LEVERAGING INSIGHTS & ANALYTICS AT FORD

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FORD MOTOR COMPANY
The Basic Business Questions Remain At The Center of The Journey

But The Tools At Our Disposal Have Certainly Changed

REFLECTING OVER THE LAST 30 YEARS
THE AUTO INDUSTRY HAS BEEN IN A TRANSFORMATIONAL MODE FOR DECADES
PRODUCTIVITY IS IMPROVING AND GROWING

Data Source: Bureau of Labor Statistics

- Compound Annual Growth Rate
  - Manufacturing: 3.44%
  - Automobile and Light Duty Motor Vehicle: 3.9%
QUALITY OF VEHICLES – PP100 IS DECLINING

Initial Quality Study 1987 - 2015

Source: J.D. Power & Associates

Indexed – 1987 Industry Average = 100
Numbers adjusted to account for redesigns
VEHICLE DEPENDABILITY

Vehicle Dependability Study 2000 - 2015

Indexed Problems Per 100 Vehicles (PP100)

Source: J.D. Power & Associates
Indexed – 2000 Industry Average = 100
Numbers adjusted to account for redesigns
WE ARE NO LONGER AN “OLD INDUSTRIAL COMPANY”
MOORE'S LAW DEFINED

A persevering prediction
Number of transistors in CPU*
Log scale

Source: Intel
*Central processing unit

Economist.com

TECHNOLOGY EVOLUTION

Moore’s Law

Lines of code
(present)

Boeing 787
14 million

Windows Vista
60 million

Ford
100 million

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PRESSURES
PRESSURES OF OEMs AND NAMEPLATES
### Fuel Economy Standards (mpg)

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Fuel Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>27.5</td>
</tr>
<tr>
<td>2011</td>
<td>30.2</td>
</tr>
<tr>
<td>2016</td>
<td>35.5</td>
</tr>
<tr>
<td>2025</td>
<td>54.5</td>
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</tbody>
</table>
MARKET CAPITALIZATION COMPARISON: Autos & Technology

New Entrants With Massive Capitalizations Threaten OEMs

Source: The Motor Weekly & Yahoo Finance (February 1, 2016)
VALUATIONS ACROSS THE AUTOMOTIVE VALUE CHAIN

Total Enterprise Value / EBITDA

Suppliers

OEMs

Dealers

Aftermarket

Capital Is Flowing From OEMs To Their Suppliers And Customers; We Are Being Disintermediated!

Source: The Motor Weekly (February 1, 2016)
DISRUPTIONS

- Technology
- New Players
- Regulatory pressures
- Change in Buyer Behavior
- Amazon
- Google
- Teslar
- CAFE
- CO₂

Techology

Global Data Insight & Analytics
“BIG DATA” IS ONE OF THE STRUCTURAL DRIVERS OF RAPID CHANGE
-- AND IT IS A LEGITIMATE DISRUPTOR
THE BIG DATA EXPLOSION IS ACCELERATING

- In the past two years, more data has been created than ever before.
- There are 50,000 searches on Google every second.
- Aug 2015, over 1 billion people used Facebook in ONE day.
- Every minute, up to 300 hours of video are uploaded to YouTube.
- Right now, less than 0.5% of data is analyzed & used.
- By 2020, there will be over 6.1 billion global smartphone users.
- Over 50 billion smart devices will be connected in 2020.
- 570 new websites come into existence every second.

Big Data

In the past two years, more data has been created than ever before.

There are 50,000 searches on Google every second.
“BIG DATA” PROVIDES US UNPRECEDENTED ABILITY TO SEE BEHAVIORS AND PATTERNS

- Vegetarians Miss Fewer Flights
- Mac Users Book More Expensive Hotels
- For Some Industries, The Type Of Web Browser You Use Is Predictive Of The Likelihood Of Being A Good Job Applicant
- Type Of Credit Card Use Correlates To The Likelihood Of Default
- Ford Truck Owners With Dogs Have 4.5% Higher Loyalty Than Average
THERE IS A SIGNIFICANT DIFFERENCE BETWEEN:

AN OBSERVATION/IDENTIFICATION OF PATTERNS AND AN ACTIONABLE INSIGHT
OLD INDUSTRIES ARE EVEN PART OF THIS TRANSFORMATION
-- THE NEXT GOOGLE?

Google

50,000 Searches/Second

23+ Petabytes/Day

Google Currently Processes Over 20 Petabytes Of Data Per Day (Using 900,000 Servers)

Ford

75 MB/Day To 25 GB/Hr

0.5 - 2500 Petabytes/Day

5M Vehicles on The Road
INDUSTRY 4.0 CHALLENGES FOR FORD

Big Data & Analytics

Analytics Accuracy
Direct impact on Product Quality

Processing Speed
Real-time and Immediate Response

Data Size
Big analog data
DATA AND ANALYTICAL COMPETENCY SCALE

Limited

World-Class

Automotive & Industrial Firms

“Gut” Based
Base
• Limited Capabilities
• Financial Reporting Systems
• Emphasis on market & product research

Business Intelligence Oriented
Incr. Requirements
• Widespread Use of BI
• Some Data Organization
• Limited Test-and-Learn
• Fragmented Analytic Teams

Evidence-Based Decisioning
Incr. Requirements
• Enterprise Data & Analytics
• Governance Processes
• Agile IT Infrastructure
• Business Engagement

Customer Centric
Incr. Requirements
• Advanced Analytic Infrastructure
• Organizational Change
• Closed Loop Adoption Processes
A SYSTEMATIC APPROACH IS REQUIRED TO REALIZE THE POTENTIAL

Focus on Creating an Informed & Actionable Perspective about our Customers

DATA

INSIGHT

FORESIGHT

ACTION

Develop foundational Knowledge

Integrate data assets

Establish complete & intimate knowledge through analytics

Transform insights & foresight into action

The Winning Hand Is To Combine Science And Art To Drive Foresight Into Systematic Workflows
SO WHAT’S THE GAME PLAN?

**WHAT?**
- Content
- Vehicle Attributes
- Pricing
- Revenue

**HOW?**
- Sourcing
- Manufacturing Costs
- Quality

**WHO?**
- Marketing
- Sales
- Service

**Feature Optimization**
- Data Driven Pricing
- Volume/Revenue Optimization

**Supplier Footprint Optimization**
- Real-Time Quality
- Correlation Proactive Maintenance
- Cost Benchmarking
- Scale Optimization

**1:1 Marketing**
- C&I Optimization
- Service Part Optimization
- Improved Forecasting
DEFINING THE ANALYTICS JOURNEY

Level of Difficulty and Value Derived

REPORTS

DESCRIPTIVE

PREDICTIVE

PRESCRIPTIVE

BEHAVIORAL & ADVANCED

What Happened?
Translate raw data into information

What Might Happen?
Actionable insights based on historical data

Why Did It Happen?
Insight into the past, learn from past behaviors

What Should I Do?
Guide to a solution based on predictive model

Change The Outcome – Act Earlier
Advanced insights to drive optimal Business Processes

Act Earlier
DEFINING THE ANALYTICS JOURNEY
GET ALL THE INFORMATION YOU CAN, WE'LL THINK OF A USE FOR IT LATER.