Front-End Ops and the OODA Loop:

A Decision Cycle-Time Strategy for Winning in a Hostile Internet Environment

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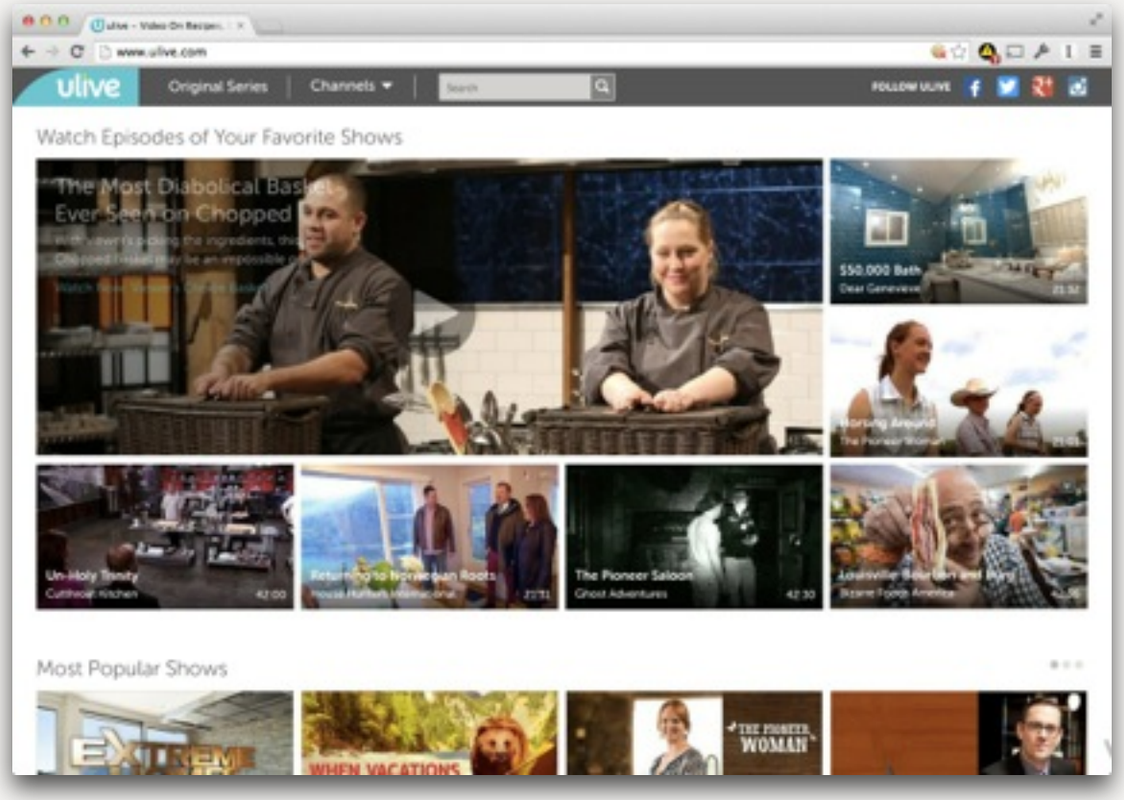
Hello! I'm here to talk to you about "Front-End Ops and the OODA Loop: A decision cycle time strategy for winning in a hostile internet environment." My name is Erik Sowa and I take care of engineering and operations for ulive.

Online Video Syndication at Scripps Networks Interactive



Ulive is the brand within Scripps Networks Interactive that is focused on online video syndication – augmenting the cable revenue stream with digital video distributed over the internet. Our video players are embedded in dozens of publishers' websites, and the revenue comes from advertising.

Screenshot: http://www.ulive.com/

Unpacking the title

- Front-end ops
- OODA loop
- Decision cycle time
- Hostile environment
- Maneuver warfare and friction

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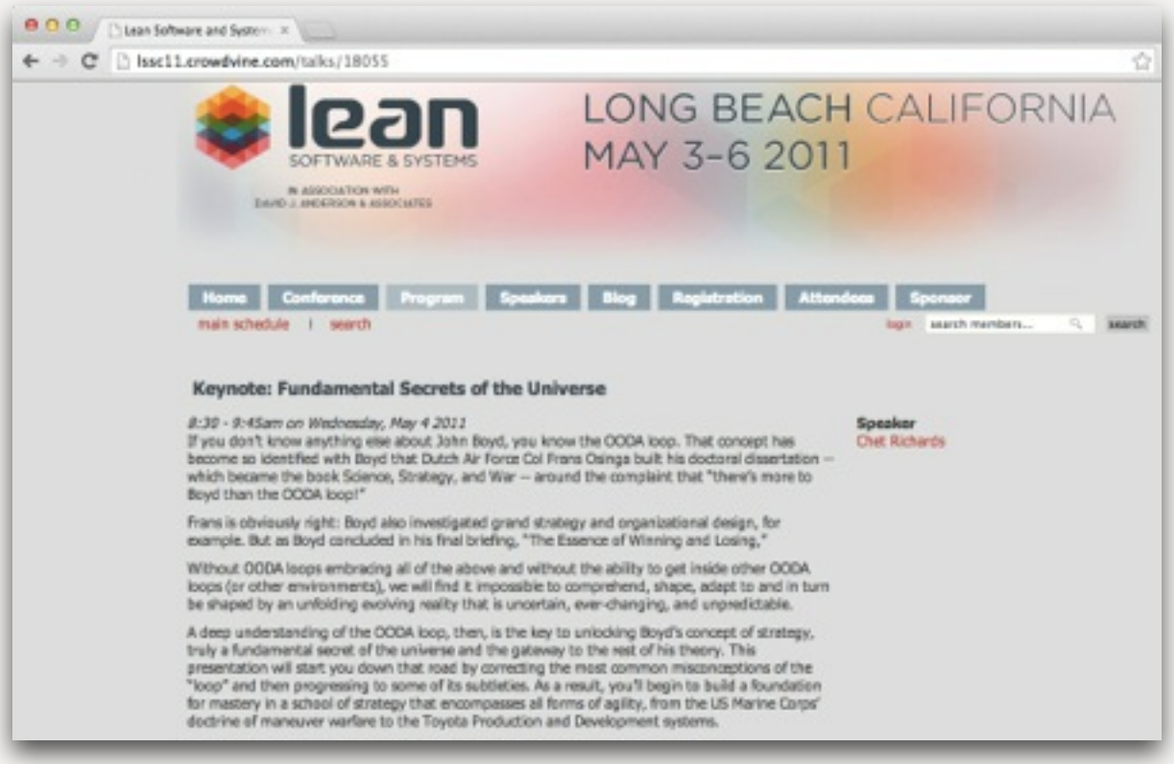
Let’s unpack the title into learning objectives. By the end of this presentation, you will appreciate the emerging term “front-end operations” and how it might relate to “devops”. You will have heard about the military history and business applications of Colonel John Boyd’s OODA loop model. You’ll understand why cycle time compression is important in a hostile business environment. And you’ll have been introduced to the use of maneuver warfare concepts in this same context. I hope to convince you that maneuver warfare principles are on a par with Toyota Production System principles when it comes to influencing and inspiring our community of flow-minded practitioners.

OODA at Flowcon13

Let's start with the OODA loop, Observe Orient Decide Act, because after all that's how Adrian Cockcroft kicked off Flowcon 13 a year ago. Adrian's keynote "Velocity and Volume (or Speed Wins)" modeled the continuous innovation cycle in the cloud as an OODA loop – and he inspired me to revisit the work of Col. John Boyd.

Presentation: https://www.youtube.com/watch?v=wyWI3gLpB8o
Tweet: https://twitter.com/eriksowa/status/396315927660097537

Fundamental Secrets of Modern Management



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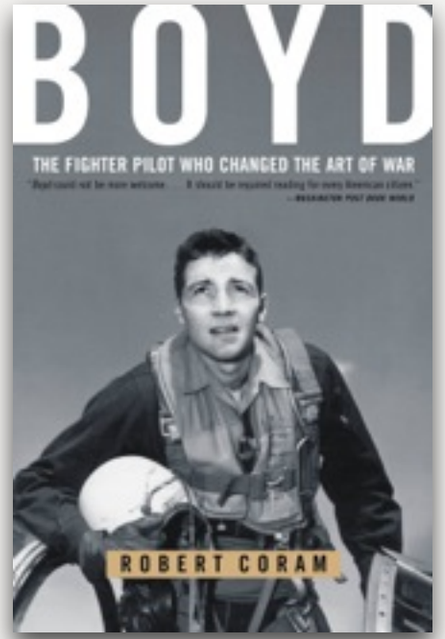
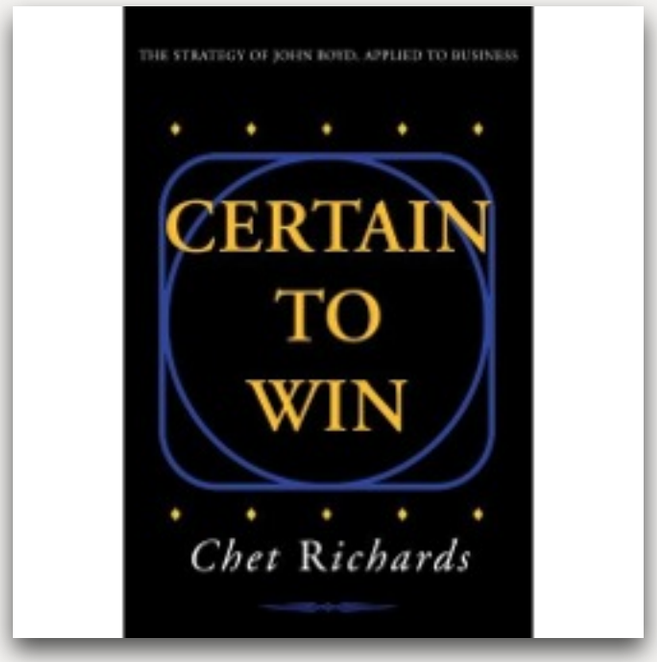
I first learned about John Boyd, the OODA loop, and maneuver warfare concepts applied to business at the Lean Software and Systems Conference in 2011 in Long Beach, where Chet Richards gave a fascinating keynote talk entitled “Fundamental Secrets of the Universe”. Actually, I read about it first in @mtnygard’s 2007 book “Release It!” but didn’t appreciate its importance until later.

LSSC 11 talk: http://lssc11.crowdvine.com/talks/18055

Col. John Boyd





After hearing Chet Richards speak, I read Coram's biography of Boyd and Chet's book "Certain to Win – the strategy of John Boyd applied to business." Of particular interest to me are the cultural and teamwork traits common to smaller, more mobile teams that defeat larger, more entrenched organizations by learning faster.

Chet Richards - Certain to Win: http://slightlyeastofnew.com/certain-to-win/

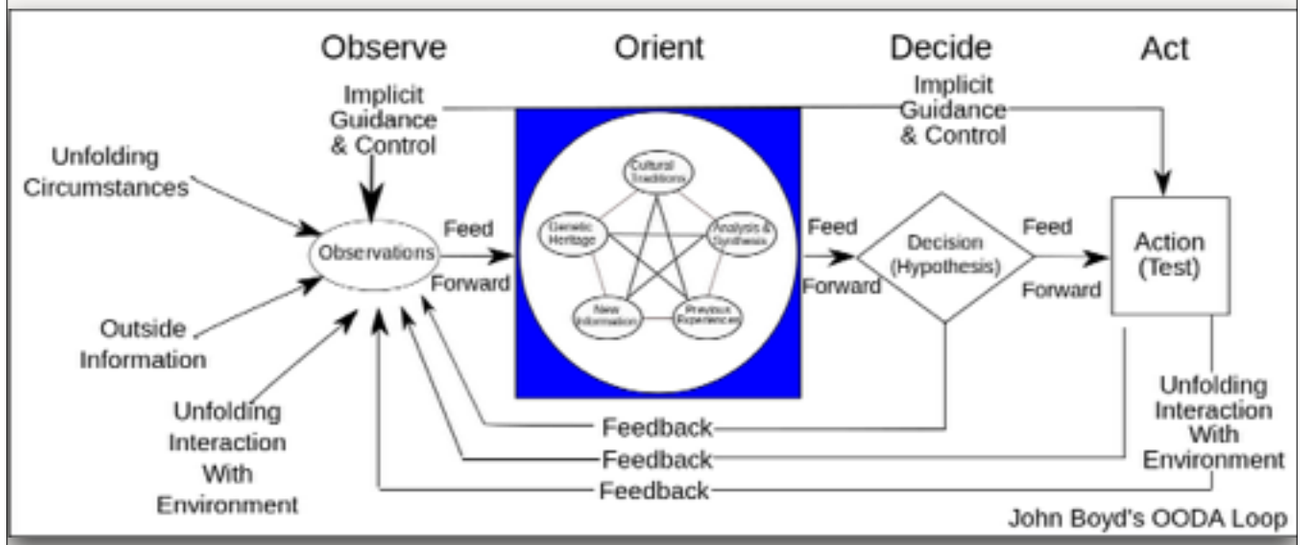
Robert Coram - biography of John Boyd http://www.amazon.com/Boyd-The-Fighter-Pilot-Changed/dp/0316796883

Korean War: F-86 vs. MIG-15

John Boyd was a fighter pilot in the Korean War. US pilots flew F-86 fighters against Chinese pilots flying MIG-15s. MIG-15s had acceleration, climbing, and turning performance better than F-86s, but were shot down 10x more often. Seeking to understand why, Boyd zeroed in on visibility and manueverability. The F-86 had a bubble canopy giving pilots a wide view of the surrounding skies. And they had hydraulic controls — power steering if you like — giving pilots the ability to adjust the aircraft path quickly without fatigue.

Photo: http://commons.wikimedia.org/wiki/File:Streaking_north_over_the_rugged_mountain_territory_of_Korea,_these_U.S._Air_Force_F-86_%22Sabre%22_jets_of_the_51st..._-_NARA_-_542248.tif

John Boyd's OODA Loop

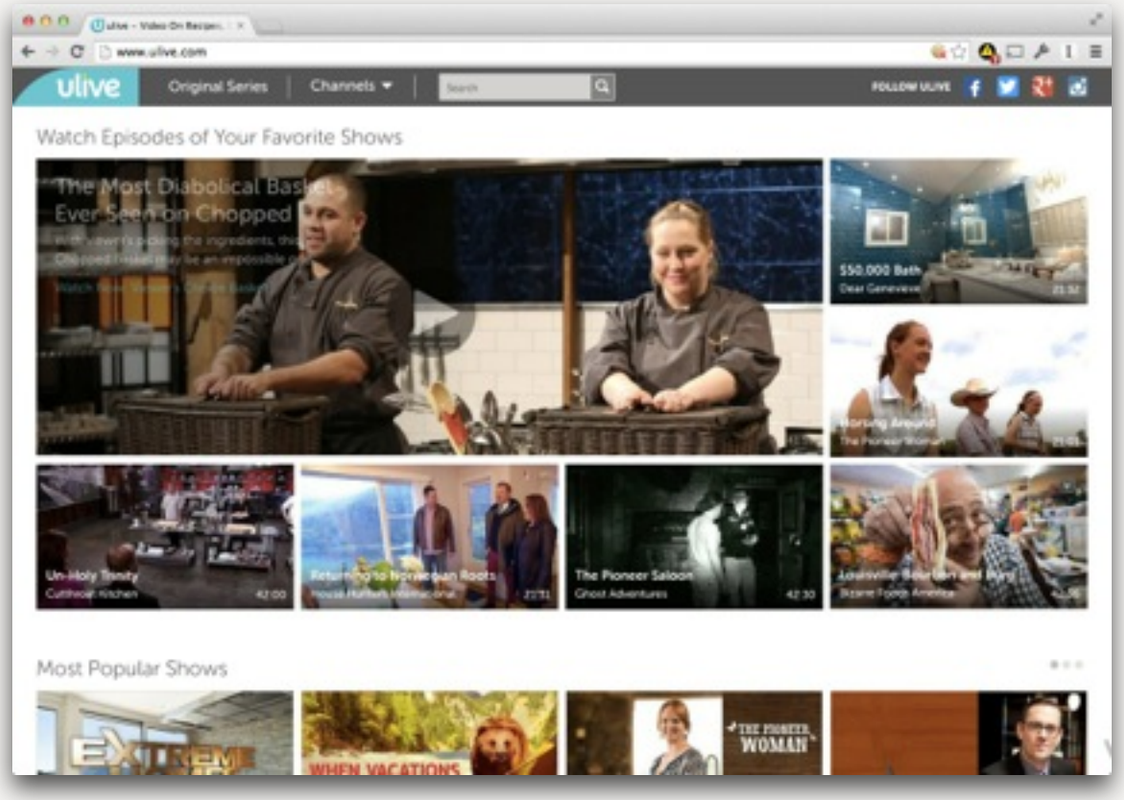


Boyd derived the OODA Loop model from this experience. In spite of the power mismatch favoring the MIG, superior visibility and maneuverability enabled US pilots to shoot down MIGs at a 10:1 ratio. The bubble canopy made for faster observation and orientation, and the hydraulic controls made for relatively faster decisions and actions. F-86 pilots were able to work their way inside the loops of the MIG-15 pilots, and dominated.

Later in his career, Boyd upset the military procurement process with these lessons and became the prophet without honor in his own "house". On the other hand, Marine officers studying maneuver warfare adopted him as one of their own. There were more Marine officers than Air Force officers at Boyd's funeral. And, as the intensity and pace of competition continues to heat up, the OODA loop and related maneuver warfare principles have found their way into business.

Photo: http://en.wikipedia.org/wiki/OODA_loop

Online Video Syndication at Scripps Networks Interactive



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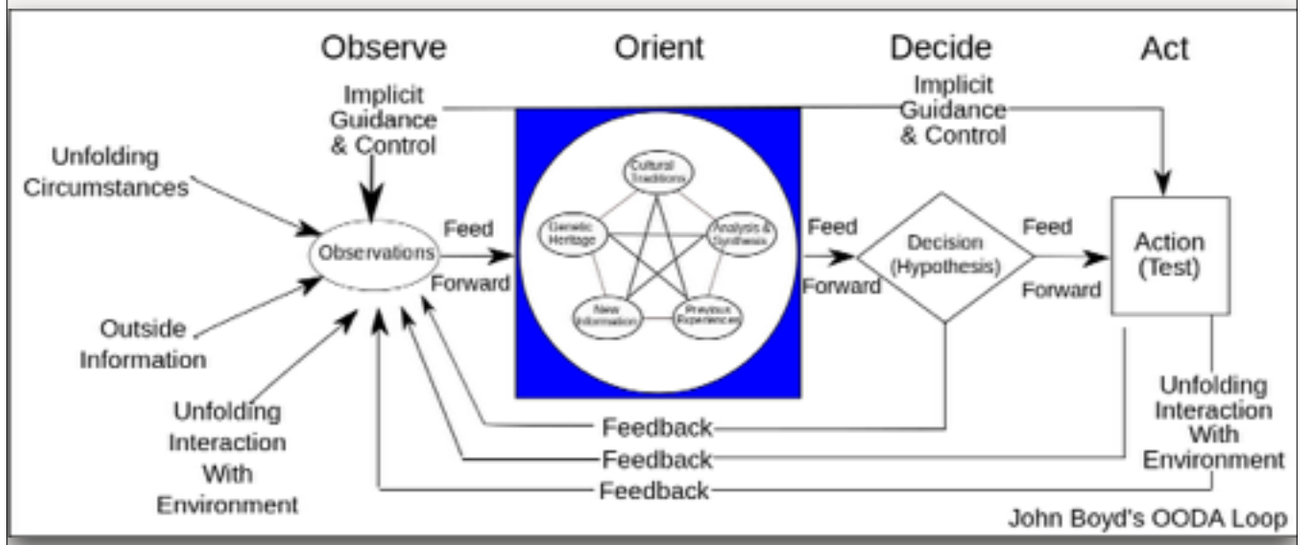
At ulive, working the online video syndication model, we are an ad-supported business on the internet. People have all kinds of words to describe this — Wild, Wild West is one of the more printable phrases — so it is reasonable to ask whether the OODA loop model is helpful in our context.

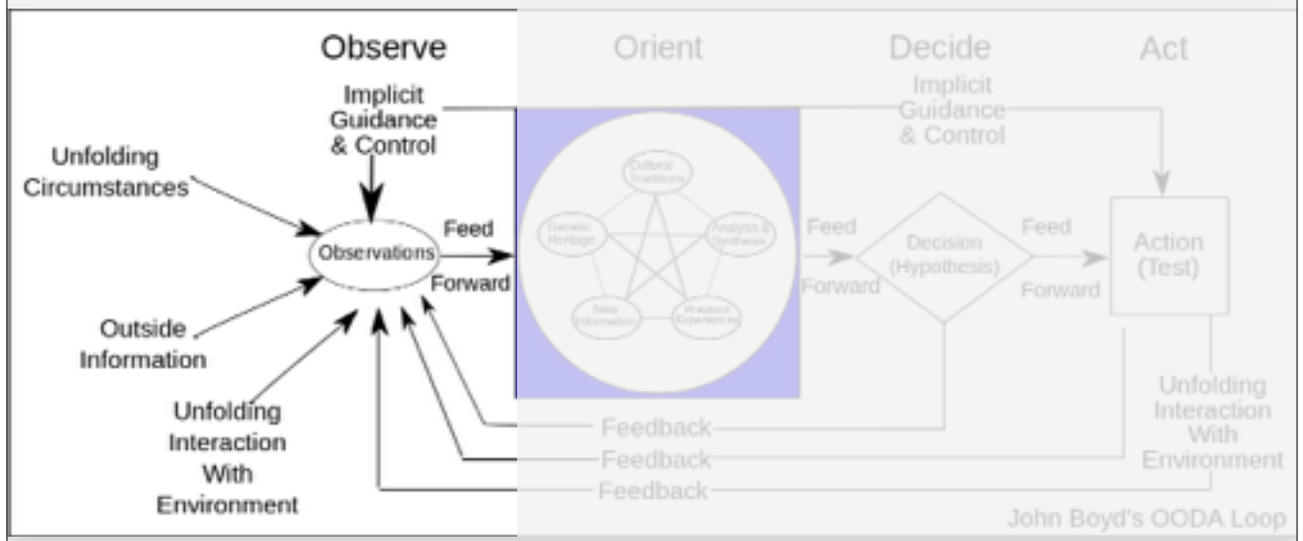
Screenshot: http://www.ulive.com/

… Observe …



Let’s look at the ulive video syndication stack through the lens of the OODA loop.

… Observe …



Our “bubble canopy” observer is our video player. Embedded in a publisher’s website, it can “see” how users are interacting with videos and ads. Depending on implementation details, it might also be aware of other things happening on the same page. But we don’t have access to the publisher’s servers. Typical devops practices such as monitoring and alerting are still possible with…

Front-End Ops

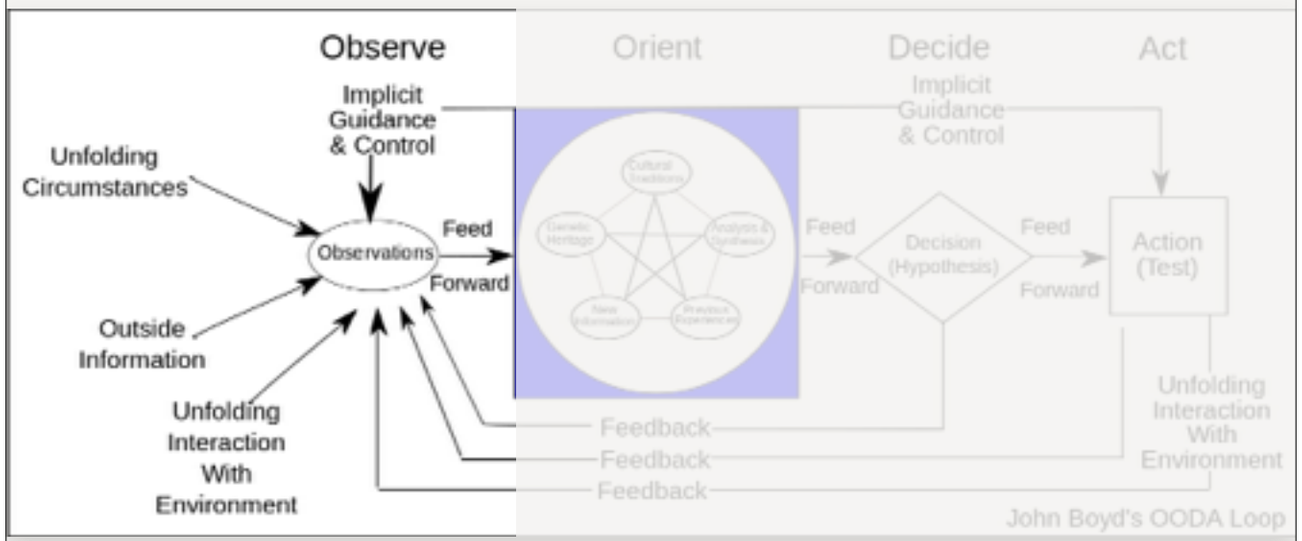
Front-end operations! The instrumented browser application is the heart of “front-end operations”. Our video players are constantly “phoning home”. We need that data to understand how our end users are engaging with the content, which helps us with everything from billing to errors in the field.

Alex Sexton in Smashing Magazine: http://www.smashingmagazine.com/2013/06/11/front-end-ops/

Front-end ops conference: http://www.feopsconf.com/

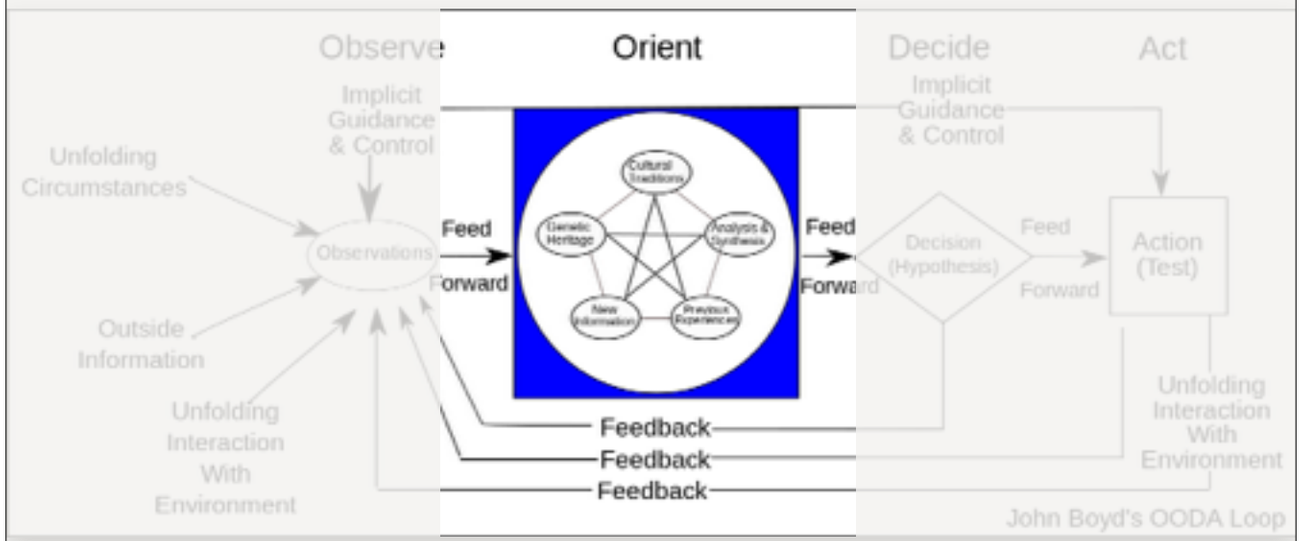
Photo: http://www.geograph.org.uk/photo/737491 Patrick De Jode

… Observe …



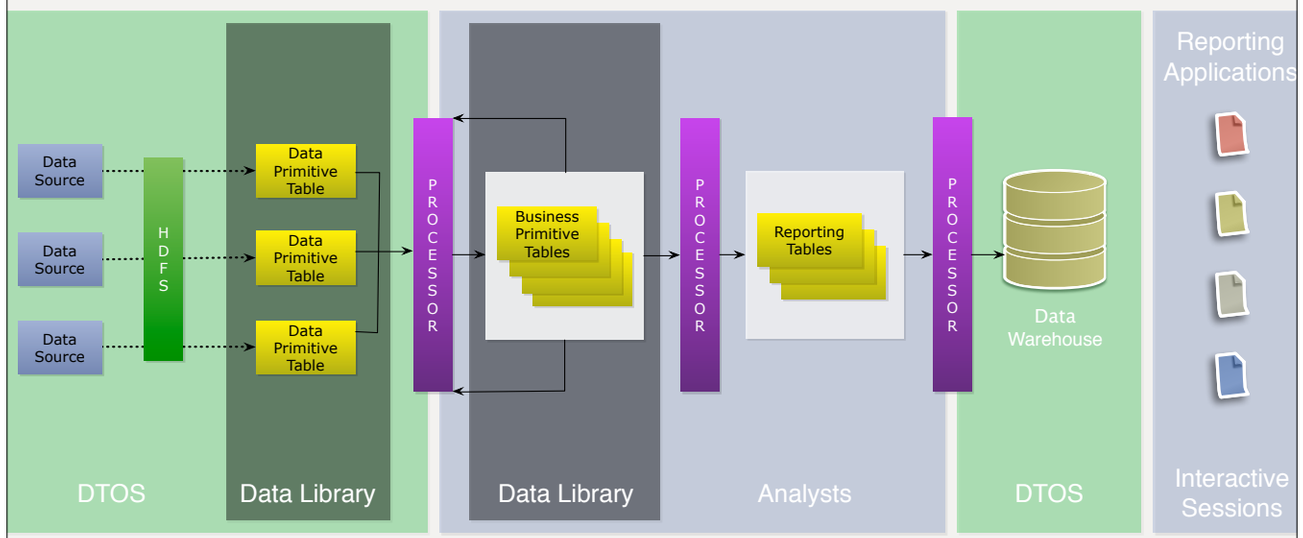
We’re collecting thousands of events per second from our players in the field. What do we do with all that data?

… Orient …



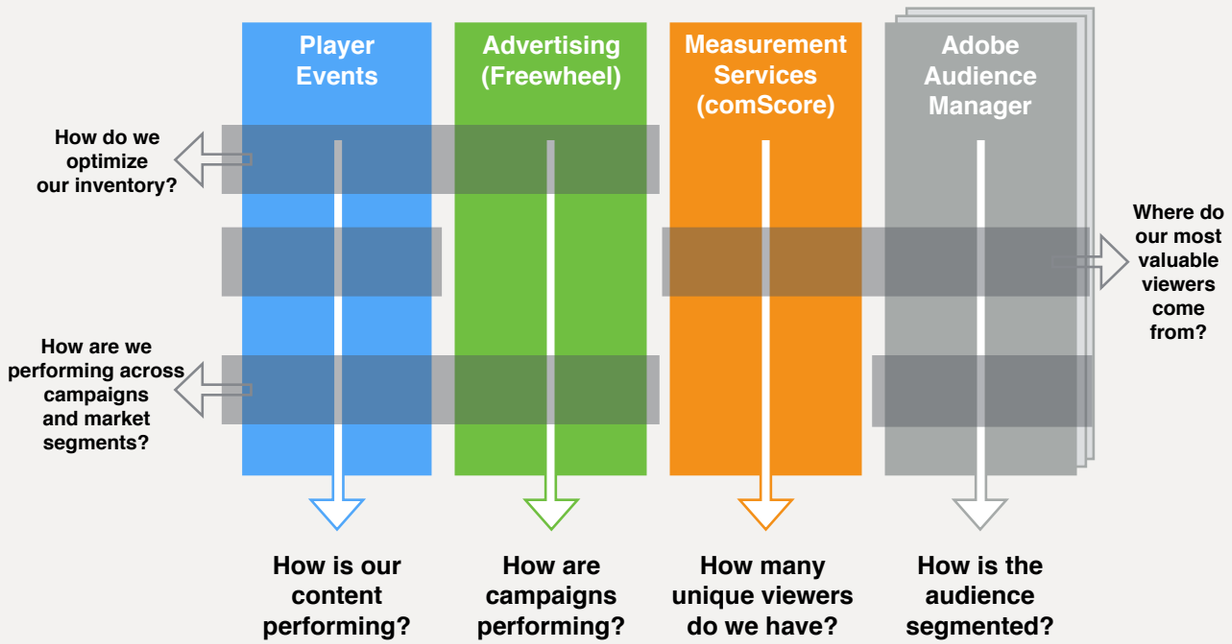
Per the OODA model, we turn that data into insight that support making decisions and taking action. Previous experience drives much of the analysis and we also have to be open to new and changing information.

Orient



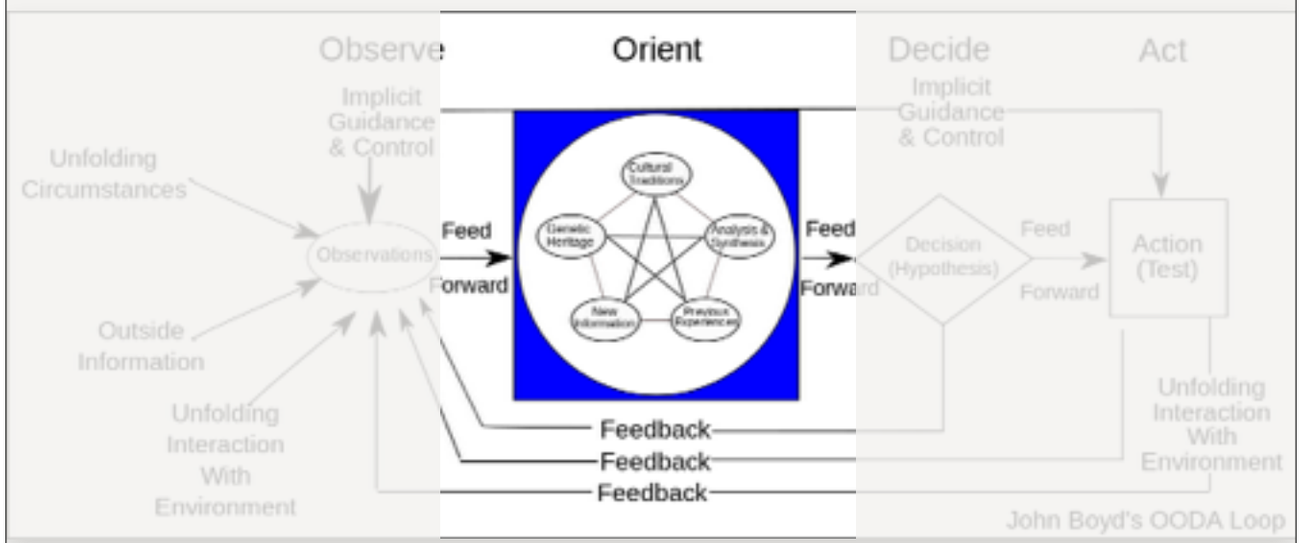
We've built a data operating system based on our understanding of our ecosystem that listens to those observations and grinds on the data to orient us to what is happening in the field. Raw events are ingested and stored in data primitive tables. Batch jobs turn those data primitives into business primitives, e.g. counting and sorting video views. Further processing makes that insight accessible through reports and dashboards.

Orient



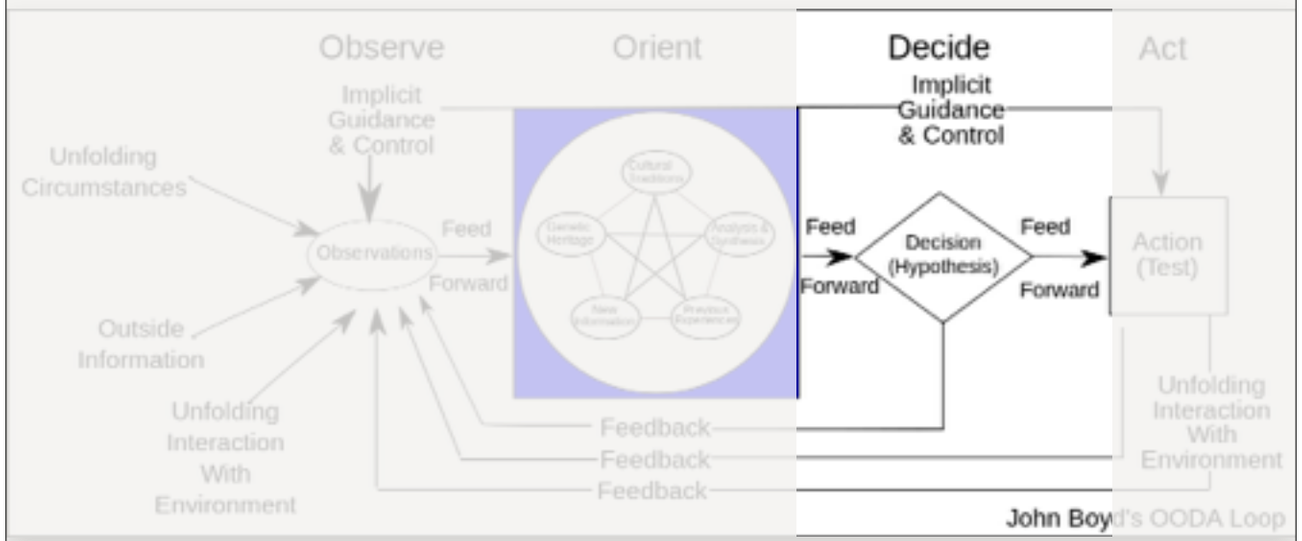
Our data operating system can correlate player events with other sources of data such as ad servers and measurement services. Correlations across those data sources drive business insights. For example, player views without the expected proportion of ad views indicate a problem with ad configuration and/or delivery.

… Orient …



The insights feed forward…

… Decide …



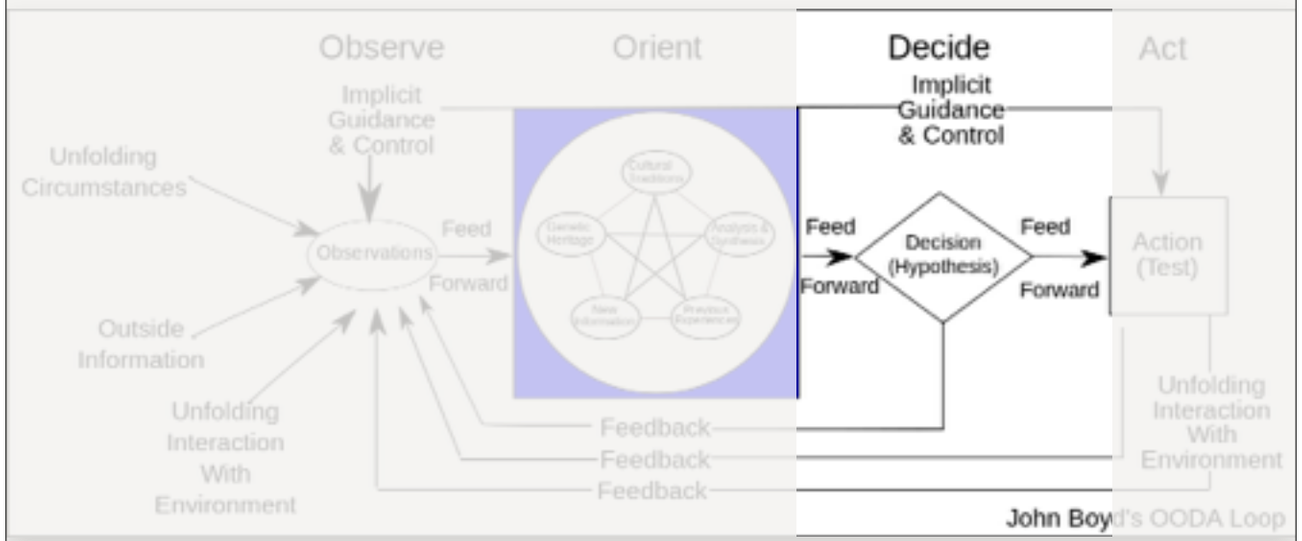
… into decision making.

Decide

If the dashboard insight is “situation normal”, the decision can be a no-op. If, however, indicators are out of range, the operator can decide to take action.

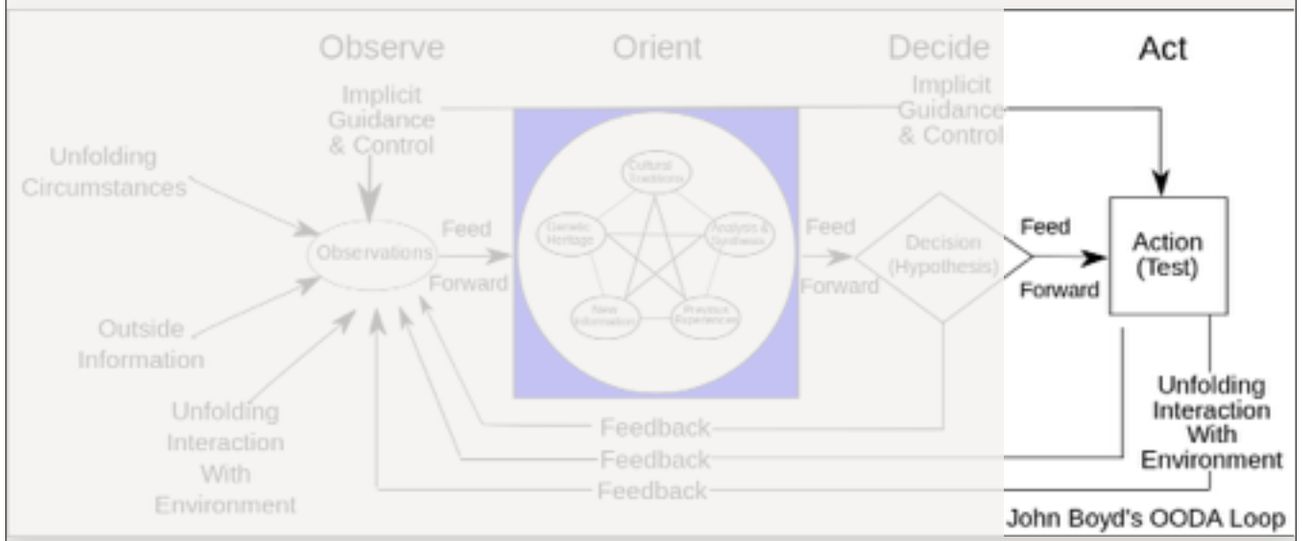
Photo: http://commons.wikimedia.org/wiki/File:Avon_Sabre_A94-974_cockpit_2.jpg

… Decide …



One output of the decision making process is…

… Act …



…action. Testing a decision requires going around the loop again, adjusting the observation and orientation steps as appropriate.

Act

A business is more agile when it can execute the OODA loop more quickly. This doesn't mean blindly building product features faster; it means being quicker to recognize and respond when appropriate.

Photo: http://commons.wikimedia.org/wiki/File:MiG-15_being_hit_over_Korea_c1953.jpg

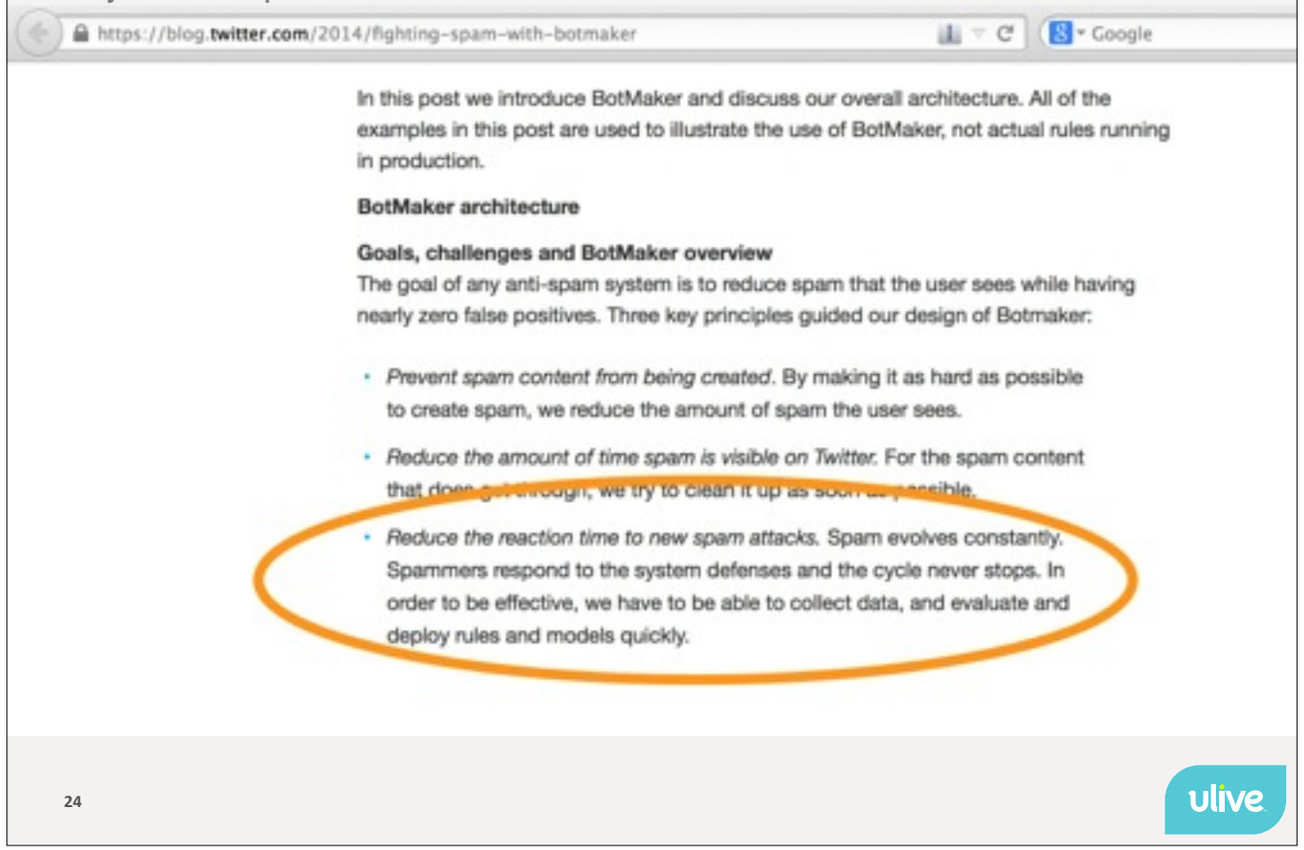
Cycle time compression

Compressing decision cycle time might mean that Marc Andreessen will be more inclined to invest in your startup.

Tweet: https://twitter.com/pmarca/status/473910743834693632

Twitter Botmaker

Cycle time compression in a hostile environment



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Compressing decision cycle time is perhaps even more important in a hostile environment. Witness this recent post from twitter on fighting spam. Doing this in a syndication context drives devops-style principles and practices into front-end engineering.

Link: https://blog.twitter.com/2014/fighting-spam-with-botmaker

Winning…

Let’s return to syndication. Since this is business, winning means that money coming in exceeds money going out. In syndication, we must serve ads to have money coming in, so it behooves us to pay timely attention to these matters.

Photo: http://commons.wikimedia.org/wiki/File:Matic_Osovnikar_winning_2007.jpg

From Monthly Cycles…

Calendar for October 2012 (United States)

October						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Phases of the moon: 8:◑ 15:● 21:◐ 29:○

Holidays and Observances: 8: Columbus Day (Most regions), 31: Halloween

Calendar generated on www.timeanddate.com/calendar

Two years ago, we looked at the data at the end of every month. This was adequate for billing but, as we discovered to our chagrin, sometimes a misconfigured ad caused a campaign to miss days of revenue. That is unacceptable.

Screenshot: http://www.timeanddate.com/calendar

To Hours and Minutes…

We first had to improve our service delivery capability by learning to use the product – which already aggregated the data hourly. And then we improved our product to enable checking ad delivery mere minutes after campaign launch. Shrinking decision cycle time made us more competitive as a business and more fit for purpose as a service delivery team.

Photo: http://commons.wikimedia.org/wiki/File:Vandalism_clock.jpg

The Hostile Internet

While we were attending to our service delivery capabilities, the internet was not standing still. This New York Times article last May is calling public attention to threats and challenges to our business model ranging from other players on the same pages competing for resources all the way to bot traffic attacking the revenue stream directly. These challenges are aptly described by my friend Jim Benson, who recently tweeted, “You can steer the car, but you can’t steer the road.”

Screenshot: http://www.nytimes.com/2014/05/04/business/the-great-unwatched.html

Hostile #1: Other publisher partners sharing the same page(s)
Hostile #2: Bots attacking ad revenue stream

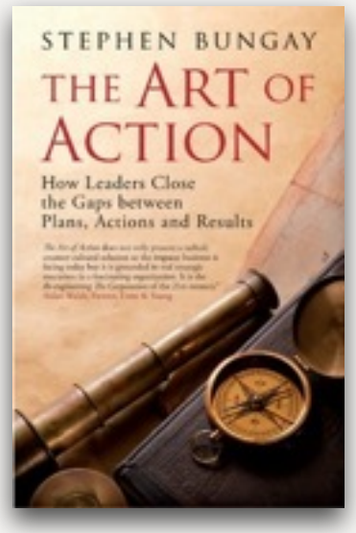
You Can't Steer the Road

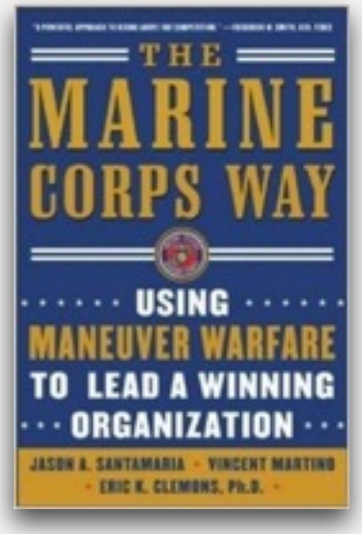
A hostile environment puts tremendous pressure on culture and management methods. Waiting for permission or approval can be fatal; the team must be able to act freely within mission constraints to advance the goals of the organization. Even a peaceful person must acknowledge that military history and culture might provide some valuable inspiration here, no matter what one might think of the motives of successful maneuver warfare teams, many of whom are "bad guys". Strategic and tactical genius is not confined to the winning side nor to the politically virtuous.

Photo: http://commons.wikimedia.org/wiki/File:Bundesarchiv_Bild_101I-127-0369-21,_Im_Westen,_zerst%C3%B6rter_franz%C3%B6sischer_Panzer_Char_B1.jpg

Maneuver Warfare

Applied to business





Two good and contrasting sources for maneuver warfare concepts applied to business are “Art of Action” and “The Marine Corps Way”. The former is a thoughtful historical analysis in the European style citing Prussian military history and the latter is a gung-ho American business book by former Marine officers.

Art of Action: http://www.stephenbungay.com/
The Marine Corps Way: http://www.amazon.com/The-Marine-Corps-Way-Organization/dp/0071458832

EBFAS

- Einheit
- Behändigkeit
- Fingerspitzengefühl
- Auftragstaktik
- Schwerpunkt

Chet Richards and Stephen Bungay both cite primarily German military history, and I will use these five German words to outline cultural and teamwork characteristics that are helpful in hostile environments where compressing cycle times is important.

As Toyota Production System influence has brought Japanese words into our community, so maneuver warfare brings German words. The German language is notorious for compounding nouns, and these words have no direct translation. We'll go through them one at a time.

Einheit

Small, nimble teams like Guderian's panzers share several interesting culture and teamwork characteristics which we would like to apply in our hostile internet environment. The first is Einheit – unity, team cohesion, trust. The real value of devs knowing how ops work and ops knowing how devs work is empathy for each others' roles.

Photo: http://commons.wikimedia.org/wiki/File:Bundesarchiv_Bild_146-1978-062-24,_Floing,_Pontonbr%C3%BCcke_%C3%BCber_die_Maas.jpg

Friction

"Activity in war is movement in a resistant medium." – Clausewitz

Clausewitz used the term "Friction" to describe how simple things become difficult in war because of many misfortunes and mistakes. Flow is impeded in a resistant medium.

Conway's Law, which asserts that system architectures are copies of the communication patterns of the organization that builds and operates them, can be a source of internal friction that erodes team cohesion.

Photo: http://commons.wikimedia.org/wiki/File:Panzer_Frankreich_1940_%28RaBoe%29.jpg

Quote: http://www.clausewitz.com/readings/OnWar1873/BK1ch07.html

Behändigkeit

The second is Behändigkeit. Nimbleness and agility can overcome unexpected obstacles and challenges.

Photo: http://commons.wikimedia.org/wiki/File:Bundesarchiv_Bild_146-1991-042-32A,_Westfeldzug,_Pontonf%C3%A4hre.jpg

Fingerspitzengefühl

The third is Fingerspitzengefühl – an intuitive feel for the situation at hand. This along with Behändigkeit can come from rehearsal, wargaming, and repetition. Engaging the Simian army prepares you for the real army. Being able to look at a graph and tell in a glance whether the situation requires attention is invaluable.

Photo: http://commons.wikimedia.org/wiki/File:Bundesarchiv_Bild_101I-769-0229-15A,_Frankreich,_General_Guderian_im_Panzerwagen.jpg

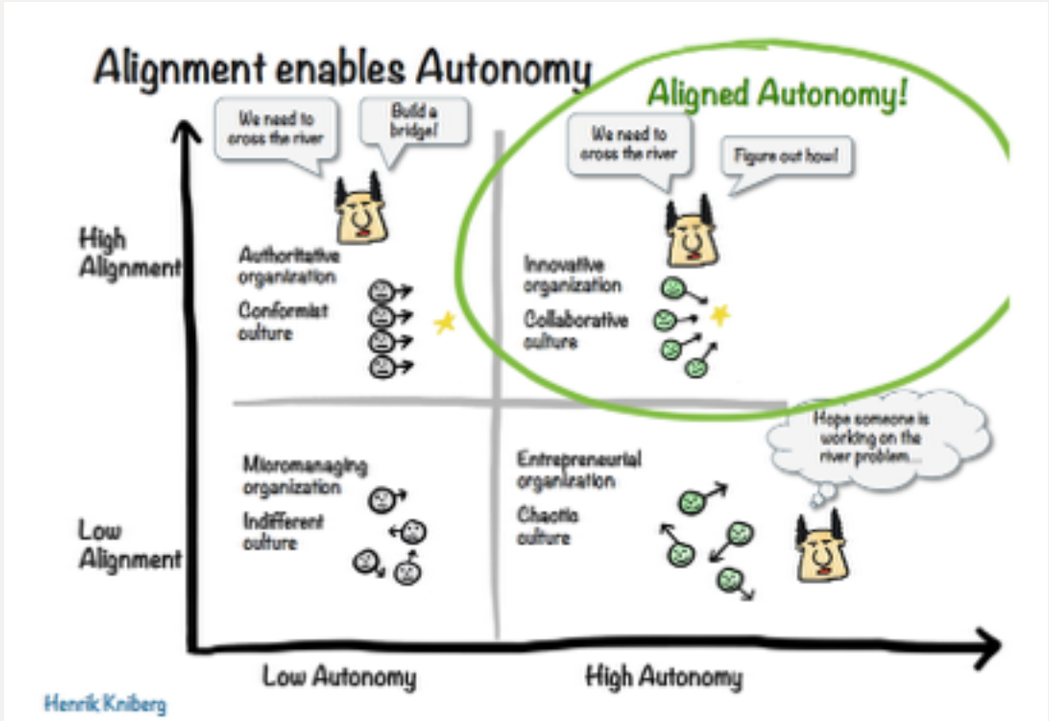
Auftragstaktik

The fourth is Auftragstaktik – mission orders. Convey commander's intent and desired end state — the "what" and the "why" — but leave "how" to the skills and motivation of the team. Please note that these officers, including Rommel himself, are not hiding out in châteaus in the rear. They are out in the field with their troops observing directly.

Photo: http://commons.wikimedia.org/wiki/File:Bundesarchiv_Bild_146-1972-045-08,_Westfeldzug,_Rommel_bei_Besprechung_mit_Offizieren.jpg

Decentralized Decision Making

The antidote to organizational friction



The antidote to organizational friction in a rapidly changing environment is decentralized decision making. Alignment is the process of making clear the constraints — the scope of autonomy to be exercised. One way to tell if mission orders are well understood is the back briefing — after you brief your teams on the “what” and “why”, listen to them back brief you on their plans. This gives you an opportunity to correct any misunderstandings.

Image credit: Henrik Kniberg http://blog.crisp.se/wp-content/uploads/2013/09/culture-over-process.pdf slide 36

Schwerpunkt

Fifth, we have Schwerpunkt – focus and direction. There can be only one primary mission, and when everyone on the team understands that primary mission, they are empowered to put aside any secondary tasks to support the primary whenever the opportunity or need arises.

Photo: http://commons.wikimedia.org/wiki/File:Bundesarchiv_Bild_146-1972-045-02,_Frankreich,_Erwin_Rommel_und_Offiziere_mit_Karten.jpg

Focus and Direction

I would be remiss if I didn’t call out limiting work in progress (WIP) as an important focusing tool.

Photo: Erik Sowa

So what does this mean for my teams? Implementing devops-style tooling on the front end is still a hard problem. There is still much to do in the domain of front-end operations.

To be honest, focus and direction are challenging to maintain in a hostile environment with many stakeholders. Recognizing that compressing decision cycle times is not the same as building features faster is key – as is evolving teams of people to fitness of purpose for operating the loop. Tooling is necessary but not sufficient to achieve cycle time compression - obsessively tending the culture matters.

Photo: http://commons.wikimedia.org/wiki/File:Daisies-Focus.jpg by Alexmenk

Thank you

- Slides will be posted online
- Image credits and sources are in the presenter notes
- Contact me:
  - erik.sowa@gmail.com
  - @eriksowa

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