Direct Digital Manufacturing (DDM) 
Automotive Context

"We need to modernize our business...we need to have a clear point of view for future trends like Artificial Intelligence , 3D printing, Robotics, Machine Learning, etc. and a plan to integrate in the business or have a POV on why not" - Bill Ford, Executive Chairman

“Today, new technologies and changing customer needs are helping us transform personal mobility and deliver new transportation solutions that are safer, more sustainable and better than ever. ... the best ways to deliver these solutions is through greater access to self-driving electric vehicles deployed in sharing networks. - Mary Barra Chairman & CEO, General Motors

“Taken as a whole, innovation-related challenges are reshaping traditional auto industry structures and relationships — in particular, by threatening the existing distribution of profits and the boundaries between OEMs and Tier One or Tier Two suppliers, as well as between automotive and tech companies. ... Decisions about investments and industry alliances that are being made now will determine the dominant positions of tomorrow.” – PWC

"It’s a perversity that when you see something changing you think it’s just a flash or a temporary moment." Jim Hackett CEO Ford Motor Company
Key Market Realities:

Agility & New Thinking about Your Current Business

Since 2012, the S&P 500 achieved a 14.8% return for investors. In that period, average auto maker [total shareholder return] was only 5.5%

Despite positive OEM performance, growth based business models are running out of steam

- Industry is changing with increasing cost pressures and innovation requirements – light weighting; new materials; mobility
- 2017 production levels down for first time in 5 years; 2018 forecast down 1.7% to 16.9M
- OEMs are shifting priorities from growth to profitability and return on capital
- Slowing the pace of cost growth
- Reallocating capital spending

Suppliers Must Continue Efficiency and Cost Gains While Preparing to Differentiate and Innovate
Perspectives From A Mid-Market Supplier

Trends/ Vectors
- Electrification over ICE
- TaaS vs. Individual ownership
- Regulators will move fast
  - California and NHTSA

Implications “So What’s”
- Inevitability of tomorrow
- S-Curve adoption rule
- New Metrics
  - Units vs. Rev/Mile
  - Passenger Cost/Mile
- Durability/Longevity
- Systemic Volume Decline

Action Steps “Monday Morning/ WIIFM”
- Agile will win
- Material Ag
- New business model
  - Change the mental model
  - “Xaas”
  - Repair/Overhand (“Aircraft model”)
- Bold Decision
  - Divert/Investment
  - Play Offense
Key Trends and Vectors

Electrification (Electric Vehicles EVs) is our new reality

- Battery cost performance improving – Chevy Bolt battery improves from $145/kwhr to less than $100/kwhr
- Higher energy density, large foot print, and better range over 200 miles

EV more Energy efficiency and cheaper

- EVs almost 10X cheaper to charge/fuel compared with ICE;
- ICE 21% versus 90-95% efficiency for Evs

Improving vehicle asset utilization

- Average individual owned vehicle utilization rates is less than 5%
- Car sharing and ride sharing improving asset utilization. Cars go parking (90%) to driving (90%)

Autonomy and Vehicle connectivity

- LIDAR sensors and GPU processors showing Moore's law cost performance trends
- Enables a Triple Zero Future (0 Crashes; 0 Emissions; 0 Congestions)

Transportation-as-a-Service (TaaS) is here

- 10 Million trips completed each day on UBER; 2 Million Drivers globally
- UBER pool in high dense cities like San Francisco account for approximately 50% of UBER rides
The Inevitability of Tomorrow
S-Curve adoption more likely with EV and AV

- Faster Growth
- Steeper Exponential Growth

Source: Rethinkx; Tony Seba; HBR
Taas Growth Will lead to Decline in Unit Volumes

Source: Rethinkx; Tony Seba
Various Forecast Shows Rise in EVs
However plan for a reduction in unit volumes

**ELECTRIC CARS ON THE RISE**

- **Fast-adoption scenario**: By 2042, around 93 percent (290 million) of all vehicles in the U.S. would be electric.
- **Slow-adoption scenario**: Around 37 percent (115 million) of all vehicles would be electric.

*Projection produced in five-year increments starting from 2017 and is based on an assumption of constant vehicles per capita with around 0.5 percent U.S. population growth per year.

**Projected trends in fleet size and composition**

- **Individual ownership**
- **TeaS**
- **Stranded individual ownership**

**Source:** Rethinkx; Asaba
Innovation Alone is Not Enough

Key Supplier Imperatives

Frame your business model

- Demand innovation – address friction points, hassles, inefficiencies with current product
- Product innovation – improve the process and cost basis; material utilization and design.
- Overlay \SaaS\PaaS value – Service level improvements, additional capabilities, etc.
- Achieve segment leading profits and margins

Improve customer stickiness

- Leverage hidden assets: customer intimacy and process know how
- Move beyond the transactional (purchasing) to Product Development/Engineering/Co-creation
- Have strategic control within the value stream – proximity and technology know how
- Seek “White Spaces”

Key Questions/Thoughts about your business

- What unique insights do very few people agree with? “Contrarian truth”?
- How do we escape the essential “sameness” with our competitors that makes us undifferentiated?
- 85% of the value comes from future years…so how do you ensure durability?
Suppliers Must Prepare for Disruptive Megatrends & Non Traditional Entrants

**Megatrends**

- Electric Vehicles
- Autonomous Vehicles
- Vehicle Connectivity
- Alternative Transportation Platforms
- Dynamic Powertrain Requirements

**SET Leveraging DDM/BWD to Address OEM Challenges Related to New Process & Material Requirements**

**Body in White (BIW) Impacts**

**New Threats**

- Transport as a Service (TaaS)
- Non Traditional Technology
- Micro Factories
- Complex Integrators
- Alternative Delivery and Value Chains
Vehicles For TaaS will be different

Source: Accessible Olli

Source: Local Motors; Toyota

Source: Toyota E-Palette
SET Direct Digital Manufacturing Strategy

Traditional Business Model
- Slitting/CTL
- Blanking
- Increasing Complexity
- Value Added Services
- Customer Stickiness/
  + Margins
- Material Management/
  Logistics
- Cost Based Competition

New Integrated Platform
- Laser Blankings
- Laser Welding
- Cells
- Co Location / Joint Design
- Increased Agility Efficiency

New BaaS Model
- Seamless Value Chain
- Design Ideal Blank
- BAAM 3D Print Prototype
- Select Processor
- Laser Blank/Weld
- Deliver JIT Blanks
- Low Cost Customization

Increasing Complexity
Value Added Services
Key Takeaways

- Bet on the inevitability of tomorrow rather than the limitations of today (Question Existing Mental Models)
- Technology must enable “doing more with less”…Not “less with less” or “more with more” (New Business Models)
- Changing from “Big Fish eats Little Fish” to “Fast Fish eats Slow Fish” (Agility)
- “Courage is in far shorter supply than genius” (Bold Decisions)

“In Times Like This We Must Think Anew”
Thank You