About Me

Red Hat Technology Evangelist
Twitter: @ghaff
Google+: Gordon Haff
Flickr: bitmason
Email: ghaff@redhat.com
Blog: http://bitmason.blogspot.com

Author: Computing Next
Formerly: Illuminata (industry analyst)
Data General (minicomputers/Unix/NUMA/etc.)
BUSINESS CHANGE IS ACCELERATING, AND OLD I.T. APPROACHES CAN'T KEEP UP
## DELIVERING SOFTWARE: THE REALITY VS. THE GOAL

<table>
<thead>
<tr>
<th>BUDGET</th>
<th>TIME</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>45% OVER</td>
<td>7% OVER</td>
<td>56% LESS</td>
</tr>
</tbody>
</table>

Source: Delivering large-scale IT projects on time, on budget, and on value
McKinsey & Company, October 2012
DevOps applies open source tools, principles, and practices with...
CULTURE of collaboration valuing openness and transparency
AUTOMATION of process from development through ongoing operations
An evolving PLATFORM that optimizes for flexible, dynamic workloads
What can manufacturing and open source teach us?
6 Principles for Success

● Open your culture
● Automate to accelerate repeatable processes
● Drive modularity and reusability
● Secure and optimize the supply chain
● Measure, iterate, and improve
● Adopt innovative tooling
‘Culture eats strategy for breakfast’
- Peter Drucker
“But our culture is too difficult!”

Really?

Consider post-war Japan.
Culture = f (l, o, i, t, …)

where:
l = leadership
o = organization
i = incentives
t = trust
… = many other things

Open source also offers guidance
incentives matter
transparency
rich communication flows
don't fear failure*

*small / fast
Automate (many of) the Things
AUTOMATE TOWARDS CI/CD
A Common Language Across DevOps

Communications is the key to DevOps.

Automation language that can be read and written across IT.

Automation engine that can automate the entire application lifecycle and continuous delivery pipeline.
Beyond Local Maxima: Reuse
Platform thinking wins

Top 10 global megaplatforms

Forecast volume and number of models for 2017

<table>
<thead>
<tr>
<th>OEM</th>
<th>Platform</th>
<th>Volume (in mn)</th>
<th>No. of Models</th>
<th>Sample models</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. VW</td>
<td>MQB</td>
<td>6.3</td>
<td>41</td>
<td>VW Golf, Passat; Audi A3</td>
</tr>
<tr>
<td>2. Toyota</td>
<td>MC</td>
<td>5.2</td>
<td>25</td>
<td>Auris, Corolla, Vibe: Scion xB</td>
</tr>
<tr>
<td>3. Hyundai/Kia</td>
<td>HD</td>
<td>3.0</td>
<td>16</td>
<td>Hyundai i30; KiaCee’d</td>
</tr>
<tr>
<td>4. GM</td>
<td>Delta</td>
<td>2.5</td>
<td>19</td>
<td>Opel Astra; Chevrolet Cruze</td>
</tr>
<tr>
<td>5. PSA</td>
<td>EMP2</td>
<td>2.3</td>
<td>24</td>
<td>Peugeot 308; Citroen C4, DS4</td>
</tr>
<tr>
<td>6. Renault/Nissan</td>
<td>B</td>
<td>2.2</td>
<td>10</td>
<td>Renault Clio; Nissan Cube, Juke, Leaf</td>
</tr>
<tr>
<td>7. Ford</td>
<td>C1</td>
<td>2.2</td>
<td>18</td>
<td>Focus, C-Max, Kuga</td>
</tr>
<tr>
<td>8. Hyundai/Kia</td>
<td>PB</td>
<td>1.9</td>
<td>18</td>
<td>Hyundai i20; Kia Rio, Venga</td>
</tr>
<tr>
<td>9. Renault/Nissan</td>
<td>CMF1</td>
<td>1.9</td>
<td>20</td>
<td>Renault Megane, Nissan Qashqai</td>
</tr>
<tr>
<td>10. Ford</td>
<td>B2E</td>
<td>1.8</td>
<td>11</td>
<td>Fiesta, B-Max; Mazda2/Demio</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td>29.4</td>
<td>202</td>
<td></td>
</tr>
</tbody>
</table>

Source: IHS Automotive, AlixPartners analysis

“45–47% passenger cars will use one of top 20 platforms by 2015.”

EvaluServe
Componentized services plus APIs

- Lighter-weight communications protocols
- Improved understanding of functional separation
- More open source and vendor-neutral philosophies
- Scale-out infrastructure standardization and automation
- Alignment with evolving development practices
A Message to Our Customers About Takata Airbags

The automotive industry is facing an unprecedented challenge in the recall and replacement of millions of Takata airbag inflators. We want to assure you that Honda is committed to addressing the needs and concerns of our customers who are affected by this issue. We stand behind the safety and quality of our products. The protection of the drivers and passengers in our vehicles is our paramount concern.
Do you know where your software came from?

“Almost 40% of general images [on Docker Hub] have high priority vulnerabilities.”

-Banyan, 2015
Strategies for sourcing software

**Wild West**
Go ahead and grab it!

**Blacklist**
Is it from a known bad source?

**Whitelist**
Is it a known good source?
Digitally signed/securely delivered
Rapid updates for vulnerabilities
Repeatable release processes
“Without data, you’re just another person with an opinion.”

W. Edwards Deming, champion of statistical process control
What are your key metrics?

- **Deployment Frequency**
- **Change Volume**
- **Lead Time**

404
Page not found
Deployment Failure Rate

Mean Time to Recover

99.999
Service Availability
DevOps Accelerates Release Cycles

On a per application basis, what has been the typical cadence for production releases prior to implementing your DevOps strategy and what do you expect in the next few years?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Currently</th>
<th>Predicted for 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or fewer annually</td>
<td>63%</td>
<td></td>
</tr>
<tr>
<td>Quarterly releases</td>
<td>23%</td>
<td>27%</td>
</tr>
<tr>
<td>Monthly releases</td>
<td>40%</td>
<td>7%</td>
</tr>
<tr>
<td>Weekly releases</td>
<td>7%</td>
<td>2%</td>
</tr>
<tr>
<td>Other/unsure</td>
<td>29%</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>3%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Majority of DevOps users expect to significantly increase the rate of code releases in the next two years.

DevOps Happens across modes of IT

IT INDUSTRIALIZATION
- Cloud/Web-scale infrastructure
- Software-defined flexibility
- Diverse sourcing

TRADITIONAL MODE
- Waterfall development
- Known vendors
- Strong governance
- Minimized risk
- Technology teams

DIGITALIZATION
- Dealing with uncertainty
- Exploratory, iterative style
- Multidisciplinary teams
- New risk/speed trade-offs

NONLINEAR MODE
- Iterative development
- Small/innovative partners
- Optimized governance
- Managed risk
- Multidisciplinary teams

When speed or innovation is needed, or there is a high degree of uncertainty
But New Platforms Optimize for it
93% Believe New Enabling Technologies Are Required for DevOps Success

Does your organization expect to make net new investments in DevOps enabling technologies over the next two years?

- 93% Yes
- 5% Unsure
- 2% No

How do you expect to deploy these enabling technologies?

- Primarily deploy software onto dedicated on-premise infrastructure in our own data center: 49%
- Primarily deploy software onto dedicated infrastructure located at co-location, hosting or outsourcing site: 36%
- Use a mix of public cloud and dedicated software deployed on-premise and/or into third party data centers: 11%
- Primarily purchase as a public cloud subscription service(s): 4%
Evolve to Software-defined Programmable Platform

- Orchestration
- Resource management
- Container packaging/API for image-based deployment
- Application & dependencies
- Application & dependencies
- Lightweight, immutable OS for running containers
- Resource pool

- Application & dependencies
- Application & dependencies
- Application & dependencies
- Operating system
- Operating system
- Operating system
- Hypervisor (or other partitioning methods)
- Server, storage, & networking hardware
Running Portable Componentized Services

AtomicApp

docker
docker
docker

PROJECT ATOMIC
Adhering to container standards

Red Hat works with the open source community to drive standards for containerization

- Isolation with Linux containers
- Container format with Docker
- Orchestration with Kubernetes
- Registry / Container discovery
80% Expect PaaS To Have a Critical Role

Platform-as-a-service (PaaS) integrates cloud infrastructure, self-service developer platform and tools, and lifecycle management with DevOps processes—speeding time to value for both developers and operations.

The common thread is open source Innovation

Along with the principles and practices creating it.
CREDITS

Aircraft factory: Flickr/cc, https://www.flickr.com/photos/jetstarairways/9130160595
Kids programming: Esti Alvarez cc license
Transparent code: iStockPhoto
Linux Collaboration Summit: Linux Foundation
Auto factory: Copyright Tesla.
THANK YOU