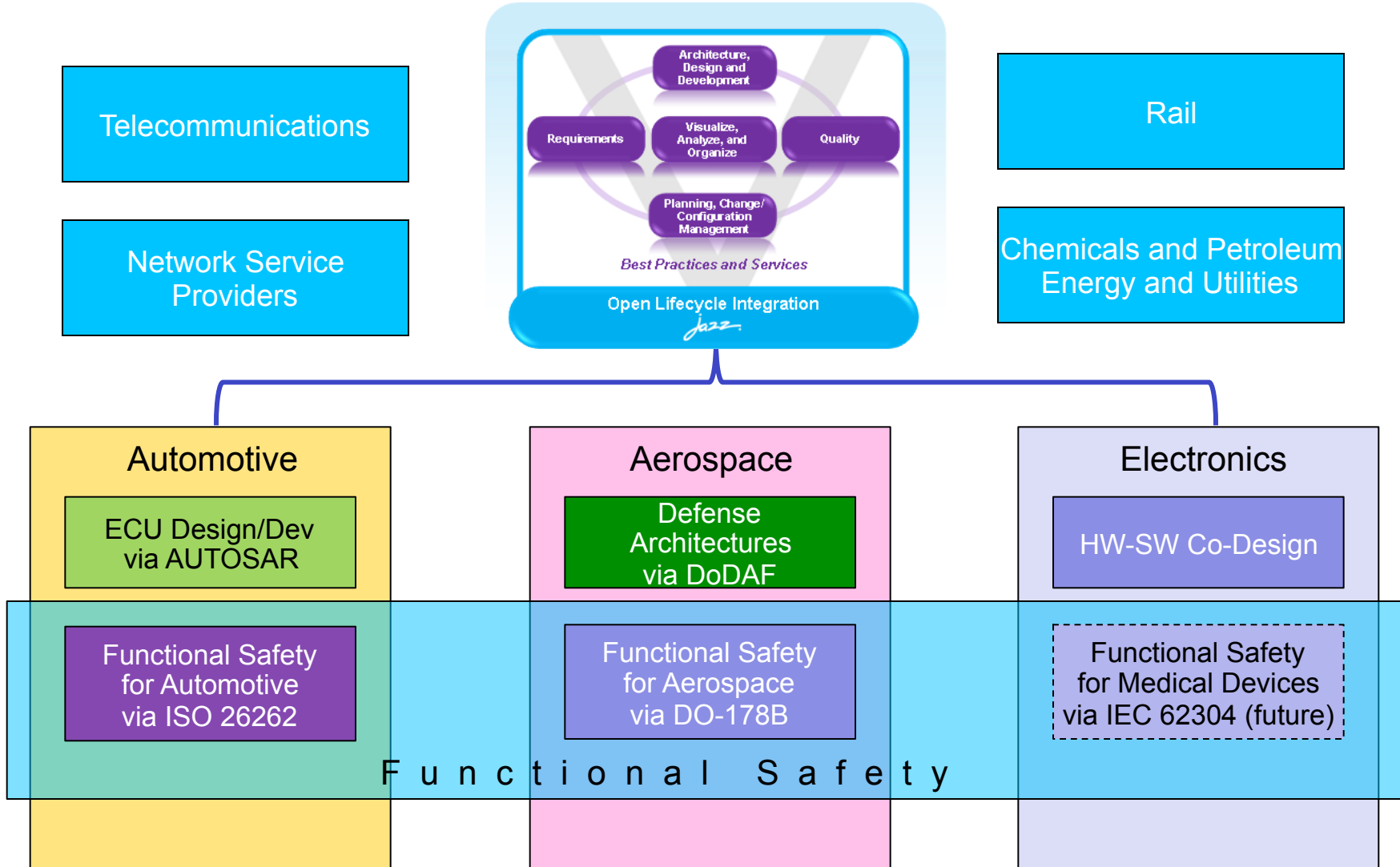
Make more informed engineering decisions with an open approach



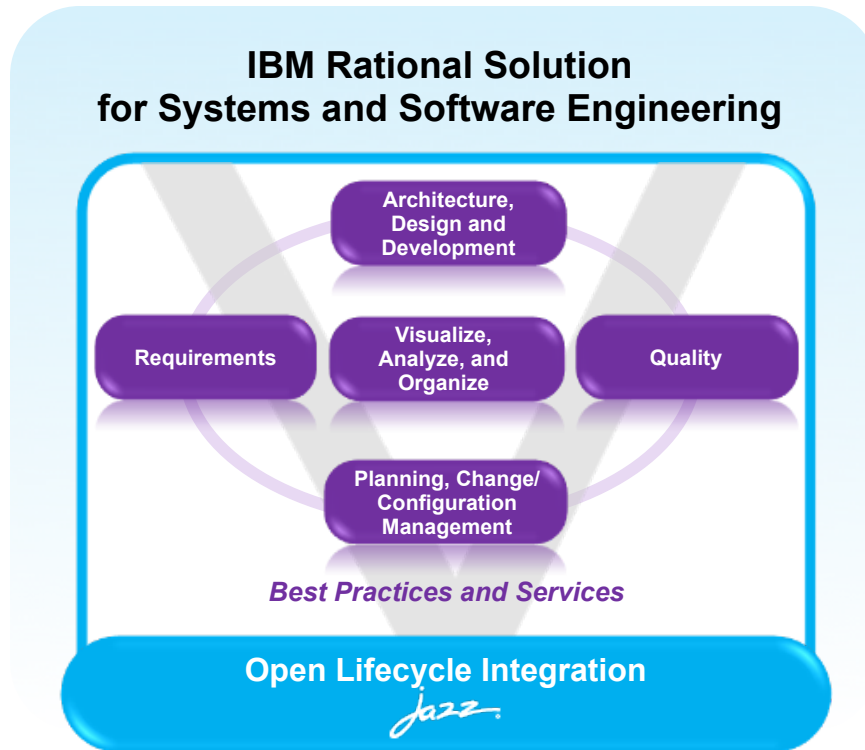
Rational Solution for Systems and Software Engineering



...and deep industry context



... enhanced through an ecosystem of high value Business Partners



Why IBM?

Expertise and leadership in embedded software and systems engineering

Systems engineering leadership since the Apollo program



Teaming with engineering organizations—access to 600,000 members



Institute of Industrial Engineers



SAE International®



#1 in Enterprise Social Software



20th consecutive year as patent leader



•15,000 industry, technology, and business process experts



Thank You

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