ATARC Federal DevOps Summit

DevOps Transformation: Critical Success Factors

Pamela K. Isom
Director, Application Engineering and Development
Office, Chief Information Officer
United States Patent and Trademark Office

28 June 2017

UNITED STATES
PATENT AND TRADEMARK OFFICE
uspto

AGENDA

- Update: USPTO DevOps Journey
- DevOps Transformation: 3 Success Categories
- 10 Critical Success Factors
- Summary
- Acknowledgements
- Q&A

Update: USPTO DevOps Journey

1980-1990

Automated Information Systems

- Wouldn't Scale Easily
- Lack of High Availability or Redundancy
- Platform/OS/Hardware Dependent
- Numerous Single Points of Failure
- Waterfall

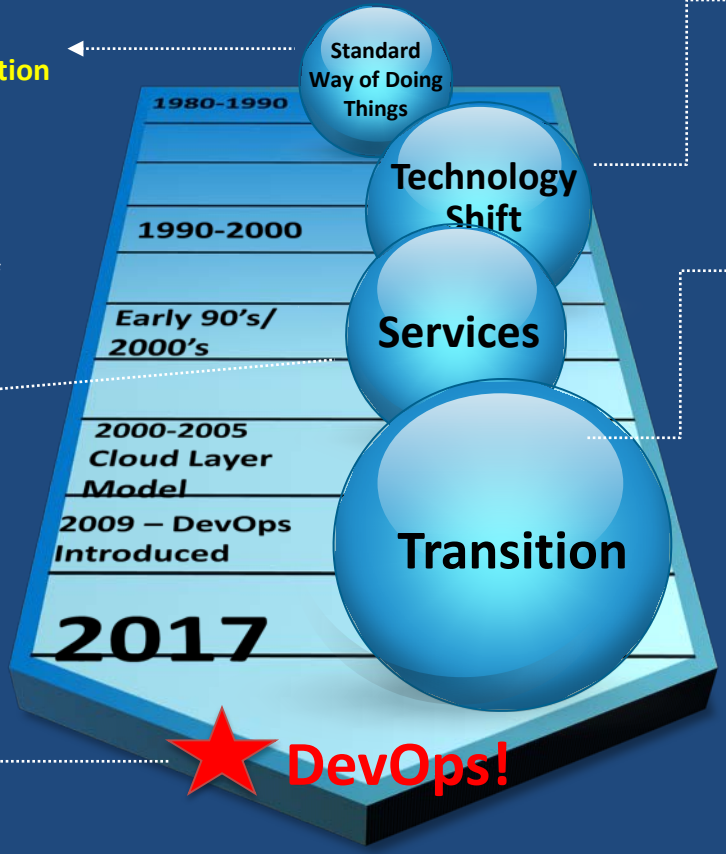
Late 90's/2000's

Service Oriented Architecture

- Virtual Environments
- Dynamically Scalable
- High Availability
- Redundancy across Data Centers
- No Single Points of Failure
- User Centered Design
- Agile and Extreme Development

Top Benefits

1. Rapid Feature Delivery
2. Reduced Costs
3. Increased Quality
4. Improved Predictability



1990-2000

Technology Shifted

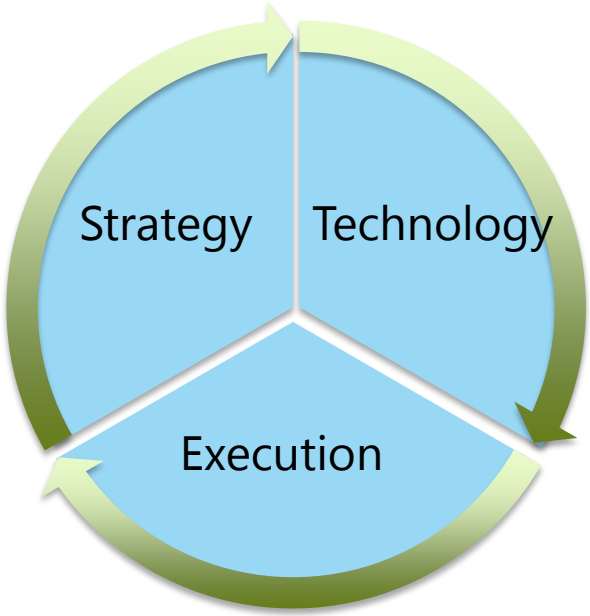
- Configuration Management
- Continuous Build & Release
- Automated Testing
- Shift to Commodity HW
- Spiral Development

Where are We?

- 82.3% Virtualized
- Agile Scrum
- Virtual Management
- Dynamic Scaling
- Refining 24x7x365 Ops
- Automated Builds
- Automated Testing
- Starting Blue/Green Deployments

DevOps Transformation

Three (3) Success Categories



Strategy

DevOps requires a well thought out and meaningful strategy

➢ Critical Success Factor (CSF) #1, **Strategic Playbook:**

- Establish achievable **goals**, iterative **accomplishments**.
- Deliver business solutions **that matter (** positive ROI **)**.
- Normalize **Faster Quality** Outcomes.
- Apply **continuous** principles.
- Exercise **One team** ownership.
- **Eliminate Waste.**

- CSF #2, **Collaboration**:
  - We cannot perform in isolation
  - Communicate and team across agencies, business units and offices

  Examples:

  Formation of the **DevOps Council**; cohesive DevOps activities

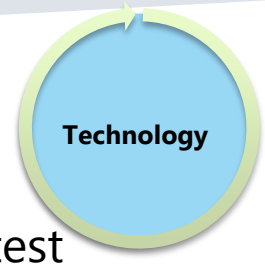
- CSF #3, **Culture:**
  - Know and Recognize talents, grow capabilities, erase fear

  Examples:

  Acknowledge **achievements** and **grow together**
  Sharpen **systems integrator** roles/responsibilities/**governance**
  Increase government (**in house**) development
  Improve vendor accountability

Technology

- CSF #4, **Selective Technologies:**
  - Choose technologies based on use case(s)



- *CSF #5,* **Automation treated like Software Engineering:**
  - Write Once – Use everywhere

  Examples: Use Common Library and Features to build scenarios to test workflows; Leverage and contribute to "Open Source".
  - Improve quality, reduce errors via Automated Tests and Rapid releases

  Examples: Quality Code Coverage, Canary Pipeline (+ measurements)

- CSF #6, **Sound Architectural Decisions:**
  - Apply Configuration and Infrastructure as Code
  - Integrate Data Science (see next slide)
  - Enterprise Architecture Alignment

  Examples: Containers, Web Tracking/Instrumentation data, Configuration Management

Data Science & DevOps

Technology

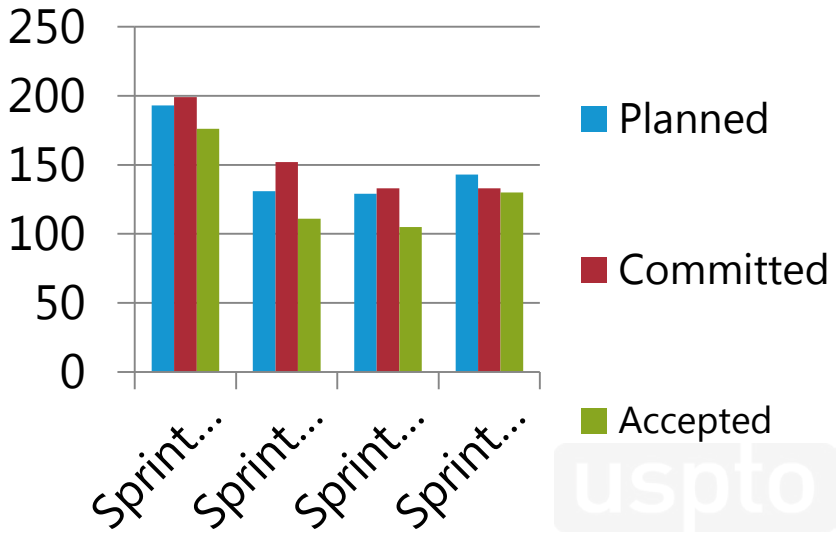
- In what ways can we apply data science to improve Patent, Trademark and/or OCIO Quality?
  - Make meaningful, measurable decisions (data driven)
  - Detect anomalies (inconsistencies) in work products
  - Measure training impacts
  - Identify and prevent problems before they become systemic - sleep on through the night
  - Data driven requirements – based on software usage; are these requirements meaningful to the business?

Issue high quality patents, hard to fix after issued – let's get it right the first time.

Execution

- *CSF #7, **Performance measures:***
  - Balance **measures** of features, velocity, and technical debt to effectively track performance
  - Proactively monitor **progress/impacts** towards viable product

ID	Points		Accepted Points %
	Preliminary	Current	
FE4698	n/a	8	100%
FE4712	50	80	80%
FE4636	220	69	100%
FE4573	50	47	100%
FE4731	50	30	100%
FE4733	50	26	100%
FE4732	50	82	85%
Technical Debt			
FE4705	20	26	100%
FE4723	150	150	100%
FE4711	20	26	90%



➢CSF #8, **Business Value Logging:**

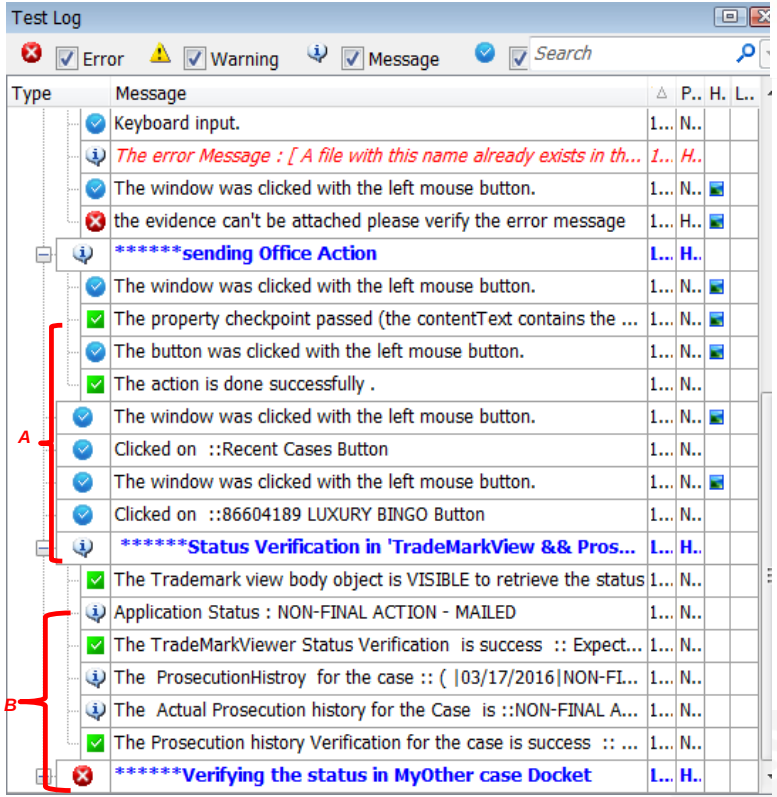
Logs show “human readable” messages to confirm verification, validation and traceability.

a) Verification – Proves the existence of a button and its selection

b) Validation - Proves that selecting the button produces the correct results

c) Traceability = quicker root cause problem resolution

Instrumentation, everyone benefits!



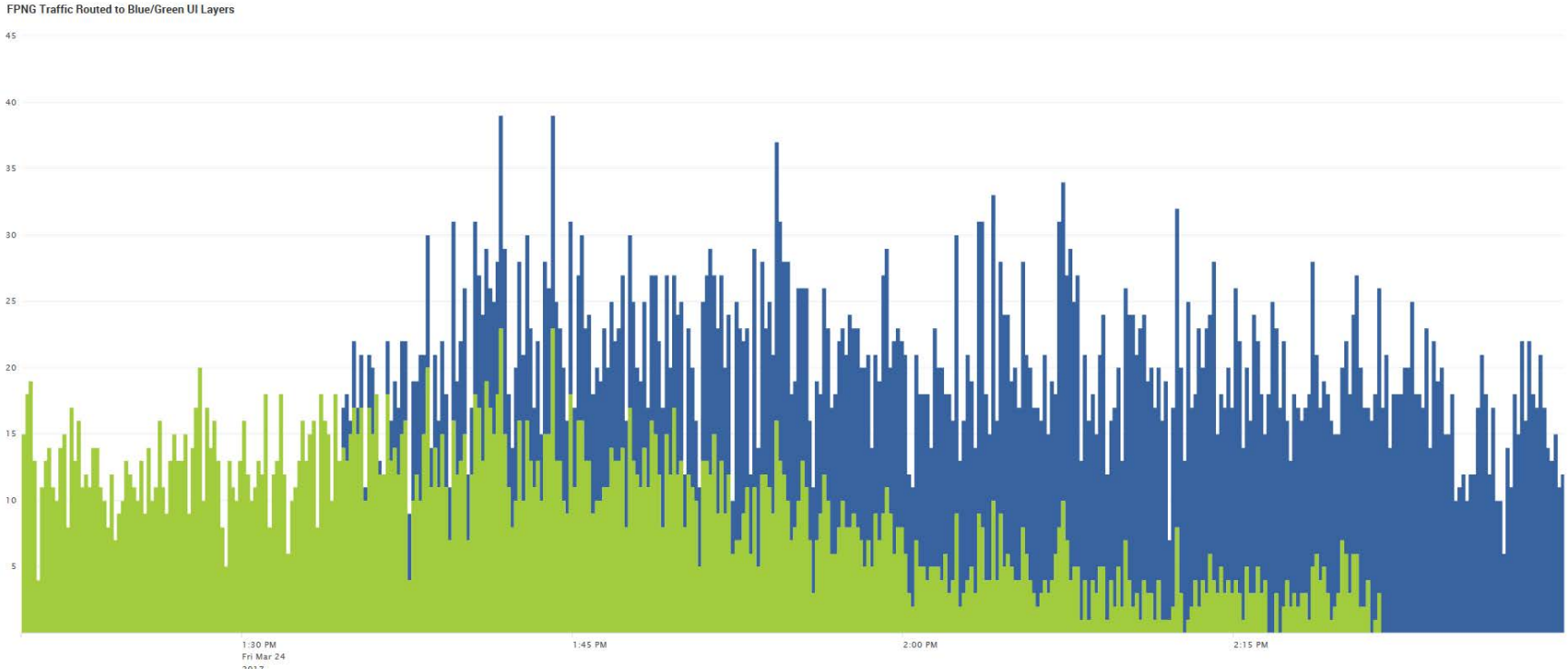
- *CSF #9,* **Security Now:**
  - Address Security in planning cycles and in sprints
  - Don't wait, do it now.

- *CSF #10,* **Continuous Principles:**

In a DevOps environment, these activities are ongoing	
Learning	Process improvements
Development	Delivery
Integration	Deployment
Monitoring	Growth

Continuous Monitoring - Example

Blue/Green Environments are essential to DevOps



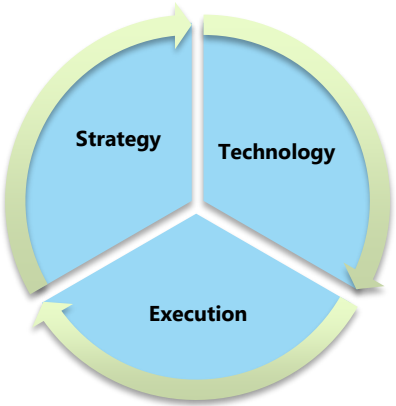
Seamless Deployments

Reduced Downtimes

Summary

Three (3) Success Categories

Ten (10) Critical Success Factors



Effectively Transforming your DevOps Organization

Acknowledgements

“DevOps is more than a slogan or rallying cry at USPTO, its our passion and way of life”.

Special thanks and recognition to some contributing team members who enable our DevOps delivery each and every day:

Ordered by last name
Tom Beach, Ted Green, Kisha Harvey, David Henderson, Ramesh Pai, Gardy Rosius, Bob Simms, Kirsten O’Nell, Calvin Wallace, Scott Williams, Joe Wolf, Jayu Wu

Q&A

UNITED STATES PATENT AND TRADEMARK OFFICE
DEPARTMENT OF COMMERCE