Agile Governance at Scale

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Agenda

- About me
- Context
  - Genesis of the effort
  - What Is Governance
  - Traditional vs Agile Governance
- Agile Audit Framework
  - Usage
  - Structure
- Agile Governance
  - Measure the Right Things
  - Avoid Common Failure Modes
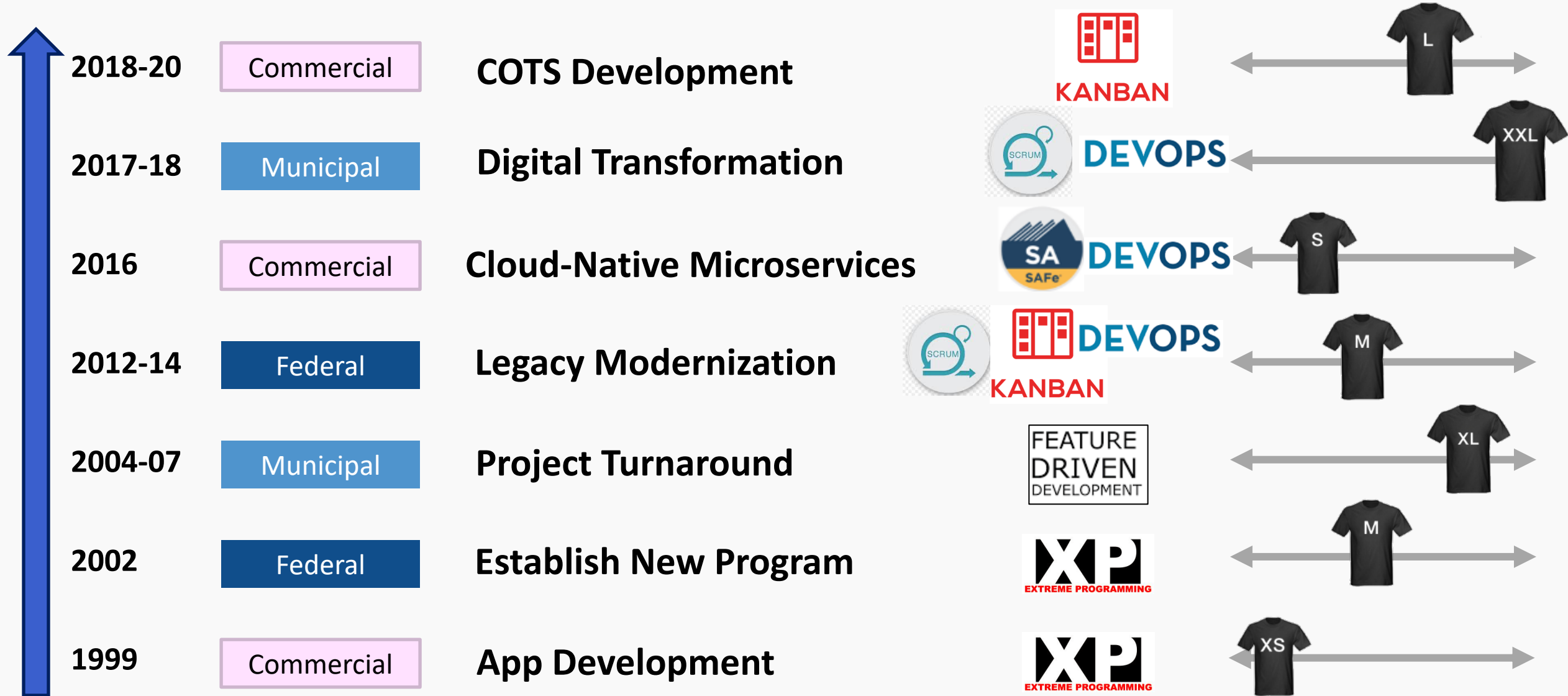 - Adopt Better Practices
  - Keep Track
- Key Takeaways
- Q & A

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CTO, Ariel Partners
AKT, KCP, KMP, CSM, CSP, CSPO,
ITILv3, PMI-ACP, PMP, LeSS, SAFe

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- Software Development since 1988

- Large Commercial & Government Projects

- Kanban Coach / DevOps Engineer

- Kanban Trainer / SpecFlow Trainer

- Performance & Scalability Architect

- Certified Ethical Hacker

- New York & Washington DC Area

Diverse Agile Experience

Year	Sector	Description
2018-20	Commercial	**COTS Development**
2017-18	Municipal	**Digital Transformation**
2016	Commercial	**Cloud-Native Microservices**
2012-14	Federal	**Legacy Modernization**
2004-07	Municipal	**Project Turnaround**
2002	Federal	**Establish New Program**
1999	Commercial	**App Development**

Context

Genesis of this Effort

- Creating Agile Auditing Framework for US Agency
- Agency Context
  - Lots of Oversight, including House Ways and Means
  - Large $100M+ Agile Efforts
  - Relatively New to Agile
  - Large, Diverse Group of Stakeholders
  - All 50 states
  - Significant Legacy Component

Governance and Oversight: Audit Effectiveness

Legislative , Regulatory Organizational goals

Program Performance, measures and effectiveness

Procurement Practices

PROGRESS and status

Reliable Budgeting

Program Value

Costs and Results

Access & Distribution of Public resources

Productivity Increases

Duplication, Overlap and conflict with other programs

Cost Decreases

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Agile Governance and Oversight

Why is oversight of an Agile projects more difficult?

Scheduling and Budgeting Challenges
- Lack of Detailed Plans Up-Front

Quality Assurance Challenges
- Reduced Emphasis on Documentation

Measurement Challenges
- Lack of Traditional Metrics such as Earned Value
- Unfamiliar, Subjective Metrics such as "Story Points"

Management Challenges
- Plethora of Agile methods and practices
- Diversity of Approaches
- Conflicting advice
- Rapidly evolving ecosystem
- Traditional sources such as PMBOK have not kept pace

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Traditional Versus Agile

What makes agile so different?

	Traditional	Agile
1	Planning with Accuracy and Precision	Planning with Accuracy and Adaptability
2	Predictive: Forecasting via Estimation	Empirical: Forecasting via Statistics and Probability
3	Adherence to Plan	Flexibility: Welcome changes/clarifications
4	Up-Front Requirements Gathering, Baselining	Direct, Continuous Customer Involvement
5	Documentation First	Automation First
6	Measure Major Milestones	Measure Continuous Flow of Value
7	Handoffs Between Defined Roles and Duties	Collaboration within and across teams, Cross-Training
8	Post-Mortem Lessons Learned	Inspection and Adaptation via Continual Retrospectives
9	Comprehensive Analysis, Design, Documentation	Lean Analysis, Design, Documentation
10	If something is risky and difficult, measure twice, cut once. Make sure to get it right the first time!	If something is risky and difficult, then do it constantly. Constant integration, constant refactoring, etc.

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Audit Framework
for Large-Scale Agile

Sources

- ❑ Digital Services Playbook
- ❑ Management and Oversight of Federal Information Technology (FITARA)

- ❑ TechFAR Handbook

- ❑ Biannual FITARA Scorecard

- ❑ Government Auditing Standards ("Yellow Book")
- ❑ Effective Practices and Federal Challenges in Applying Agile Methods
- ❑ Technology Assessment Design Handbook
- ❑ Organizational Transformation: A Framework for Assessing and Improving Enterprise Architecture
- ❑ A Framework for Assessing and Improving Process Maturity
- ❑ 10+ Congressional Reports

Sources

- PMBOK 6th Edition Agile Practice Guide

- CMMI v2.0 Model At-A-Glance
- How to Truly Scale Agile Development In the Enterprise – with CMMI
- Using Agile with Scrum and CMMI

- DIB Guide: Detecting Agile BS
- DIB Ten Commandments of Software
- DIB Metrics for Software Development

- Agile Development & Delivery for Information Technology Instruction Manual

Project Scorecard

What is our level of risk?

1. Project Integration Management
2. Project Scope Management
3. Project Schedule Management
4. Project Cost Management
5. Project Quality Management
6. Project Resource Management
7. Project Communications Management
8. Project Risk Management
9. Project Procurement Management
10. Project Stakeholder Management

PMBOK Knowledge Areas

FITARA 9.0

Agency	Nov 2015 Grade	May 2016 Grade	Dec 2016 Grade
USDA	D	C	C-
DOC	B	B	B+
DOD	D	D	D+
Ed.	F	D	C+
Energy	F	C	C-
HHS	D	D	D-
DHS	C	C	B-
HUD	D	D	C-
DOI	C	C	B+
DOJ	D	C	B-
DOL	D	C	C-
State	D	D	D-
DOT	D	D	F+
Treas.	D	D	C-
VA	C	C	B+
EPA	C	C	B+
GSA	B	C	B+
NASA	F	F	C+
NSF	D	D	C-
NRC	C	C	C-
OPM	D	C	C+
SBA	D	D	D-
SSA	D	C	B+
USAID	D	D	D-

	Project DCAPS
Agile Methods & Frameworks (AMF)	D
Agile Requirements (AR)	F
Forecasting, Scheduling & Planning (FSP)	C
Metrics & Tracking (MT)	F
Risk Management (RM)	D
HR Management / Staffing (HR)	A
Human Centered Design (HCD)	C
Quality and Test Automation (QA)	D
DevOps and ALM (DO)	C
Agile Architecture (AA)	D
Procurement Management (P)	B
Overall	C-

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Governance and Oversight Framework

Control Areas

- Agile Requirements
- Metrics
- HCD
- Forecasting
- DevOps
- Quality

Critical Elements

Control Activities

Control Techniques

Audit Procedures

- Warning Signals
- Comparison
- Inspection
- Key Questions
- Measurement
- Observation
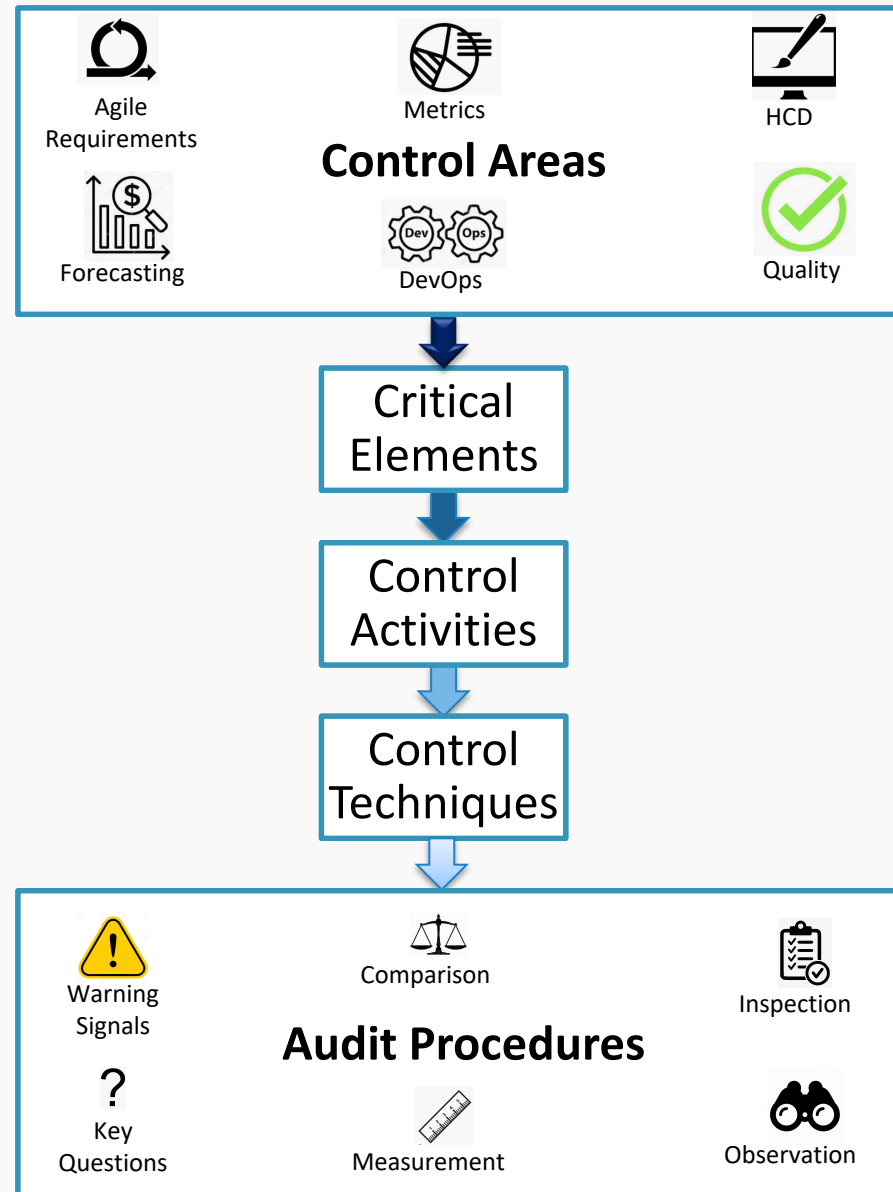
Control Areas & Critical Elements

- **Agile Methods and Frameworks (AMF) Controls**
  - Critical Element AMF-1. Ensure Project Team uses an Appropriate Team-Level Agile Method
  - Critical Element AMF-2. Implement Effective Team-Level Agile Controls
  - Critical Element AMF-3. Ensure Project Team Uses an Appropriate Scaled Agile Method
  - Critical Element AMF-4. Implement Effective Scaled Agile Controls
- **Agile Requirements (AR) Controls**
  - Critical Element AR-1. Ensure Project Team Has a Documented Vision and Overall Strategy
  - Critical Element AR-2. Implement Effective High-Level Scope Controls
  - Critical Element AR-3. Implement Effective Roadmap Controls
  - Critical Element AR-4. Implement Effective Requirements Elaboration & Maintenance Controls
  - Critical Element AR-5. Implement Effective Scope Management & Reduction Controls
- **Forecasting, Scheduling, & Planning (FSP) Controls**
  - Critical Element FSP-1. Ensure Project Team Establishes Initial Project Forecast
  - Critical Element FSP-2. Implement Effective Progress Tracking Controls
  - …

Control Activities, Control Techniques, Audit Procedures

Control Activities	Control Techniques	Audit Procedures
AR-1.1 Project has a documented vision	AR-1.1.1 Overall Objectives and Goals for the Project Have Been Documented	- Project Vision artifact exists - Appropriate level of detail - All team members are aware - Evidence of being actively maintained
	AR-1.1.2 Business Drivers for Project Have Been Documented	- Vision describes business drivers, goals, and objectives - Goals include reasoning and justification - Goals are ordered - Target dates and cost, any budgetary or time considerations - Evidence of trade-off decisions informed by drivers
	AR-1.1.3 High Level Functions for Project Have Been Documented	- Vision includes high-level business functions with context - Functions out of scope are listed - Reasonable cardinality (dozens / hundreds, not thousands)
	AR-1.1.4 Technical & Business Constraints Have Been Documented	- Major Integrations, platform requirements, standards listed - Business constraints are listed (e.g. data center, place of performance)

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Governance for Large-Scale Agile

Highlights

1. **Measure the Right Things**
   - Broken Windows Strategy
   - Balanced Metrics
   - Human Centered Design
   - Testable Architecture
2. **Avoid Common Failure Modes**
   - Agile Methodology Failures
   - Using Velocity for Long-Range Forecasting
3. **Adopt Better Practices**
   - Kanban Flight Levels for Dependency Coordination
   - Monte Carlo Simulation Based Forecasts
4. **Keep Track**
   - We Need a High-Quality Repository of Reference Data

Agile Governance
1. Measure the Right Things

Broken Windows Strategy

Sweat the Small Stuff

Code Does Not Meet Style Guide	→	Linting / Code Static Analysis
Huge Product Backlog	→	Query: Find Old & Untouched Stories
Orphan / Unlinked Items in ALM Tool	→	Query: Find Badguys ("Lint" for ALM)
ALM Has Poor Usability / Friction	→	Count # Clicks, # Defaultable Items without Default Value
Rubberstamp Reviews	→	Count Short / Blank Peer Reviews
Duplicative / Copy Paste Code	→	Detect Duplicates, Watch For Trend of Code Size to Flatten

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Balanced Metrics

Balance Armor & Mobility

Sprint Velocity & Sprint Story Delivery Count	**+**	Undelivered Story Points Undelivered Story Count
Average Throughput	**+**	Average Lead Time
Number of Unit Tests	**+**	Build Time
Code Coverage	**+**	Functional Coverage
Deployment Frequency	**+**	Failed Deployment Down-Time

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What are some key DevOps Metrics?

Google DORA

Change Failure Rate (CFR)
- Number of changes that result in failure
- An indicator of how well we are doing manual and automated testing

Mean Time to Recover (MTTR)
- Downtime divided by number of incidents
- Decreases may indicate our DevOps pipeline is better able to deploy things more quickly and safely

Mean Lead Time for Changes (MLT)
- From Code commit to running successfully in prod—how long on average does it take?

Deployment Frequency (DF)
- Number of deployments per day

PERFORMANCE METRICS

SOFTWARE DEVELOPMENT	SOFTWARE DEPLOYMENT	SERVICE OPERATION
Lead Time	Change Fail	Availability
Deployment Frequency	Time to Restore	

FOUR KEY METRICS

https://www.youtube.com/watch?v=Fzu5Ry5lU8c
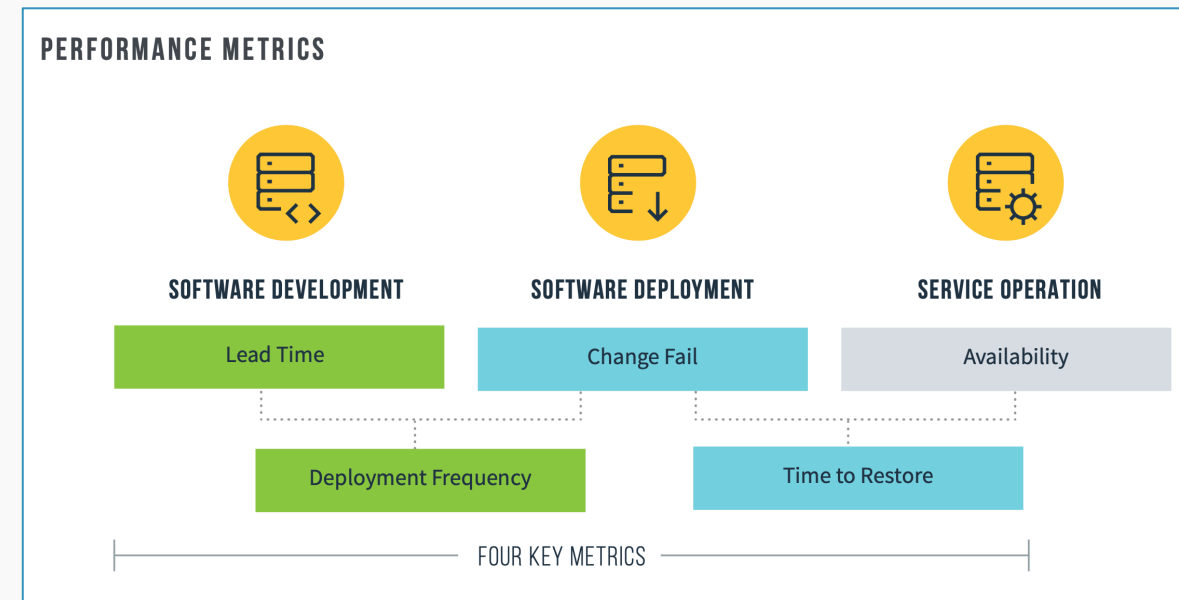
Human Centered Design

Know Your Customer

- How Many Team Members Have Participated in In-Context Immersion?

Testable Architecture: APIs

The More Testable an Architecture Is, The Better It Is

Testability Brings

- Instrumentation
- Scalability
- Pluggability
- Performance Tunability
- Tests-as-Documentation
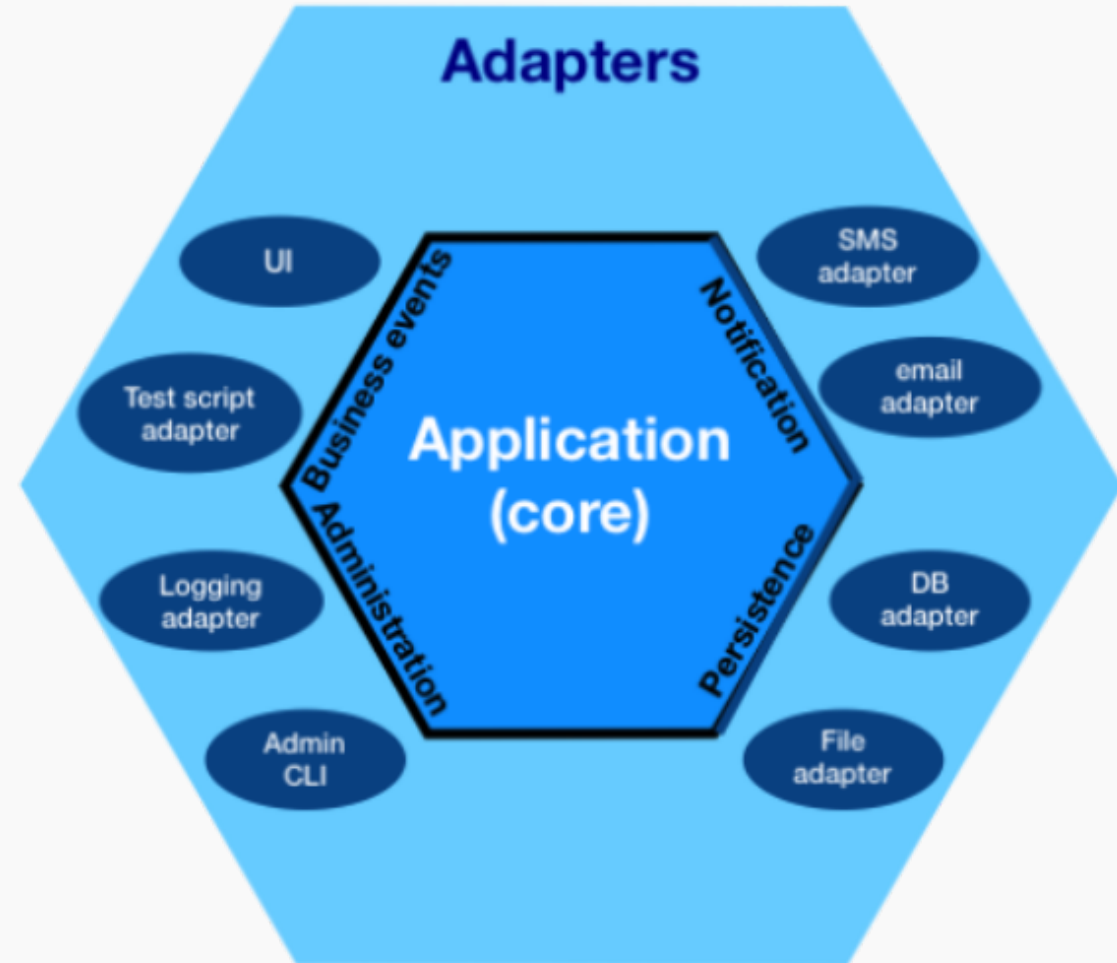
Agile Governance

2. Avoid Common Failure Modes

Common Failure Modes

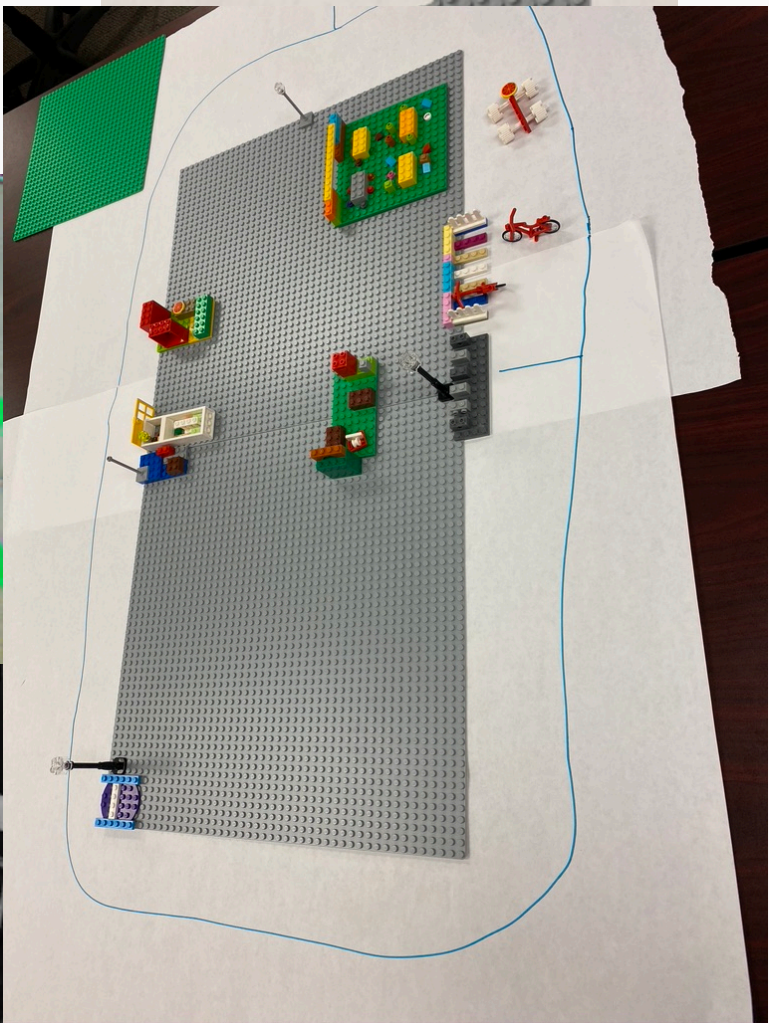Mixing and Matching Disciplines

Skipping Inconvenient or Difficult Practices

Mandating Advanced Practices w/o Adequate Prep

Common Failure Modes: Using Velocity for Long-Range Forecasting
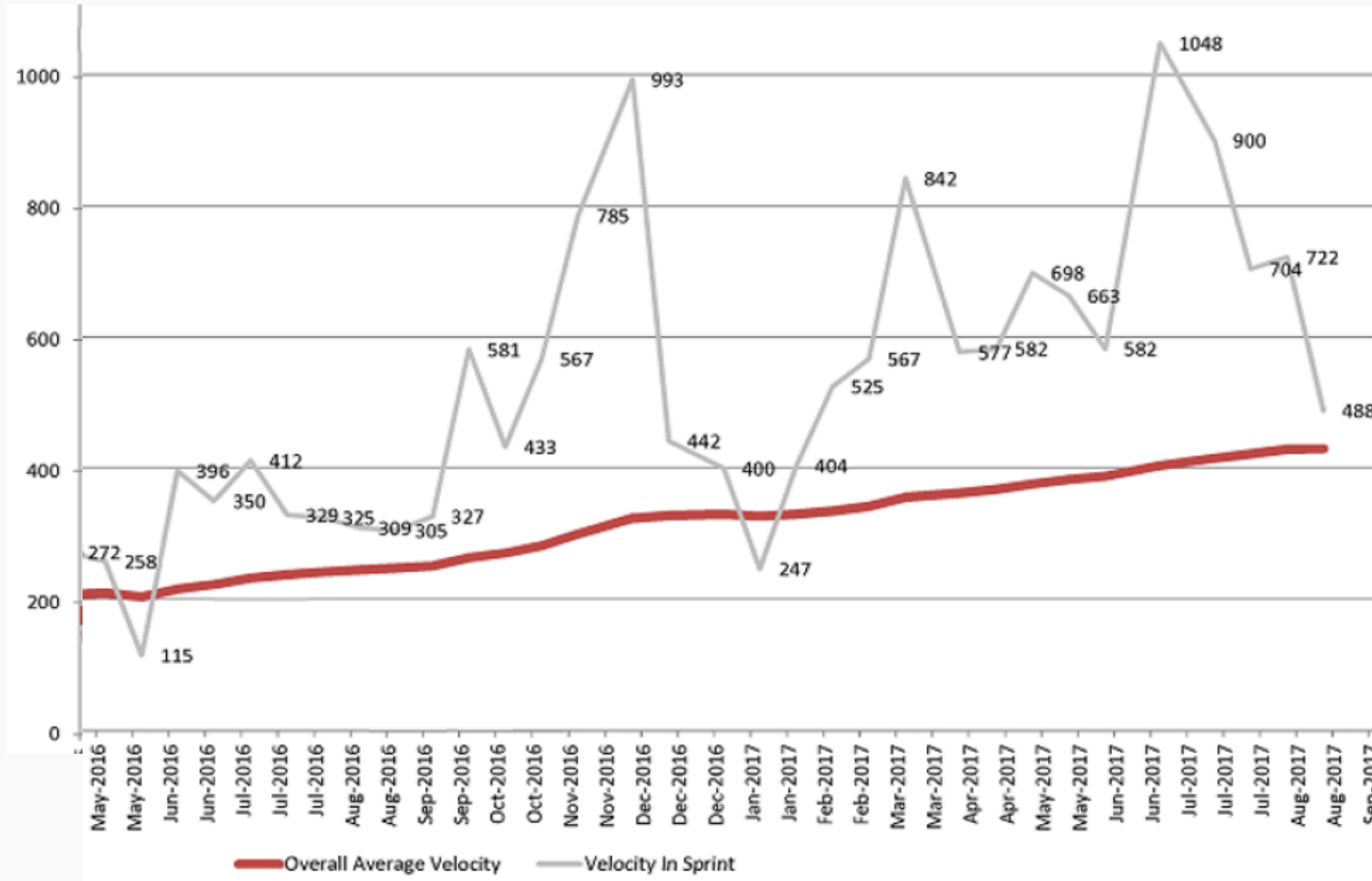
Why Not Use Story Point Estimates for Long-Range Forecasting?

Agile Governance
3. Adopt Better Practices

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Dependency Handling The Hard Way

Method One: Giant Up-Front Meeting
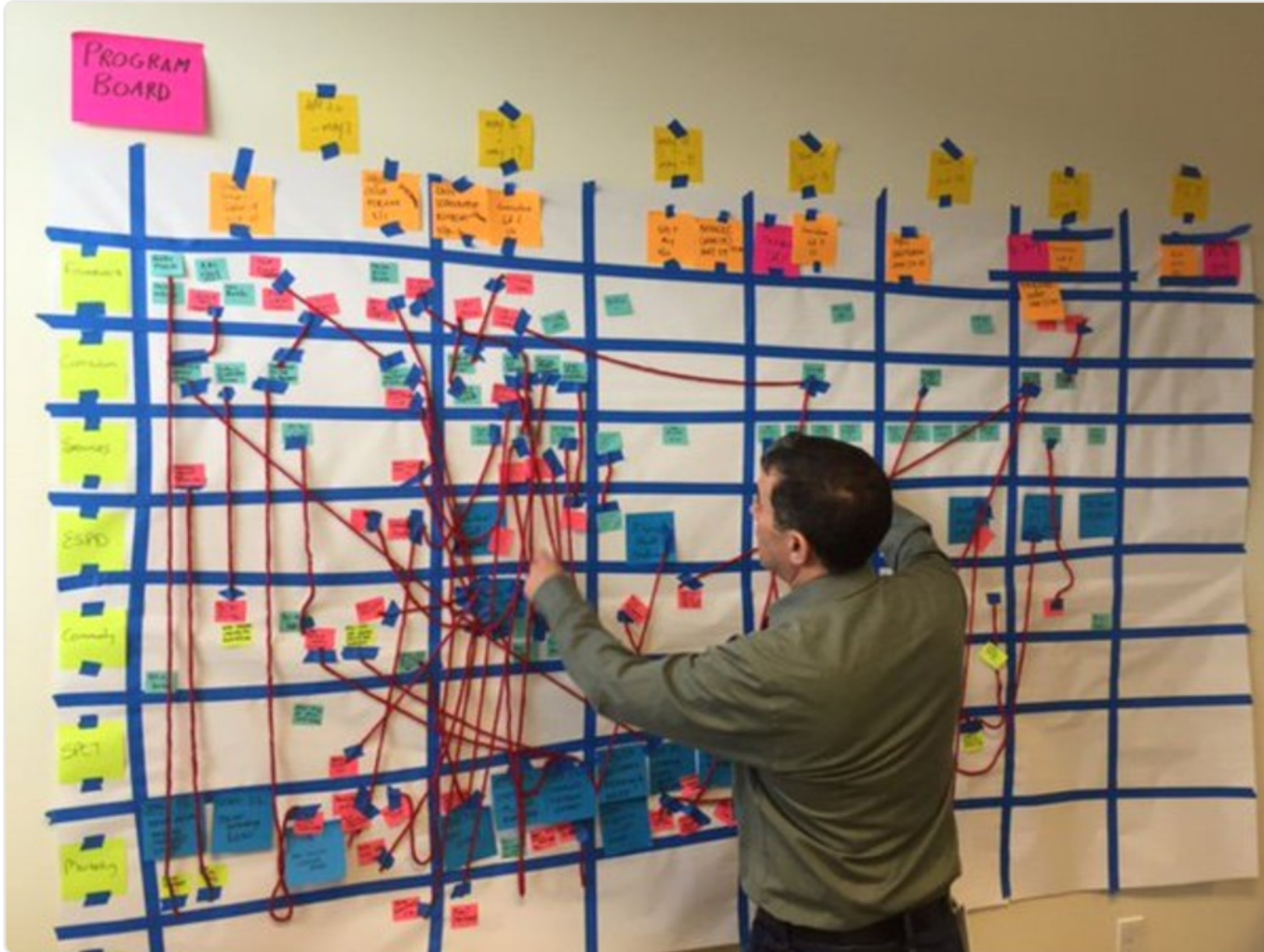
- Opportunity Cost of Large Meeting
- Tough to Detect all Dependencies Up Front
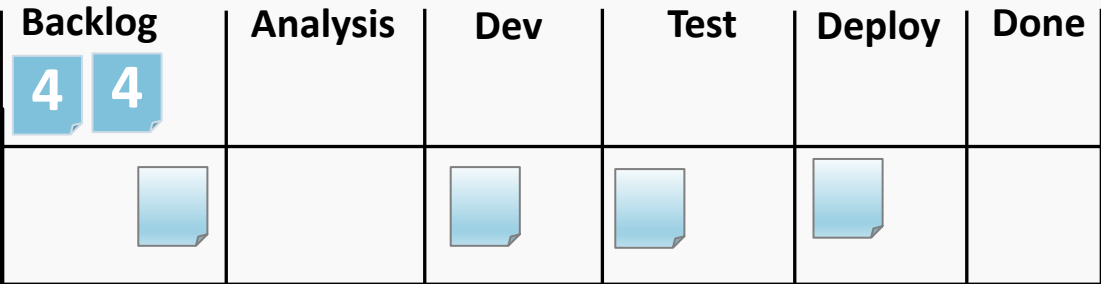- Significant Planning & Management Overhead

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Easier Dependency Handling: Kanban Coordination Board
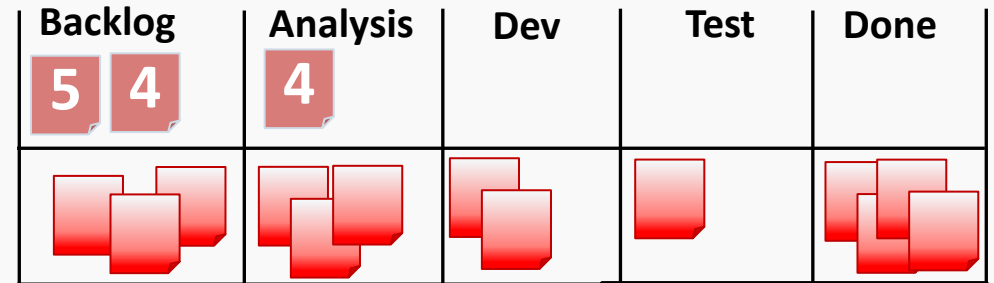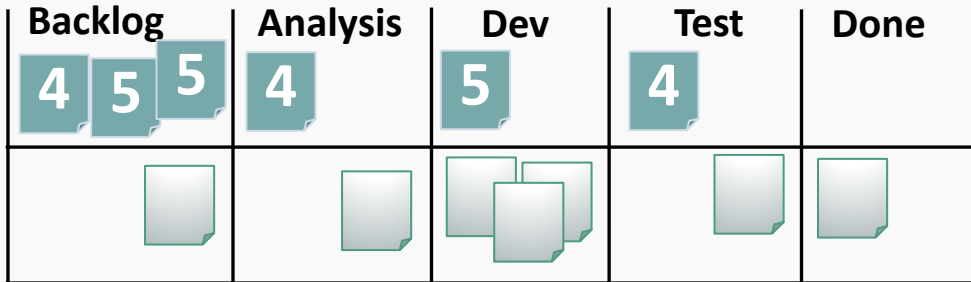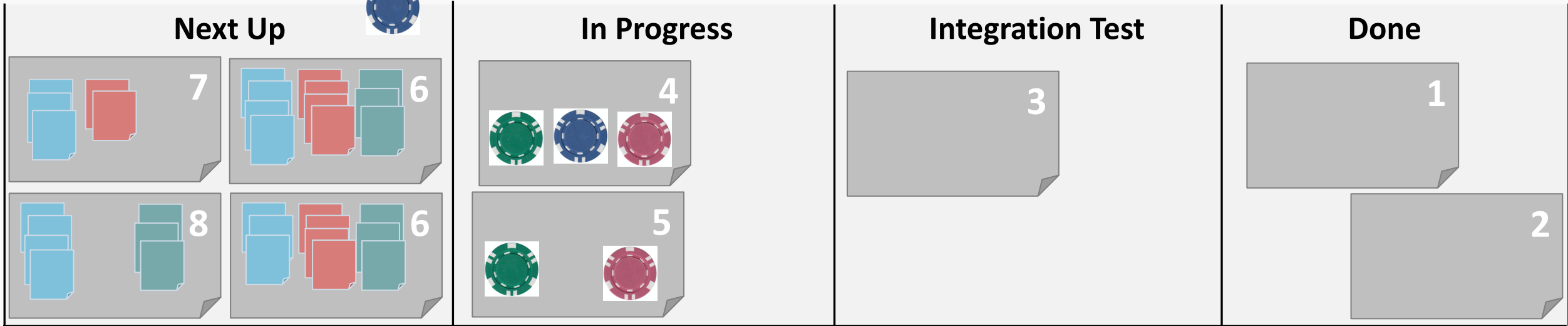
Portfolio Board Example

- Ties strategy to execution
- Simplifies trade-off analysis
- Facilitates Hypothesis-Driven Development (HDD)
- Enables Business Agility

Forecasting

Modern Methods Provide Improved Predictive Power

Feature	Total Stories	Freeze Date	85% Completion Date	Completion Likelihood	Stories Remaining
Carryover from previous PI	32	1/31/17	1/25/17	37.42%	12
Child turning 18	20	1/31/17	5/12/17	24.56%	5
Age 18 redetermination	1	1/31/17	1/10/17	99.99%	1
Auto cas assignment	35	1/31/17	1/3/17	99.99%	35
FiscalSearch	4	1/31/17	1/3/17	99.90%	4
Hourly invoice/pay per action	24	1/31/17	2/22/17	28.46%	8
Link Family cases	27	1/31/17	1/17/17	99.94%	27
3rd party child contacts	6	1/31/17	2/3/17	80.58%	5
Multi-language insert	17	1/31/17	12/21/16	99.99%	17
Enhanced Referrals	188	1/31/17	3/24/17	25.06%	47
Assistance Scope	5	1/31/17	12/21/16	99.99%	5
Workload sharing	12	1/31/17	1/17/17	99.99%	12
MER - Auto match vendors	10	1/31/17	12/21/17	0.74%	10
Resend correspondence	63	1/31/17	9/12/17	0.01%	63
Re-openings	6	1/31/17	2/8/17	99.90%	6

- Use Reference Class Forecasting
- Address Outliers, Increase Predictability
- Use Monte-Carlo Simulations to Predict Likelihood of Hitting Target
- Proactive: Few Surprises!
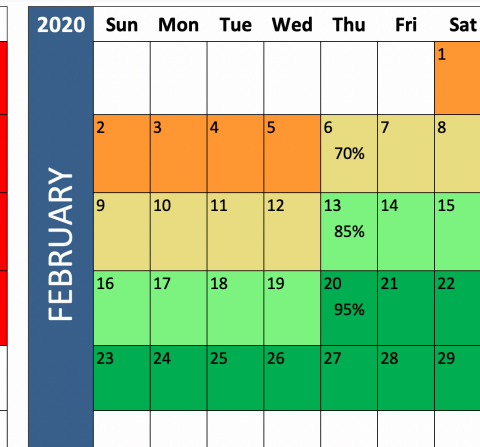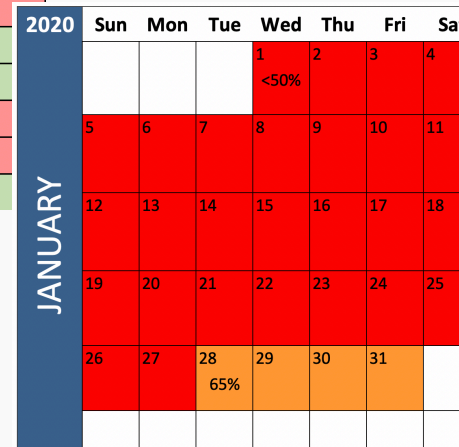
MCS-powered release dashboards expose areas of higher risk early in a release, enabling them to be addressed proactively
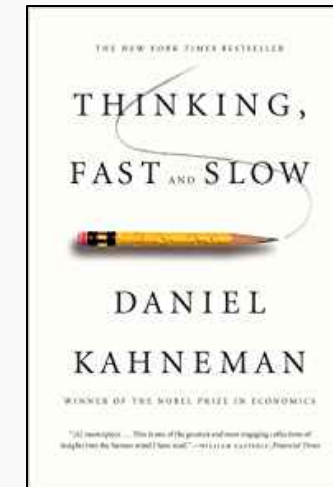
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Agile Governance
4. Keep Track

Keeping Track: Reference Class Forecasting

- Degree of Complexity: Stakeholders, Interfaces, Legacy
- Agile Methods & Practices Used
- Retrospective Notes
- Rate of "Dark Matter" Expansion
- Cumulative Flow Diagram
- Test Coverage Curve
- Other Metrics
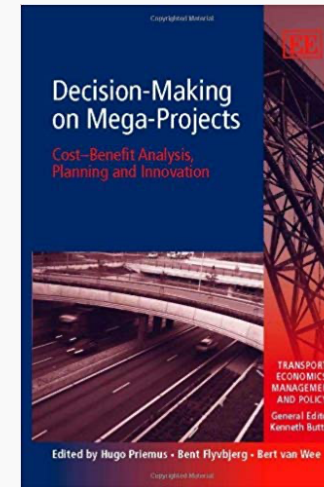
2008

2013

Key Takeaways

- Current State of Large-Scale Agile Governance is Woefully Inadequate
- Fixing This Requires A New Approach
  - Measure the Right Things
  - Avoid Common Failure Modes
  - Adopt Better Practices
  - Keep Track
- Benefits: Lower Risk for Large-Scale Software Development

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Selected Training Offerings

Class	Duration and Description
1. Fundamentals of Agile	(2-day) Overview of scrum, Kanban, scaling, HCD, DevOps
2. Human Centered Design	(2-day) Design thinking, journey maps, personae, How Might We (HMW), stakeholder mapping, empathy mapping, behavioral economics
3. Professional Scrum	(1-day) Team-level scrum
4. AKT	(1-day) Team-level Kanban
5. KMP I and II	(4-day) Certification course for Kanban Management Professional (KMP)
6. Scaled Scrum	(1-day) Overview of LeSS, SAFe, Nexus, Scrum@Scale
7. Scaling with Kanban	(1-day) Overview of flight levels, portfolio Kanban, managing dependencies with coordination boards, Kanban Maturity Model (KMM)
8. Agile Requirements	(1/2-day) User story workshops, story splitting
9. Agile Estimation, Metrics and Forecasting	(1/2-day) Forecasting using Monte Carlo simulation, rightsizing, NoEstimates, t-shirt, story points
10. Agile Architectures	(1/2-day) Design patterns for testability, manageability and legacy migration including Strangler and Hexagonal patterns.
11. Application Lifecycle Management (JIRA or VersionOne)	(1/2-day) Power user's guide to using advanced features, reporting, querying, import/export. Variants for both VersionOne and Atlassian JIRA.
12. Agile Automated Testing	(1/2-day) Test-driven, behavior-driven, acceptance-test-driven, hypothesis-driven development, traceability, reporting
13. DevOps Foundations	(1/2-day) Overview of DevOps and DevSecOps
14. Agile for Leaders and Executives	(1 day) Seminar for leaders and executives leading digital transformation, reviewing mindset and behaviors for cultural shift and connecting strategy to execution.

About Ariel

Training Offerings

- Fundamentals of Agile
- Agile for Leaders & Executives
- Kanban Management Professional
- Professional Scrum
- Human Centered Design
- BDD With Cucumber Acceptance Testing
- Agile Estimation, Forecasting, & Metrics
- Agile Requirements

Other Offerings

- Digital Transformation
- Cloud Native App Development
- Agile / Kanban Coaching
- DevOps Jumpstart
- Compliance As Code
- Test Automation Jumpstart
- Legacy Modernization
- JIRA Jumpstart