Alexander Uborcev, David Sweenor & Angela Waner

Scaling Data Science & Empowering the Masses with TIBCO Statistica
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Are you running out of analytics gas?

WHAT IF YOU COULDN’T...

• Handle the amount of data to make accurate analytic decisions
• Share and version control your analytic models
• Do analytics on data that was created in real-time
• Do analytics unless the data had been “pre-prepared”
• Do customer facing analytics
Barriers to effective analytics

Organizational
Data scientists & business translators

Process
Inability to incorporate data into business processes

Technology
Reinventing the wheel
One stop shop for actionable insights

BI & ANALYTICS
AI-driven visualization to gain insight to find actionable insights

DATA SCIENCE
Create analytics that can predict the future based on history

STREAMING ANALYTICS
Provide analytics and take action on real time streaming data
Thirty Years of Customer Success
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Comprehensive Analytics Platform

Easy to use predictive analytics
with built-in smarts to enable your workforce

Access and prepare, any data, anywhere
Using databases, cloud, and Apache® Hadoop® sources

Open, flexible, & extensive
R, Python, Scala, in-database or at the edge

Real-time analytics
to process high-volume, streaming data

Collaborate & share
insights and best practices across geographies

Combine rules & analytics
to make prescriptive business decisions

Security & governance
for a well managed approach to analytics.

Access and prepare, any data, anywhere
Using databases, cloud, and Apache® Hadoop® sources
Analytics are used everywhere for competitive advantage

<table>
<thead>
<tr>
<th>ENERGY</th>
<th>FINANCE &amp; INSURANCE</th>
<th>HEALTHCARE</th>
<th>PHARMACEUTICAL</th>
<th>MANUFACTURING</th>
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<tbody>
<tr>
<td>Optimize exploration, production, and operations while anticipating demands</td>
<td>Reduce risks and detect fraud</td>
<td>Improve quality of care and efficiency</td>
<td>Ensure safety and product quality</td>
<td>Optimize processes, improve quality, and monitor suppliers</td>
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- Demand forecasting
- Distribution optimization
- Emissions reduction
- Ground composition analysis
- Predictive maintenance
- Reservoir characterization
- and more

- Credit scoring
- Customer analytics
- Fraud detection
- Risk management
- Churn analysis
- SOX
- Scorecard
- and more

- Fraud detection
- Claims management
- Patient safety
- Risk mitigation
- Personalized medicine
- and more

- Product traceability
- Stability & shelf life analysis
- Validated reporting & analytics
- Compliance
- Manufacturing analytics
- and more

- Improve yields
- Reduce scrap, rework, & recalls
- Detect warranty fraud
- Regulatory compliance & safety
- Predict & equipment failures
- and more

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Statistica™: 30+ Years of Success

50% Reduction in Time to Create and Deploy Models

58% Reduction in Surgical Site Infections

Predict critical mfg process excursions

Deployment time ↓ from 9 months to 1 day with Citizen Data Scientists

$100M+ saved, # of users ↑ from 200 to 400

Insurance claims prediction & fraud detection

Predictive and preventative maintenance

Used by 7 of top 10 pharma

58% Reduction in Surgical Site Infections
Drive Business Outcomes Through People Decision Making Analytics

Alexander Uborcev, Ph. D, GEMBA

October 25, 2017
Organization can use people analytics to make significant business improvements by focusing on decisions that impact profitability and strategy implementation.
Royal Bank of Canada
(RY on TSX and NYSE)

Market leader with a focused strategy for growth

Largest in Canada(1)
A market leader across all key businesses

Purpose
Helping clients thrive and communities prosper

Top 15 Globally(1)
One of the 15 largest global banks by market capitalization with operations in 37 countries

16 Million+ Clients
Served by ~80,000 employees worldwide

Vision
To be among the world’s most trusted and successful financial institutions

Strategic Goals

In Canada: To be the undisputed leader in financial services

In the United States: To be the preferred partner to corporate, institutional and high net worth clients and their businesses

In Select Global Financial Centres: To be a leading financial services partner valued for our expertise

About RBC (1) Based on market capitalization as at July 31, 2017
What are Problems in the Predictive People Analytics

Major concerns:
- Sourcing, recruiting, pipeline
- Talent assessments
- Diversity
- Compliance: measuring risk, identification & prevention
- Engagement improvement
- Manager effectiveness
- Workforce managements
- Performance management
- Payroll & benefits

Overall
- Key hard issues: data science technology, clear and on target thinking
- Key soft issues: trust; willingness and ability to change
The Environment

- Focus on people decision making support:
  - Actionable insights through drivers’ identification and relationships’ understanding

- Technologies:
  - Teradata
  - HDFS
  - Kafka
  - Elastic
  - Statistica
  - R
  - Python
  - Tableau

- People Data:
  - Employees
  - Customers
Why Do People Analytics Matter?
What Drives What?

Data Warehouse → Analytical Dataset → Decision Analytics → Reporting → Decision Making

- Demand:
  - Questions
  - Insights
  - Hypothesis
  - Actions
  - Learning from Changes
  - New Knowledge

Insight Sourcing/Supply → Support & Data Requirements/Demand
Putting the Pieces Into Place

- Leadership Support
- Integrating Decision Making and Analyses
- Building the data Infrastructure
- Top Techniques
How Decisions Should Be Made

Understand Objectives
- Identify Decision and Problem Statement
- What is important?
- Alternatives

Model
- Narrative
- Structure
- Preferences
- Process
- Uncertainty

Best Alternative
- Scenario Testing
- Sensitivity Analyses
- Risk Profiles
- Best Alternative to Support the Decision
- Implementation
## Decision Support Building Blocks

Where We Are and Going To Be

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Analytical Tools to Fit for Purpose

› Explore, describe, understand, and tell the story with:
  › Visualization
  › Assumption based Excel models – sensitivity and risk analyses, forecasting and optimizations
  › Statistica
  › System Dynamic Simulation
  › Process Mining
  › Others
People Analytics Trends
There Is Only Your Path, But…

- Shift from hypothesis testing to a broader exploration of relationships
- Dataset preparation
- Visualization
- Predictive analytics
  - R / Python
  - Spreadsheet like
  - Workflow GUI
  - Automatization – it is not human vs. software, but human enhanced by software
  - Ensemble learning (cognitive)/ modeling
- System Dynamics/ Agent-Based Models
- Risk modeling: scenarios, simulations, sensitivity and risk analysis
- Network analytics
- Process mining
RBC + TIBCO Partnership

- Partnership with Statistica from 2014
- Comprehensive and interactive tool
  - Industrializing data science
    - Easy to peer review, share and re-use entire analysis path
  - Unique and broad range of algorithms
- Statistica has been a great partner:
  - Evaluation
  - Installation and upgrades
  - Trainings
  - Helping in building customized employee satisfaction and sentiment dictionaries
A Bright Future
What’s New: Statistica 13.3

- **Integration with TIBCO**
  - Ability to read/write TIBCO Spotfire® SPDF files
  - TIBCO StreamBase® integration

- **Analytics**
  - H2O Distributed Random Forest, K-Means, Principal Components Analysis, Deep Learning
  - Spark Decision Tree Classifier, Decision Tree Regressor, Feature Selection, Generalized Linear Model, Linear Regression, Logistic Regression, Random Forest, SVM
  - Fit Johnston Distribution by CPM - used to accurately characterize a process
  - Correspondence Analysis - simple and multiple correspondence analysis (MCA) can analyze data with fractional weights
  - Alternating Least Squares - matrix factorization method designed to handle big data
    - Used for recommender systems, text mining, impute missing data
  - Weight of Evidence node enhancements

- **General**
  - PI Asset Framework integration
  - Model Comparison node
  - Improved reporting capability
  - Dynamic filtering capability in Enterprise Manager

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What’s next... (not necessarily in this order)

- Model Scoring Across TIBCO Portfolio
- Statistica in Spotfire Predictive Ecosystem
- Predictive Modeling for Spotfire Users
- Common Data Wrangling
- Real-time & Edge Model Scoring
- Hybrid Cloud
- Predictive Analytics for Citizen Data Scientists: Automation
- Visualize Statistica Data in Spotfire
Break down barriers for effective analytics

Organizational
Collaborate, communicate, and use data-driven insights

Process
Ask the right questions and infuse algorithms everywhere

Technology
Reuse and automate
Next Steps

Learn more about Data Science

• Watch Statistica Demos
• Join the TIBCO® Community
• Download free trial
• Submit a product idea
Scale Data Science with Statistica

Accelerate innovation with Data Science
Make innovation easy with smart, flexible, and comprehensive analytics

Scale Advanced Analytics Across the Business
Facilitate reusable data science fortified with governance

Infuse Algorithms Everywhere
Deploy deep insights for a competitive advantage.
Questions?

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