

National Modeling & Simulation Coalition

National Meeting - September 26, 2017

ModSim Teams: *Data-driven multidisciplinary teams solving 21st century challenges*

Jeff Segall MA, MBA

CEO, Founder Inflow Interactive LLC

➤ **Enterprise perspectives**

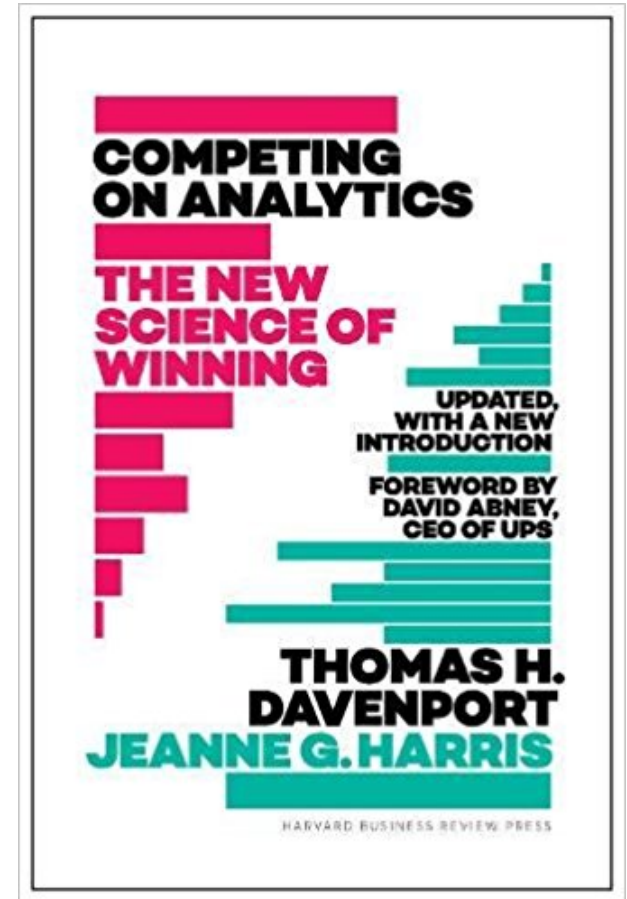
- Data talent challenges: A threat to M&S?
- Need for multidisciplinary teams

➤ **New leadership opportunities for M&S**

Core Skills for Knowledge Workers 2017

“To succeed at an analytical competitor, information workers and decision makers need to become adept at three core skills:

- Experimental (design valid tests)
- Numerate (interpretation of results)
- Data literate (*modeling, simulation and visualization*)”



Data-Science-Analytics Talent Pipelines

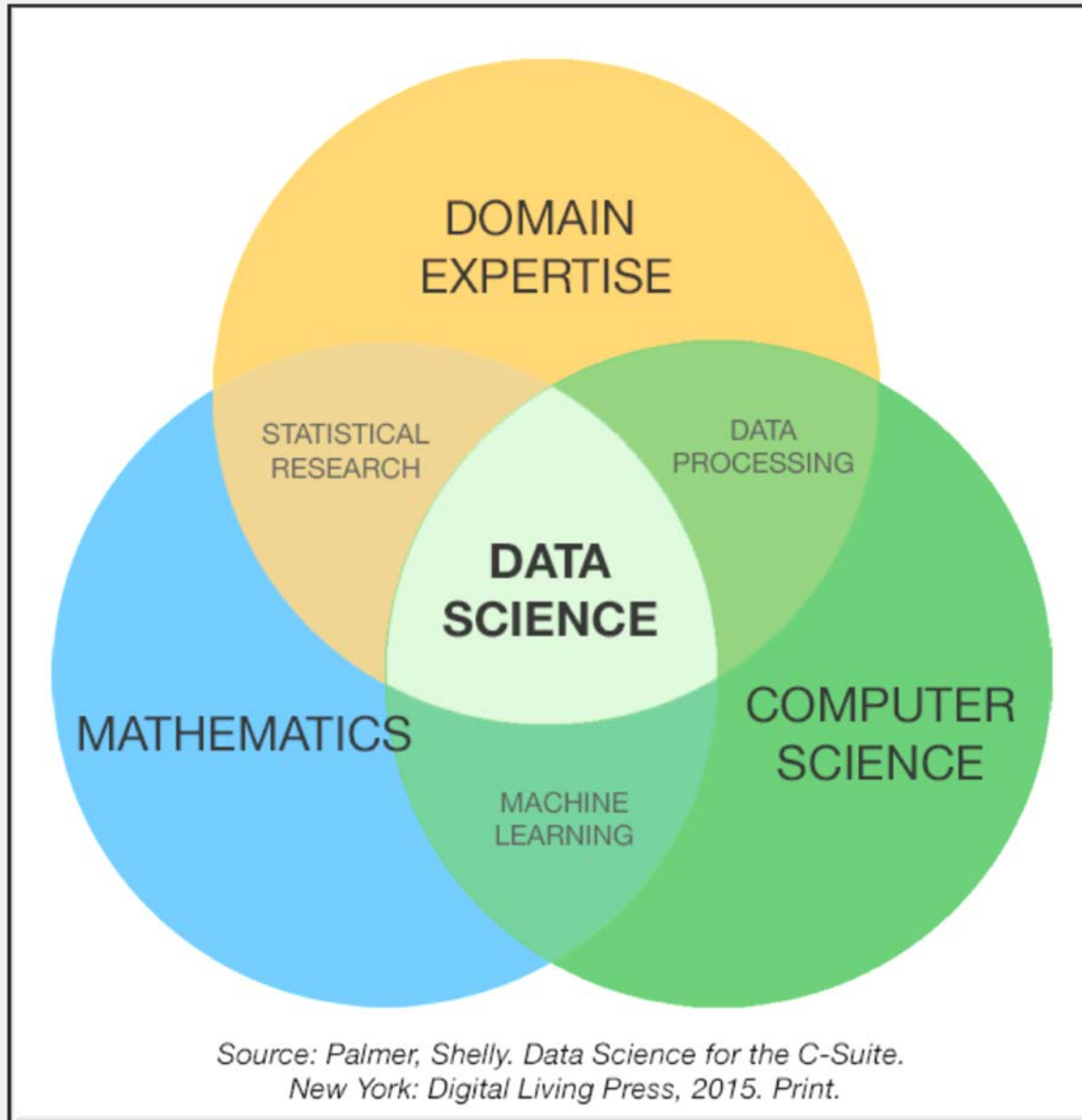
Analytics Semi-Professionals	Analytics Professionals	Data Scientists
MBAs, business analysts, supply chain analysts, market researchers	Advanced degrees in statistics, econometrics, mathematics, physics, operations research	Masters or PhD. in applied analytics, informatics, data science

“By 2020 the number of DSA job listings is projected to grow by nearly 364,000 listings, to about 2,720,000 openings.

If McKinsey’s predicted supply of 2.8 million analytically savvy workers is accurate, then nearly every one of these workers must change jobs annually to fill open DSA positions.”¹

1. The Quant Crunch: How the demand for data science skills is disrupting the job market. Burning Glass Technologies, 2017. Pp. 4-6.

Chasing the Unicorn...



Data Scientists Follow the Money

(and technical challenges)

Harvard
Business
Review



DATA

Data Scientist: The Sexiest Job of the 21st Century

by Thomas H. Davenport and D.J. Patil

FROM THE OCTOBER 2012 ISSUE

Data scientists today are akin to the Wall Street “quants” of the 1980s and 1990s.

Converging Mod/Sim and Data Science Skills¹

	Statistics	Computer Science	Data Viz	Typical Data Analysis
Instructional Design	1		1	Learning Evaluation
MBA	3	1	3	Product/profit, optimization
HR – People Analytics	3	2	3	Engagement, productivity, performance modeling
Data Analysts (OR, statistics, informatics)	4	3	3	Reporting, optimization, predictive modeling
Data Scientists (PhDs, MS Data Science)	3	5	4	Explore complex data types, HPC, prescriptive modeling, machine learning, AI
Modeling & Simulation	4	4	5	Algorithms, HPC, model complex data types, engineered systems

¹ Informal review of MS curricula prerequisites for Mod/Sim and Data Science

Data-driven Multidisciplinary Teams

PWC study 2017

*“We found a fundamental disconnect. Employers will need **data-driven, multidisciplinary** teams to tackle their biggest problems and grasp their most promising opportunities.”*

“Competency in data science includes the ability to thrive in multidisciplinary teams...Educators need to provide a program that brings industry, policy makers, computer science and data science together through a diverse range of skills, expertise and experience.”

Data-driven Multidisciplinary Teams

SMART Emergency Medical Teams

NIST Global Cities Team Challenge

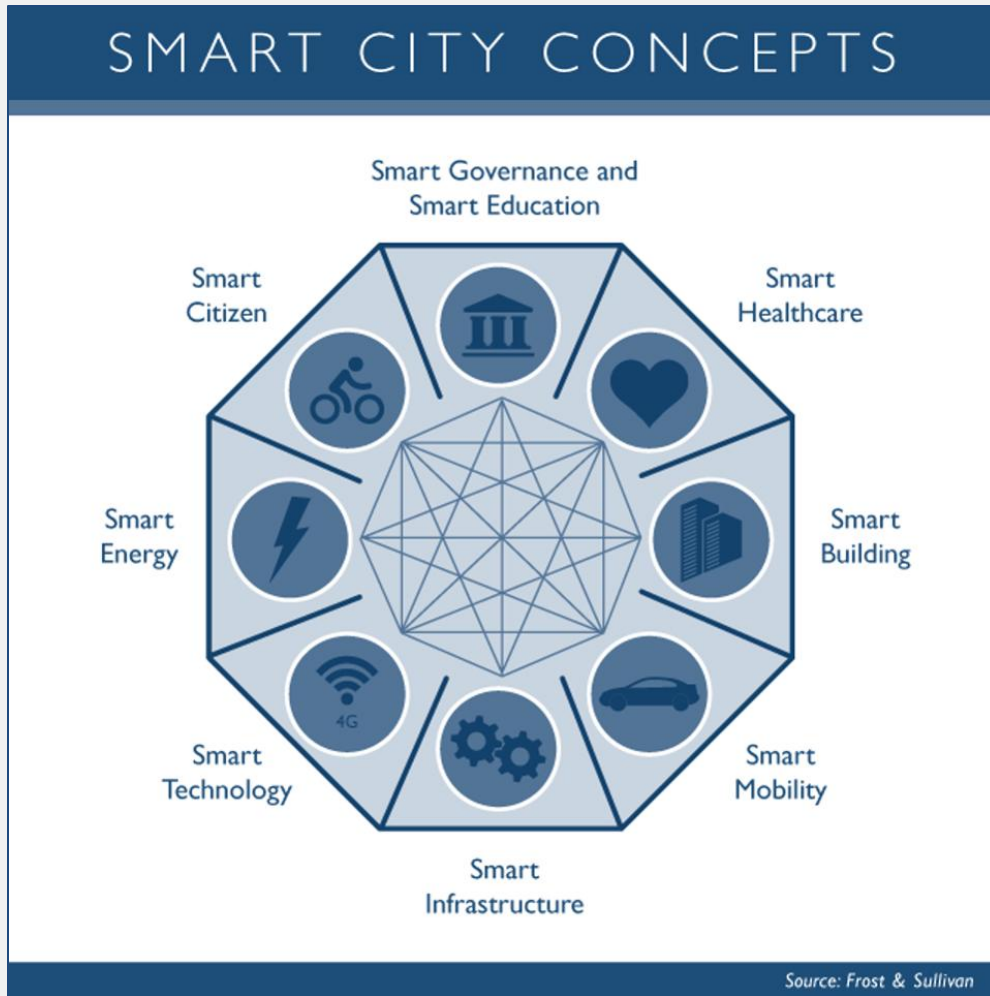
Using IoT Sensors to Enhance Simulation and Training in Multi-team Systems¹

“When multi-team systems act without any prior training focused on the entire system...there is increased risk of information not being handed off efficiently or correctly, and teams competing instead of collaborating.

Behavioral data analytics can play a key role in making multi-team systems training possible.”

1. Brenda Bannan, Jeff Segall, et. al. I/ITSEC 2017 paper No. 17064, p. 11

Smart Cities Estimate - \$1.5 Trillion by 2025¹



"IoT analytics developers have been brewing sensor data skills for over a decade. Every day, data integration developers wrangle sensor data into usable data. And every day, data scientists distill sensor data into ROI."

Dan Graham,
GM Enterprise Systems, Teradata²

1. Frost and Sullivan. Strategic Opportunity Analysis of the Global Smart City Market. 2013
2. How can organizations close the IoT skills gap? Internetofbusiness.com 2/13/2017

Cybersecurity and Modeling Needs for IoT and Smart Cities



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« BATTELLE DRONEDEFENDER, DEDRONE TO
DEVELOP AIRSPACE SECURITY SOLUTIONS
POSED BY UNAUTHORIZED DRONES

LOS ALAMOS RESEARCHERS INVESTIGATE
BIOTHREAT LOOKALIKES TO AID BIOLOGICAL
SURVEILLANCE EFFORTS »

DHS, NIST to jointly sponsor Global City Teams Challenge
for “smart city” solutions in 2018

Tuesday, August 29, 2017 by Alex Murtha

IoT Sensors + Data Analytics

The M&S Advantage

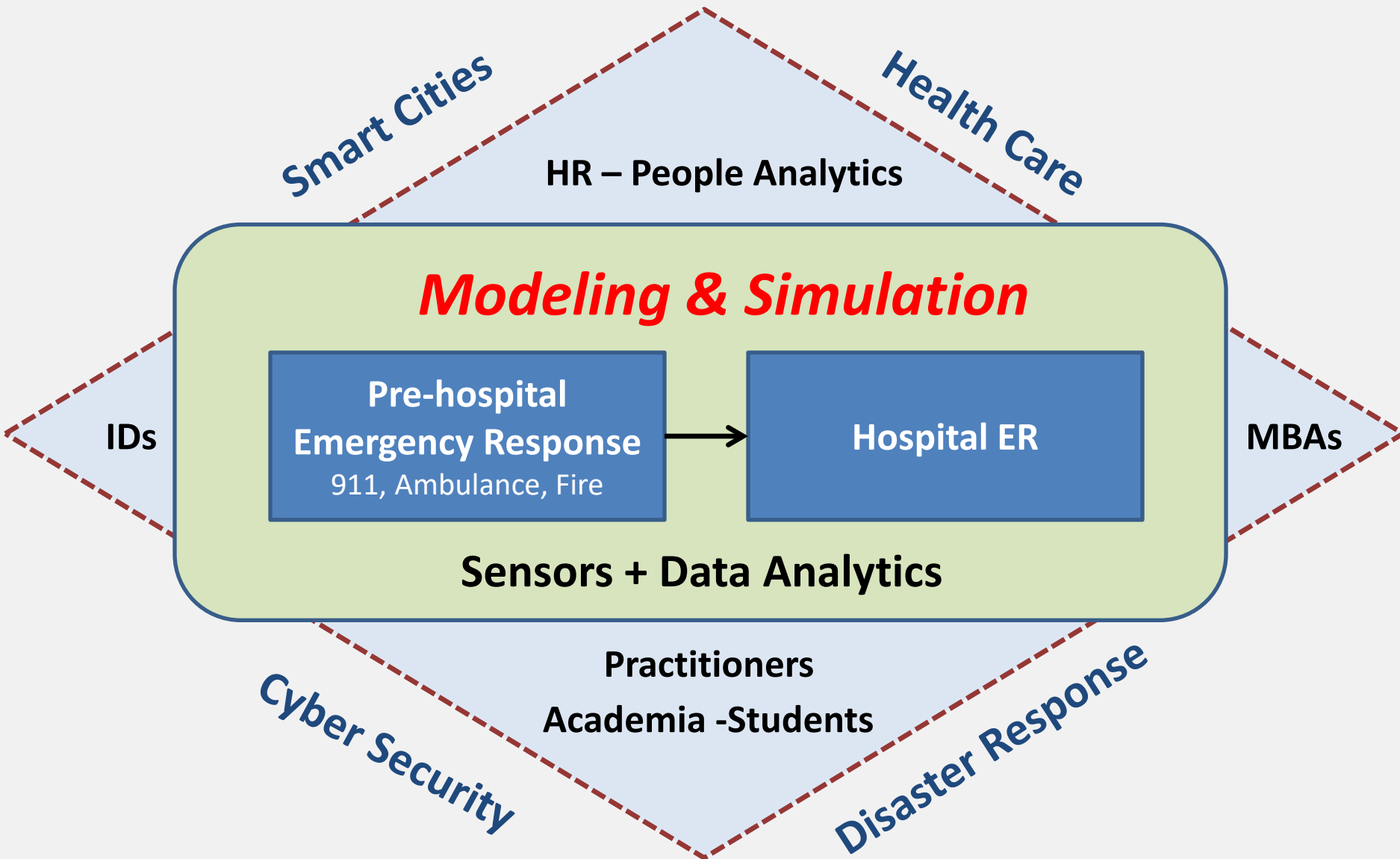
- Federal IoT market grew 20% in FY2015 to over \$9 billion annualized
- Sensors growing at 56% a year to \$4.1 billion, driven chiefly by defense technologies¹

“Those organizations with analytics capabilities that are good or excellent are three times more likely to report having no trouble getting business value from IoT.”

MIT Sloan Management Review

M&S at the Core

Data-Driven Multidisciplinary Teams



Focused Support for Multidisciplinary Teams

Stanford D-school

Columbia University Data Science Institute



Envisioning...

ModSimTeam School



- **‘MoST School’** – immersive, multidisciplinary seminars solving local/regional problems
- ***M&S holds a core leadership role***
 - Builds pipeline of M&S capable teams
- Data analytics skills are the bridge
 - M&S strengths in IoT sensors and physical systems
 - Easing the data analytics talent shortage

The logo for inFlow Interactive features the company name in a blue, italicized sans-serif font. The text is positioned on the left side of a white rectangular area, which is set against a background of dynamic, flowing blue lines and small white dots, suggesting motion and technology.

inFlow
Interactive

Accelerating Time to Capability

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InFlow Interactive LLC enhances workforce capabilities via rapid prototyping of workforce analytics, simulations and embedded performance support solutions