Digital Information Manufacturing

SPC, Value Stream Mapping, Lean and DevOps
Lee Thompson - CTO MorphLabs
About Lee

• 10 years of distributed control systems design, implementation, and integration

• 13 years of online financial services at E*TRADE (dev, arch, and ops)

• Advisor to DTO Solutions, Exist, MaestroDev

• Blogger at http://dev2ops.org

• CTO at MorphLabs
DevOps contributor...

- Fully automated provisioning paper: 10/09
- OpsCamp Austin: 01/10
- O’Reilly Velocity Online: 03/10
- Google group “devops-toolchain”
- OpsCamp SF: 05/10
- O’Reilly Velocity presenter 2010 and 2011
About my sponsor!
DevOps intro

I want change!

Wall of Confusion

I want stability!

Development

Operations

@damonedwards
DevOps intro

Wall of Confusion

Development  Operations

@damonedwards
DevOps intro

Dev Tools → Wall of Confusion ← Ops Tools

@damonedwards
DevOps intro

ah ha!

Biz

Agile Development fixes this

Dev

DevOps fixes this

Ops

ka ching!

@damonedwards
Development Drivers

- Lack of visibility into production tools and configuration to reliably effect change
- Schedule slippage due to deployment problems which can’t be produced in dev environment
- Lack of understanding in operations of application nuances and ideal utilization
- Release process awkward and meeting intensive
Operations Drivers

- 80% of all production outages are related to change ("Visible Ops")

- Developers can’t support scale, uptime, security initiatives

- Developers apply configuration changes manually without deployment automation in mind

- Over allocating Ops staff to app release projects
Lots of time on Deploy!

Data Source: Deepak Patil, Microsoft Global Foundation Services via James Hamilton (Amazon Web Services)
App Control “points”

- Webhits/sec, latency
- Firewall MBits/Sec
- Auth Success/Fail per Second, latency
- Transactions Second, latency
- Service Queue Depths
- App errors/sec by type
- Users
Digital Info Manufacturing

- Almost everyone has monitoring in their technical operations
- Almost no one has control
- If your business is data, isn’t your application manufacturing that data?
Control Toolchain

- Control Toolchain
- Measurement Instrumentation
- System
- Charting, History, SPC
- Eventing, Alarm Mgmt
- Runbook Automation

Diagram: Utility Water System with temperature (23.12 degC), level (0.22 m), and pressure indicators (0.29 Bar and 0.14 Bar) connected to Filtered Water.
SPC Control Charting

Rule 1: Any point falls beyond 3σ from the centerline (this is represented by the upper and lower control limits).

Rule 2: Two out of three consecutive points fall beyond 2σ on the same side of the centerline.

Rule 3: Four out of five consecutive points fall beyond 1σ on the same side of the centerline.

Rule 4: Nine or more consecutive points fall on the same side of the centerline.
Value Stream Mapping

Annual Production Plan → Production Control

Market Forecast → Customer A, Customer B

Weekly delivery schedule → Daily schedule

Production Control

Supplier 1, Supplier 2

Milling: 2 people, C/T = 2 min, C/O = 2 hr, Uptime = 74%, Haz. Waste = 5 lbs

Welding: 2 people, C/T = 4 min, C/O = 3 hr, Uptime = 61%, Haz. Waste = 20 lbs

Painting: 3 people, C/T = 7 min, C/O = 4 hr, Uptime = 48%, Haz. Waste = 60 lbs

Assembly & Inspection: 3 people, C/T = 2 min, C/O = 30 min, Uptime = 93%

Value Stream: 5 days (Receiving), 10 days (Milling), 15 days (Welding), 8 days (Painting), 30 days (Shipping)

Total Lead Time = 63 days
Value Added Time = 15 min

DEV OPS Day
DevOps intro next gen!

Value Stream Map this!

Business Process

ah ha!

Biz

Agile Development
fixes this

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ka ching!

DEVS Day
Getting Buy-in

- Put the problem in Business terms
- “Lean Startup” best reference I’ve found
- Minimum Viable System
- Reduce the Batch Size
- Continuous Integration
- Continuous Deployment
- Innovation Accounting
- Fail quick and Pivot!
DevOps part of Lean

Lean Startup Class 2010

Customer Discovery → Customer Validation → Customer Creation → Company Building

Pivot

Hypotheses, Experiments, Insights

Data, Feedback, Insights

User Stories → Requirements

Architectural Spike → Release Planning

Iteration

Acceptance Tests

Small Releases

Agile Development

Test Scenarios

Bugs

Latest Version

Next Iteration
DevOps part of Lean

Lean Startup Class 2010

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User Stories

Requirements → Test Scenarios → Iteration

Architectural Spike → Release Planning

Bugs → Latest Version → Acceptance Tests → Small Releases

Agile Development

Business Process

ah ha! ka ching!

Biz Dev Ops

Agile Development fixes this

DevOps fixes this
Get it under Control