Getting Agile

A Case History

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Parker Aerospace

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Joseph Hillery
Scott Pigman

Who We Are

Scott Pigman - **I started my professional career as a mechanical engineer performing finite element analyses and then switched over into mechanical design using Unigraphics (NX). Along the way I became interested in software development and managed to eventually make the transition into my current career at Northrop Grumman. My primary focus is Teamcenter architecture and development.**

Joe Hillery – **I have been working in software development since the 70s, and with (Westinghouse) Northrop Grumman since the early 80s. Over the years, I've worked with various PDM systems: Sherpa, Teamcenter Enterprise, and now, Teamcenter.**

This presentation is not about *what* we're doing, but…

We have an existing Teamcenter 10.1.4 being used for CAD Model Management and Manufacturing Support. Our initial goal is to:

- **Upgrade to Teamcenter 11.2**
- **Add Aerospace and Defense (A&D) module**
- **Interface with a legacy Configuration Management System (load data and keep synchronized)**
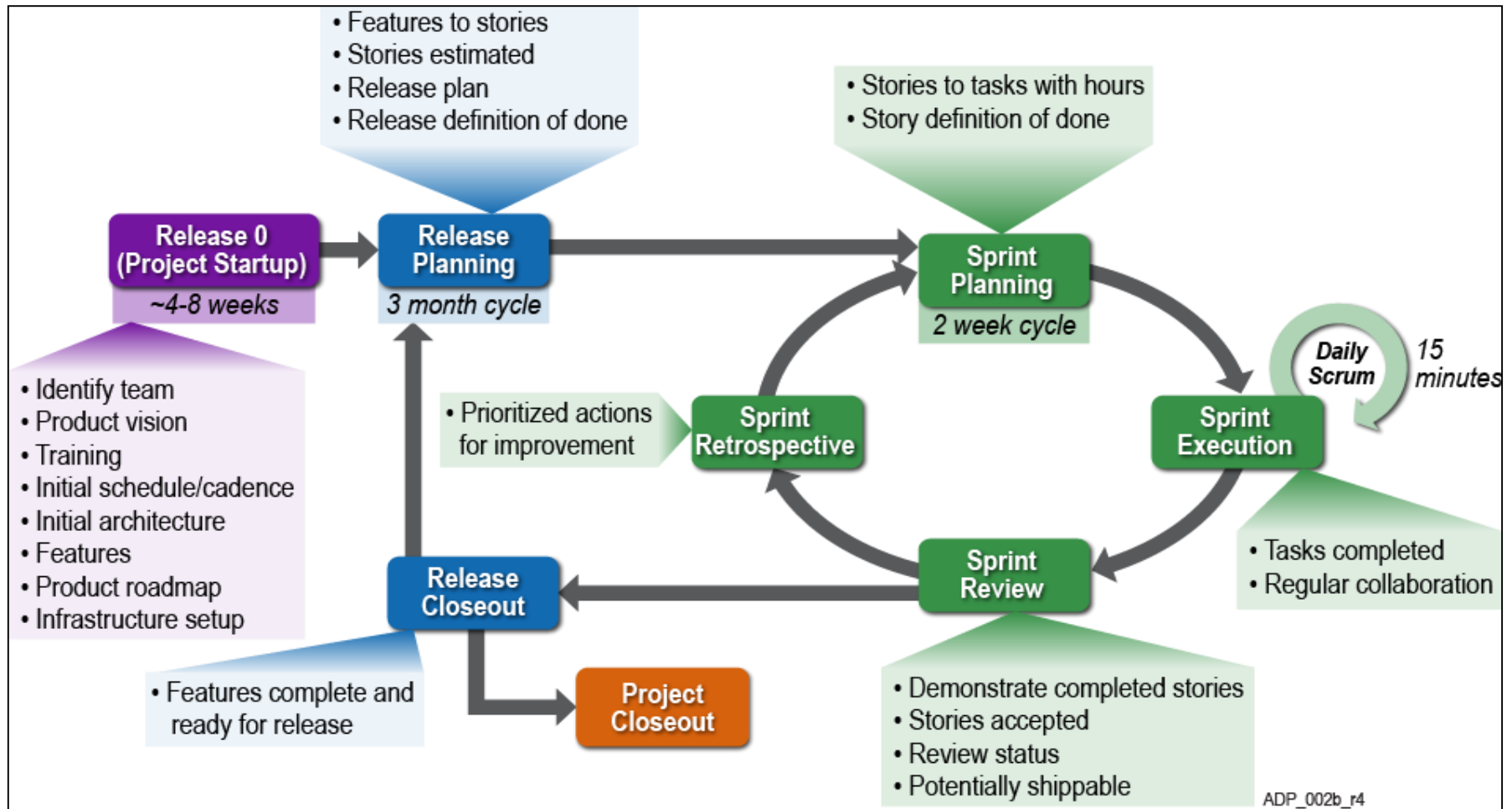
Why use Agile Scrum?

Three key factors converged in the beginning of 2016:

- **IT Management began to push the use of Agile.**
- **Agile Tools Became Available**
- **We were stuck.**

The Agile Scrum Methodology

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The Agile Scrum Methodology

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Business / Management

Dev Team

Product Owner

Solution Architect

Stake Holders

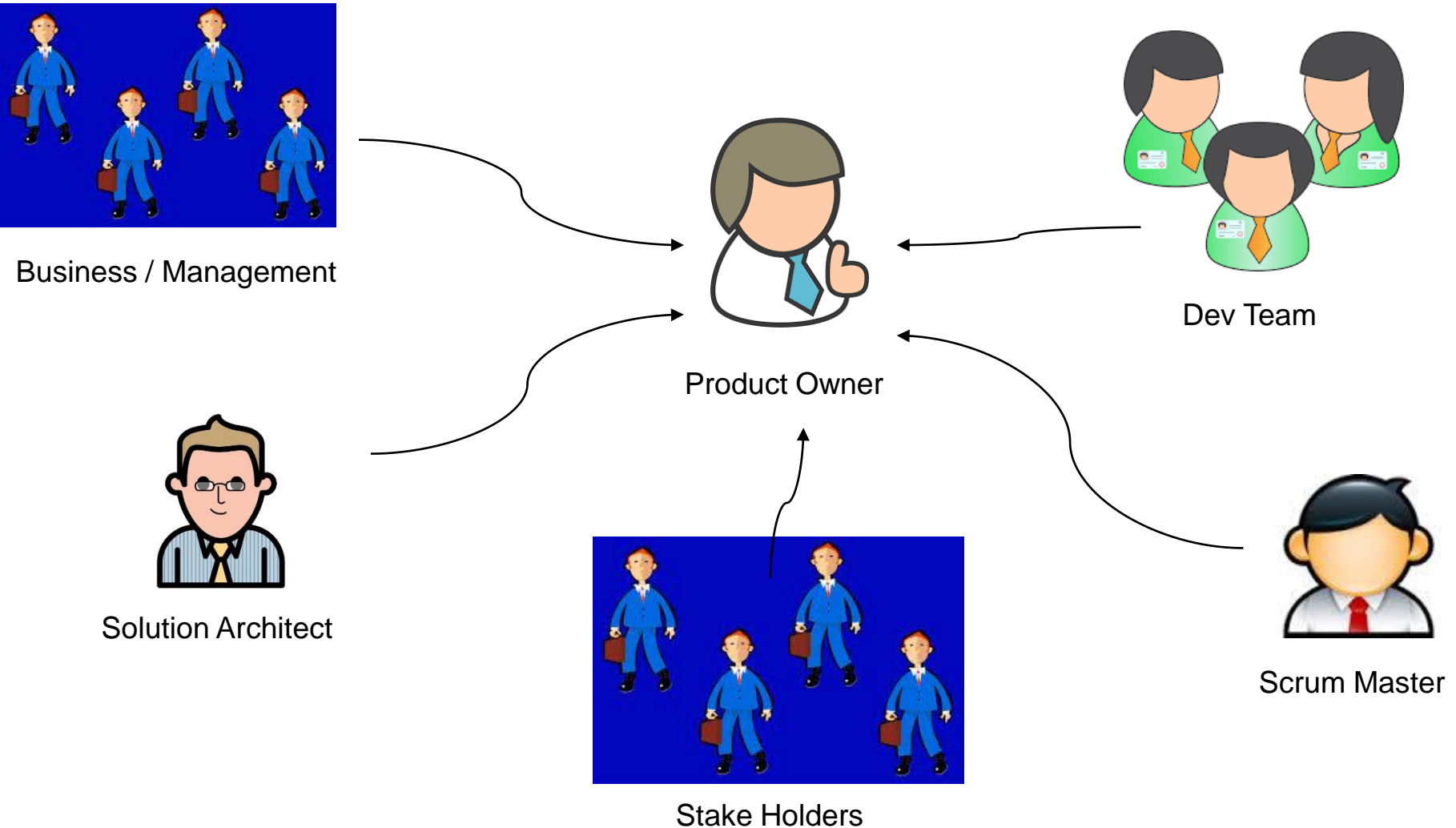Scrum Master

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Starting from Scratch

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Collective experience of team on Agile Scrum Methodology
0

Certified Scrum Masters
0

What resources are available within the company?

- **Agile Center of Excellence**
- **Agile Community of Practice**
  - **Web site with links to online resources**
  - **Bi-weekly lunchtime online meetings**
- **Agile coaching**
- **Training**

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Essential Scrum: A Practical Guide to the Most Popular Agile Process (Addison-Wesley Signature Series (Cohn)) by Kenneth S. Rubin (Author)
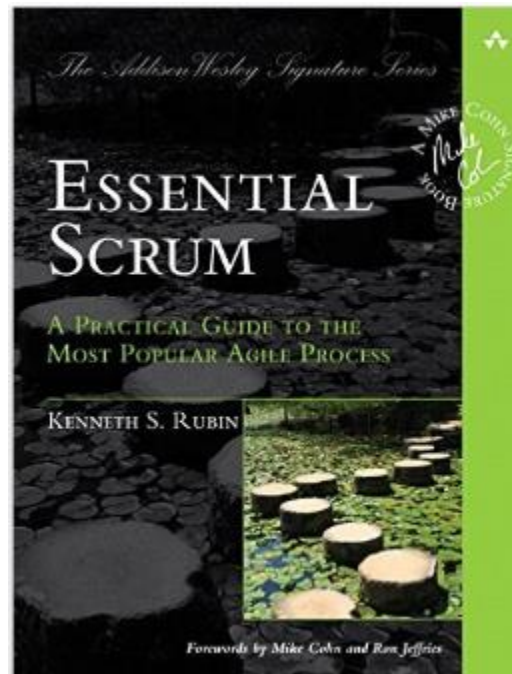
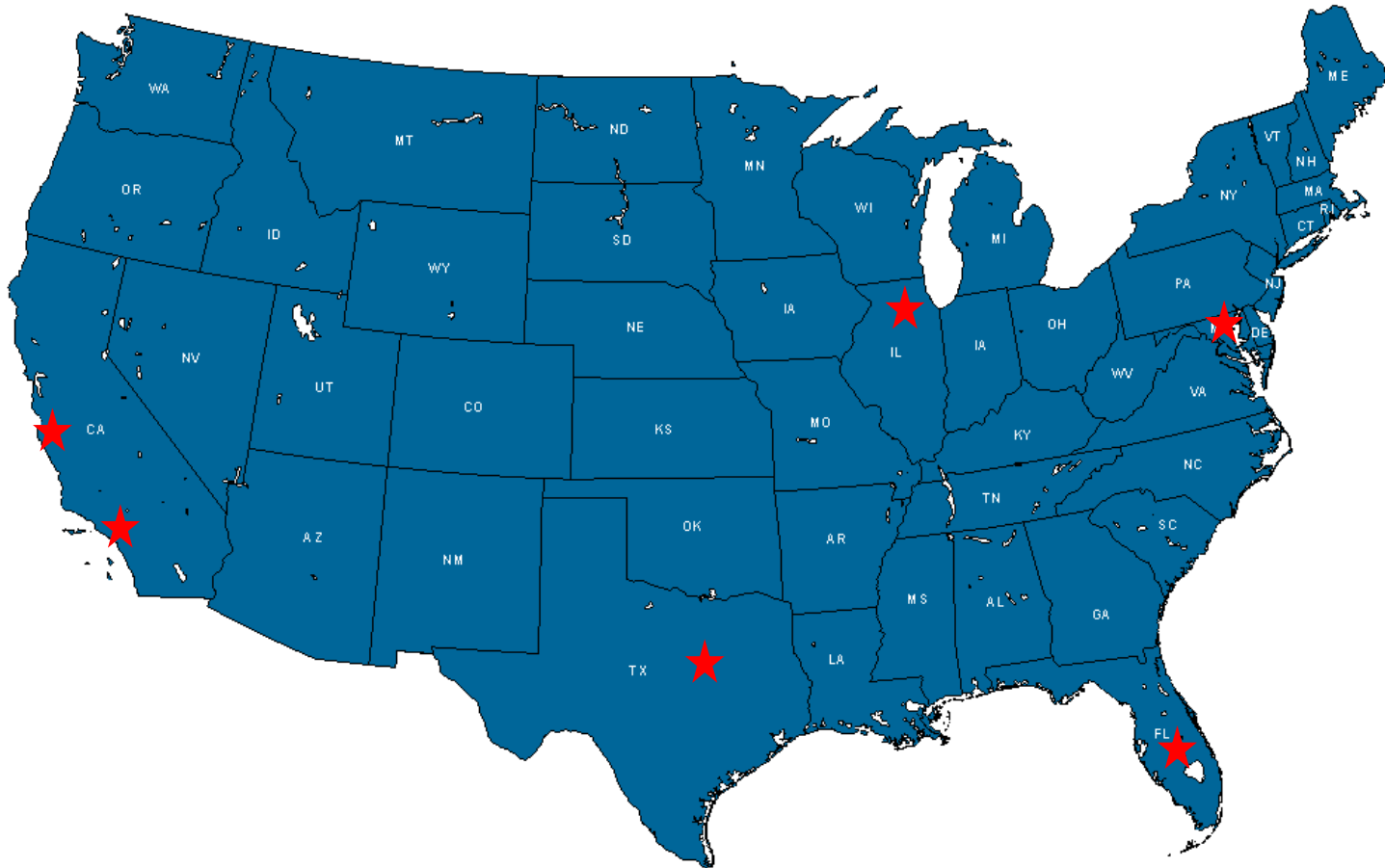## Our approach to getting started

- Agile 101 Training
- YouTube videos
- Find a Coach
- Pick Teams
- Decide Roles

- Recruit potential Scrum Masters
- Recruit Product Owners

- Bang out product backlogs, while learning TFS
- Figure out next step when we get there

Challenges

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Team members in three time zones

Organizing

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What we want to accomplish in Release 1

- **Support all existing functionality for Manufacturing and CAD integration in new system.**
- **Load Parts and Documents from legacy system and keep them in sync. The primary tool used for this function is eQube/MI.**

Our initial plan was to have three Scrum teams:
- **Manufacturing**
- **Design Data (CAD)**
- **ERP integration**

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Who is the Product Owner?

Product Owner

The challenge was to find a single person for each Scrum Team who was willing to define the Product Backlog, knowledgeable about the product, and could speak for everyone in our multi-campus coast-to-coast environment.

Organizing

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Who is the Scrum Master?

Scrum Master

We looked for people who could
- **Help the other team members with the Scrum process**
- **Advocate for the team and shield from external interference.**
- **Work to eliminate impediments to team's progress**
- **Don't Annoy! We're doing a lot of new things in new ways. A calming presence would help.**

Organizing

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The Development Teams

Dev Team

Dev Team

Dev Team

We did not have a pool of developers experienced with the technologies we were using (Teamcenter, eQube/MI, git). We tried to balance the experience levels across the teams.

The teams each had representatives for development, test and validation, and system administration.

We had some people as members of multiple teams. That became a problem, so we adapted.

A Sprint is a time-boxed period of one month or less during which the Development Team produces a useable, potentially releasable, product increment.

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How long is the Sprint?

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We started with a 4-week Sprint. That seemed too long, and out-of-sync with ~~what we were~~ hearing was the norm around the company.

Then we "adapted" to a two-week Sprint, which we thought was more the norm. We found that was too short, and we weren't ~~finishing our~~ Product Backlog Items. Plus, it was difficult to manage meetings with three Scrum Teams.

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How long is the Sprint?

Week	Time	Monday	Tuesday	Wednesday	Thursday	Friday
1	Morning	Team C – Backlog Refinement Continued (if needed) (10 AM) – 1 ½ hrs			Team B – Backlog Refinement (9 AM) – 2 hrs	
1	1-2 PM	Daily 15-minute Scrums				
1	Afternoon		Team C – Review and Retrospective (2 PM) - 1 ½ hr	Team C – Sprint Planning (2 PM) - 2 hrs		
2	Morning	Team B – Backlog Refinement Continued (if needed) (10 AM) – 1 ½ hrs			Team A – Backlog Refinement (9 AM) – 2 hrs	
2	1-2 PM	Daily 15-minute Scrums				
2	Afternoon		Team B – Review and Retrospective (2 PM) - 1 ½ hr	Team B – Sprint Planning (2 PM) - 2 hrs		
3	Morning	Team A – Backlog Refinement Continued (if needed) (10 AM) – 1 ½ hrs			Team C – Backlog Refinement (9 AM) – 2 hrs	
3	1-2 PM	Daily 15-minute Scrums				
3	Afternoon		Team A – Review and Retrospective (2 PM) - 1 ½ hr	Team A – Sprint Planning (2 PM) - 2 hrs		

Just Right!

Finally, we moved to a three-week Sprint. We could finish Stories, and scheduling meetings wasn't such a nightmare.

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Our Agile Scrum Tool

Although it is not an Enterprise standard, our sector is centering on Microsoft Team Foundation Server (TFS) for managing Scrum. It maintains:

- **Separate Team Areas**
- **Product Backlogs**
- **Sprint**
  - **Backlogs**
  - **Team membership and capacity**
  - **Tasks and the Task Board**
  - **Test Plans and Test Results for the Tasks**
  - **Burndown chart.**
- **Reports and Queries (e.g. Velocity Chart).**

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Early Mistakes

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- **We skipped Release Planning!**
- **We should have had a Sprint 0 for each development team where the environmental issues were ironed out.**

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Incorporating other Agile tools (trying anyway)

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We wanted to do more than just break the Product Backlog into Sprints. So, we wanted to include

- **Test driven development**
  - **Teamcenter private classes makes this a bit difficult.**
- **Pair programming**
  - **In our case, a learning tool for inexperienced developers.**
- **Test automation**
  - **So far only manual, but TFS tracked.**
- **Build automation**
  - **Semiautomatic creation of deploy packages.**
  - **Continuous integration is our goal.**

A Mid-Release Adjustment

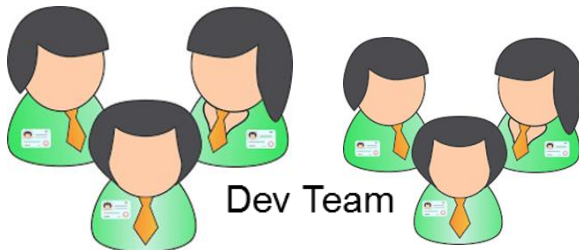Global Product Data Interoperability Summit | **2016**

Dev Team

Dev Team

Dev Team

After about five parallel Sprints, we decided that the Manufacturing and the Design Integration Development Teams had a lot of commonality and it made sense to merge them.
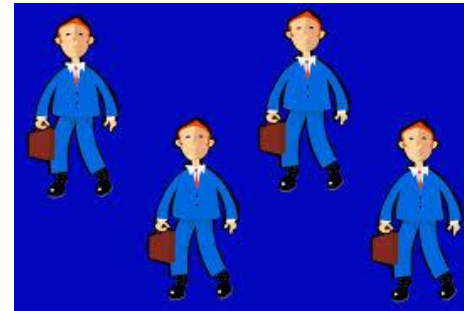
Dev Team

Dev Team

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A Mid-Release Adjustment

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Product Owner

Stake Holders

At that time we also rearranged roles, moving two former Product Owners to Stakeholders.

And, the Solution Architect, who really was the one who knows the application became, also, a Product owner.

Solution Architect / Product Owner

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Challenges

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How the Developers have taken to Scrum

- **Lots of additional meetings, especially if someone is on more than one team.**
- **Developers reporting to different management chains might have different levels of support.**
- **Many new things all at once: TFS, Teamcenter, git, eQube. Can be overwhelming.**
- **Scrum Lingo**

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Challenges

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Getting the Test and Validation Team members involved early. We want to avoid two weeks of inactivity and boredom, followed by a week of furious activity.

Challenges

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"Deliverable" Product at the end of the Sprint?

We have to really bend the definition of "Deliverable" for our two projects, especially the legacy data load.

Challenges

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Velocity and Burndown

- **Keeping remaining hours up-to-date**
- **How do we handle Stories we don't finish:**
  - **Split up into parts we did and didn't finish?**
  - **Just carry forward and average velocity?**
- **Try to make stories that better match the sprint capacity**

Challenges

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Breaking free from traditional patterns of behavior:

- **Someone has to be the boss vs team responsibility**
- **Reluctance to create tasks and assign to others**
- **Unit Manager Identity Crisis**
- **Upper Management still wants to track with traditional metrics (MS Project).**
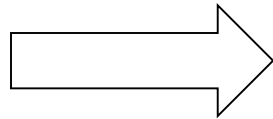
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Retrospective

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We are now eight months into this process. How has it been?

Retrospective

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Where are we on the path to DevOps?

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- Plan
- Code
- Build
- Test
- Release
- Deploy
- Operate
- Monitor

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