BUILDING THE DATA-DRIVEN ENTERPRISE
AGENDA

Why is Big Analytics a topic today?

The role of Big Analytics in the data driven enterprise

Challenges that organizations face
WHERE’S THE BUZZ COMING FROM?

Disruptive Technology

Unrivaled Processing Power

Infinite Volume and Variety of Data

New Problem-solving Mindset
WHERE’S THE BUZZ COMING FROM?

Disruptive Technology

Unrivaled Processing Power

Infinite Volume and Variety of Data

New Problem-solving Mindset

Data Driven Enterprise
WHAT'S TRENDING?  INTERNET OF THINGS

Some 30 billion objects may be connected to the Internet of Things\(^1\) by 2020.

- 7 billion–10 billion objects in 2013
- 26 billion–30 billion objects in 2020
- 15–20% growth annually

\(^1\)A networking of physical objects via embedded devices that collect and/or transmit information.

Source: Forecasts derived from ABI Research; expert interviews; Gartner; IDC; McKinsey analysis

1 gigabyte/second

40 terabytes/hour
CONNECTED EVERYTHING AND...

THE ANALYTICS OF THINGS
THE ROLE OF BIG ANALYTICS IN THE DATA DRIVEN ENTERPRISE
THE QUIET REVOLUTION OF NUMERICAL WEATHER PREDICTION

Source: Nature, Bauer et.al. 2015
Who’s Winning?

Companies that are leveraging of the explosion of data have derived a significant competitive advantage and have seen their valuations increase dramatically.

<table>
<thead>
<tr>
<th>Company</th>
<th>2003 Value</th>
<th>2013 Value</th>
<th>Traditional Competitor</th>
<th>2003 Value</th>
<th>2013 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon</td>
<td>$15</td>
<td>$176</td>
<td>Borders</td>
<td>$1.4</td>
<td>Bankrupt</td>
</tr>
<tr>
<td>Apple</td>
<td>$64</td>
<td>$506</td>
<td>Nokia</td>
<td>$77</td>
<td>$7</td>
</tr>
<tr>
<td>Facebook</td>
<td>Did not Exist</td>
<td>$131</td>
<td>MySpace</td>
<td>Private</td>
<td>$0.035</td>
</tr>
<tr>
<td>Google</td>
<td>Private, 4 years old</td>
<td>$355</td>
<td>Yahoo</td>
<td>$41</td>
<td>$34</td>
</tr>
<tr>
<td>Pandora</td>
<td>Private, 3 years old</td>
<td>$6</td>
<td>Tower</td>
<td>$3</td>
<td>Bankrupt</td>
</tr>
<tr>
<td>Netflix</td>
<td>$0.7</td>
<td>$21</td>
<td>Blockbuster</td>
<td>$4.3</td>
<td>Bankrupt</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$80 Billion</strong></td>
<td><strong>$1,195 Billion</strong></td>
<td></td>
<td><strong>$127 Billion</strong></td>
<td><strong>$41 Billion</strong></td>
</tr>
</tbody>
</table>
“THE BEST WAY TO PREDICT THE FUTURE IS TO CREATE IT.”

PETER DRUCKER
WHAT DOES ANALYTICS HELP YOU DO?

ANTICIPATE OPPORTUNITY
WHAT DOES ANALYTICS HELP YOU DO?

ANTICIPATE OPPORTUNITY

TAKE ACTION
WHAT DOES ANALYTICS HELP YOU DO?

ANTICIPATE OPPORTUNITY    TAKE ACTION

DRIVE IMPACT
THRIVING IN THE NEW DATA ERA

VOLUME

VARIETY

VELOCITY

VALUE

DATA SIZE

BIG DATA

INFORMATION OVERLOAD

RELEVANT DATA

TODAY

THE FUTURE

THOMAS H. DURHAM, CHAIRMAN, SAS INSTITUTE INC.

THOMAS H. DURHAM, CHAIRMAN, SAS INSTITUTE INC.
Transformational Analytics

The application of modern analytics to big data has disruptive power and has become an important topic at the board table of many organizations.

Risk Modeling
Compliance
Demand Planning

Fraud Detection
Complaint Analysis
Workforce demand planning
Human resource planning
Quality Analysis

Cyber Security
Network Capacity
Planning
Business Enablement

Customer Segmentation
Customer Lifetime Value
Best Next Action
Personalize contextual marketing
Pricing
Campaign Optimization
Net Promoter Scores
GARTNER DEFINITION OF THE ANALYTICS CONTINUUM

Data

- Descriptive
  - What happened?
- Diagnostic
  - Why did it happen?
- Predictive
  - What will happen?
- Prescriptive
  - What should I do?

Human Input

- Decision support
- Decision automation

Analytics

- Decision
- Action
WHAT IS PRESCRIPTIVE ANALYTICS?

Real-time decision support

Real-time decision automation
Prescriptive
Predictive
Diagnostic
Descriptive
Each technology works well on its own, but combining them all is the real opportunity.
CUSTOMER SCENARIO

PREDICTIVE ASSET MAINTENANCE

BUSINESS CHALLENGE

• Predict maintenance needs of individual trucks before failures occur
• Proactively service trucks at opportune time
• Provide new service offering with high fleet SLA

SOLUTION

• Data from 60+ sensors / truck
• Integrated data with product details, warranty claims, and related data sources
• Analytic models predict the likelihood of specific failures within 30 days with 90% accuracy
• Better root cause insight led to higher productivity
BUSINESS CHALLENGE

- Monitoring Electronic Submersible Pump efficiency & well performance for deep sea drilling rigs
- Failure of one pump is $2M/day; one day of productivity loss equates to $20M in deferred revenue

SOLUTION

- Over 2.1 million sensors generating 3 trillion rows of data/minute monitored for potential failure (temperature, vibration, ..)
- Failure predicted 90 days in advance
- Reduced down time from 3 days to 6 hours
- Savings est. $3 million per failure
CUSTOMER SCENARIO

SMART GRID STABILIZATION

Continuous monitoring for patterns of interest

Detecting:
- Occurrence
- Detection
- Qualification

Bad Match

Good Match
WIFI MONETIZATION

CLIENT EXAMPLE: SPONSORED FREE WIFI

Your brand is always visible at the start of each surf session ("sponsored free Wi-Fi"). ZapFi supports ubiquitous authentication & roaming (register once, use anywhere) and is highly secure.
CHALLENGES THAT ORGANIZATIONS FACE
Experiment is the only means of knowledge at our disposal. Everything else is poetry, imagination.

−Max Planck
It is proven that analytically empowered decision making provides a significant uplift.

Producing a new model or adjusting an existing model for the business often takes too long to meet fast changing markets.

Complexity is added as many stakeholders are involved in the predictive analytics process.

Big data is adding to the complexity.

Automation of the process model is needed to provide fast, repeatable and high-quality results.
EXPANDING DATA REQUIRES NEW APPROACH

THE NEW ANALYTICS PARADIGM

Data
Analytics Workflow
Data
Analytics Workflow
Data
Analytics Workflow

Project centric business use:
• Mainly structured and internal selected data

Data
Analytics Workflow
Data
Analytics Workflow

• Discovery centric business use:
• All data relevant for the problem to solve
SCALE YOUR ANALYTICS PLATFORM WITH YOUR DATA AND YOUR PROBLEM COMPLEXITY
CASE STUDIES | BIG DATA ANALYTICS DRIVES HIGH IMPACT RESULTS

Retention Campaigns: 15% improvement

Increase coupon redemption rate from 10% to 25%

Regression analysis from 167 hours (1 week) to 84 seconds!

Recalculate entire risk portfolio from 18 hours to 12 minutes

270 million price points analyzed in 2 hrs. (from 30 hrs.)
SO WHAT IS A DATA SCIENTIST?
MIT Sloan Management Review

Fifth annual research to understand the challenges and opportunities with analytics.

2,719 global survey respondents across industries.

28 in-depth interviews with executives from companies like Coca-Cola, General Mills, General Electric, DBS Bank etc.

Top Three Analytics Challenges

- Companies that have a talent strategy and are able to successfully combine analytics skills with business knowledge are more likely to create a competitive advantage with data.

- Increase in data not insights. Despite more data companies are still struggling to turn their data into insights that drive value.

- 8 in 10 respondents are seeing an increase in data but only half are seeing an increase in insights from the data.

- Surprisingly, 80% have yet to develop a strategy to build and maintain their talent bench.
COLLABORATION

EXTEND ORGANIZATIONAL TALENT POOL

Data Scientist Superhero

Analytics Collaboration

- Business Analyst: Uses model pipeline templates
- Citizen Data Scientist: Adapts model pipeline templates
- Data Scientist: Builds model pipeline templates
WHAT IS HAPPENING TO THE STATISTICIAN?

Source: Indeed.com
DATA SCIENTIST ARE EXPENSIVE AND HARD TO FIND

Source: Indeed.com
Welcome to SAS® Analytics U
An exclusive online community for students and professors.

SAS® for Teaching

SAS® for Learning
THANK YOU!
LATENCY DRIVERS

Data latency drivers
- Data from different sources and systems
- Departmental silos / Dependency of LOB on IT
- Need to create ABT for modeling task
- Move data between data repositories and analytics environment

Modeling latency drivers
- Different tools for different steps in analytics workflow
- Tools do not support experiments and iterative approach
- Need to apply algorithms from different analytical disciplines
- Analytics environment does not scale with size of data and complexity of problem
LATENCY DRIVERS (CONTINUED)

• Deployment latency drivers
  • Departmental silos / Dependency of LOB on IT
  • No integration between development and production environment
  • Manual creation and validation of production scoring assets

• Decision Latency drivers
  • Production scoring environment does not scale with size of problem
  • Results are not provided at right time in right format
  • No buy-in for business on use of analytical results in business process
• Evaluation Latency drivers
  • Failure to automatically capture actual outcomes and feedback into the analytic loop
  • No standard workflow for addressing model decay
  • No standardized KPIs to measure model performance
  • No standardized thresholds for actions to refresh models
  • No automated model refitting where appropriate
SAS and Open Source Analytics

• **Open Source Analytics can leverage SAS enterprise capabilities**
  - Data Access and Preparation
  - Data Dictionary
  - Lineage
  - Resource Management

  ![Workflow Management Diagram](image)

  - Deployment
  - Model Assessment
THE REALITY OF MANAGING BIG DATA

THE SITUATION TODAY

BUSINESS PROBLEM

Preparing to solve the problem

80%

BUSINESS DECISION

Solving the problem

20%
FLIPPING THE SCRIPT

HOW CAN YOU CHANGE THE EQUATION?

BUSINESS PROBLEM

Preparing to solve the problem

SOLVING THE PROBLEM

Solving the problem

BUSINESS DECISION