Agenda

- The Kellogg Company
- CPG Recent History
- The Analytics Journey at Kellogg’s
- Supply Chain of the Future
- Translating Data Insights into Action
- Forecasting Redesign
- Questions & Open Discussion
### Our Vision:
To enrich and delight the world through foods and brands that matter.

### Our Purpose:
Nourishing families so they can flourish and thrive.
The Kellogg Company

25 domestic US plants, plus CoMan and CoPackers

Mfg in 18 countries and distribution in over 170 countries
The Kellogg Company

Sustainability

• Strong focus on reducing the environmental impact of our business practices

SUSTAINABILITY

Energy

By 2020, expand low carbon energy use in plants by 50% and reduce energy GHG in plants by an additional 35%

By 2050, reduce GHG from our operations by 65% and work with direct suppliers to help reduce their GHG by 50%.

$28M

2005-2016 in Energy and Water Cost Savings in our manufacturing sites

Packaging

Continue adding value to foods and the planet via increased resource-efficient packaging

1,000,000

Pounds of packaging avoided in just one of dozens packaging reduction initiatives in 2016

Water

By 2020, implement reuse projects in at least 25% of plants, reduce usage by additional 15%* and continue watershed quality support

7.1M

Gallons of water reduced in just one plant per year through conservation initiatives

Waste

By 2020, reduce total waste in plants by 15%*

68%

Reduction in total waste from 2005 - 2016

Ingredients / Materials

Responsibly source priority 10 ingredients by 2020

Validate social compliance with suppliers

35+

35 Kellogg’s Invoke™ Projects in 5 continents to support best practices in sustainable agriculture

Sustainable Agriculture

Support 500,000 farmers, focusing on Climate Smart Agriculture, to improve livelihoods

294,000

farmers supported directly and indirectly through programs from 2014-2017

Smallholder Farmers

Help improve livelihoods for 15,000 smallholder farmers in regions from which we source

15,200

Smallholder farmers supported through Kellogg programs from 2014-2016

Women Farmers / Workers

Identify women in the value chain & develop programs to help improve their livelihoods, families and communities

10,000

Women farmers and workers supported through Kellogg programs from 2014-2017
Quick Facts:

- HQ in Battle Creek, Michigan
- Founded in 1906
- 2017 revenue of 13 Billion dollars
- #216 on Fortune 500 list (2017)
### Consumer Packaged Goods - Food (CPG) Recent History

#### General Mills
- Sales or Revenue: $15.62 B
- Sales or Revenue Growth: -5.70%

#### Mondelez
- Sales or Revenue: $25.90 B
- Sales or Revenue Growth: -0.10%

#### Kraft Heinz
- Sales or Revenue: $26.23 B
- Sales or Revenue Growth: -0.94%

#### Pepsico
- Sales or Revenue: $63.53 B
- Sales or Revenue Growth: +1.15%

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**Five Challenges for the CPG Sector in 2018**

Tough hurdles amidst a steady shift in consumer preferences

**2018 Consumer Products Industry Outlook**

Newer approaches and bolder moves in consumer goods

As consumers prosper from stable US and global economies, the consumer products industry will reinterpret traditional levers to fuel growth in a hyper-competitive market.

**7 Mega-Trends, Challenges and Opportunities Disrupting the CPG Industry**

by Jesper Grode and Carlos Gutierrez | June 21, 2017

**Megadeals in Consumer Packaged Goods**

The Capable Deal Maker

How supersized deals are helping the sector respond to challenges.
Consumer Packaged Goods - Food (CPG) Recent History

Challenges
- eCommerce Disruption of Retail Landscape
- Lower barrier to entry for startups
- Changing consumer preferences – fresh – avoiding center aisles
- Private equity take overs -focus on cost cutting and efficiencies
- Increasing transportation costs

Opportunities
- New distribution methods
- Incentive to innovate and acquire
- Accelerating trend identification
- Revenue growth management analytics
- Supply chain analytics
The Analytics Journey at Kellogg

Think Big

- Start with End State in mind
- Cross-functional
- Common platform for efficiency and speed

Start Small

- Quick wins
- Leverage pilots to prove out business cases, new approaches, and technologies

Scale Fast

- Once we have proven the business case, we will then scale quickly to other businesses and geographies
The Analytics Journey at Kellogg

KEYSTONE: Our Analytics Ecosystem
<table>
<thead>
<tr>
<th><strong>The Analytics Journey at Kellogg</strong></th>
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<tbody>
<tr>
<td><strong>Data Science</strong></td>
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<tr>
<td><strong>Data Visualization</strong></td>
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<td><strong>COE</strong></td>
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<tr>
<td><strong>Reporting &amp; Modeling</strong></td>
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<tr>
<td><strong>Platform Architecture</strong></td>
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<td><strong>Data Services</strong></td>
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<td><strong>Data Governance</strong></td>
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# The Analytics Journey at Kellogg

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large amounts of data in silos</td>
<td>Integrated data w/ improved insights</td>
</tr>
<tr>
<td>Poor data quality</td>
<td>Data governance</td>
</tr>
<tr>
<td>Reporting the past - reactive</td>
<td>Real-time and predictive insights</td>
</tr>
<tr>
<td>Internal focus: reporting on ourselves</td>
<td>External focus: customer/consumer</td>
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<tr>
<td>Inconsistent metrics</td>
<td>Consistent exception based measures</td>
</tr>
<tr>
<td>Redundant activity: significant time on data collection and reporting</td>
<td>Consolidated data collection and reporting activities</td>
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</tbody>
</table>
Translating Data Insights into Actions

1. Process engineering for “action-based analytics”

2. “Immersive technology” for interaction & collaboration

3. “Storytelling” with the full analytics ecosystem

101101001 + eye + hand = idea
Translating Data Insights into Actions

Process Engineering: Action Based Analytics

1. DATA
   Collect, Cleanse, Collate, Consume

2. MODEL
   ETL, Data Modeling, Statistical Modeling, Machine Learning

3. VISUALIZE – “Dazzle”
   Expose your insights for decision making

4. CONSUME
   Engage users to interact and learn from the data

5. ENRICH
   Provide a mechanism for users to provide context, decisions, and feedback on the data

6. ACTION
   Decide – Implement
   Act – Real World Activity
Translating Data Insights into Actions

Process Engineering: Action Based Analytics
Translating Data Insights into Actions

Process Engineering: Action Based Analytics

1. Kellogg Data Lake
   - Data Transformation

2. Predictive Model (Decision Tree)

3. Tableau Server
   - Inventory Exposure
   - Level of Risk
   - 24, 114, 269, 216, 80, 142

4. Actual Real World Decisions and Actions

5. Microsoft .NET

6. Database

7. Human Representation
Translating Data Insights into Actions

K-Max: Immersive Technology

• A typical monthly staff meeting

• Interactive, immersive, and agile

DEATH BY POWERPOINT

DATA IMMERSION
Translating Data Insights into Actions

K-Max: Immersive Technology – Go “Big” or Go Home

<table>
<thead>
<tr>
<th>Small Form Factors</th>
<th>Big Form Factors</th>
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<tr>
<td>Tablets</td>
<td>Touchscreen Monitors</td>
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<tr>
<td>Phones</td>
<td>Multi-Screen Projectors</td>
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<tr>
<td>Smart Watches</td>
<td>Large Format Displays</td>
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</tbody>
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**ADVANTAGES**
- Mobile
- Forces simplicity
- Individualized

**DRAWBACKS**
- Small Screen Size
- Loss of ‘Context’
- Constrains Design

**ADVANTAGES**
- Large Canvas Size
- Clear Context in Viz
- Collaborative
- ‘Immersive’

**DRAWBACKS**
- Can lead to ‘chart junk’
- Requires Dedicated Tech.
- Reqs Dedicated Dashboards
Translating Data Insights into Actions

- Multi-Screen Visualization
- (All Visible at the Same Time - Context)
- Removing ‘scrolling’, ‘jumping’, or ‘hyperlinking’
- Context of visualization apparent
- Holistic view
- Guided ‘flow’ – filling in sections based on selections
- Extended canvas for storytelling

- “Long-form” Viz Style
- (Requires Scrolling)
Translating Data Insights into Actions

K-Max: Immersive Technology

**Business Value**
- Elicits interaction, collaboration
- Moves away from static PowerPoints to interactive discussions
- Provides a comprehensive view (E2E) performance in one view
- Engages individuals to ask questions and ‘see’ interactions of data
- Provides a multi-purpose environment:
  - Creative problem solving
  - White boarding
  - Wireless projection of screen content
  - Interactive data visualizations
Demand Planners spent a lot of time improving the stat model output. The efforts were not guided by a clear and updated segmentation for prioritizing effort.
Forecasting Redesign at Kellogg

Objective – reduce work required to obtain the consensus forecast – move to total forecast – implement forecast value add

• **Method:** Alternative ways to forecast consumption (first tier in Multi-tiered causal analysis)
  - Broader set of forecasting models to apply to forecast consumption
  - Better use of feature, display, etc.
  - Achieved through repetitive ‘design of experiments’ to evaluate multiple settings for forecast server parameters

• **Method:** an analytical segmentation hierarchy rather than a business hierarchy
Forecasting Redesign at Kellogg

Design of Experiments for Forecast Server Settings
Thank you for your time and attention.