Electronics Recall and Defect Reduction through Advanced Analytics

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Optimal+ Intro

• Big Data Analytics
• Focused in Electronic components and systems
• Product Analytics – going to the roots of product DNA
• Delivering $100’s of millions in ROI every year
Value We Deliver

Customers

50 Billion Devices every Year

Supply Chain

Efficiency

$250M a year

Quality

50% less escapes

Yield

10% NPI / 2% HVM

Adaptive Test

30% reduction
Electronics Content is Increasing

90% of car innovations and new features are driven by electronics, which account for 35%-40% of an average car’s production cost.

Source: Automotive change drivers for the next Decade, EY

“80% percent of innovation is electronic”
“Impossible to comply with regulation without electronic systems”
-Automotive OEM

Advanced Driver Assistance
Active-Passive Safety
Green Powertrain
Radar / Vision
Telematics
Infotainment

Electronic cost as % of total car cost

Airbag
ABS / ESP
Body Electronics
Multiplexing

Electronic Fuel Injection


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No More “Comfort Zone” for Automotive Semiconductors

Source: Audi – SEMICON Europa 2015, Dresden
More Recalls due to Electronics in Newer Cars

Recalls of Electronic Components Since 2007 by Age at Time of Recall

- New Cars
- Old Cars

Vehicle Age at Time of Recall:
- Vehicles 3 Years Old or Younger
- Vehicles 5 Years Old or Older


Source: NHTSA Recall Data
OEM’s are Feeling the Effect of Semiconductor Quality

7,000
Semi devices per car
1 dppM
Failure rate
4,000
Cars each day

= 24 Cars a day

3,500
Semi devices per car
1 dppM
Failure rate
10,000
Cars each day

= 35 Cars a day

Source: Audi Semicon 2015; BMW AEC 2017

Suppliers to be pushed to DPPB!
Connected Supply Chain is a Necessity

- Wafer
- IC/SOC
- Multi Chip
- PCB
- Modules
- Batteries
- Displays
- Sub-System
- Systems

- Test & Process data
- Rework data
- Performance data
- Genealogy data
- Reliability Data
- Usage Data

Field Failures and Returns
Recall & Warranty

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Use Case Example

Supplier 1

Supplier 2

Supplier 3

Electronics Tier-1
Customer Failures and Predictive Recall

1. Supplier 1 - Test A

2. Actual Customer Returns (RMA)

3. Potential Recalls

Strong bivariate correlation detected by O+ QPaaS Algorithm
Summary

- Electronics content is increasing (importance, complexity and cost)
- Automotive electronics is now relying on cutting edge semiconductor technology – no more “comfort zone”
- Newer “in-warranty” cars are more susceptible to recalls due to electronics
- Semiconductor components quality needs to improve beyond DPPM
- Fragmented supply chain will not meet the quality requirements

Optimal+ QPaaS can drive up quality and productivity by connecting the supply chain
Thank You!