WELCOME

WHARTON FAMILIES:
SUMMER WEBINAR SERIES

Wednesday, July 15

The Future of Big Data
with Professor Eric Bradlow

Vice Dean of Analytics, The Wharton School
K.P. Chao Professor
Professor of Marketing, Economics, Education, and Statistics
Chairperson, Wharton Marketing Department

Wharton
University of Pennsylvania

MORE THAN EVER
Our Campaign

How do you compute corporate profits?

The New Business Era: Making Profit One Customer At a Time

Product Centricity v

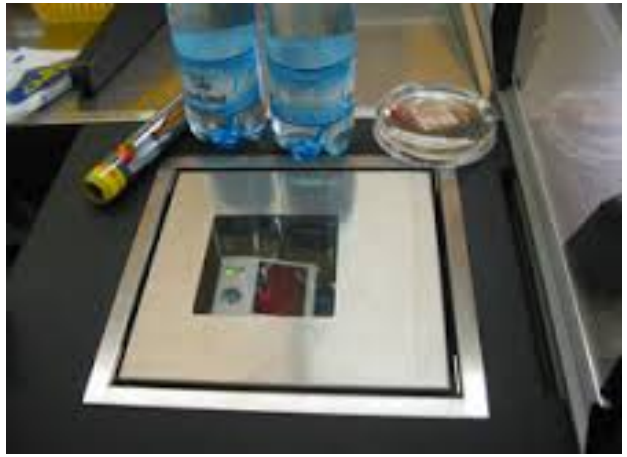
Customer Centricity

$$\sum_{products} (\text{Revenue} - \text{Cost}) = \sum_{customers} (\text{Revenue} - \text{Cost})$$

- CLV is King
- Fire customers!
- Rank-order customers
- Find valuable customers and “print” millions of them!

Radically new data sets in business

What is This?



Right, it's a data-collection device to help firms understand what products a given consumer has bought

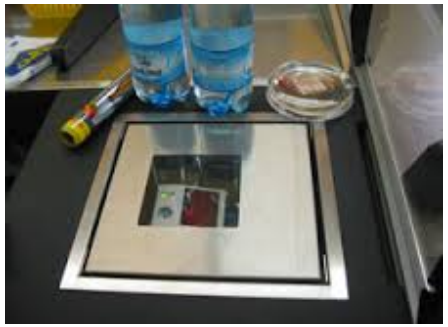
What is This?

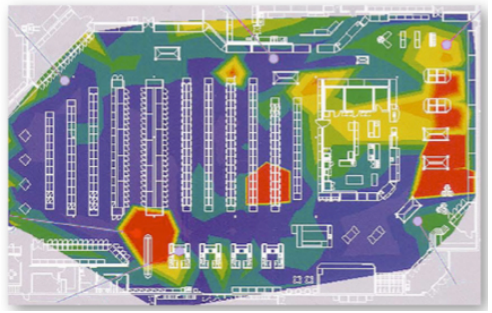
Right, it's a data-collection device to help you assess the products that customers are looking at and what products they may be interested in

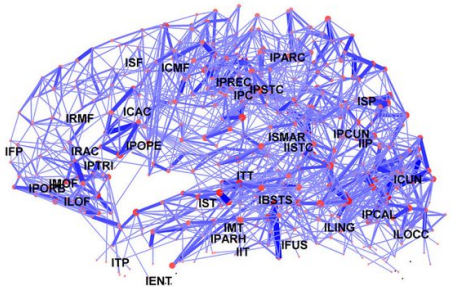
What is This?

Right, it's a data-collection device to help you figure out someone's GPS location

Radically new data sets in business







Uses of Advanced Management Science by Leading Firms

Kohl's: Smartphone Targeting

BRING THIS TO THE STORE WITH YOU TO REDEEM YOUR OFFER.

$10 off

your men's wardrobe purchase of $30 or more in store or 15% off online. Shop Kohls.com with promo code MENSTYLE15.

PROMOTIONAL OFFER VALID **SUN., SEPT. 8—SUN., SEPT. 22**

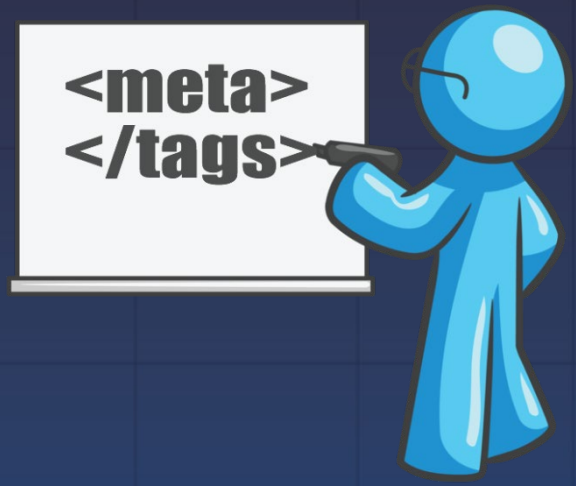
KOHL'S
expect great things

$10 OFF $30 OFFER VALID FOR ONE-TIME USE IN STORE ONLY OR 15% OFFER VALID ONLINE ONLY SEPT. 8–22, 2013. ONLY ONE MEN'S WARDROBE MERCHANDISE OFFER MAY BE USED PER CUSTOMER. $10 offer valid on a minimum $30 pre-tax purchase of men's apparel, dress and casual footwear and luggage merchandise. $10 offer is nontransferable and must be presented at time of in-store purchase. $10 offer can be combined with other offers and will be applied prior to percent-off total purchase discounts. **Offer cannot be redeemed for cash. No cash back.** Return value of merchandise purchased with $10 coupon will be subject to adjustment. 15% offer is nontransferable and valid only on men's apparel, dress and casual footwear and luggage merchandise on Kohls.com. 15% Promo Code must be entered at Kohls.com to receive discount. 15% offer cannot be combined with any other percent-off discounts, including age-specific discounts. Offers not valid for price adjustments on prior purchases, the purchase of Gift Cards, payment on a Kohl's Charge account, the purchase of Kohl's Cares® cause merchandise or other charitable items or in conjunction with any percent-off discounts, including age-specific discounts. Offer excludes prestige brands of cosmetics and skincare and select prestige brands of fragrance. For a complete list of these excluded brands, go to Kohls.com/beautyexclusions or look for signs in our stores. Offer also excludes select electronics; see store for details. Photocopies or duplicates not acceptable. Only one men's wardrobe merchandise offer may be used per customer. See store for details.

Prices good Sun., Sept. 8–Sun., Sept. 22, 2013, unless otherwise indicated.

KOHL'S®
expect great things®

Netflix: Designing Content



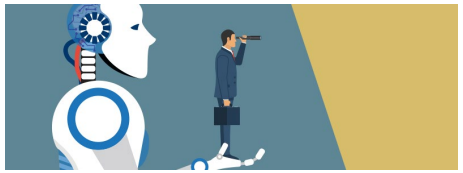
NETFLIX

Wharton
University of Pennsylvania

ANALYTICS AT WHARTON

THE FUTURE OF BIG DATA (at Wharton)

Analytics at Wharton unites the School's trail-blazing teaching, research, and industry engagement initiatives that use data to improve decision-making and generate actionable business insights.



AI FOR BUSINESS

CUSTOMER ANALYTICS

PENN WHARTON BUDGET MODEL

PEOPLE ANALYTICS

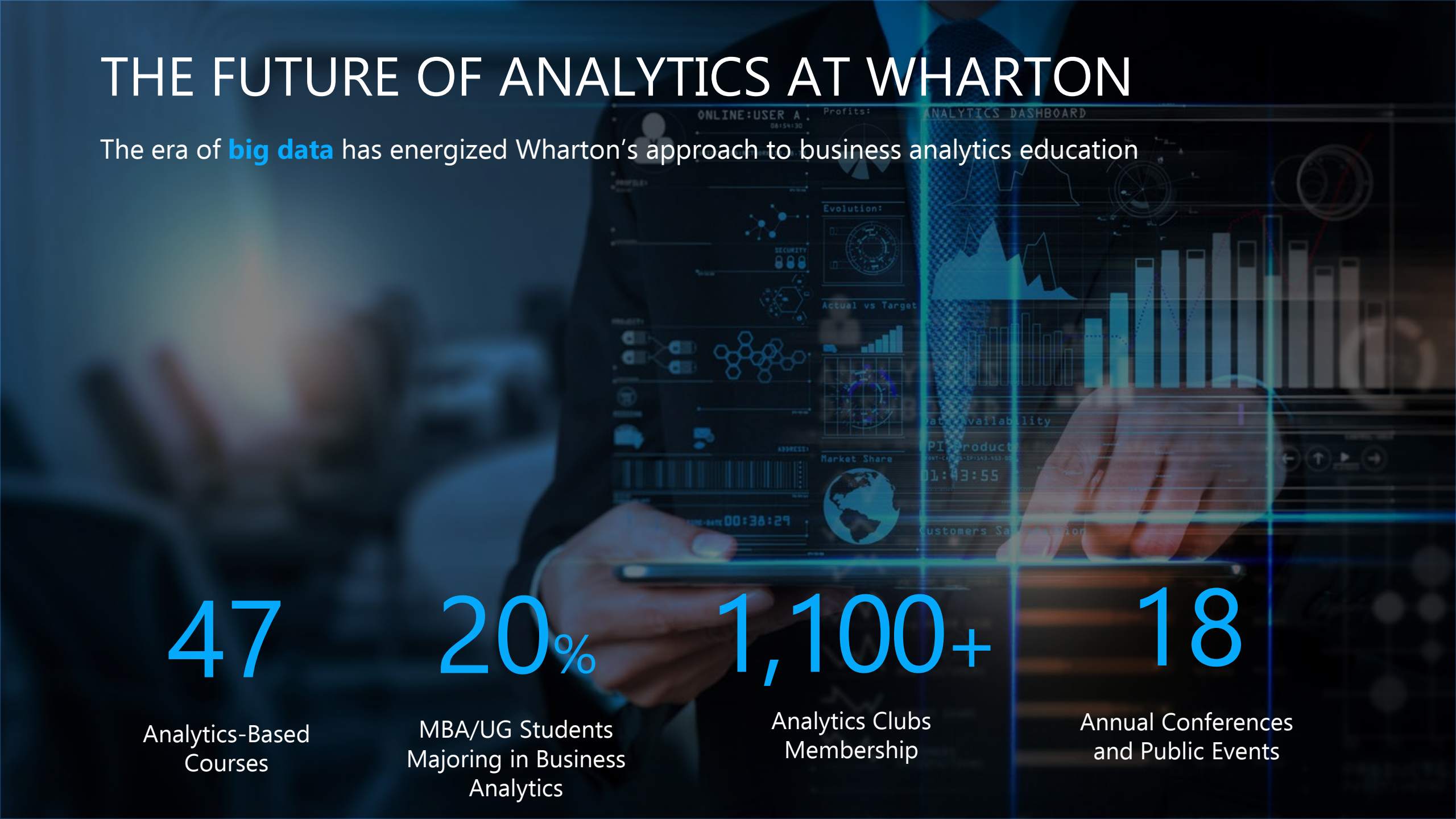
WHARTON NEUROSCIENCE

WHARTON RESEARCH DATA SERVICES

WHARTON SPORTS ANALYTICS BUSINESS INITIATIVE

THE FUTURE OF ANALYTICS AT WHARTON

The era of **big data** has energized Wharton's approach to business analytics education



47

Analytics-Based Courses

20%

MBA/UG Students Majoring in Business Analytics

1,100+

Analytics Clubs Membership

18

Annual Conferences and Public Events

Student Programming

EXPERIENTIAL LEARNING

2 **Datathons** per semester
Fall & Spring **Analytics Accelerators** – 8 projects per competition

LEARN ANALYTICS

Technical Workshops & **Online Courses** in SQL / Python / Data Visualization / Cloud Computing / Chat Bots

INDUSTRY ACCESS

Speaker Series
Career Treks
Analytics Conferences
Mentorship and Networking

RESEARCH

Technical Assistant Program to assist with WCA research & **Student Data Portal** provides students with real datasets for research

WCA BY THE NUMBERS

24 Annual Student Programs
1,100 Analytics Clubs Membership
2,000+ Students Engaged
500+ Online Course Enrollments

Wharton University of Pennsylvania CUSTOMER ANALYTICS

CUSTOMER ANALYTICS

COMPANY

The Barnes Foundation is an art collection and educational institution promoting the appreciation of art in horticulture in downtown Philadelphia.

PROJECT

Students developed an integrated predictive analytics model that could inform pricing, attendance behavior revenue, and programs.

OUTCOME

Pricing, Customer Segmentation, and Regression Analysis

- **Business Implications:** Development of demand-forecasting models to capture variation in changes in visitation for members and non-members, special exhibitions, seasonality and discounts.

For more information about this research project and data, click here.

Corporate Partners

Inputs into Models (Data)

- **Economists often turn to insights from other disciplines about human behavioral biases at individual levels instead of merely studying (and relying on) past patterns in macro data.**
  - Example: Are households "beta-delta" discounters? i.e., place little weight on future
  - Lots of evidence that it holds in SR. However, now considered irrelevant

- **Some data sources we (PWBM) and other economic modelers use:**
  - **Household survey data**: Census' American Community Survey and Current Population Survey, U. of Michigan's Panel Study of Income Dynamics, Federal Reserve Board's Survey of Consumer Finances.
  - **Administrative data**: Social Security Administration (Office of the Chief Actuary), Internal Revenue Service (Statistics of Income), Centers for Medicare & Medicaid Services.
  - **Firm level data**: Census, BEA, BLS and many other sources.
  - But for COVID-19, we radically expanded to get private data at county / daily level.

AI FOR BUSINESS

Analytics at Wharton

COMPANY

Reed Smith is a dynamic international law firm, dedicated to helping clients move their businesses forward. Its long-standing relationships, international outlook and collaborative structure make it a go-to partner for speedy resolution of complex disputes, transactions, and regulatory matters.

PROJECT

Students developed machine learning models and a methodology to fill in missing data to determine budget fees and billing rates and to predict future case activities and tasks.

OUTCOME

Clustering Methodologies and Regression Analysis

- **Business Implications**: Methods to cluster both categorical and continuous data and implementation of models to predict fee budgets and billing fee rates for clients.

For more information about this research project and data, click here.

Wharton PEOPLE ANALYTICS

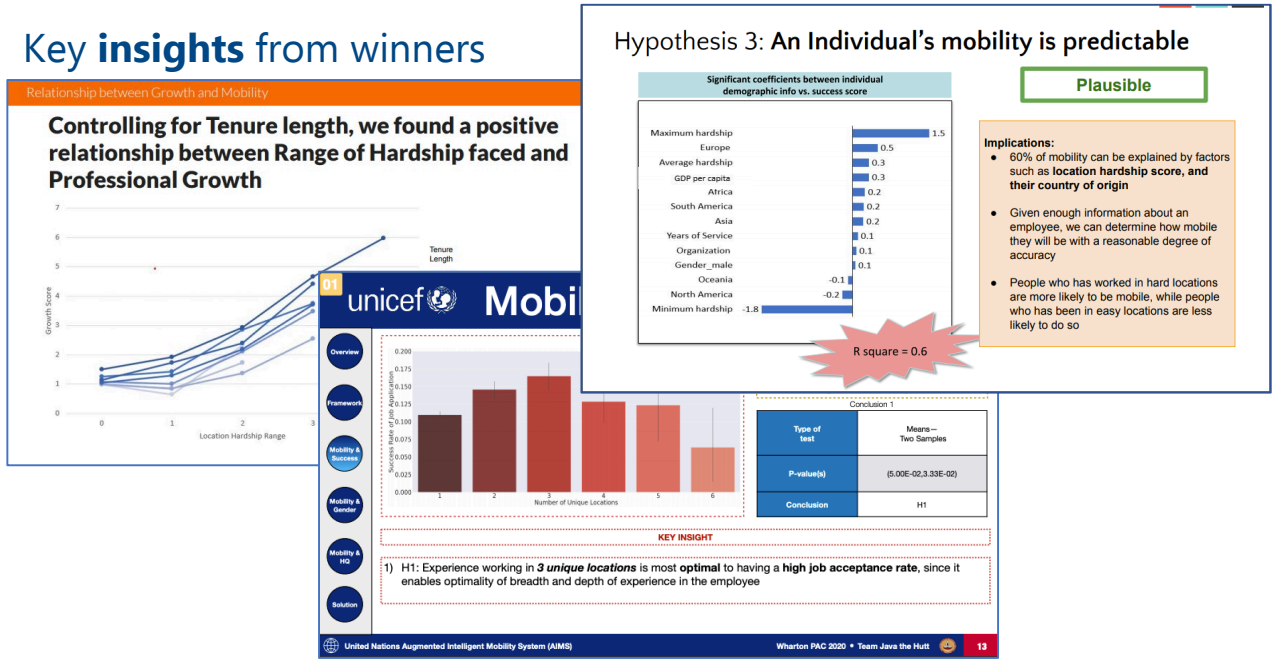
University of Pennsylvania

Partnered with **United Nations** for 2020 Case Competition

Data on patterns of **staff mobility**

- What is impact on an individual's career advancement?
- Are there differences between genders and other?
- Which mobility systems are more beneficial?

Key **insights** from winners



Watch the finalist presentations here

Adam Grant with Marcus Buckingham

Wharton Neuroscience collaborated with a major B2B company to quantify attendee experience at the largest tech trade shows.

Simultaneous quantification of engagement and enjoyment as users explore the show floor

Each user had an experience trajectory during exploration

Integrating tracking data provided experience snapshots in key conference locations and events

Wharton
UNIVERSITY of PENNSYLVANIA

NEUROSCIENCE
Initiative

(CEO keynotes can be engaging, even when not enjoyed)

Students are welcome, encouraged, and become integral to all Wharton Neuroscience research projects (learn more: https://neuro.wharton.upenn.edu/education/)

Wharton Neuroscience is always looking for corporate partners to share ideas and collaborate on innovative projects (learn more: https://neuro.wharton.upenn.edu/partners/)

questionnaires.

SPORTS ANALYTICS AND BUSINESS INITIATIVE

Analytics at Wharton

Undergraduate Seminar: **Sports Research Group**

- Small group discussions with faculty
- Individual project work
- Coffee chats with analysts from pro teams

Seminar students share research at CMU Conference

Individual Project Work Example:
Baseball - PlayerELO Project

- Innovative expansion of the ELO rating system generated new insights
- Evaluated individual players in baseball enabling forecasts
- Accounted for variability in competition

	PA	wOBA	xwOBA	wRC+	playerElo
Freeman, 1B	643	0.398	0.396	144	1329
Santana, 1B	624	0.389	0.371	141	1146

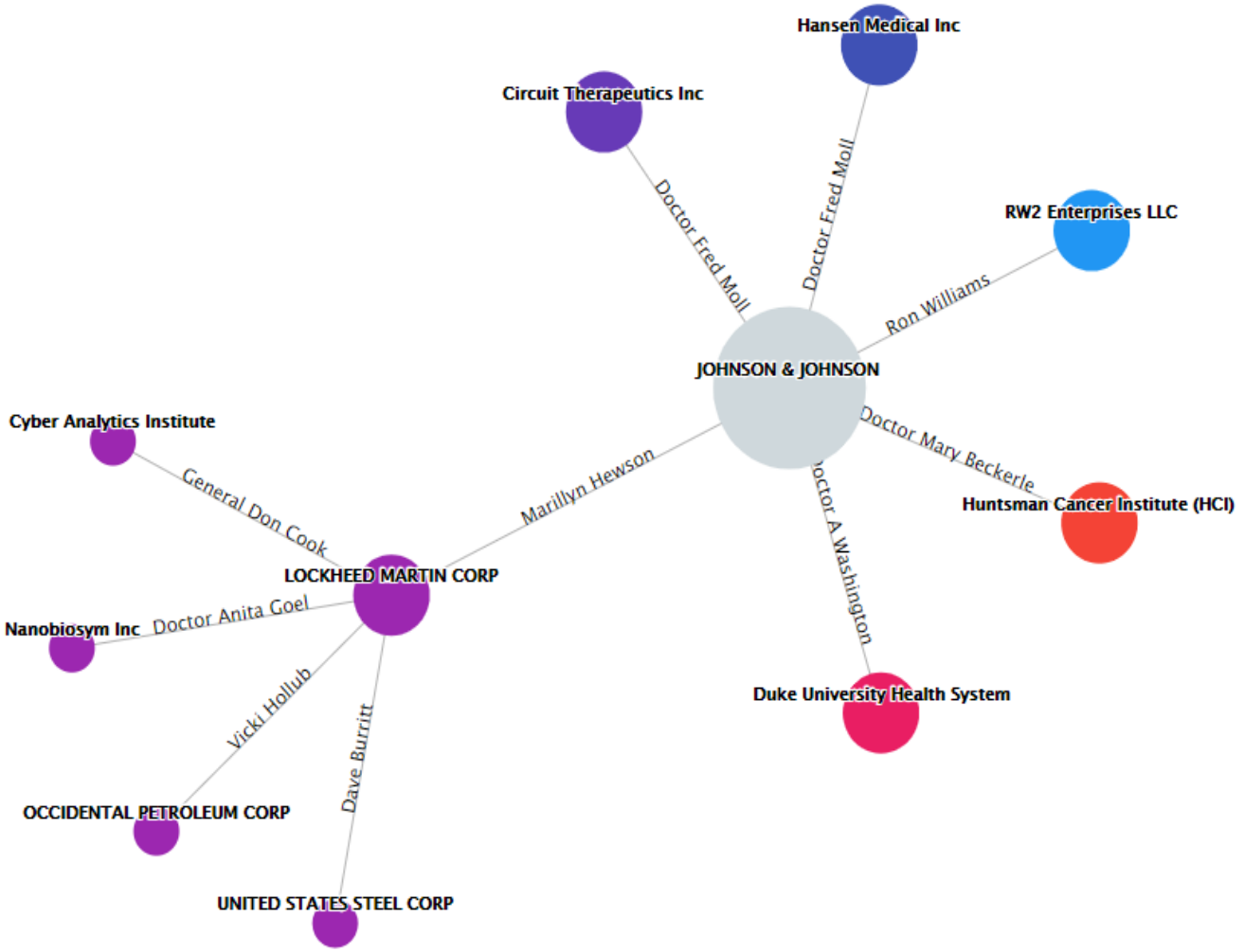
Note: the student subsequently published a paper on this and interns w/ the New York Mets - link to full paper

Wharton University of Pennsylvania | wrds Wharton Research Data Services whartonwrds.com

- Financial and economic data available to Wharton undergraduates
- Over 600 Databases covering a variety of topics:

Stock Prices	Corporate Financials	ESG – Environmental, Social, & Governance	Bonds
Indices	Mutual Funds	Analyst Estimates	Regulatory Filings
Board Membership	Executive Compensation	Options	

WRDS Case Study: Visualizing Executive Board Membership



Wharton University of Pennsylvania | wrds Wharton Research Data Services whartonwrds.com

NEW LOCATION FOR ANALYTICS AT WHARTON

Located in the bustling heart of the Wharton campus, the Wharton Academic Research Building (WARB) will bring innovative teaching and research activities in data and analytics under one roof, providing an ideal environment for collaboration between industry and academic thought leaders.

Wharton
University of Pennsylvania

ANALYTICS AT WHARTON

THANK YOU!

ERIC T. BRADLOW
ebradlow@wharton.upenn.edu
WH' 88, Par '19, Par '22, Par (?) '28