

# Technology-Driven Changes to Market Research and the Social Sciences

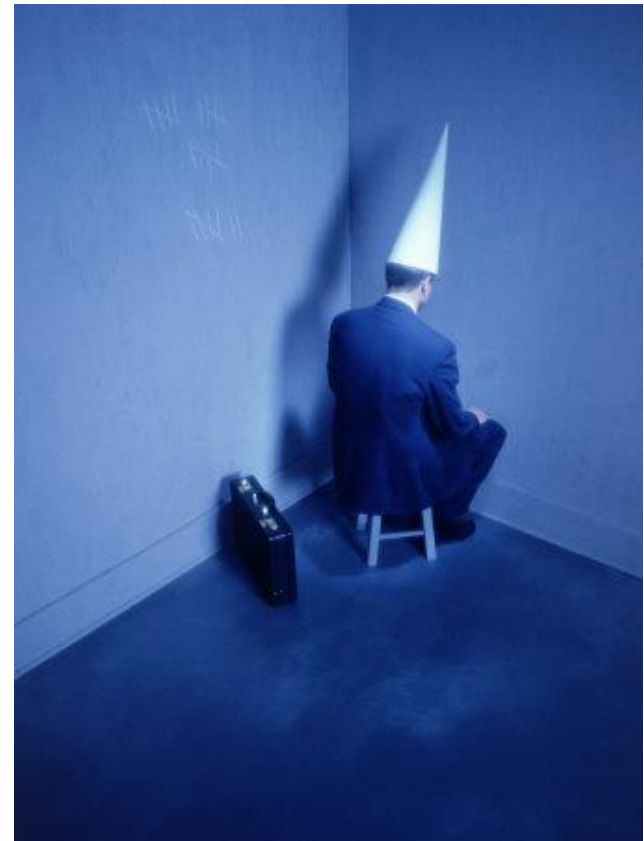
Scott McDonald, Ph.D.

Social Science Matrix. UC Berkeley. January 29, 2015



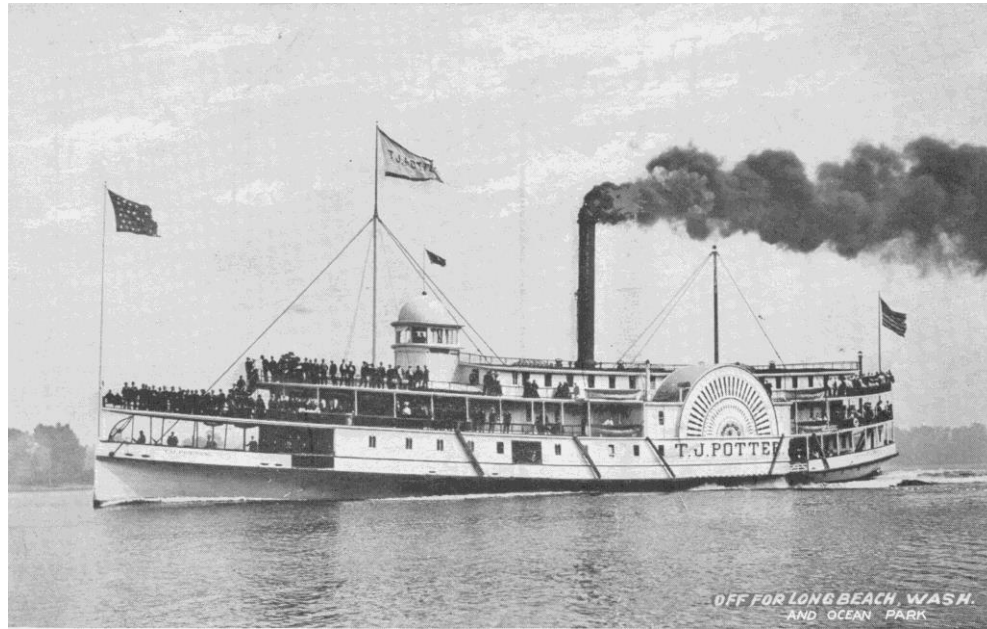
“Prediction is difficult, especially about the future”  
Yogi Berra





“Any useful statement about the future should appear to be ridiculous”  
Jim Dator, Hawaii Center for Futures Study





“What, sir? You would make a ship sail against the wind and currents by lighting a bonfire under her decks? I pray you excuse me. I have no time to listen to such nonsense”

Napoleon Bonaparte upon hearing of Robert Fulton’s plans for a steam-powered engine





“The Americans have need of the telephone, but we do not. We have plenty of messenger boys.”

Sir William Preece, Chief Engineer, British Post Office, 1878





“There is no reason anyone would want a computer in their home.”

Ken Olson, president and founder of Digital Equipment Corp. (DEC), maker of VAX and mainframe computers, 1977



# The Future as of January 1, 2000

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- ▶ Serious essays on the 21<sup>st</sup> Century
- ▶ Most did not see:
  - ▶ 9/11 and security challenges of stateless terrorism
  - ▶ Tech bubble burst of 2001
  - ▶ Housing bubble burst of 2008
  - ▶ Derivatives-based financial crisis
  - ▶ Destabilization of Euro
  - ▶ Rise of China
  - ▶ Social media
  - ▶ Mobile devices transforming everyday life



# June 29, 2007

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- ▶ Apple launches first iPhone
- ▶ No one anticipated
  - ▶ Web 2.0 growth of social media
  - ▶ User-generated content on YouTube
  - ▶ Showrooming impact on retail
  - ▶ Political impact through Twitter
  - ▶ Google at the dinner table
  - ▶ Ubiquitous food photography
  - ▶ Newsstand sale of magazines
  - ▶ Big Data impact on research





# Today's Agenda

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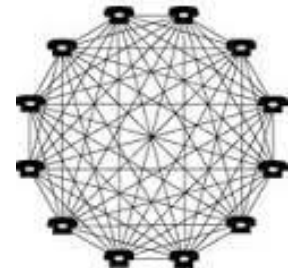
- Forces for change
  - Economic
  - Technological
  - Social
- Impact on research practice
- Impact on jobs and structure of opportunity
- Impact on research possibilities in social sciences



# Economic Forces

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- ▶ Globalization
- ▶ Schumpeter's Gale
  - ▶ Creative destruction
  - ▶ Marx's falling rate of profit
  - ▶ Capitalist dynamism
  - ▶ Relentless search for growth
  - ▶ Margin squeeze
  - ▶ Labor market substitution
- ▶ Growing importance of networks
  - ▶ Metcalfe's Law
  - ▶ Network Effects
  - ▶ FB buys WhatsApp for \$19BN



# Technological Forces

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## ▶ Moore's Law

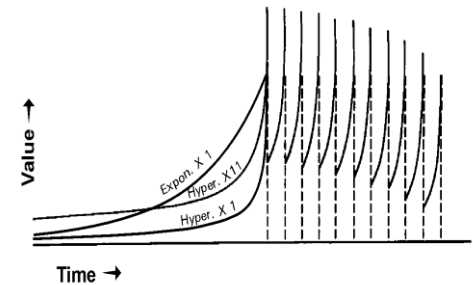
- ▶ Accelerating price/performance ratios
- ▶ Falling cost of computing, storage, transmission
- ▶ Google: Internet data rate growing at CAGR of 44%, while costs fall

## ▶ Advances in AI and Machine Learning

- ▶ Speech recognition
- ▶ Natural language processing
- ▶ Sensors & robotics

## ▶ Biotech & Nanotech

## ▶ Data are digital



# Social Forces

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## ▶ Average is Over

- ▶ Shifting border between man & machine
- ▶ Global labor market competition
- ▶ Advanced specialization in tech and science fields
- ▶ Squeeze on anything that can be routinized

## ▶ Shorter shelf-life of a college education

- ▶ Need for adaptive intelligence
- ▶ Shelly Palmer: “You don’t get to live in a world without constant learning”



# These Macro Forces Have Already Affected Commercial Research Practice

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- ▶ Surveys have already largely gone
  - ▶ Offline to online
  - ▶ Desktop to mobile
- ▶ Researchers have already shifted from
  - ▶ Asking questions to capturing behaviors
  - ▶ Qualitative research to social media listening
  - ▶ Human coding to machine coding (or crowdsourced)
- ▶ New technologies introduced
- ▶ Offerings are “productized”



# Outlook: More Focus on Behavior, Less Focus on Motivation

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## Passive Observations

- ▶ More digital footprints
  - ▶ Shopper data
  - ▶ Online transactions
  - ▶ GPS
  - ▶ Health data
  - ▶ Wearable tech/internet of things/sensors
  - ▶ Digital media delivery
- ▶ More dashboards for managers
  - ▶ Market indicators

## Direct Questions

- ▶ Less conventional MR
  - ▶ Fewer surveys
  - ▶ Less qualitative
  - ▶ Less F2F
- ▶ Less reporting
- ▶ Less tracking
- ▶ Less routine processing



# Implication: Less SQL, More Hadoop

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- ▶ More integration of disparate datasets
- ▶ More unstructured data
- ▶ Closer relationship (or more competition) between data analytics and market research
- ▶ Skills in demand:
  - ▶ Data Scientists
  - ▶ Statisticians
  - ▶ Engineers
  - ▶ Machine learning



# Implication: Less Gauss, More Bayes

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## Today

- ▶ Gaussian functions
- ▶ Measures of central tendency
  
- ▶ Starting point:
  - ▶ assume a normal distribution
  - ▶ independence
  - ▶ random

## Tomorrow

- ▶ Bayesian priors
- ▶ Non-parametrics
- ▶ Tukey's EDA
  
- ▶ Starting point:
  - ▶ question the properties of the distribution
  - ▶ dependence
  - ▶ self-selection





# Implication: More Direct Response, Less Marketing

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- ▶ More predictive analytics
- ▶ More automated marketing processes
  - ▶ Programmatic ad buying/RTB
  - ▶ Monetizing viral content
- ▶ More A/B tests
- ▶ Less concern with theory
- ▶ Less focus on motivations
  
- ▶ “My algorithm is better than your algorithm.”



# Great Implications for Labor Market

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- ▶ Tech progress has generally brought higher employment, productivity, wealth
  - ▶ Farm to factory
  - ▶ Factory to services
  - ▶ Rise of the middle class
- ▶ **Still true?**
  - ▶ Frey & Osborne (Oxford) think 47% of occupational categories at high risk of automation
  - ▶ Brynjolfsson and McAfee (MIT) make similar claims
- ▶ **Big Data + Smart Machines = Fewer Jobs?**
- ▶ **Higher “natural” level of unemployment?**



# Some Recent Examples

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- ▶ Handwriting recognition
- ▶ Fraud detection (pattern recognition)
- ▶ Sensor-based automatic meter reading
- ▶ Robotic logistics management
- ▶ Robotic quality control of lettuce
- ▶ Wind turbine repair
- ▶ Forbes.com company & stock reporting
- ▶ Live translation
- ▶ Hit song detection through Shazaam
- ▶ Uber et al



# Jobs At High Risk: Probabilities of Displacement by Computers

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## High Risk

<b>Telemarketers</b>	<b>0.99</b>
Accountants & auditors	0.94
Retail salespersons	0.92
Technical writers	0.89
Real estate sales agents	0.86
Word processors & typists	0.81
Machinists	0.65
Commercial pilots	0.55
Economists	0.43
Health technologists	0.40

## Low Risk

<b>Recreational therapists</b>	<b>0.003</b>
Dentists	0.004
Athletic trainers	0.007
Clergy	0.008
Chemical engineers	0.02
Editors	0.06
Firefighters	0.17
<b>Market researchers</b>	<b>?</b>

# Prospects for Researchers?

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<b>Computer &amp; Information Research Scientists</b>	<b>0.15</b>
Operations Research	0.35
Survey Research	0.23
Social Science Research Assistants	0.65
Market Research Analysts	0.61



# Market Research Function Circa 2025?

## Insights

- Domain expertise/Cross-disciplinary
- Client facing
- Business problem assessment/consulting
- Analytic strategy/Research design
- Management & Storytelling

## Analytics

- Deep functional expertise
- Math/Stat/Machine Learning/AI/Engineering
- Dynamic databases
- Support multiple business units
- Free to be geeky

## Activation

- Bridge between Insights/Analytics and Operations
- Monitor and assist implementation
- Feedback loop



# Research Opportunities in Social Sciences

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- ▶ **Observe social interactions at scale**
  - ▶ Time-stamped digital footprints (email, phone logs, texts, postings, photos, comments, likes, tags)
- ▶ **Measure changes in behavior**
  - ▶ As function of network, not just individual attributes
  - ▶ As function of time & sequence
- ▶ **Observe structure & density of networks**
  - ▶ Contagion & diffusion
  - ▶ Social exchange, cooperation & trust
  - ▶ Collective action and social movements
  - ▶ Opinion formation, persuasion, influence
- ▶ **Scalable field experiments**



# Desired Skills for Social Science Graduate Students

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- ▶ Facility with programming interfaces (APIs)
- ▶ Training in manipulation of unstructured data and nested data structures
- ▶ Ability to create web pages with ability to collect online survey and/or experimental data
- ▶ Managing large datasets
- ▶ Machine learning, sentiment analysis, topic modeling





Do you want to be a fox or a hedgehog?

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