# How we build software

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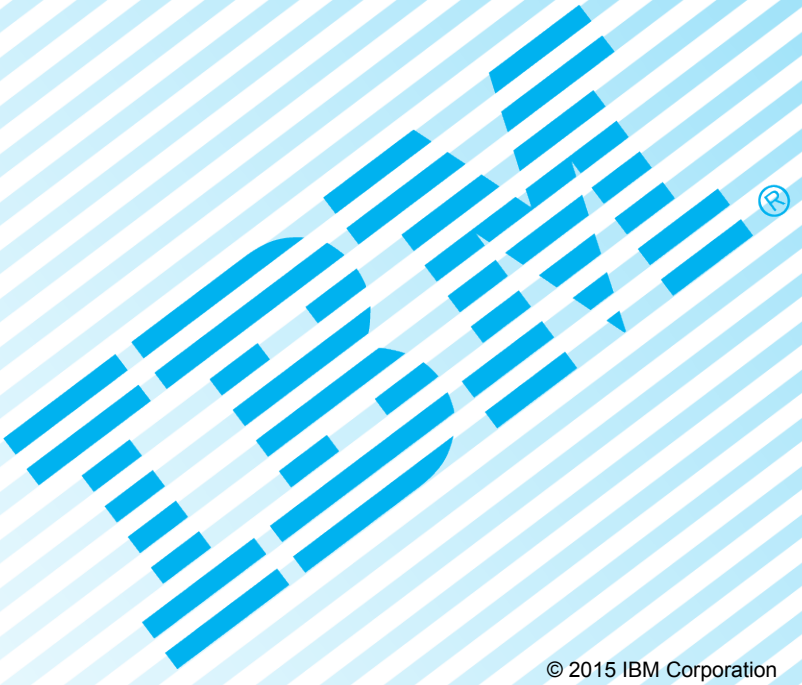
Chief Architect – Smarter Care Development



# Agenda

- Introduction
- Project lifecycle
  - Vision
  - Plan
  - Develop
  - Deliver
  - Support
  - Manage Evolution
- Doing it
  - Cúram
  - Smarter Care
- Key considerations
- Summary

# Introduction

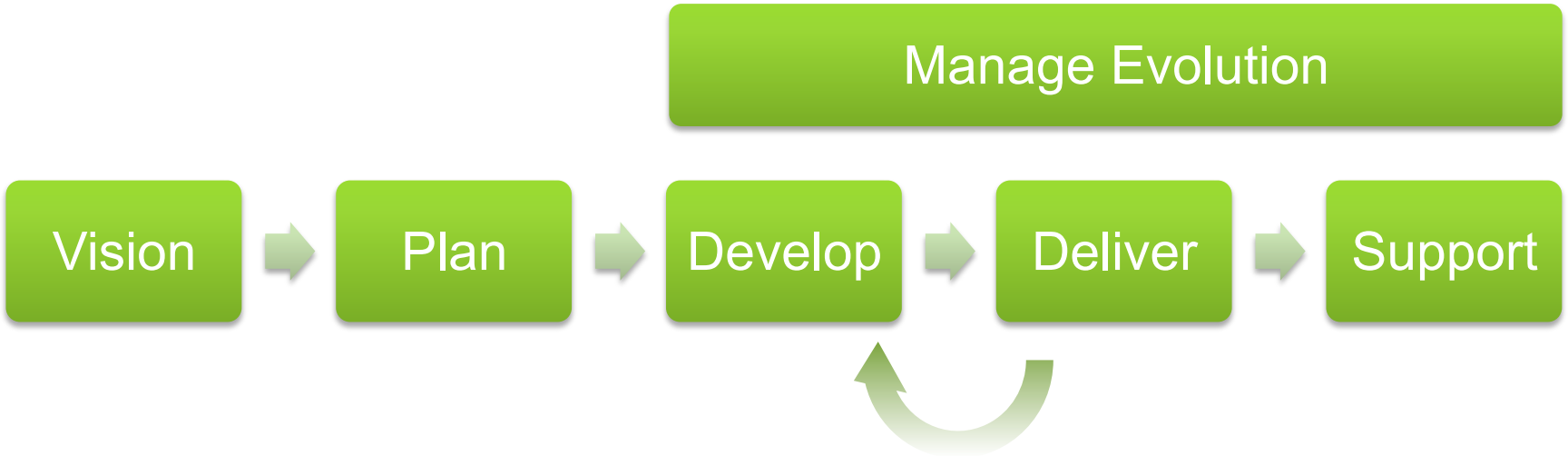
- Me
  - Paddy Fagan, BSc Advanced Software Engineering, UCD (and BAI Computer Electronic Engineering, TCD)
  - 17+ years in software industry, 15 years in Cúram Software, 2+ years in IBM
  - Career path: Developer, Team Leader, Manager, Architect
- IBM
  - Over 100 years old, operates in 170+ countries, 400,000+ employees, annual revenues approx. $93 billion.
- Cúram Social Program Management
  - Social and human services business application, first version released in 1999, used in agencies across the globe.
- Smarter Care
  - New offerings in development, bring experience from Cúram to new markets.

# PROJECT LIFECYCLE

# Project – more than software, more than engineering

- More than software
  - A successful project is about more than the software, its about
    - What's the right offering
    - Getting it to market
    - Selling it
    - Supporting it
    - Evolving it
- More than engineering
  - A successful project team draws on many professions/disciplines
    - Project Management, Business, Design, Test, Sales & Marketing, Pricing, Legal

# Lifecycle



# Vision

- From expressed or assumed need(s) to a clear vision
  - IBM has a process called Design Thinking
  - Engineering, Business, Marketing and Design teams collaborate to produce a clear vision
  - The aim is to produce a ‘to be’ vision of how the users of the software should work
  - They use wiki's, Post Its™, screen mock ups, docs, presentations, etc
  - This phase also includes a ‘Technical Foundation’ where we start to elaborate the high-level technical activities that are needed.
- Understand and express the architectural risks
- A ‘Hills Playback’ is used to share and agree this vision with all stakeholders.

# Plan

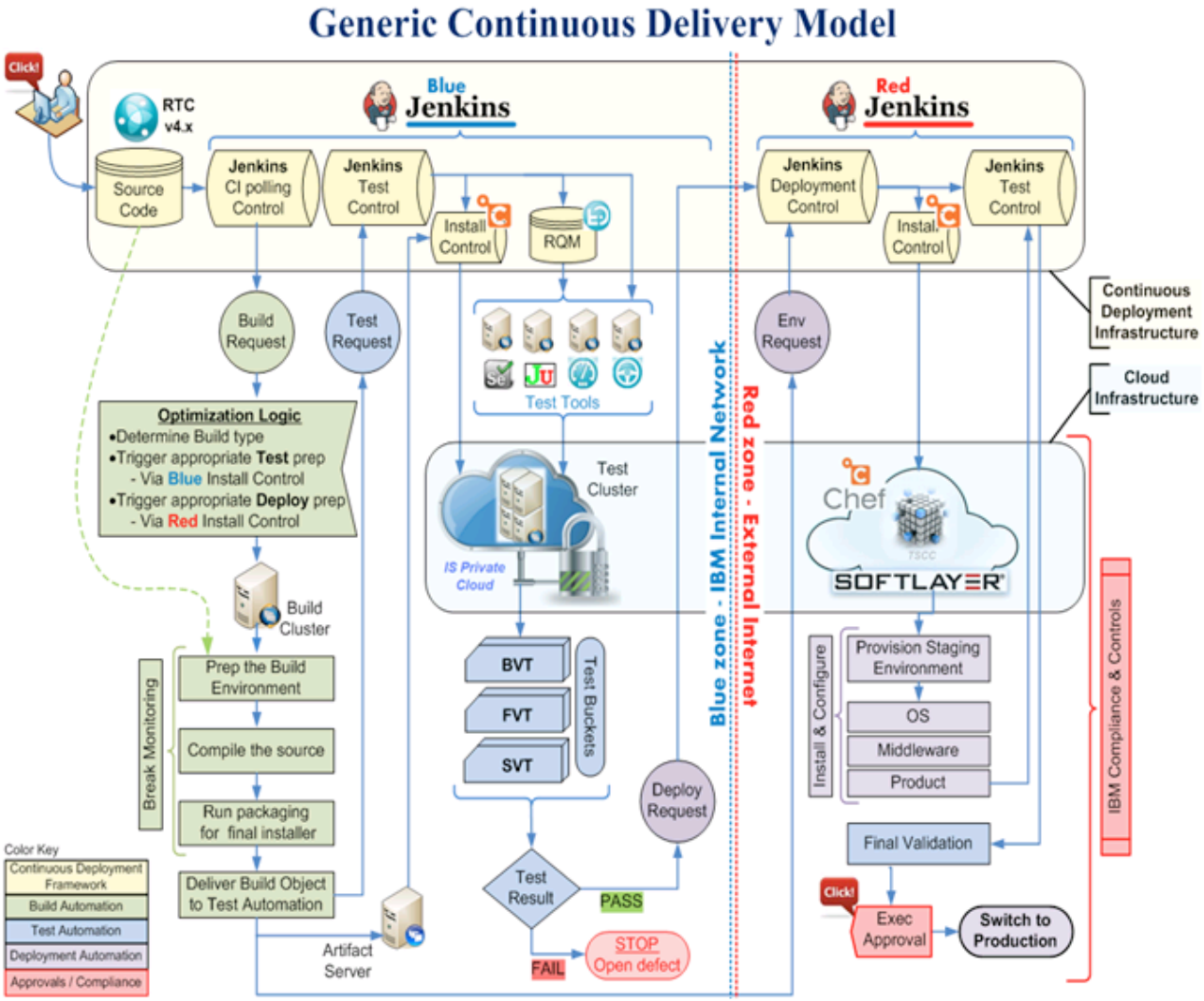
- From the vision to a set of activities
  - We map the vision down to story boards, folding in activities identified in the AD and in that identify the following (link)
    - EPICs (theme's, sub-hills)
    - Features (user identifiable features)
    - Plan Items (development iterations)
    - Stories (development sprints)
  - These get recorded in Rational Team Concert (Jazz)
  - This process also includes Test, Documentation (Information Development) and Deployment.
- A 'Playback 0' is used to share and agree this elaborated vision and plan with all stakeholders.

# Develop

- Stories get developed, tested and business verified
  - Developers use: Eclipse, Ration Software Architect, RTC, tomcat, DB2, JUnit, Selenium, CheckStyle, mobile development tooling, etc
  - Builders run using Jenkins/Build Forge
    - Automated progression criteria, test pass, test coverage, policing
  - Scripting & Artifact repositories
  - Deployed for testing (WebSphere & DB2)
  - Functional Verification Test (FVT - does it do what we said it would)
  - System Verification Test (SVT - have the non functional requirements been met)
  - Business verification – can a user met their business need.
  - Peer code reviews, sample reviews by senior developers.
- For each iteration there is a ‘Playback N’ to share and agree the content developed so far with all stakeholders.

# Deliver

- Continuous Delivery & Continuous Integration (from link)



# Support

- Manage customer issues
  - What's an Issue, what's a Defect…?
  - Who has the knowledge to respond?
  - How can we change things to reduce the rate of issues?
  - What happens when things go badly wrong?
- Support organizations (L1/L2/L3)
- Common IBM structures and processes:
  - Service Requests (SR)
  - Problem Management Records (PMR)
  - Critical Situations (CritSits)

# Manage Evolution

- Scheduling releases
  - iFix, FixPack, minor (0.0.X), major (0.X.0) & mod (X.0.0) releases
- Separate streams for parallel development
  - Means separate ‘instances’ of: Vision, Plan, Develop, Deploy, Support
  - Merging of streams
- Check-points for
  - Legal clearances (open source use, export regulations, third party licenses)
  - Patentable Content (22 years as leading recipient of US patents - link)
  - Translation and globalization of content

# DOING IT

# Cúram

- Long running (and huge) product
  - Started development in 1997
  - Model Driven Architecture
  - Simplified development of JSP-based User Interface
  - More than 10,000 User screens
  - 3 million lines of Java code
- Development is more: Water-Agile-Fall
  - Development teams use scrum, but most activities have a big upfront design effort
  - The scale of the existing product, makes ‘fit’ a key issue
  - On premise (and customized) deployments, make for a classic release cycle.

# Smarter Care

- New offerings
- Much more agile approach
- Still needs to ‘fit’ within the processes and checkpoints

# Key considerations

- Scale: Doing it once in isolation is one thing, but each product version has it's own 'copy' of this life cycle.
- Everything is moving, all the time
- More people, means more ‘lost’ time managing and communicating among them

# Summary

- IBM is a very large company
- There are processes, standards and checkpoints to offer standardization
- But, each project is an ‘instance’ of all these things.
- A project is more than software and needs more than engineers
- But even when there was a roomful of people in Cúram, the life-cycle, process and distinct disciplines where still needed.
  - Even if we didn’t always know it, and sometimes learnt the hard way.

# References


- Hohmann, Beyond Software Architecture: Creating and Sustaining Winning Solutions – Addison Wesley, ISBN 0201775948
- Rozanski & Woods, Software Systems Architecture: Working With Stakeholders Using Viewpoints and Perspectives – Addison Wesley, ISBN 032171833X
- Brooks, The Mythical Man-month: Essays on Software Engineering – Addison Wesley, ISBN 0201835959
- That iOS games developer I mention is ustwogames – see monument valley in numbers and the download ratios (paid for/not) is from their twitter feed
- That story about the hospital and their failing systems "How Complex Systems Fail"