The DevOps Transformation

From here to there and why
What is DevOps?
DevOps is a cultural and professional movement.

Adam Jacob
It’s not a tool (thing).
It’s not a title (person).
It’s not just dev & ops.

*dev*ops*
CAMS

• Culture
• Automation
• Measurement
• Sharing

John Willis
It’s a banner for change.
Re-envisioning the IT World

“We are the music makers,
And we are the dreamers of dreams,”

Arthur O'Shaughnessy (1874)

The world is changable, if we only have the courage to break with the status quo (overcome inertia)
Pro Tip #1

DevOps is a journey of discovery, not a destination.
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DevOps is a journey of discovery, not a destination.

Please join the global conversation!
DevOps Deconstruction

- Collaboration of People
- Convergence of Process
- Creation & Exploitation of Tools

In that order, not the reverse.
Simon Sinek’s Golden Circle

Why
How you do it
What you do

Ted Talk: Simon Sinek: How great leaders inspire action”

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Simon Sinek’s Golden Circle

Why

Motivation, Values, Belief
(Both make up the limbic brain, feelings, behavior, decision making, no language)

How

Method

What

Product
(Maps to Neo-Cortex; Rational Thought & Language)

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Golden Circle in DevOps

1: Quality through Collaboration is our motivation
2: Process & Tools is how
3: Build awesome services
DevOps Done Wrong

1: Automate using Configuration Management
2: Building Process around automation
3: To improve efficiency of infrastructure management

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“Why is the only true source of power. Without it you are powerless.”
Ackoff’s 5 Contents of the Mind

- Wisdom
- Understanding
- Knowledge
- Information
- Data
<table>
<thead>
<tr>
<th>Wisdom</th>
<th>Insight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding</td>
<td>Why</td>
</tr>
<tr>
<td>Knowledge</td>
<td>How to</td>
</tr>
<tr>
<td>Information</td>
<td>Who, What, When, Where, How much..</td>
</tr>
<tr>
<td>Data</td>
<td></td>
</tr>
</tbody>
</table>

Architect

Systems Engineer

Jr SA/Support

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Systems Thinking

Synthesis
  - Wisdom
  - Understanding

Analysis
  - Knowledge
  - Information
  - Data

Insight
  - Why

Who, What, When, Where, How much..
Systems Thinking

- Systems Thinking is concerned with the interaction of the parts to form a whole
- Systems Dynamics is concerned with the feedback loops between the parts
- "A system can not understand itself." - W. Edwards Deming
Pro Tip #2

DevOps starts with why, with a holistic vision, and supports that vision with process and tools.
Should be this.
The reality is usually this.
The Value Stream

Requirements → Dev → Software → Ops → Service

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Silo’ed Priorities

- Get it out on time, no defects.
- Get it up. Keep it up. Cheap.

Requirements

Dev → Software → Goods

Ops + NFR → Services

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Who’s responsible for quality?
What is Quality?

- ISO-9000: "Degree to which a set of inherent characteristics fulfills requirements."
- Dr. Juran: "Fitness for use."
- Crosby: "Conformance to requirements."
- 6 Sigma: "Number of defects per million opportunities."

And you wonder how we used waterfall so long....
What is quality really?

• The degree to which a good or service is what the customer expects it to be.

• Examples: The Big Mac, Velveeta, Steak
Quality Software

- Does what it purports to do
- Is intuitive and easy to use
- Is quick and responsive; given the task
- Observable ("What's it doing?!")
Quality Service

- Does what it purports to do
- Is intuitive and easy to use (Friendly)
- Is quick and responsive; given the task
- Observable (“Whats it doing?!”)
- Available
- Self-Service if possible
“Efficiency is doing things right; effectiveness is doing the right things.”

Peter Drucker
Pro Tip #3

Quality is a result effectiveness of the interactions across the entire value stream.
Agile Manifesto

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

2001
Agile Advantages

- Non-Prescriptive
- Simple philosophy became an umbrella
- Applies to both the developer and the product management alike
- Widely known and easy to grok.
IT Service Management

- Control Objectives for Information and related Technology (CobiT)
- Capability Maturity Model Integration (CMMI) for Service
- IT Infrastructure Library (ITIL)
- ISO Standards: 20K, 27001, 38500
- NIST SP800-53, PCI DSS, FIPS 200, TIA-942
Making Sense of ITSM

ISO 20K

CobiT
ISO 38,500

SOX
COSO

Auditing
SAS70

Governance Framework

Best Practice

ITIL
PMBOK
PRINCE2
ASL
BISL

ISO 27K
NIST SP800-53
PCI-DSS
FIPS 200

Security Controls
Problems with ITSM

- Compliance Driven
- Security Focused
- Complex, Complicated, and Bureaucratic
- Pushed down from the top on already overburdened staff
- Consultant Heavy
- Hard to grok. Most info 2nd hand.
IT Infrastructure Library
ITIL Advantage

• Most complete & respected pattern for IT
• Source for Change Management, Event/Incident/Problem Management, CMDB, etc.
• Provides a common terminology for IT
• Chock full of good ideas! Why reinvent the wheel?

Guru session on ITIL, Thursday @ 3:30!
Visible Ops
The rules don’t make RPGs fun... the DM does.

It's all about how you use the rules.
ITSM in Perspective

• No idea should be rejected without consideration
• Don’t view it as “all in” or “all out”
• Educate yourself on them (many are free) and use it however is most appropriate for your team/organization
Ars Gratia Artis

- Art for the Sake of Art
- Only satisfies a select few

The Fountain by Marcel Duchamp
Pro Tip #4

Agile & ITSM are both sources from which to draw strength, but never at the expense of your vision.
Cloud Changed the Game
IT Paradigm Shifts

- Virtualization stops being about consolidation and begins enabling self-service, automated infrastructure without bare metal constraints
- HPC becomes less interesting
- Role of the OS changes
- Broad platform standardization becomes realistic
Dev Paradigm Shifts

- Dev can bypass IT at will
- Dev has more experience with the APIs that drive cloud than IT (typically)
- The Great Leveler; anyone can be a player
- SCRUM, Continuous Integration, etc. speed up rate of deployment
“The Rift” Surfaces

• Increased awareness of IT and “Web Operations” sub-culture rift

• Migration of services from heavy iron into virtualized environments changes more than expected

• Over-specialization becomes an issue

• X86 Management is different
Rise of the Tools

• Commercial & Open Source “Build your own cloud” solutions speed up

• Puppet & Chef arrive alongside CFEngine to tame the new complexity

• “Infrastructure As Code” starts looking realistic, as tools are more about CM than deployment

• SaaS allows IT teams to offload undesirable or complex components. (ex: PagerDuty)
Vagrant

- Create test/dev environments on your laptop
- Configure with CM
- An excellent method for using Operations “Infrastructure as Code” to empower dev, ops, qa, etc.
Pro Tip #5

The Cloud is here to stay, and its awesome.

Contrary to popular belief, it will generate MORE demand for SA’s, not less.
Operations management is an area of management concerned with overseeing, designing, and redesigning business operations in the production of goods and/or services.”

Wikipedia
What is Operations?

Operations is *doing* what you do.
OM Subjects

- Operations Strategy
- Product & Service Development
- Project Management
- Process Measurement
- Financial Analysis
- Quality Management
- Forecasting
- Wait-Line Theory
- Scheduling
- LEAN
- Six Sigma
- TOC ...and more.
A Brief History of Operations Management

Understanding the genesis of the ideas we now take for granted as common sense.
Fredrick Winslow Taylor

- “The Principles of Scientific Management” (1911)
- Applied scientific method to work.
- Generally blamed for everything.
Henry Ford

- Father of “Mass Production”
- Built the Model T from 1908 ($850, $20K) to 1927 ($290, $3K).
- No formal education, worked at Edison Co from 1891 to 1899.
Alfred Sloan

- President of GM in 1923
- Did for big management what Ford did for manufacturing
- Involvement with MIT later became the Sloan Business School.
- BS EE from MIT
Sakichi Toyoda

- Started Toyoda Automatic Loom Works 1927
- Invented Jidoka (autonomous automation) [Fault Management], and “5 Whys”
- Started making cars in 1933
W.A. Shewhart

- Invented PDSA Continuous Improvement Cycle
- Worked at Bell Labs from 1925 to 1956
- Father of Statistical Process Control
- PhD in Physics
W. Edwards Deming

- Student of Shewhart
- Sent to Japan after WW2 and taught the Japanese (1950)
- Father of the Quality movement
- Ignored in US until late 1970’s
- BS EE, MS/PhD Math
Taiichi Ohno

- Created the Toyota Production System in late 1940’s, refined through the 1950’s
- Father of Just-in-Time, Kanban, etc.
- Learned from Ford’s book “Today & Tomorrow” & Deming
Shigeo Shingo

- Technical man behind TPS
- Father of SMED, Poka-Yoke (“mistake-proofing”), “Zero Quality Control”, etc.
Peter Drucker

- Father of Modern Management
- Wrote 39 management books between 1939 and 2005
Ludwig von Bertalanffy

- Father of Systems Theory
Russell Ackoff

- Friend of Deming
- Pioneer in Operations Research (OR) in 1957 and Systems Theory
- (imho, the Feynman of OR)
- BS Architecture, PhD Philosophy of Science
Armand V. Feigenbaum

- Coined the term “Total Quality Control” (1961), which later became “Total Quality Management” (TQM)
- Together with Deming and others ideas, became basis for ISO-9000
- PhD Econ MIT
The US Decline

- 1973 Oil Crisis deals a nasty blow to the US Mass Production system
- Japanese weather the storm thanks to Kanban (Just in Time; Toyota Production System)
- In 1980’s Japanese quality puts US to shame
Eliyahu Goldratt

- Created the “Theory of Constraints”
- Published in his novel “The Goal” (1984)
- Applied TOC to other areas such as project management (“Critical Chain”), sales (“Mafia Offer”), etc.
James Womack, et al

- Coined “Lean” in 1988 HBR Article.
- Becomes “The Machine that Change the World” (1990) which brought TPS to the masses.
On the Shoulders of Giants

- There is a continuous chain of ideas being condensed and re-applied again and again throughout the 20th Century.
- Today it's largely rolled into “Lean”
- Many of our “new” ideas are not new at all, they are new applications of proven ideas that are simply new to this field.
- Many of the OM pioneers were geeks.
“Those who cannot remember the past are condemned to repeat it”

George Santayana

These things aren’t going away, a little education will serve you for years to come.
The 3 Aspects of DevOps

dev>OPS

DEV<ops

DEV<>OPS
dev>OPS

- Operations centric focus on DevOps
- Adopts “Infrastructure as Code” ideal
- Considers SCRUM, Kanban, and Agile Operations Concepts
- Gets serious about metrics and holistic/qualitative monitoring
DEV<ops

• Development centric focus on DevOps
• Adopts continuous deployment
• Embedded metrics and increased focus on operational performance
• Dev’s learn about operational challenges
DEV<>OPS

• Full collaboration between teams
• Boundaries between them blur
• Both teams are accountable, full participation in emergencies and postmortem meetings
• Dev access to prod environment
• Joy.
Transitioning

- If at all possible, go directly to DEV<>OPS and grow together
- If not, do what you can to set the stage, measure results and make allies to build a case for management support.
The Most Powerful Tool in the DevOps Arsenal?
Other Tools to Start

- Office Hours
- Sit together
- Join the other teams meetings
- Ask lots of questions
- Implement the “No Asshole Rule”
- Have fun
Pro Tip #7

If it ain’t fun, it ain’t workin’.
Collaboration of People
Convergence of Process
Creation & Exploitation of Tools

* Measure Everything
* Have a systems view
* Focus on effectiveness & quality
* Learn from others and the past
* Encourage pride of workmanship (fun)
Thank You.
Join the Conversation!

Twitter:
@patrickdebois
@botchagalupe
@damonedwards
@allspaw
@RealGeneKim
@jordansissel
@portertech
@luis @LordCope
@jamesurquhart
@puppetmasterd
@netik
@atl @markimbriaco
@adamhjk
@ernestmueller
@ripienaar
@markimbriaco
@MikeOrzenLeanIT

Websites:
http://dev2ops.org
http://devopscafe.org
http://planetdevops.net

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