Advanced Information Technology Solutions: An Engine of Innovation

CAR Breakfast Briefing
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Study Objectives

• Identify the key market drivers that influence the use of automotive IT solutions

• Investigate new tools and approaches to IT that address these market drivers

• Evaluate information technology’s potential impact on the automotive industry
Overarching Market Drivers

Manufacturing
Flexibility

Sustainability

Vehicle Electronics
and
Software
Manufacturing Flexibility

• Increased need for manufacturing tools and facilities that can deliver a wide range of parts

• Trend toward common architectures

• Globalization and Localization

“Any customer can have a car painted any colour that he wants so long as it is black.”

- Henry Ford
Sustainability

- Greater industry focus on fuel efficient products as well as sustainable products and manufacturing systems
- Driven by policy changes, consumer acceptance, and profitability

“Ten years ago nobody was communicating on carbon impact; today it is part of our day-to-day communications.”
Sustainability

- Challenges:
  - Diverse set of fuel efficient technologies
  - Supplier metrics based on key fuel saving goals
  - Monitoring of entire value chain
  - Internal carbon tax
  - Requires a systems approach to engineering
Vehicle Electronics and Software

- Exponential growth of vehicle electronics and software to control almost every aspect of the vehicle
- Significant growth in vehicle computing power
- Consumer demand for in-vehicle connectivity
- Advances in vehicle safety and automation
Vehicle Electronics and Software

- Challenges:
  - Significant increase in vehicle complexity
  - Verification and validation of millions of lines of code
  - Cyber security and data privacy
  - Driver distraction and HMI

Source: National Highway Traffic Safety Administration
EMERGING OPPORTUNITIES
Cloud Computing

- Global operation and standards
- Real-time collaborative engineering
- Centralized data
- Advanced analytics of data
Enterprise Social Networks

- Improve internal communication – particularly for tribal knowledge
- Easy and intuitive to use
- Potential to provide quick feedback

“Most of the knowledge is tacit. It is walking around in the heads of our employees. The question is how do you get that knowledge?”
Big Data

- Vast amount of data in automotive industry – market studies, social networking, testing, change orders, plant quality, logistics, warranty, repair history, vehicle telematics, etc.

- Connected vehicle technology estimated to generate 11.1 petabytes of data by 2020
Simulation Tools

- Increasingly reliant on simulation tools
- Frontloading of programs
- Shows dependencies between systems
Mobile Devices

• 69% of college educated employees own a smartphone

• Tablet ownership increased from 2% to 42% between 2011 and 2013 (adults 18+ years of age)

• Automotive industry looking to leverage this through BYOD

• Some examples in automotive exist today (Google docs, internal social networking)

• Would like to use more, but may not make sense in some instances
IMPLICATIONS OF NEXT GENERATION IT
Manufacturing

• Transition from green screens and clipboards to completely visual and digital environment

• Central collection of data enabling the ability to analyze all data at any time

• Automated report locally and globally

• Improve work force work instructions through visualization and real-time updating
Product Development

- Advancements in simultaneous and collaborative engineering
- Systems engineering tools to drive requirements management and traceability
- Simulation tools have moved from an added bonus to essential
- Accessibility of data is greater than ever and with almost any device
- Real-world data driving continuous improvement
Supply Chain

- Analytics to assess risk of supply chain
- Greater visibility of sub-tier suppliers
- Shipping efficiency
- Logistics forecasting
Service Centers

- Improved logistics
- Integration with connected vehicle technology
- Service technician tools
Marketing

- Use of CRM and Big Data analytics

- Identify key life events of consumers (e.g., Target’s ability to identify expecting mothers)

- Challenges with Dealer Management Systems
Workforce

• Greater focus on software engineering

• New tools may require specialized workforce and training

• Some tools may make it easier for average worker
Consumers

- Potential to improve relationship with dealers
- Vehicles are getting more complex and demand more of the drivers attention
- Collection of vehicle data raises consumer privacy issues
Conclusions

• Enterprise IT systems impact virtually all elements of the automotive industry

• Transitioning from mechanical to software driven industry

• Global platforms, manufacturing flexibility, and increase vehicle complexity is pushing the industry to increased use of IT systems
  – Manufacturing visibility and historical data
  – Systems level approach to engineering
  – Supply chain risk analysis

• New opportunities with Big Data analytics and vehicle connectivity
THANK YOU

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