OPERATIONS ANALYTICS

OR: HOW I LEARNED TO STOP WORRYING AND LOVE THE DATA

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The OODA Loop of Analytics

- Command and control is a continuous, cyclical process
- High tempo yields an ever-increasing advantage with each cycle
- With each cycle, slower actions become less relevant to the true situation
Monetized Data

• The results of having an integrated approach to applying advanced analytics.
• A competitive edge resulting from leveraging data science to improve decision making.
Motivation

Historical Peak = $577B

Historical Low = $383B

Korea

Vietnam

Late Cold War

OIF/OEF

OCO

-37%

-29%

-33%

-31%?
An Analytic Framework

Data Analytics

- BI Reporting
- Dashboards
- Data Mining
- Linear Regression
- Statistical Analysis
- Data Analysis
- Trend Analysis
- Risk Analysis
- Root Cause Analysis

Data Analytics Governance

- VV&A / UAT
- Portfolio Mgmt.
- System Eng.
- Lifecycle Mgmt.
- Analytics Maturity Assessment
- Commodity and Corporate Models
- M&S CFT

Descriptive Analytics

- Forecasting
- Simulation
- Performance Segmentation
- Ensemble Modeling
- Non-linear Regression
- Bayesian Networks
- Decision Analysis
- Network Analysis
- Time-Series Analysis
- Sensitivity Analysis
- “What-if” Analysis
- Cost Benefit Analysis

Prescriptive Analytics

- Optimization
- Design of Experiments
- Discrete Event Simulation
- Agent-Based Modeling
- Decision Analysis
- Game Theory
- Machine Learning

Metrics Framework

- MDM
- In-Database Processing

A

D

P

Rx
Delivering Speed to Value

- **Vision**
- **Assisted**
- **Automated**
- **Discovery**
- **Ignorance**

Data Volume:
- YB
- EB
- PB
- TB
- GB
- KB

Decision Latency:
- Sec
- Min
- Hr
- Day
- Mo

Adapted from ONR (2011)
First Principles of Data Analytics

1. Executive-level data analytics support program
2. Routine corporate approval and review of assessments
3. Shared ‘sandbox’ of data and analysis tools
4. Professionalized, incentivized, and tracked workforce of analysts

Instead of asking, "How can we get far more value from far more data?" successful big data overseers seek to answer, "What value matters most, and what marriage of data and algorithms gets us there?“
Balanced Portfolio

Accredited Models

Commodity Models

Ad-Hoc Models
Performance Management

- Identify, assess, mature, and manage the data, systems, models and tools used to develop policies and decisions.
  - Data-to-decision mapping, highlight value of data
  - Comparative data health assessments
  - Information to support system investment planning
- End state:
  - Identify best of breed
  - Mitigate redundant capabilities
  - Assess data, software, and VV&A liabilities
  - Frame the return on investment(s)