



# Innovate2013

The IBM Technical Summit



An abstract graphic on the left side of the slide, composed of overlapping, semi-transparent geometric shapes in shades of blue, green, and yellow, creating a dynamic, layered effect.

# Gaining the Software Edge through DevOps

*Neeraj Chander*

*How effective software development and delivery drives  
competitive advantage*

**Innovate2013**

The IBM Technical Summit

# We Are at An Inflection Point in the Industry



## MOBILE CUSTOMER TARGETING

Card swipe in one store attracts coupons from nearby store – resulting in 109% incremental sales lift



## JUST-IN-TIME MAINTENANCE

Global aircraft engine manufacturer increases service revenue by 12% in one year using real-time monitoring and proactive fault detection

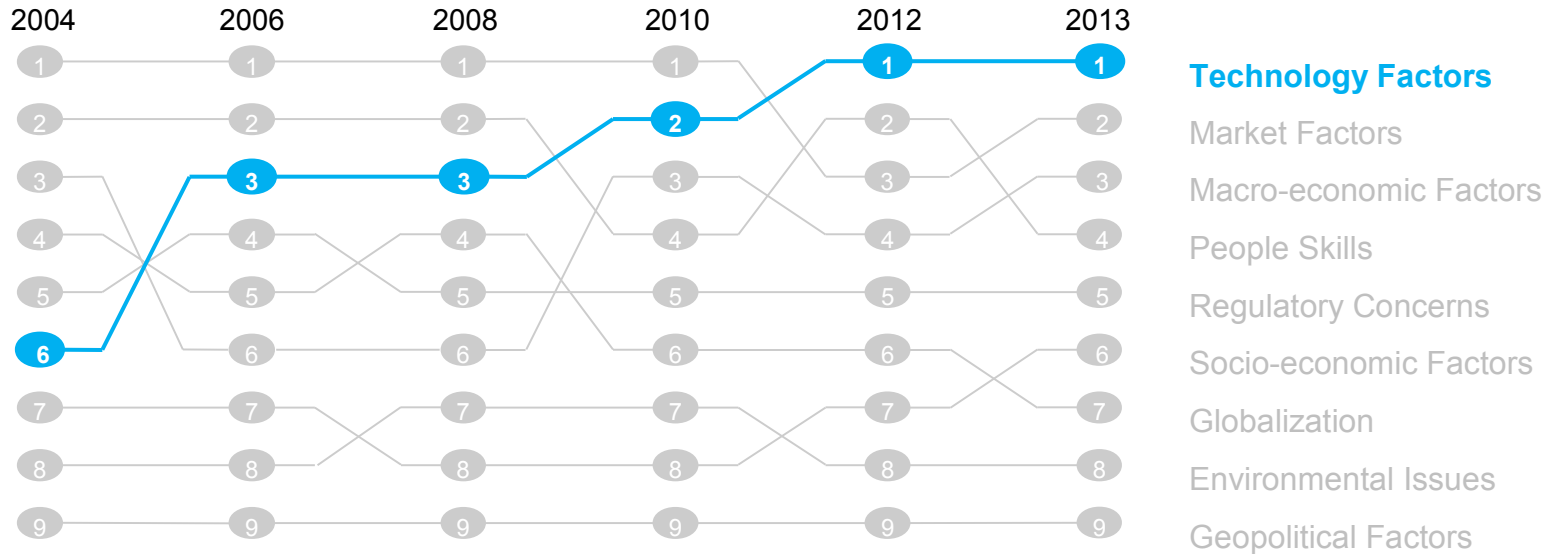


## BUSINESS INNOVATION DRIVER

Building materials manufacturer deploys social collaboration platform driving real-time process improvement and reducing time to market by 2/3

# CEOs identify technology as the most important external force impacting their organizations – again

## CEO Studies 2004–2013



Source: IBM Institute for Business Value, The Global CEO Study 2012. Question: “What are the most important external forces that will impact your organization over the next 3 to 5 years?”

# Software Delivery Is at the Heart of Today's Top Technology Trends

## Big Data

Insights on new products by more efficiently interpreting massive quantities of data

## Cloud

Demand for apps requires fast, scalable environments for dev and test, as well as production

## Social Business

Broader set of stakeholders collaborates to deliver continuous innovation and value

## Instrumented Products

Industry requirements demand faster response to regulations and standards, with traceability and quality

## Mobile

Modern workforce expects constantly updated software to connect to enterprise systems

## Intelligent/Connected Systems

Software component in smart products driving increased value and differentiation

**Software delivery**

# A lack of continuous delivery impacts the entire business

## Line-of-business

Takes too long to introduce or make changes to mobile apps and services

## Operations

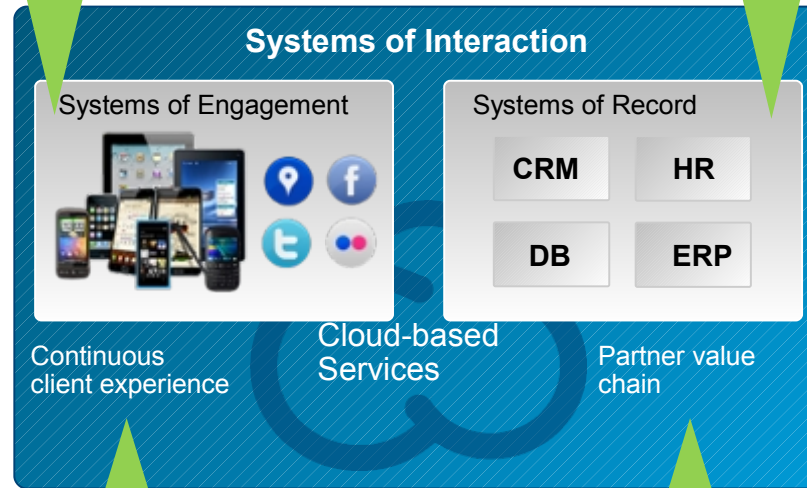
Rapid app releases impact system stability and compliance

**>70%**

of budgets devoted to maintenance and operations

**4-6 weeks**

to deliver even minor application changes to customers



**>45%**

of customers experience production delays

**>50%**

of outsourced projects fail to meet objectives

## Development/Test

Speed mismatch between faster moving front office and slower moving back office systems, delaying time to obtain feedback

## Suppliers

Delivery in the context of agile

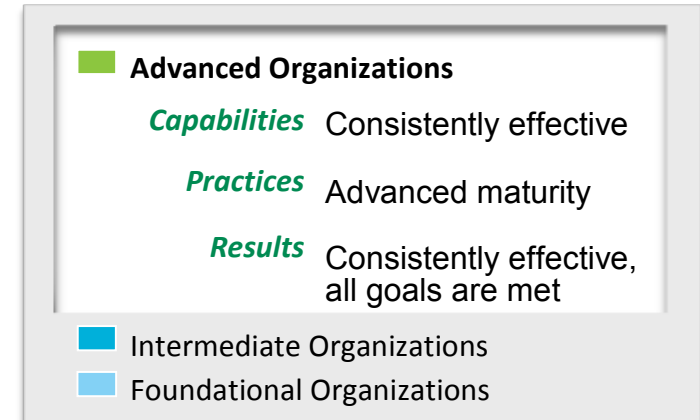
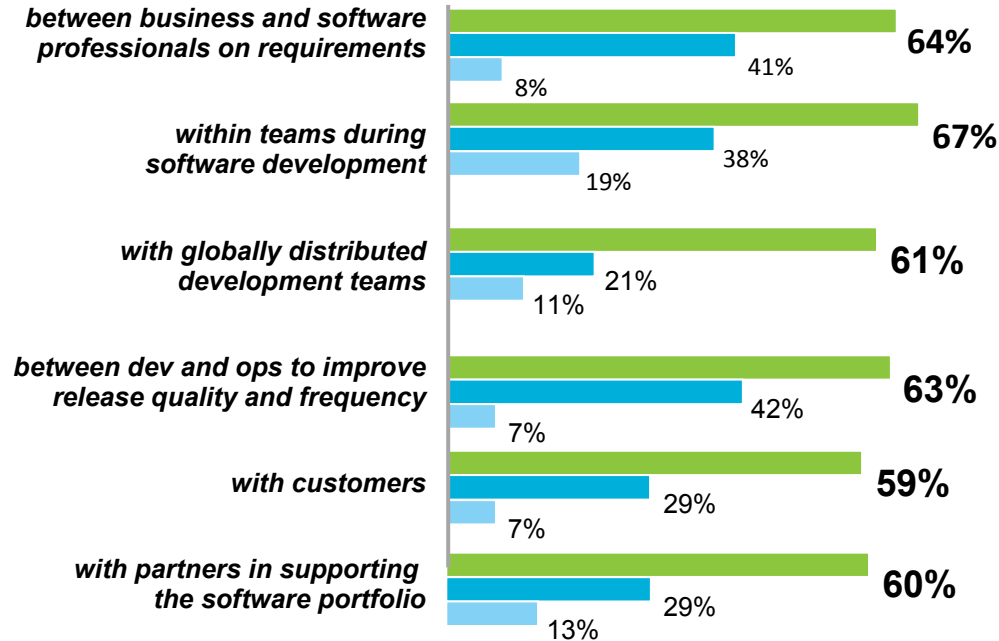
Only a few enterprises, who are addressing these challenges are finding success



Source: "The Software Edge: How effective software development drives competitive advantage," IBM Institute of Business Value, March 2013

# Organizations considered advanced in software delivery strongly leverage collaboration across an expanded lifecycle

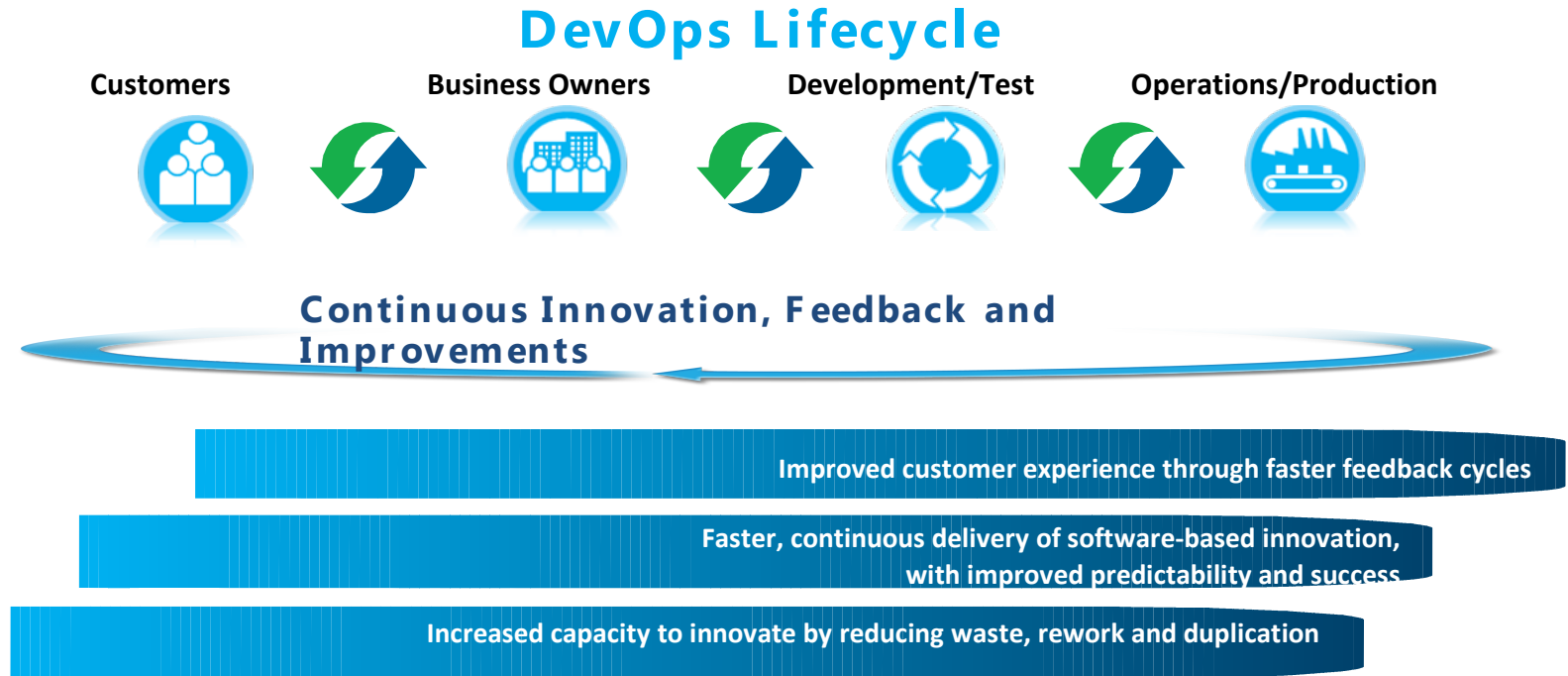
## Software delivery collaboration...



Source: "The Software Edge: How effective software development drives competitive advantage," IBM Institute of Business Value, March 2013

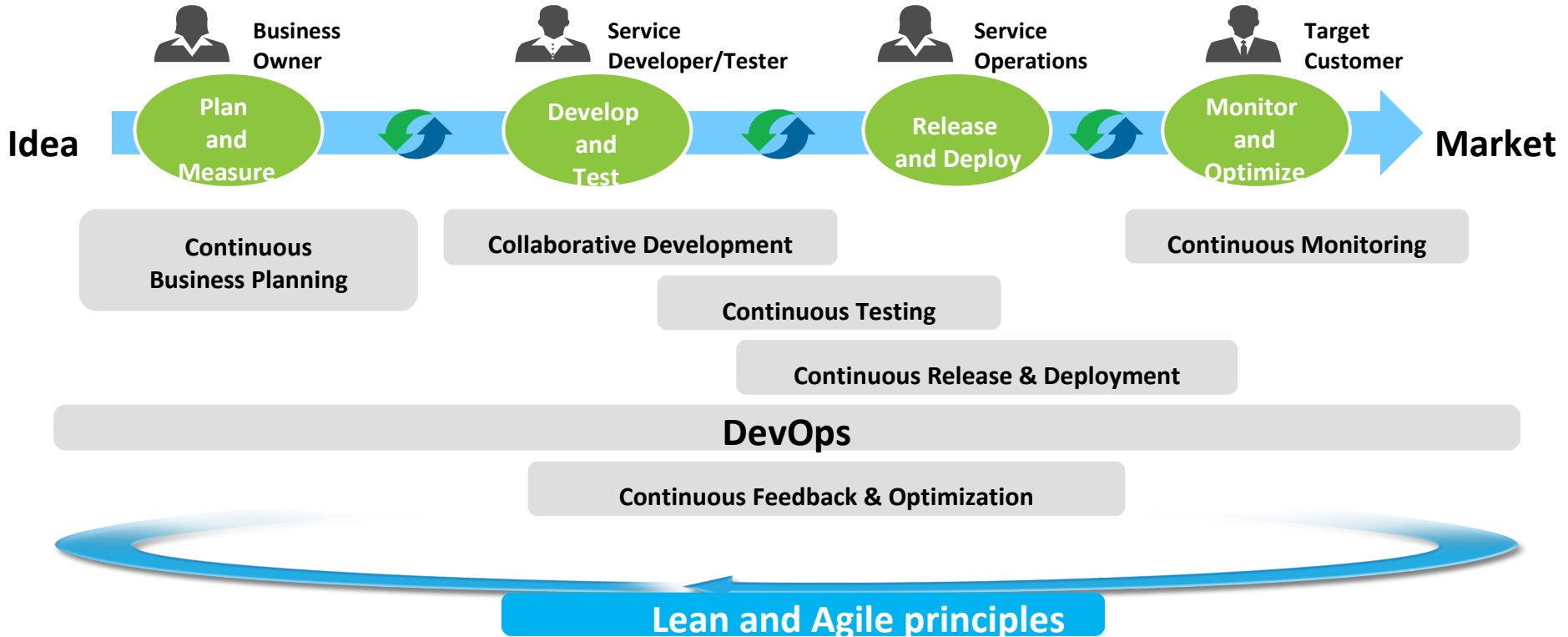


# A new end to end approach has emerged: DevOps



# DevOps takes a closed-loop approach to application delivery

Builds on Agile/ Lean initiatives across the enterprise



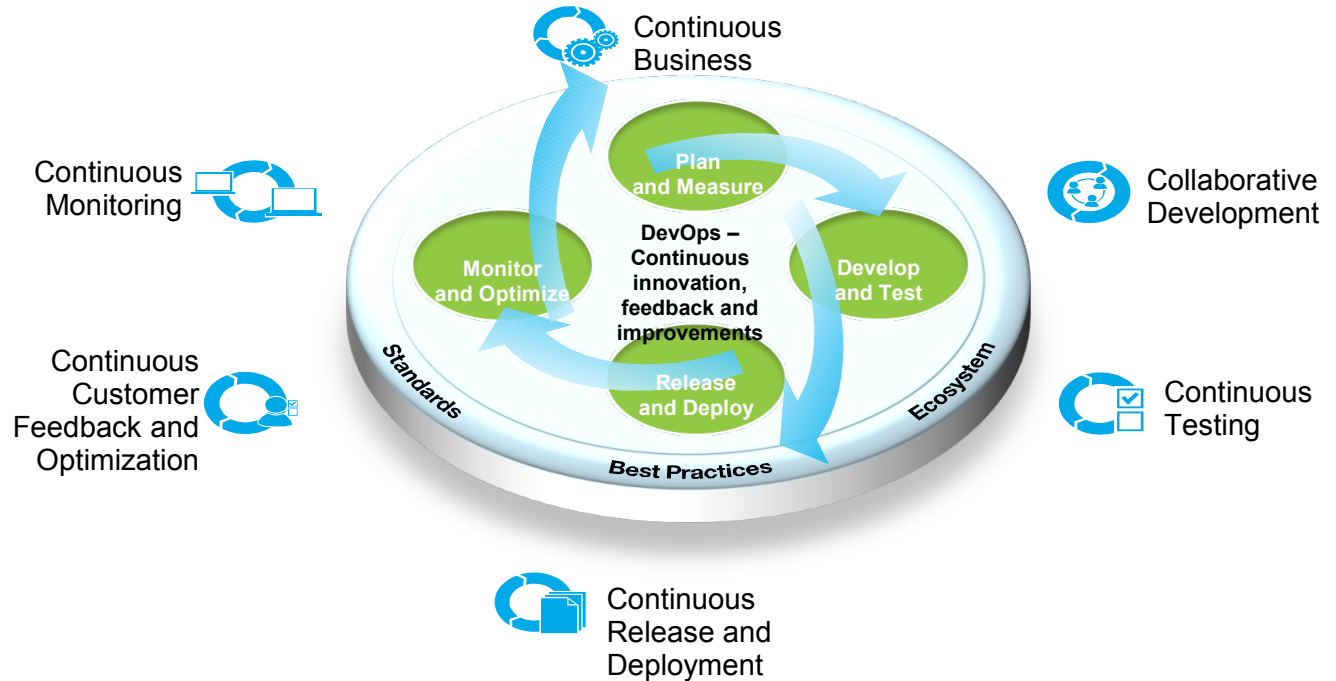
# IBM DevOps

Enterprise capability for continuous software delivery that enables clients to seize market opportunities and reduce time to customer feedback

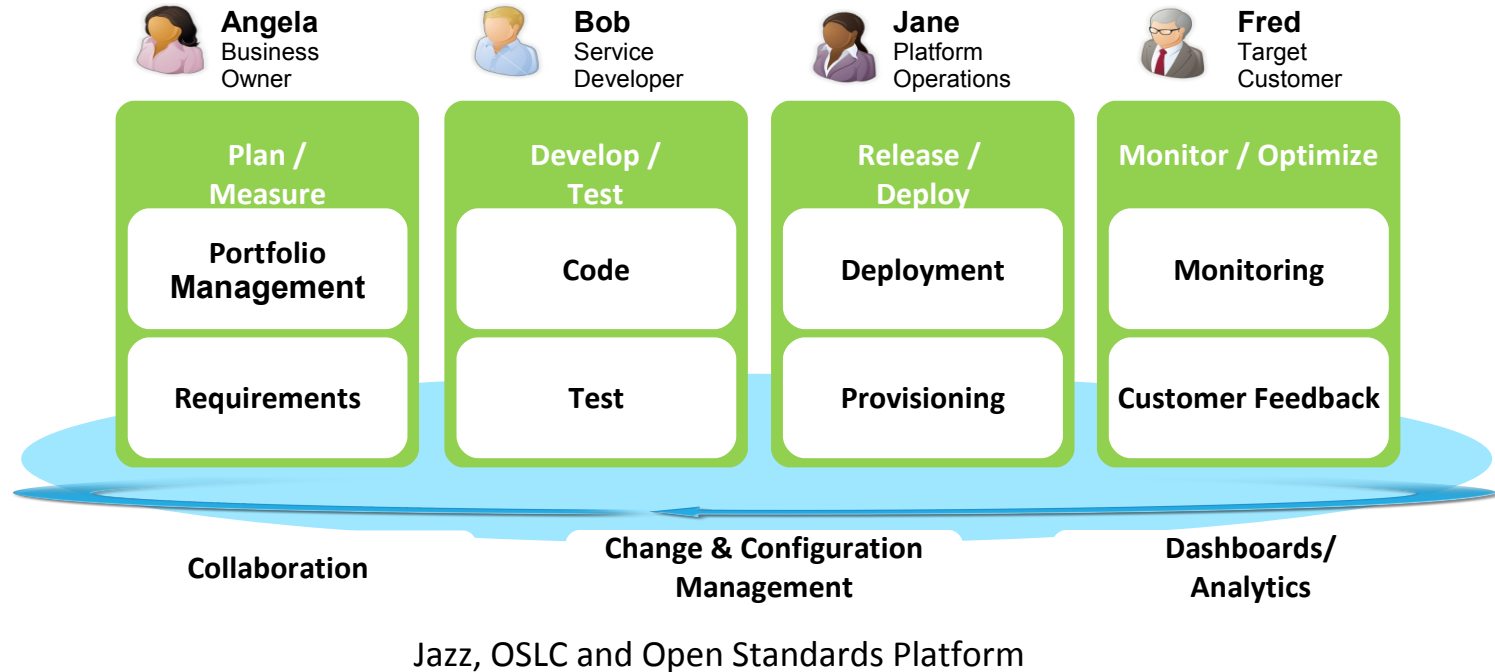
**Accelerate software delivery – for faster time to value**

**Balance speed, cost, quality and risk – for increased capacity to innovate**

**Reduce time to customer feedback – for improved customer experience**



# DevOps adoption paths and capabilities

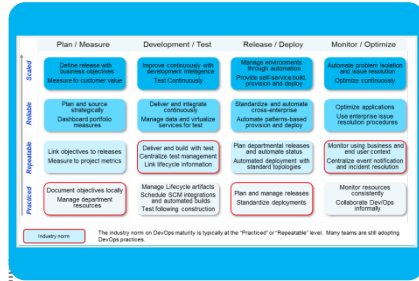


# Prescription for DevOps adoption

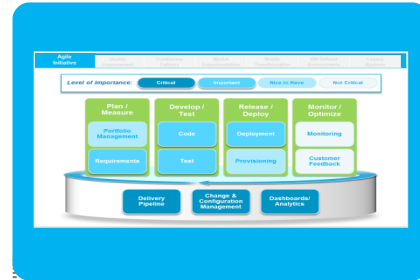
A maturity model approach: identify key pain points, assess current capabilities, produce a heat map of focus areas, and establish a roadmap for execution



Identify key pain points in the delivery process



Assess current capabilities using the DevOps maturity model



Produce heat maps of capability gaps and areas of improvement to determine priority



Establish a roadmap with milestones and execution timelines

"Any improvement not made at the constraint is just an illusion"  
- Phoenix Project (Kim/Behr/Spafford)

# Nationwide embraces DevOps to drive continuous delivery across platforms and improve speed to market

**50% increase** in software  
**quality** over three years

**90% on-time delivery**  
vs. 60% previously

**70% decrease**  
in user downtime

**58% of developers** moved to  
industry top quartile in  
**productivity measures**



*“We’re more agile as a business and more responsive to our customers. Collaboration has become an expected part of our culture.”*

— **Steve Farley**, Vice President,  
Application Development Center, Nationwide

# Panasonic collaboration across systems, software and validation engineering accelerates delivery

## Unify on an integrated, open platform

- Promote common jargon, tools, processes, data sources among all lifecycle disciplines
- Integrate early and continuously
- Demonstrate integrated behaviors before investing in unit coverage and completeness



*“We’ve seen a reduction in build times from 70 minutes to 17 minutes—that’s a huge advantage for us.”*

**Mark Thornton**  
*Director, Software Systems  
and Validation Engineering*

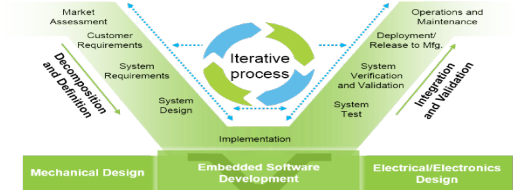
# Smarter Products need Smarter Product Development



Smarter products are more connected, more complex and more intelligent than earlier generation products and systems—taking their design and development challenges to a new level



Engineers are the heroes that are changing our world through innovation in smarter products—and Smarter Product Development means maximizing the value that engineers deliver



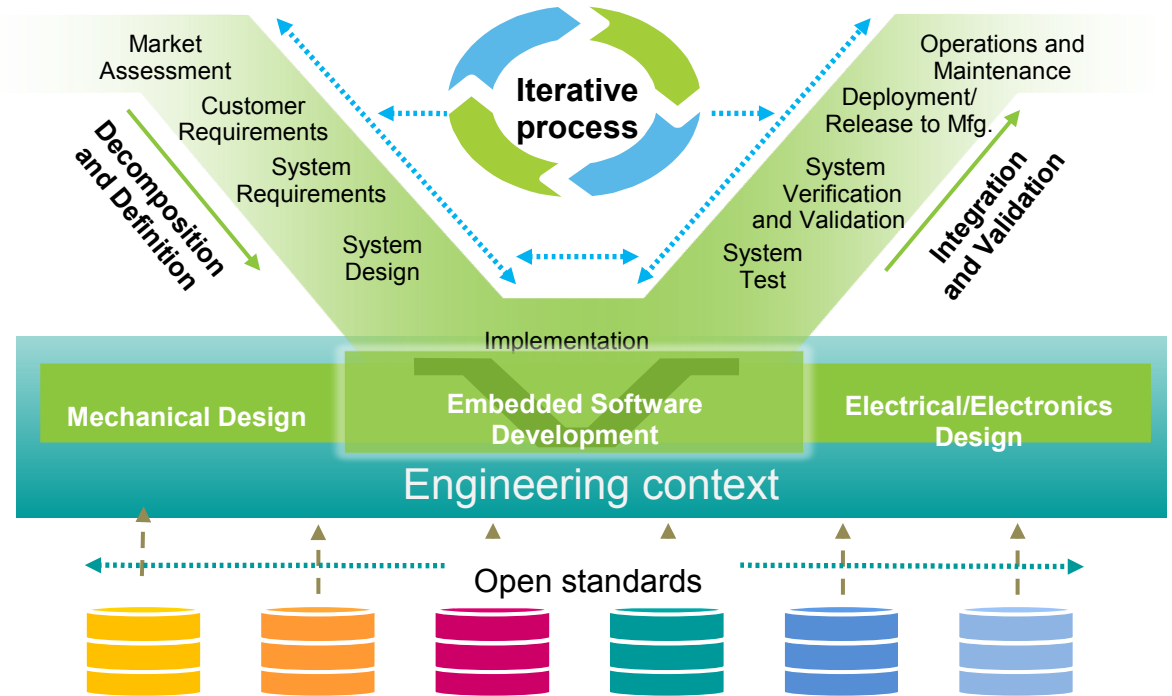
And that's where IBM comes in...

... supporting engineers, teams and enterprises with a systems approach to Smarter Product Development

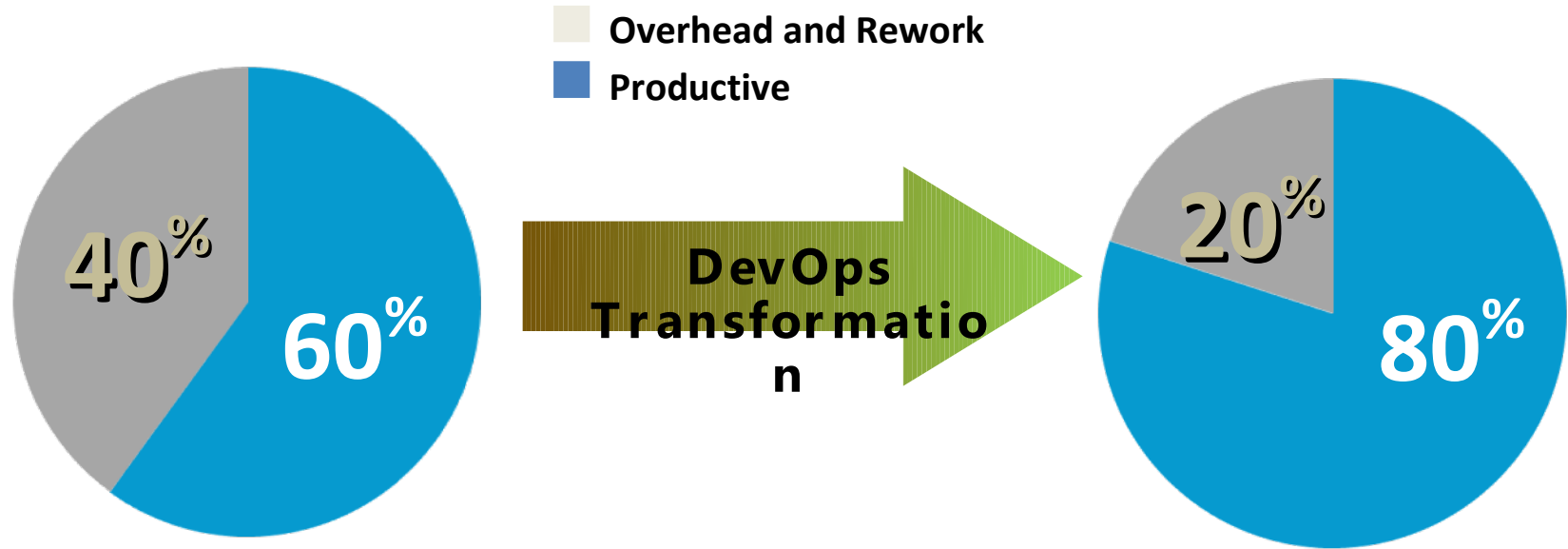


# IBM is committed to helping clients turn product development into a competitive advantage with a Systems Approach

- 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 associated information**



# The Critical Measure of DevOps Success



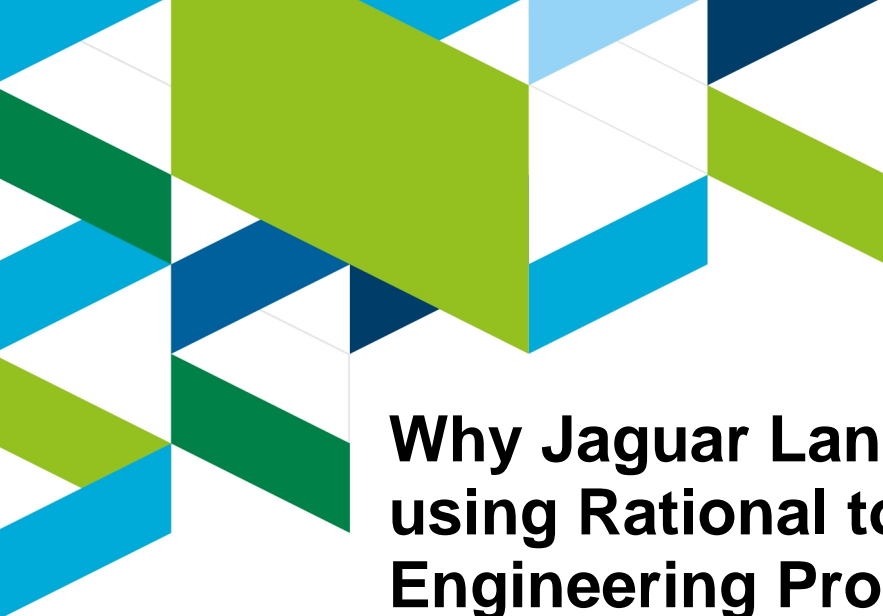
**Eliminate any activity that is not necessary  
for learning what customers want**

# Take Action Right Now!

- **Jaguar Land Rover - Dave Sharrat**  
Senior Manager PLM – Product Creation
- **Airbus - Andreas Keis**  
Head of Systems Engineering Processes and Platforms
- **Royal Bank of Scotland - Stephen King**  
Head of Middleware Development, GIS, Technology Services







# Why Jaguar Land Rover are focused on PLM using Rational to support new Systems Engineering Processes.

David Sharratt

Snr Manager – PLM Product Creation

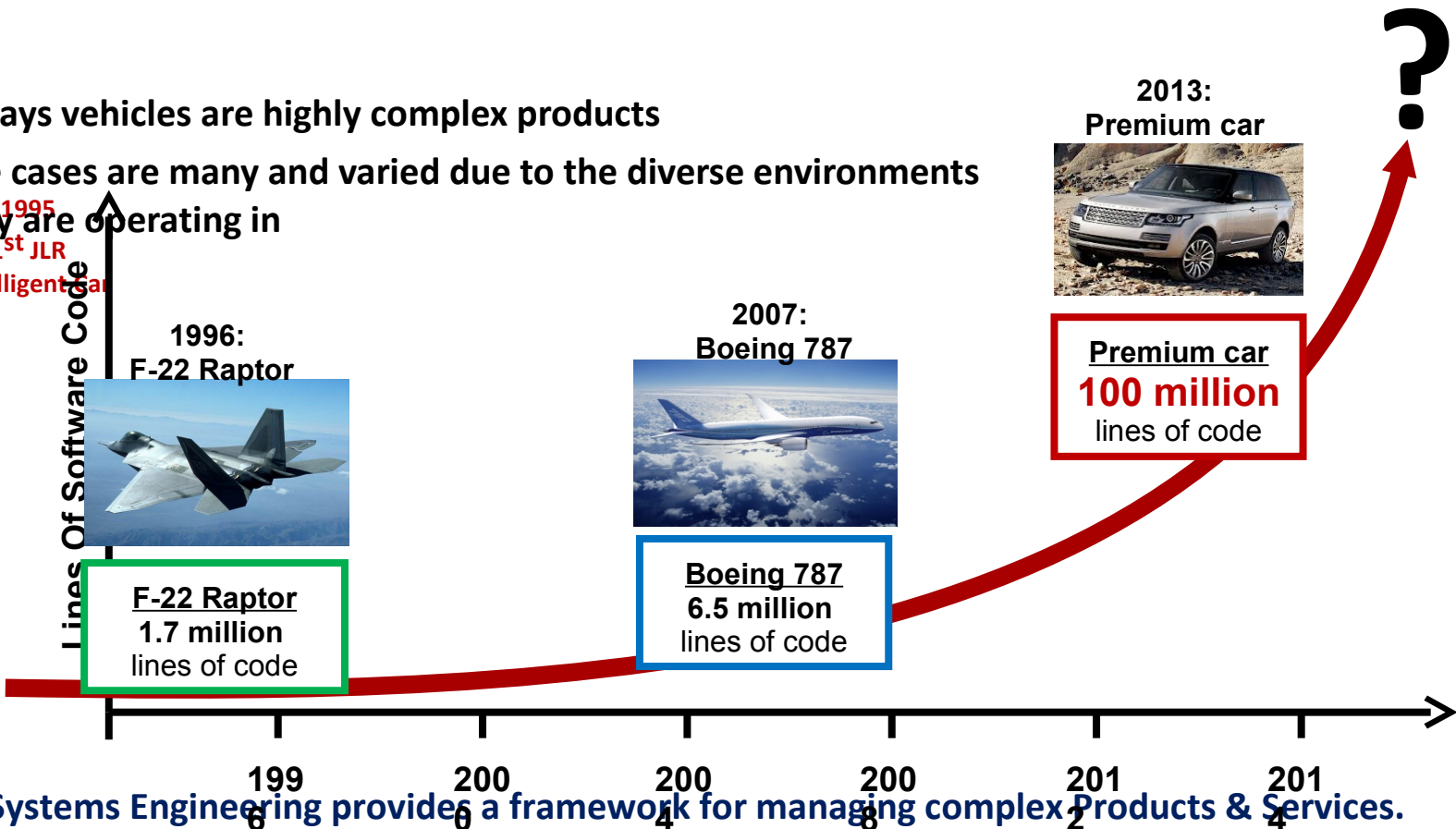
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# The Problem Statement

- Today's vehicles are highly complex products
- Use cases are many and varied due to the diverse environments they are operating in

1995  
1st JLR  
Intelligent car



Systems Engineering provides a framework for managing complex Products & Services.

# The Automobile is becoming a hive of embedded systems



Consumer Electronics Show

Jan 2013, Las Vegas

the categories included 3D, Accessories, Audio, **Automotive Electronics**, Embedded Technology, Lifestyle Electronics, Wireless & Wireless Devices

## Best of Show - Automotive Software

*"The story leading up to CES on the automotive front was self-driving cars, .... but that ended up being a bit of a bust. The biggest story, was instead one of software"*

<http://www.engadget.com/2013/01/14/ces-2013-best-of-show-roundup/>

## Predictions for the Future - Connected Cars

*"Thanks to IPv6, now cars can have their own IP addresses, and many new 2013 models include the ability to create their own mobile hotspots for itself and its passengers' connected gadgets."*

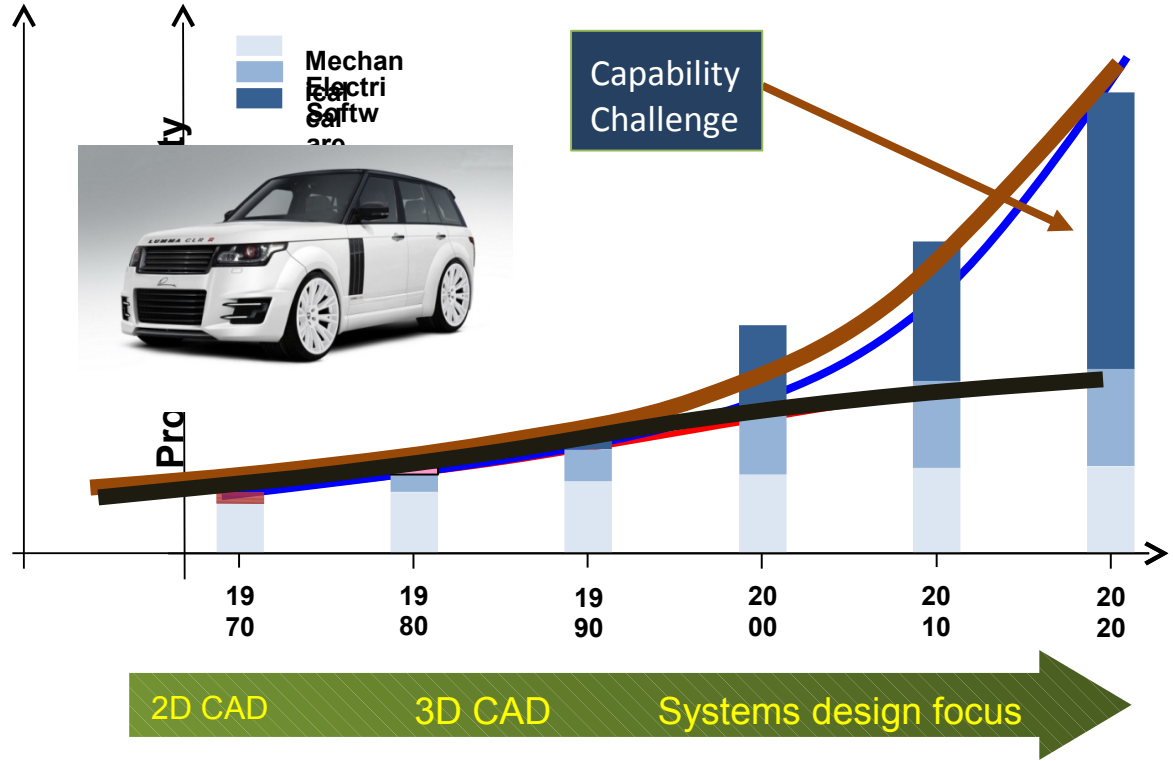
<http://www.device.com/2013-2-14/after-ces-10-tech-predictions-immediate-future>



# A Product Complexity

## Challenge

- Complexity is increasing exponentially
- “Electronics and software content of vehicles will increase from 30% to 70% of the automotive product cost in the near future”



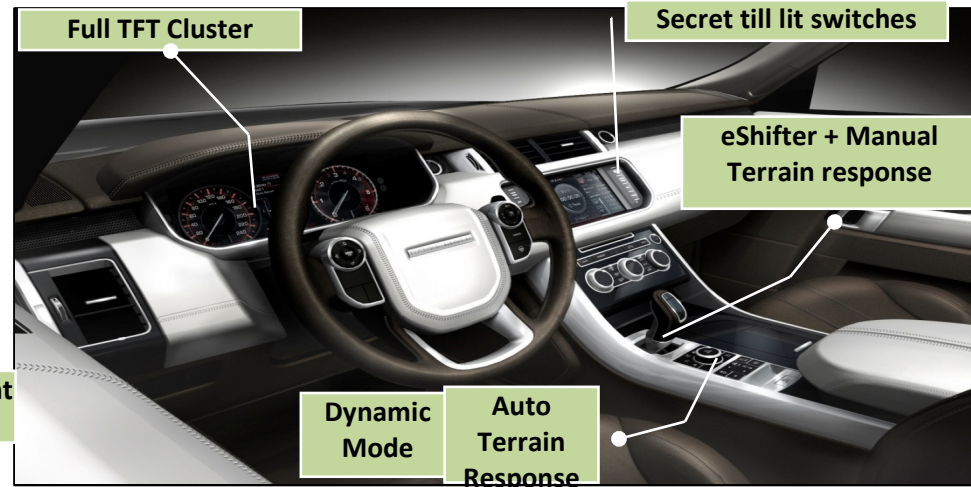
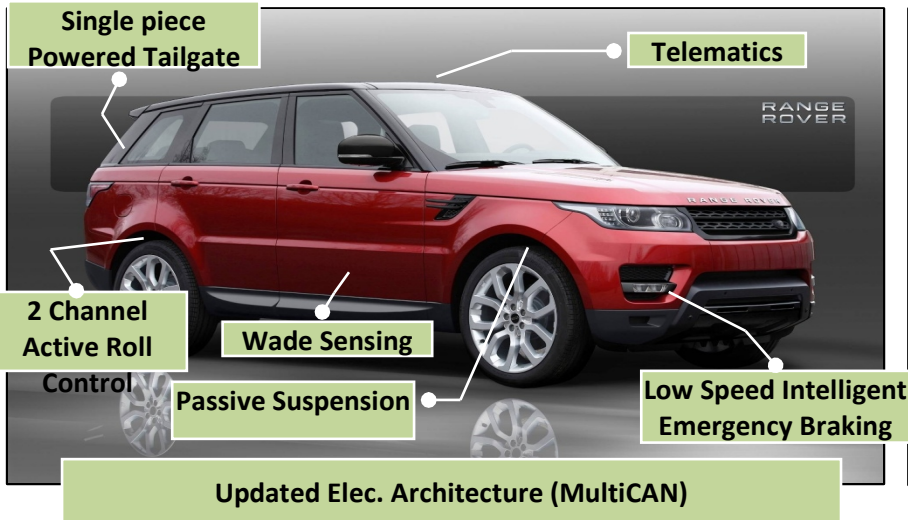


# Why Systems Engineering

- Consumers want Automotive Gadgets
- New Architectures, New Features, New Functions
- Complexity vs Capability vs Cost
- Doing It Early, Doing It Right, Doing IT Now



## Customer Features require New Functions



# Traceability End to End is Essential

i

plm

Product Lifecycle Management

Connectivity & consistency  
'One environment'

PLM Data  
'Single source of the Truth'



# Program vision and objectives

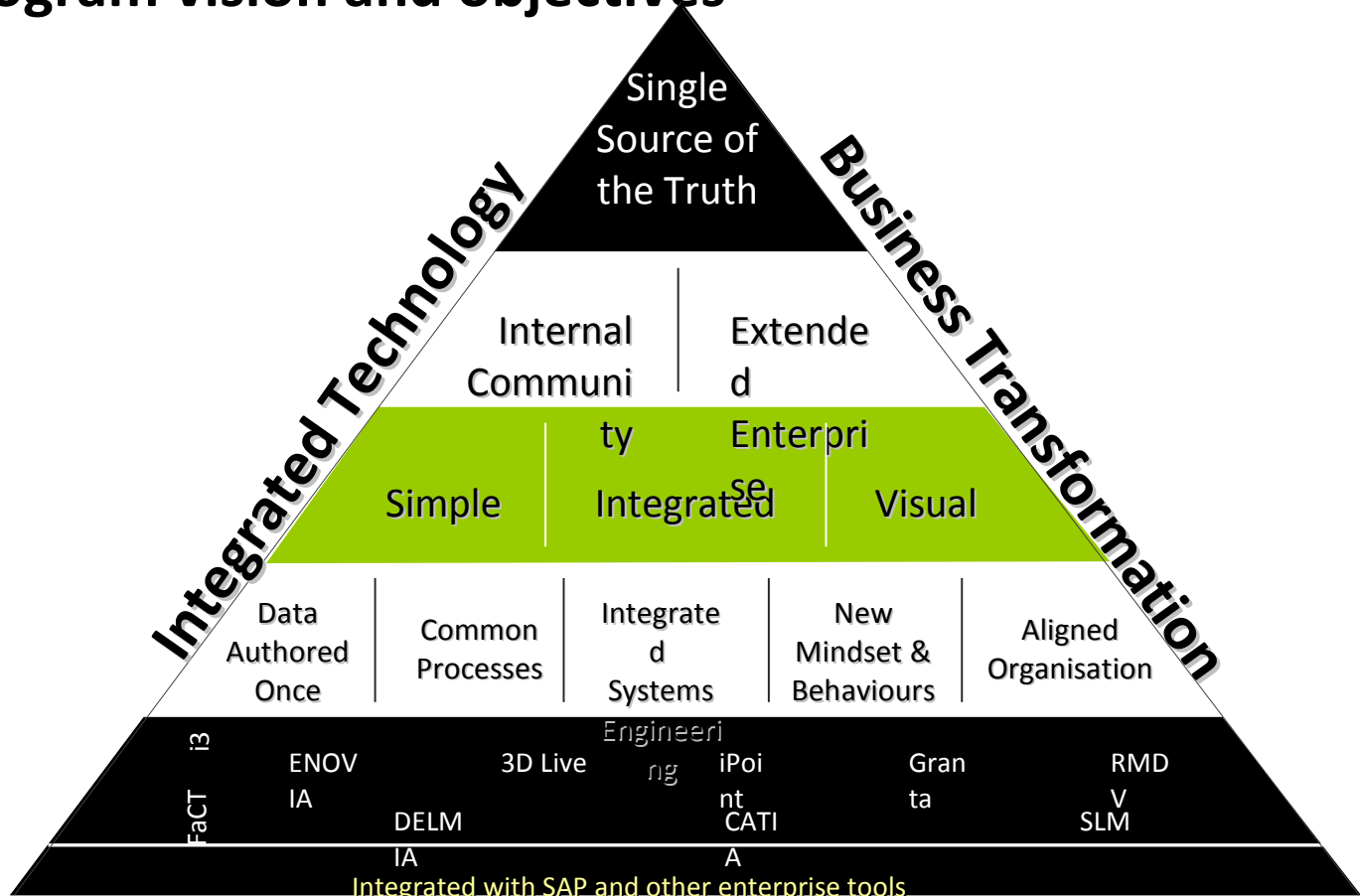
*One High Performance Company*

*Globally Connected*

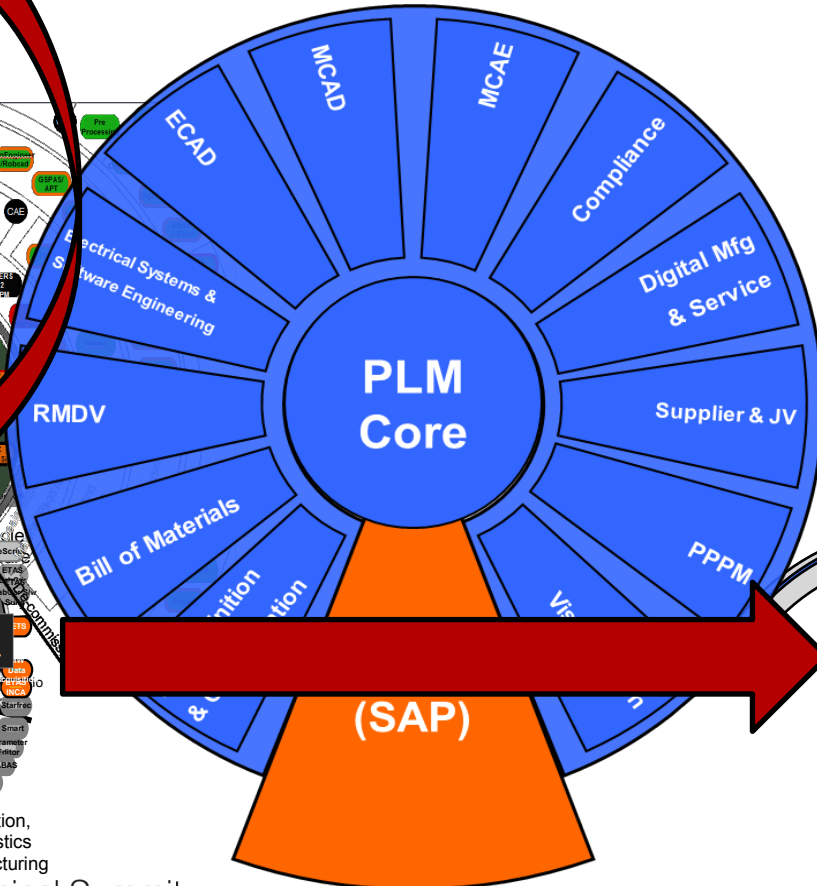
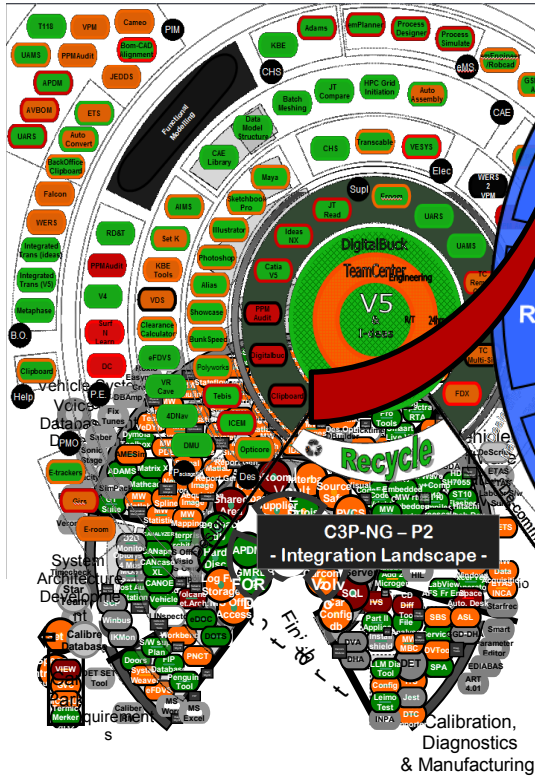
*Globally Accessible*

*New Business Approach*

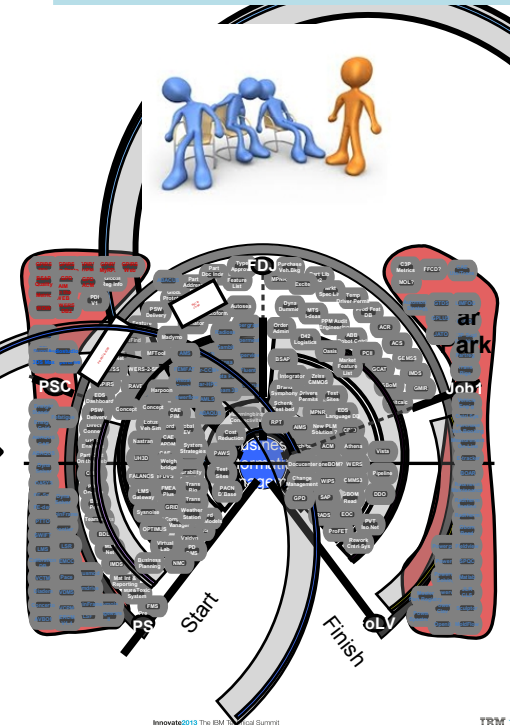
*Integrated Toolset*



# From a Complex IT Legacy Landscape

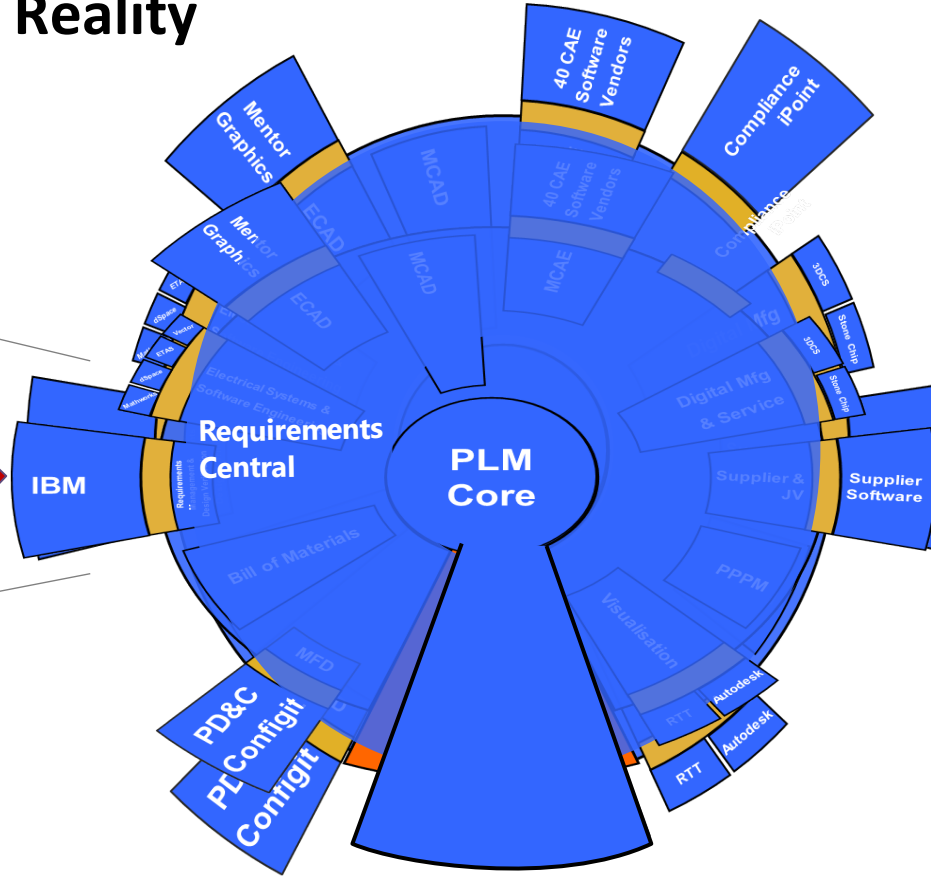
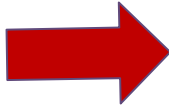


JLR  
i-PLM Technical  
Architecture



# Wave 1 Reality

IBM Rational  
Connected to  
Dassault Systems  
V6 via  
OSLC

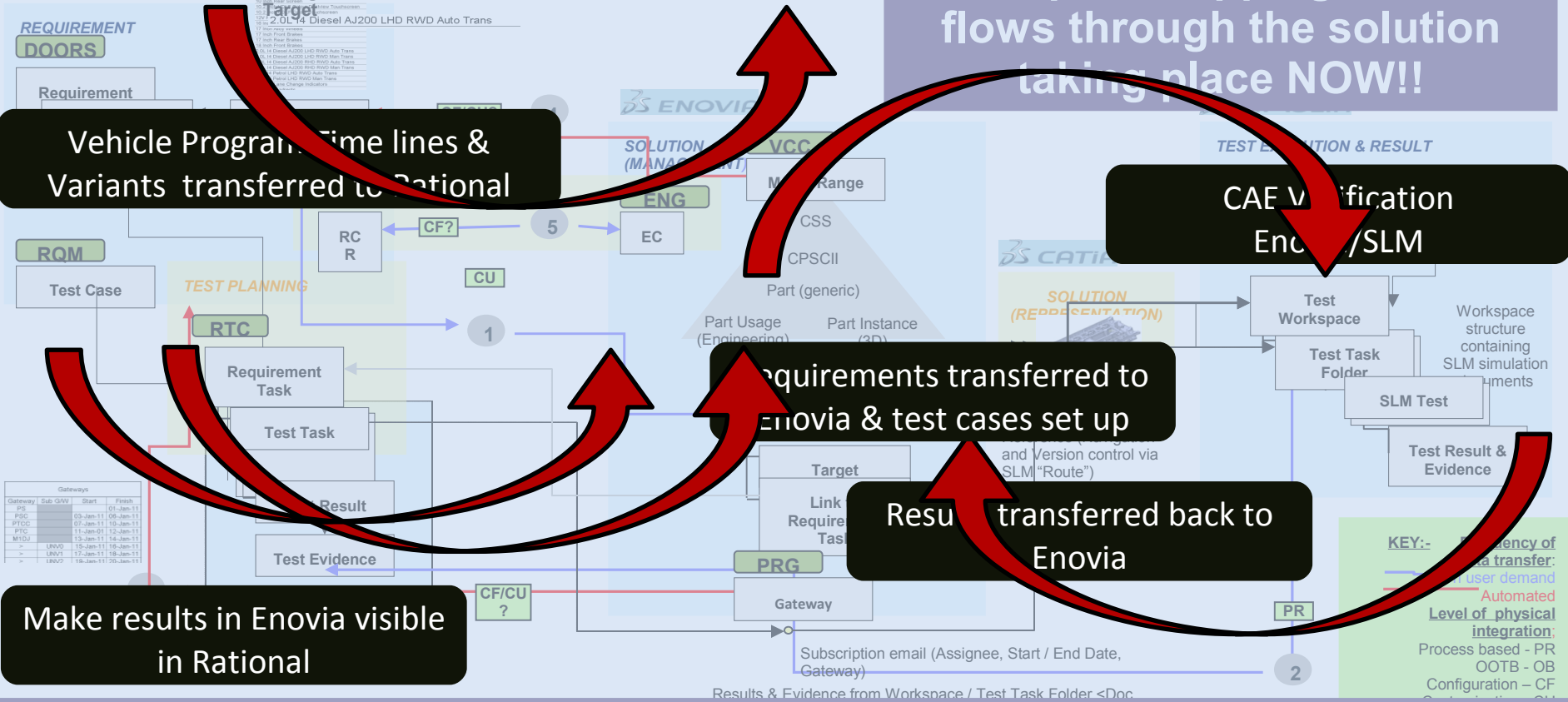


**OSLC Interface – Joint Development IBM & Dassault Systems**

# i-PLM Wave 1 RMDV – OSLC - Enovia

Complex mapping of data flows through the solution taking place NOW!!

RCR = Requirements Change Request / EC = Engineering Change Request  
 Engineering Requirement\* = Requirement + Variant + Target



Vehicle Program Time lines & Variants transferred to Rational

CAE Verification Enovia/SLM

Requirements transferred to Enovia & test cases set up

Results transferred back to Enovia

Make results in Enovia visible in Rational

Gateway	Sub	GW	Start	Finish
PRG			03-Jan-11	08-Jan-11
PRC			07-Jan-11	10-Jan-11
PRC			11-Jan-11	12-Jan-11
M10U			13-Jan-11	14-Jan-11
LNVD			15-Jan-11	16-Jan-11
LNVT			17-Jan-11	18-Jan-11
LNVP			19-Jan-11	20-Jan-11

**KEY:-**

- Frequency of data transfer:
- User demand
- Automated
- Level of physical integration:
- Process based - PR
- OOTB - OB
- Configuration - CF

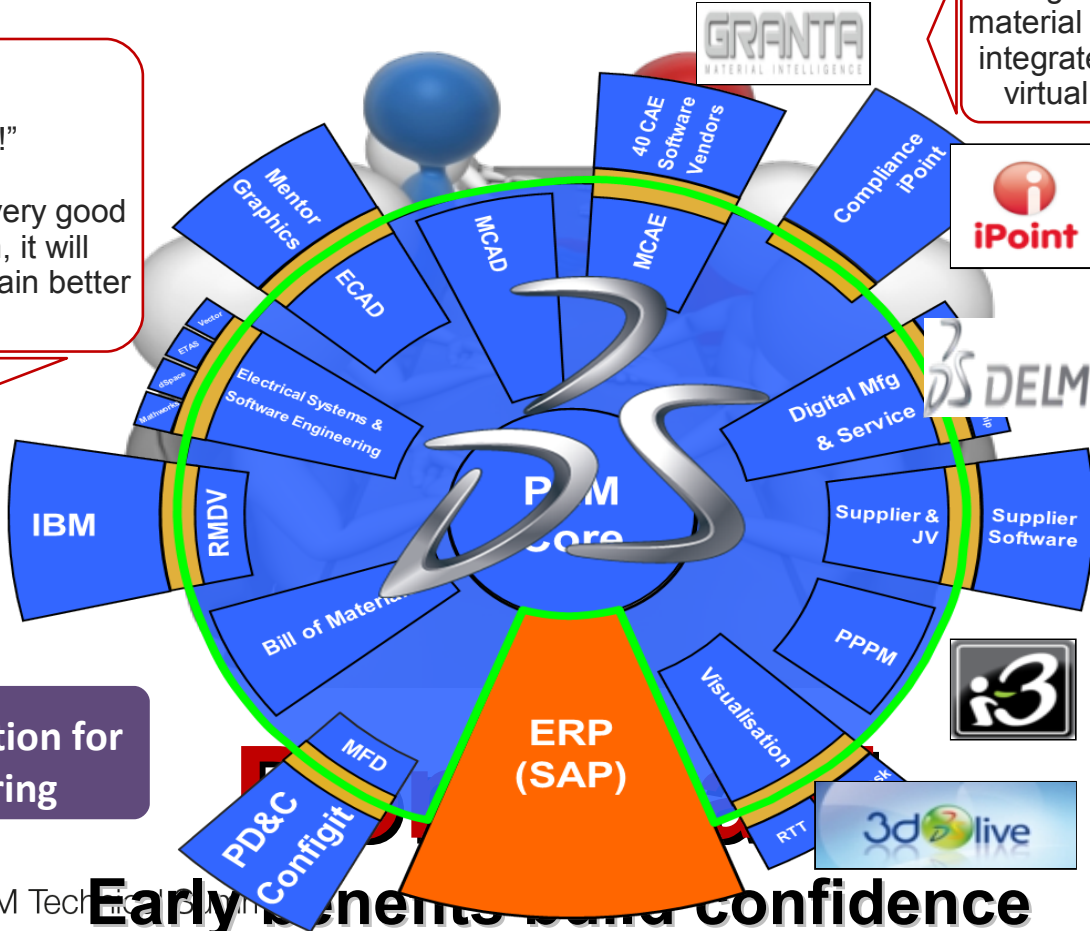
# JLR Early Customer Committee

"The metrics & dashboards are BRILLIANT!!!"

"The dashboards are a very good addition to the system, it will enable all users to maintain better control"



**RMDV is the foundation for System Engineering**

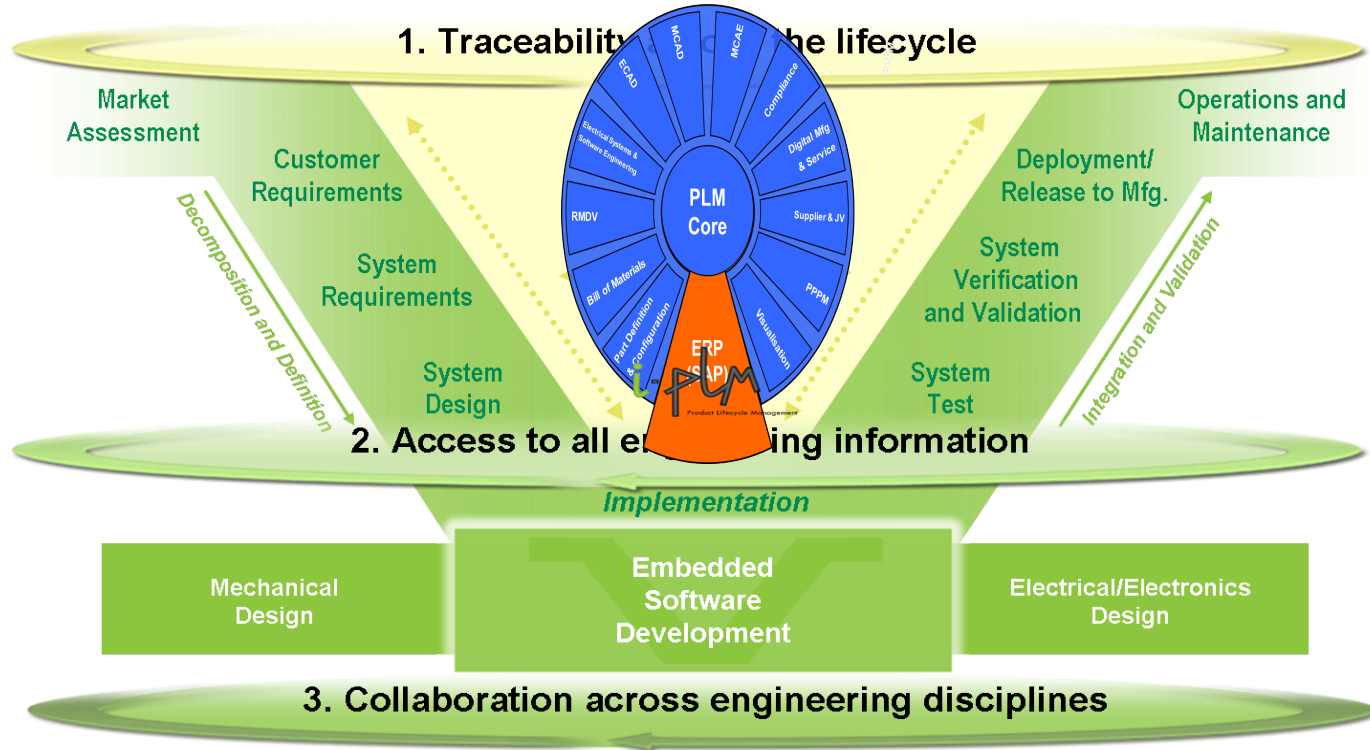


"Single source of material information integrated with the virtual product"

Mfg Director  
"Great quality performance data on my i-PAD"

**Colour-Washing**  
"A massive step forward, being able to see status of the virtual"

# To Summarise PLM & System Engineering foundational Capability



Customer requirements to design and validation/verification with full traceability.





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# Next Generation Systems Engineering Environment

Andreas Keis

Head of Systems Engineering Processes and Platforms

EADS

**Innovate2013**

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# EADS at a Glance



## EADS Innovation Works

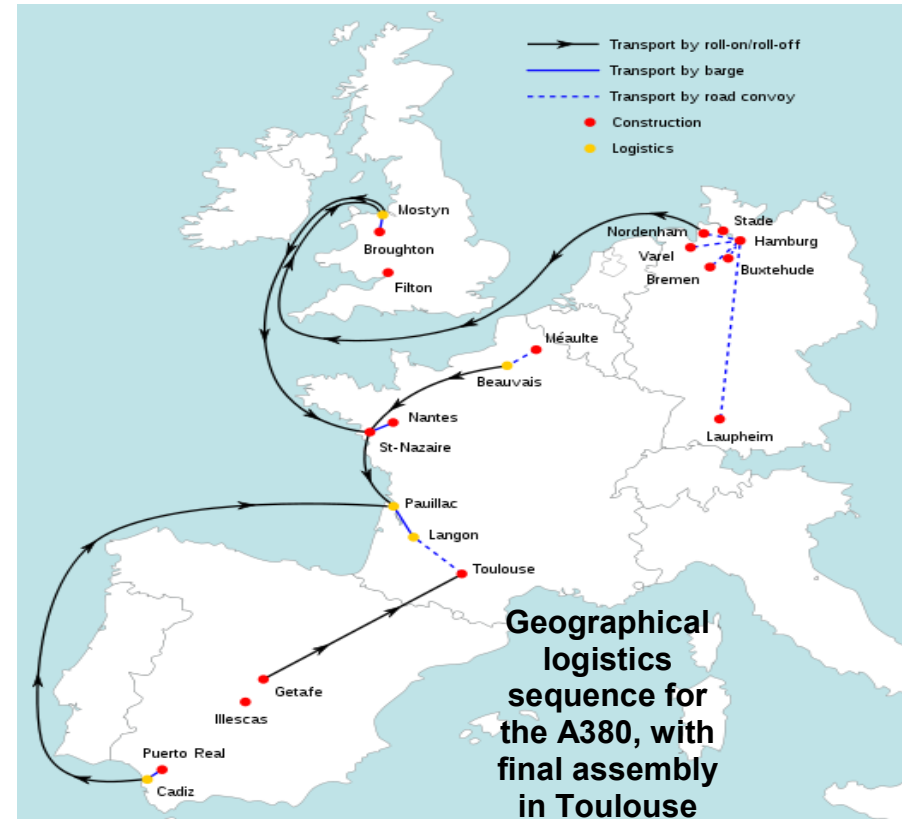
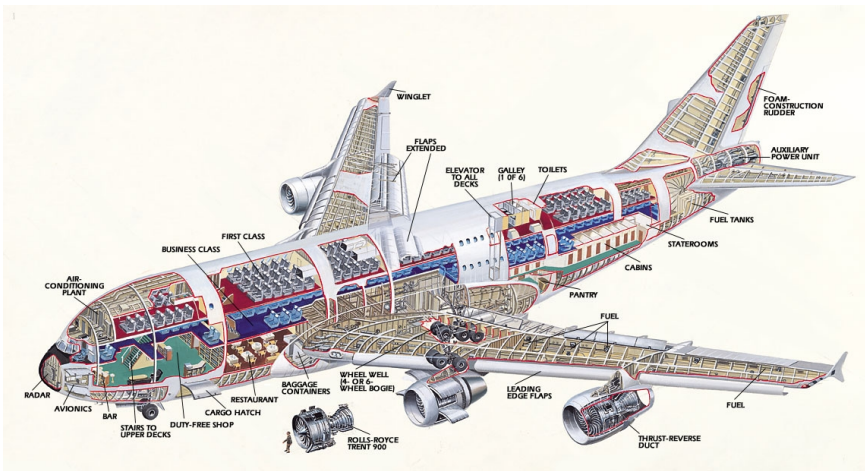
- Over 1000 Researchers, Scientists, Engineers
- Systems Engineering related Research
  - Newport / Bristol / Paris / Toulouse / Munich / Hamburg
  - Systems Engineering Processes and Platforms



Total number of employees: 140,405



# EADS Key Challenges for Systems Engineering Lifecycle Management

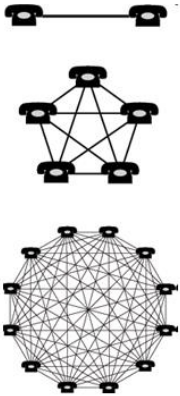


- Complex & Safety-critical Systems
- Long Lifecycles
- Geographically distributed teams

Innovate 2013 The IBM Infrastructure & Supply Chain Summit

# The Integration Challenge

Point-to-point  
Integrations  
don't scale



Monocultures  
lock you in



Maintenance and change costs  
go up over time



Ongoing and unexpected  
costs drain resources

Creating new  
integrations is  
unpredictable

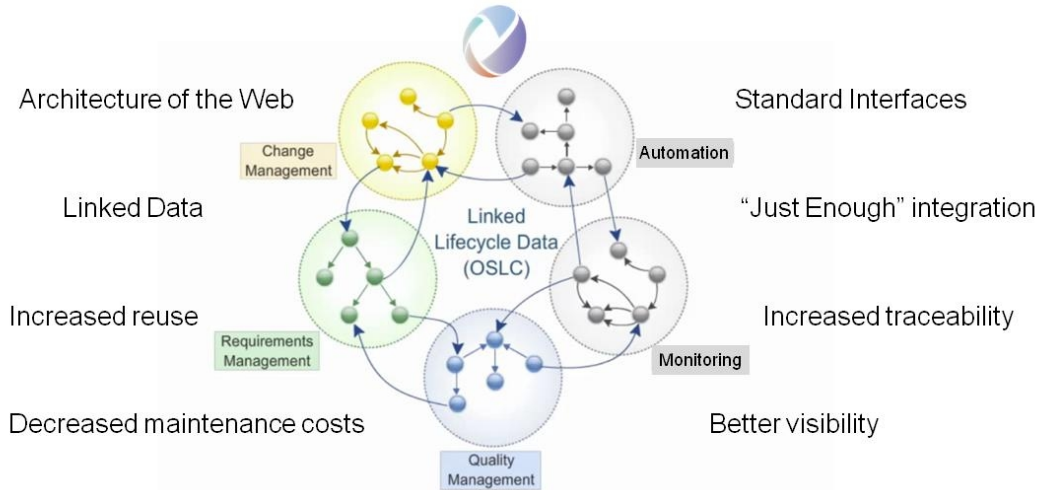
Past choices  
restrict present  
action and  
future vision

## Our Lessons learnt

- Data Integration must be based on Open Standards
- Engineering Artefact Management and Traceability is a Key Capability
- We need to manage data lifecycles; just connecting tools is not enough

# Open Services for Lifecycle Collaboration (OSLC)

Users can work seamlessly across their tools



**OSLC is an open and scalable approach to lifecycle integration. It simplifies key integration scenarios across heterogeneous tools**

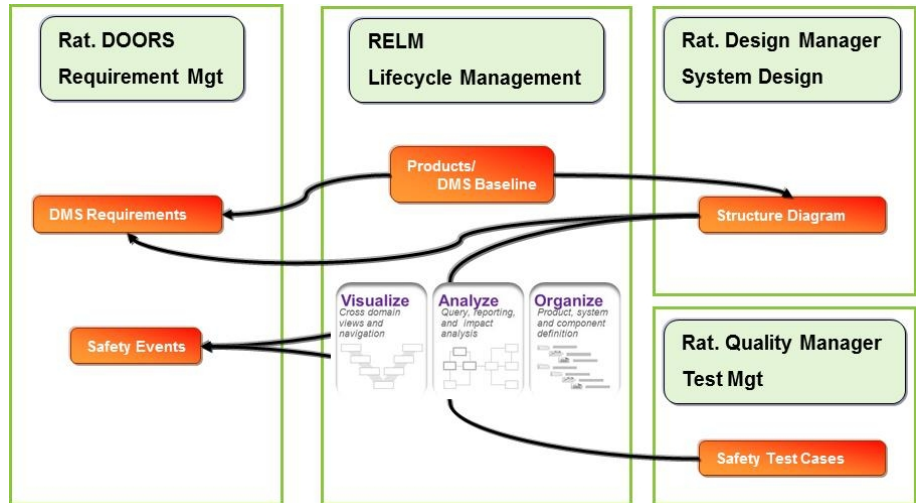
- OSLC develops open specifications for integrating systems/software engineering data
- Integrating using OSLC follows a pragmatic and “good enough” approach
- Workgroup participants from Industry, Tool Makers and Research Institutes
- OSLC is governed by OASIS, a recognized standard development organization  
<http://www.oasis-oslc.org/>

# EADS RELM / JAZZ Pilot Case

- Pilot Case: Aircraft Doors Management System
- Rational DOORS, Rhapsody / Design Manager, Quality Manager, RELM
- Run Pilot Case with 15 Systems Engineer to evaluate RELM tool and integrated environment
- Overall feedback was very positive! However, working in a collaborative environment is a new challenge

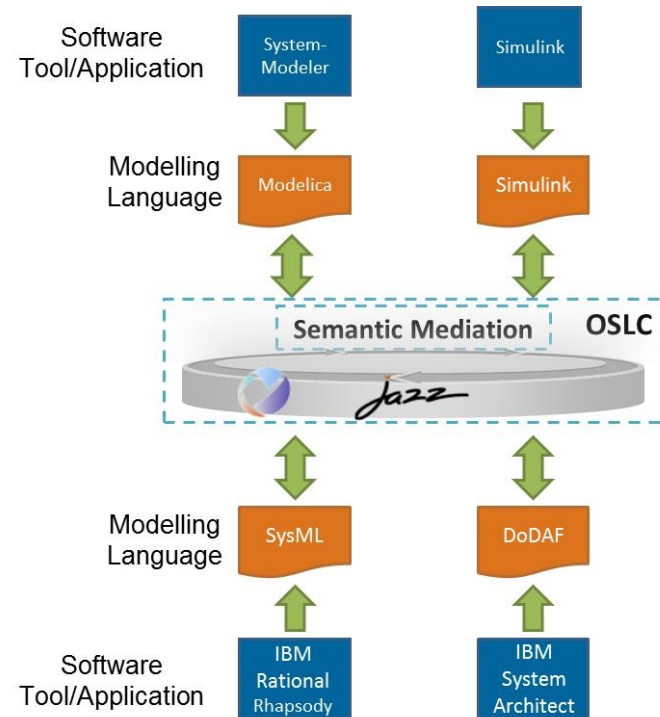


Monitor and Control Passenger Doors, Emergency Exits, and Cargo Doors



# The Step Beyond OSLC – Semantic Data Integration

- A multi-disciplinary system design approach requires a richer integration
- Semantic Mediation aims to “translate” commonalities between different system models on the fly
- FP7 SPRINT Project led by EADS UK Partners: IBM Research, Fraunhofer, Wolfram, UTC, Elvior, IAI
- Project URL: [www.sprint-iot.eu](http://www.sprint-iot.eu)

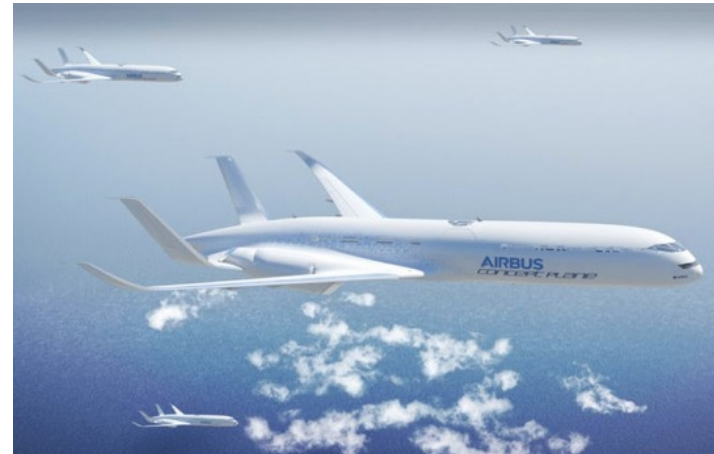





# Summary

- Interoperability is the key capability in our next generation systems engineering environment
- However, we need to involve all our partners, therefore a flexible and pragmatic interoperability concept is required
- New challenges for us:
  - Deployment
  - Training / Usability
  - Data Management

- Next Generation ++
  - Software-as-a-service?
  - Cloud?
  - Flexible Licence Models?





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# Accelerating Delivery whilst Maximising Quality within Transaction Banking

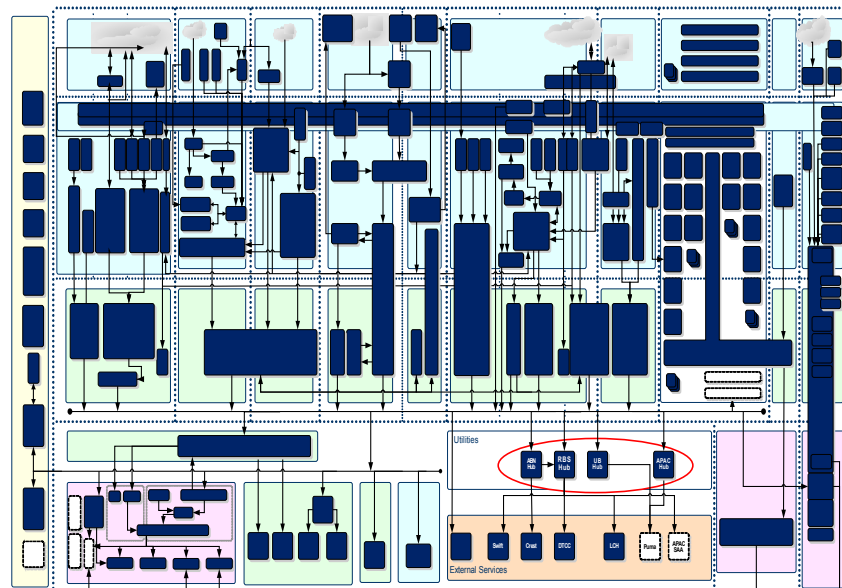
Stephen King  
Head of Middleware Development  
RBS Markets & International Banking

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# The Application – Global Message Hub (GMH)

## Messaging Hubs at start of 2010

- 4 **business critical** integration hubs over different technologies and geographies
- Processing **£900 Million** of transactions per week
- **2 million** messages a day
- Payments & Confirmations, Trade Reporting, Clearing
- Integrating 20+ internal systems to 10 external systems (SWIFT, Crest, DTCC, Trax, LCH etc)



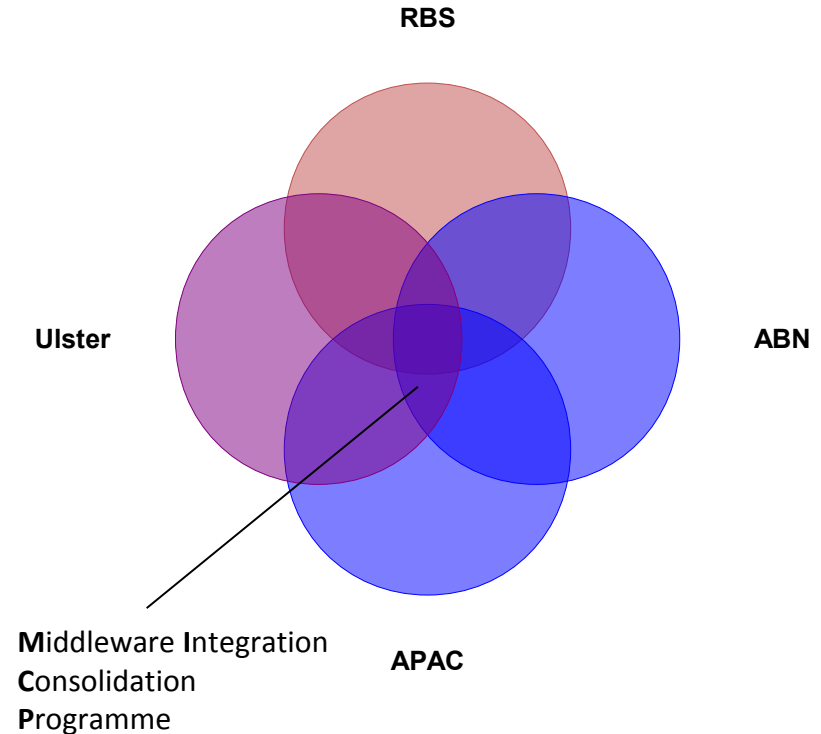
# What was wrong in 2010?

- Duplicate **out of date** systems
- **poor track record** of releases
- Small team, **little process**
- **Incidents the norm** rather than the exception
- Testing done **manually** by developers
- **Fear of change** - fines, reputational damage

# The Project Challenge

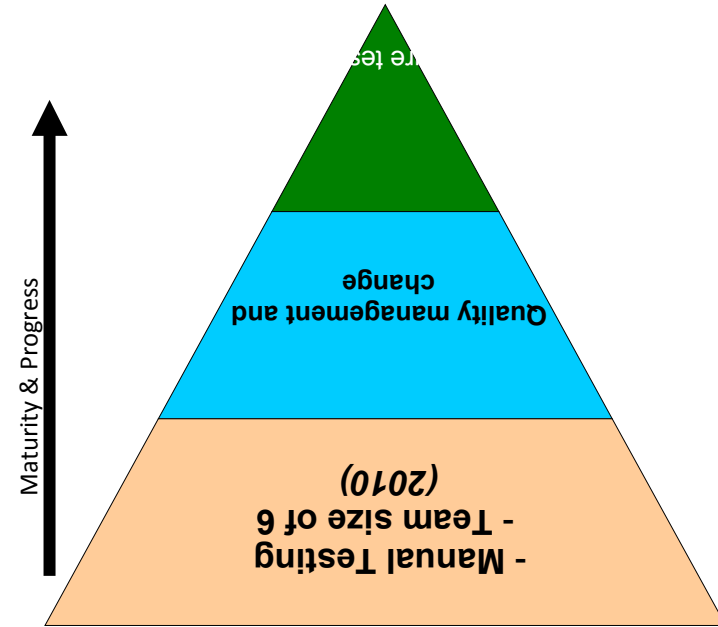
## One Strategic Middleware Solution

- 2 to 3 year programme
- In parallel to delivering business driven functional change (35 projects)
  - FX Programme – Rewrite of FX Systems to support quadrupled volumes
  - Global Transaction Reporting
  - Brand New Derivatives Clearing function



# Strategy

- Instil a '**Quality Mindset**' into the team
- **Coherent process** to manage change from initiation to implementation
- Fundamentally **change testing** process – No more manual testing!
- Rapidly **scale** the development team (from 6 to 30+)



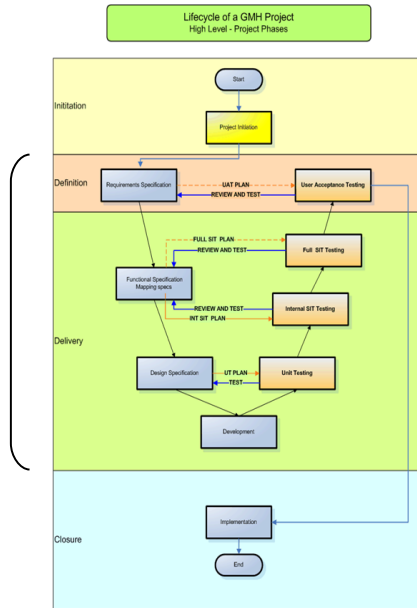
# Execution - How the Challenges Were Met

- Created SDLC for Integration Projects
- Test Automation strategy
- Selected an Automated Testing Tool - **IBM Rational Integration Tester**
- Employed integration experts
- Proof of concept project - 6 month compliance project reduced to 6 weeks
  - Potential fines of £5 million avoided.
- Full project rollout



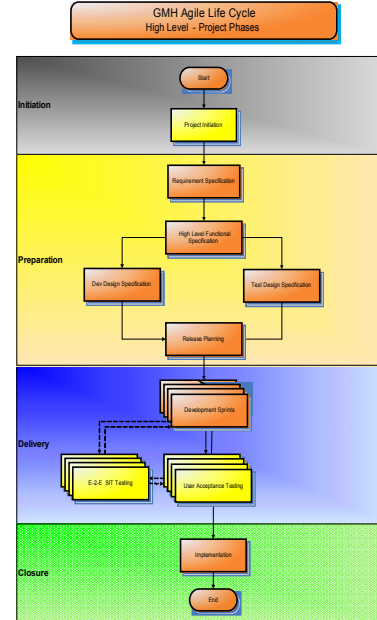


# SDLC and 'The GMH Lifecycle'



Traditional V-Model

OR



Customised Agile

Rational  
Integration  
Tester

Rational  
Integration  
Tester

# Results at end of 2012

1 Global messaging hub on 1 technology processing **£1.25 Trillion** per week

**400** Project deliveries over **3 years**. 205 deliveries in 2012 (**up 95%** from 2010)

Average **0.07 incidents** per delivery a **99.64% reduction**

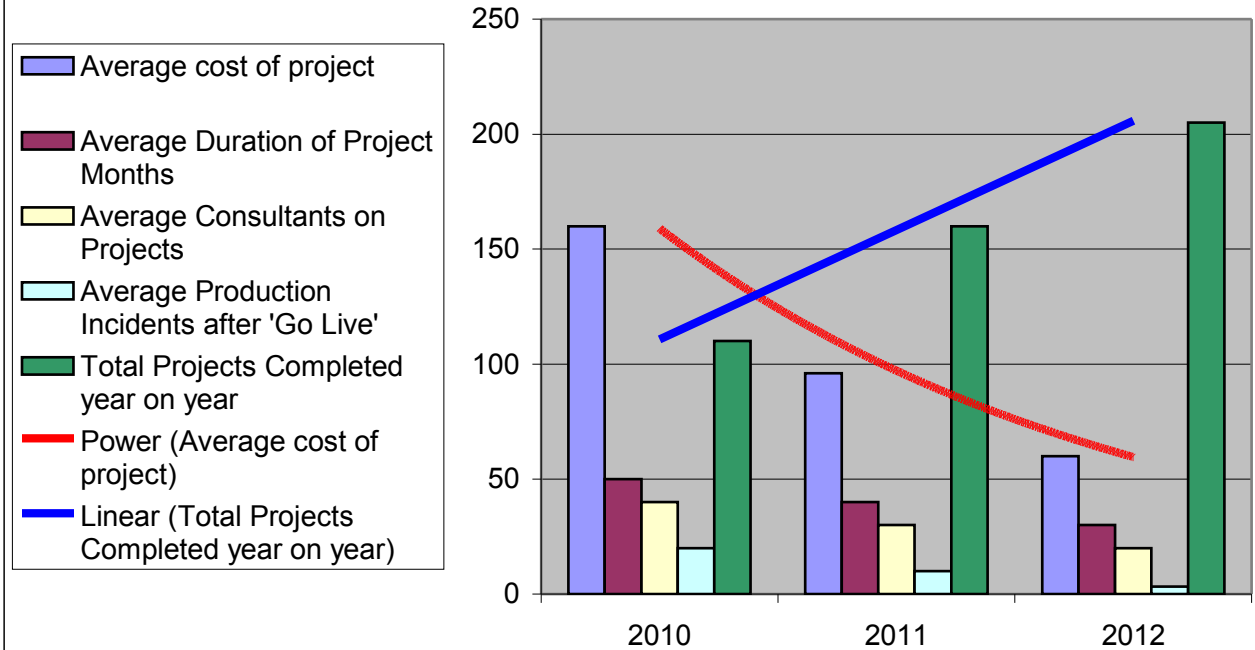
Average **cost** of project £60k a **reduction of 63%**

Time to Market **reduced by 40%**

All projects on time to budget!

# Key Performance Indicators

## KPIs after adopting Test Automation, Service Virtualisation and Agile Development for GMH



# Rational Integration Tester a major contributor

- **97 %** Test coverage. 3000 Test cases generating **15000** test scenarios.
- **Before:** 4 week regression test. **After:** 1 hour regression test. **£10k saving** per week.
- Manual testing **errors eradicated**
- Impact Analysis prior to development. **Embrace change** rather than fear it.
- Service Virtualization **saves costs** of environments

# Key Success Factors

- A strong but flexible **development methodology** – Waterfall, V-Model, Agile
- Attention to **testing is critical** to a successful delivery - Make sure your business sponsors know this!
- **Maximise** test automation
- Factoring in time to **learn** the test tool & **seeking help** from experts at the start

# What Next?

- Move to **Service Virtualisation** to reduce environment scale and external testing costs
- **Adoption of Continuous Integration**
  - For more attend [‘Leveraging continuous testing to enable continuous delivery’](#) session today.



# Thank You







# Teamwork

## Austin Healey



# Consumers now want to engage with banks on their own terms



**7,096,192,506**  
MOBILE SIM CARDS<sup>1</sup>



**93%**  
UK BROADBAND ACCESS<sup>2</sup>



**92%**  
OF ALL THE WORLD'S DATA WAS  
CREATED WITHIN THE  
**PAST 2 YEARS<sup>3</sup>**



**\$600**  
YOU CAN BUY A DISK  
THAT CAN STORE ALL OF  
THE WORLD'S MUSIC<sup>4</sup>



**700,000**  
FACEBOOK SHARES<sup>5</sup>



**2,000,000**  
GOOGLE SEARCHES



**100,000**  
TWEETS



**48HRS**  
VIDEO UPLOADS

Sources:  
<sup>1</sup>GSMA  
<sup>2</sup>Ofcom.gov.uk

<sup>3</sup>Media Post  
<sup>4</sup>McKinsey Global Institute  
<sup>5</sup>DOMO

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**monitise**<sup>TM</sup>

It sounds simple because it is

**KNOW...MORE**

**PREPARE...MORE**

**DELIVER...GO**





# Vision or Drive

- Take it from anywhere
- Inspire your teammates/colleagues
- Understand the people/players around you find their buttons and push them
- Diversity

# Be True To Yourself





# Sustainable Innovator

ATTENTION TO DETAIL

EMPOWERED CONFIDENCE

PUSHING BOUNDARIES

MAXIMISE OUTPUT...24HRS

TRUST





# Confidence



Personally

Team

The 1 thing that can't be faked

Something that can be built together

# Thinking Together



Personally

Team

RESPECT  
EVERYONE... You  
never know  
who the next leader  
will be!!

STAY AHEAD



**HOW MANY F'S  
CAN YOU SEE?**



FINISHED FILES ARE THE RESULT  
OF YEARS OF SCIENTIFIC STUDY  
COMBINED WITH THE  
EXPERIENCE OF MANY YEARS



**HOW MANY F'S  
DID YOU SEE?**



FINISHED FILES ARE THE RESULT  
OF YEARS OF SCIENTIFIC STUDY  
COMBINED WITH THE  
EXPERIENCE OF MANY YEARS

# Working outside your comfort zone...FEAR



- What is Pressure?
- Fear of the unknown?
- Who sets the limits?
- How far can you really go?



**HOW WOULD  
YOU FEEL?**





## If someone said...

- You've got 3 days
- Learn 700 steps that you've never seen before!
- To music that you won't hear until 2 hours before the LIVE performance
- 500 Live Audience
- 12 Million People watching including all your old team-mates and friends...who hate the show!!
- Whilst a man runs in front of you with a big camera... And you only get 1 chance to get it right!!!!



*Strictly  
Come  
Dancing*





# To me Innovation is NOT always;

- A Product
- A Platform
- Disruptive
- Collaborative
- Just about technology





# Innovation

- A state of mind
- A movement
- A team of people, shoulder to shoulder, together prepared to dream of what others see as impossible and...

# MAKE IT HAPPEN





# Win or Lose

Excellence is not a singular act...It's a habit

- **Re-affirm.....Learn**
- **Re-Motivate.....Prepare**
- **Do it all again.....Deliver**

# LIFELONG MEMORIES





# Questions



# Thank You



