Analytics & the OODA Loop
OODA Loop

- John Boyd, fighter pilot, “father of the F-16”
- Grand Theory of Combat Maneuver
- Observe, Orient, Decide, Act
How do you win an air-to-air dogfight?
1978: Nifty Nugget

- Real-world simulation of mass mobilization to fight WW3 in Central Europe: air, sea, land
- Analysts computed that if this exercise had been an actual conflict, there would have been 400,000 troop casualties, and thousands of tons of supplies and 200,000 to 500,000 trained combat troops would not have arrived at the conflict scene on time.
- Mobilization and logistics were a hot mess because Army, Navy, Air Force were running uncoordinated efforts to move men and materials, and because plans and execution were not robust to “unfolding events.”
1980: Proud Spirit: Make the Crisis Easier!

• Assume all stocks are already in place!
• Assume 60% of the Americans in Europe spontaneously decide to come home before the evacuation has to begin!
• Replace “shooting war” with “rising tension in Europe” and no actual shots fired (no casualties or medical system demands in Europe), one-war mobilization in U.S.
• System still fell on its ass.
• Civilian side: coordinated by FEMA (lessons not learned)
Big Data Problem?

General Edward C. Meyer, the Army’s Chief of Staff, warned planners afterward that “there is more information than we need. We must discipline ourselves to only get at the level of data needed to cause decisions to happen.” The answer, according to General Meyer, did not lie in asking Congress to buy more computers:

Clearly we are passing too much data back and forth. If there is any one thing I want to charge the staff with, it is to decide what are the elemental bits of data we need to make the decisions.

The Army’s duty to higher civilian officials, General Meyer continued, is to “ensure people are working on the right problems and not the wrong ones.”
“The institutional response for overcoming these fiascos is: more and better sensors, more communications, more and better computers, more and better display devices, more satellites, more and better fusion centers, etc. - all tied into one giant fully informed, fully capable C&C system. This way of thinking emphasizes hardware as the solution.

I think there is a different way - a way that emphasizes the implicit nature of human beings”
Obligatory Cybernetic Wireframe

Observe

Implicit Guidance & Control

Unfolding Circumstances

Outside Information

Unfolding Interaction With Environment

Observe

Observations

Forward

Feed

Orient

Cultural Traditions

Genetic Heritage

Analysis & Synthesis

New Information

Previous Experiences

Orient

Forward

Feed

Decide

Implicit Guidance & Control

Decision (Hypothesis)

Forward

Feedback

Feedback

Feedback

Feedback

Act

Action (Test)

Forward

Feed

Unfolding Interaction With Environment

John Boyd's OODA Loop
“Operate inside the adversary’s OODA loops to enmesh the adversary in a world of uncertainty, doubt, mistrust, confusion, disorder, fear, panic chaos,…and/or fold adversary back inside himself so that he cannot cope with events/efforts as they unfold.”
Own the OODA Loop?
Observe

• Introspective observation: looking at internal processes and inputs
  – Supply chain, Logistics, Ops, Finance, HR
  – Instrumentation
  – Beware industrial methods for non-industrial processes: Is the long walk a developer takes to clear his head mis-characterized as “waste?”
  – Observation overhead: automated feeds vs. people taking two days a week to fill out reports
    • Observation overhead slows down the OODA loop, because it leaves less time to act (too much time characterizing/discussing “blank” time on TPS-in-the-cloud reports to actually execute)
Extroverted Observation

- Market and customer research
- Declarative vs. Transactional Systems of observation
Perils of Declarative Systems of Observation: Social Media

- Cheap or free
- Highly available
- Would be so awesome if the secrets to the universe were here…
- Assumption: *this* is the place to look
Declarative vs. Transactional Systems of Observation

- Declarative systems of observation are interesting, but transactional systems are more useful: what people do vs. what they say.
  - Music people tweet about isn’t necessarily the music that they listen to - or buy

- Transactional system of observation is the “validation layer” for declarative systems of observation

- When it’s known that a declarative system of observation is linked to action, the system will be gamed
Squeaky Wheel Interventions

- People know that if they check into a hotel and bitch about it on Twitter, they’ll get an upgrade!
- Unintended consequence: flaming in public!
Trader Joe’s: OODA Loop on Aisle 5

• “Captains spend most of their day on the retail floor and have a lot of autonomy to set up their stores to meet local needs. Employees can open any product a customer wants to taste and are encouraged both to recommend products they like and to be honest about items they don't. All store employees can email buyers directly with ideas or feedback from customers.”

• Trader Joe’s does not scan you at the register, or send you coupons
Orientation

- Boyd: Orientation is "the repository of our genetic heritage, cultural tradition, and previous experiences – is the most important part of the O-O-D-A loop since it shapes the way we observe, the way we decide, the way we act."

- “Orientation shapes the character of present OODA loops - while these present loops shape the character of future orientation.”
• Who are we, where are we, where do we want to be in the marketplace, where *can* we be?
• Orientation is the part of the loop that’s least susceptible to automation
  – Construction of context that includes one’s own identity (actual and desired) is a human cognitive and social process
Decisions: Command & Control

• Command: clear, unambiguous direction
• Control provides assessment of what is being done, also in a clear unambiguous way
• “Direction and shaping, hence “command” should be evident while assessment and ascertainment, hence “control” should be invisible and should not interfere - otherwise “command and control” does not exist as an effective means to improve our fitness to shape and cope with unfolding circumstances.”
• Yin and Yang of the decision cycle
The Heisenberg Effect of Deciding

- Shared Decision Making in medicine
  - Asthma, diabetes, breast cancer
  - The *act* of patient decision improves outcomes
  - It’s not about efficiency or pre-making the decision based on the “right” answer
    - Beware mirroring bias among computer programmers
  - Especially when there are trade-offs and no clearly better option
- “Right” is sometimes only “right” when it’s chosen.
  - Choice is an expression of values, identity, agency
  - Love match vs. arranged marriage
  - Actual choice vs. the illusion of choice
Act

• A cautionary tale: Target
  http://www.nytimes.com/2012/02/19/magazine/shopping-habits.html?
pagewanted=1&_r=2&hp

• “Creepy” exists because the consumer did not choose tracking or intervention
Life Without OODA
Questions?

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References

- Proud Spirit: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CCoQFjAB&url=http%3A%2F%2Fwww.google.com%2Furl%3Fsa%3Df%26rct%3Dj%26q%3D%26esrc%3Dsource%3Dweb%26cd%26ved%3D2%26q%3D%26url%3Dhttp%253A%252F%252Fwww.carlisle.army.mil%252Fusawc%252Fparameters%252FArticles%252F1981%252F1981%252520fialka.pdf%26ei%3D1HhOT7eXFQfY0QGq6qDHAg%26usg%3DAFQjCNEk4iF79LBb_cOstx1GobVTbjYsgg&ei=1HhOT7eXFQfY0QGq6qDHAg&usg=AFQjCNEk4iF79LBb_cOstx1GobVTbjYsgg