Designing Mobility 2.0

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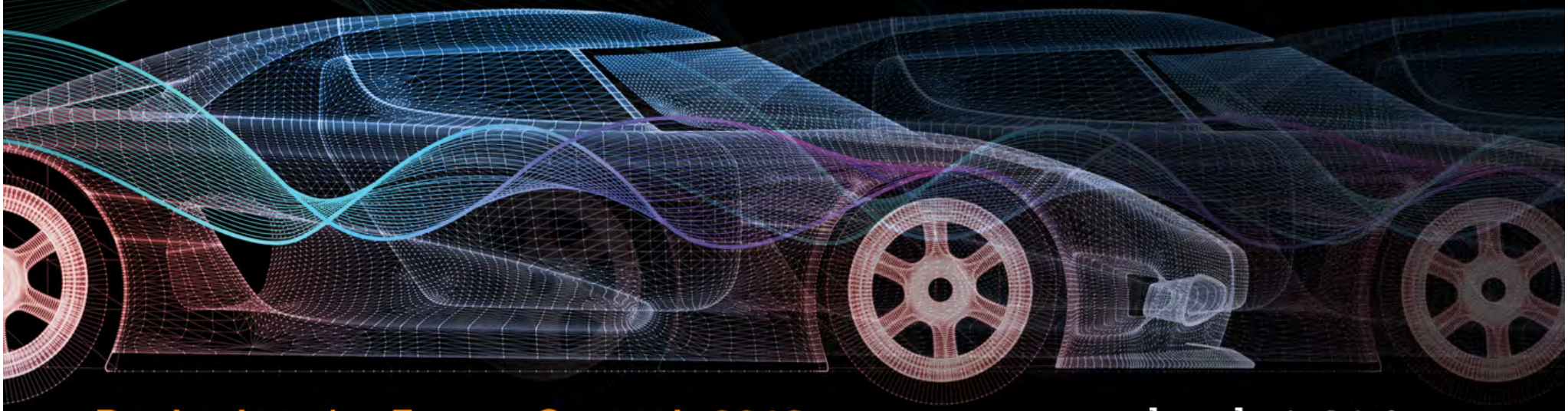

Designing the Future Summit 2018

lppd Lean Product & Process Development

Lean Was Born in Automotive

- Henry Ford was the first systematic lean thinker.
- Kiichiro Toyota, Eiji Toyoda and Taiichi Ohno stood on the shoulders of Henry.
- So it's not surprising that many in the Lean Community are from the auto industry or spent years studying the auto industry.
- And I've always felt it is important to remain in touch with automotive, but for many years after 1990 it was a bore.

That Changed in 2009

- The Great Recession pushed the reset button at many of the legacy firms.
- Dan Roos and I offered a seminar on the Automotive System at MIT in the spring of 2009 and realized that the world had changed.
- We also met R.J. Scaringe who participated in the seminar and described his efforts to create a new type of automotive company.

Where We Have Arrived Today

Automotive 2.0 (almost Toyota) with Mobility 1.0:

- A vast, global design/produce/service industry largely converted from Automotive 1.0 (mass production with modern management) to Automotive 2.0 (lean production with lean management.)
- Embedded in a complex system of roadways, energy supplies, government regulations, and personal assets (vehicles) summing to Mobility 1.0, which hasn't changed.

Why Might We Be Moving from Mobility 1.0 to 2.0?

To address problems with 1.0:

- Air pollution – but can conventional ICE clean-up do it?
- Climate – but how much CO2 insurance do we need?
- Safety – but fatalities per unit of travel always fall.
- Congestion – self-correcting with high-density modes?
- Equity – all those boomer/geezers like me who can't see!
- Cost – but why was cost of personal vehicles OK until now?

What real problems in search of solutions?

Why Might We Be Moving From Mobility 1.0 to 2.0?

Because new technical capabilities offer attractive solutions:

- Autonomy – to reduce mortality, relieve congestion, reduce costs of travel, address equity problems (plus fun?)
- No/low carbon energy – electrons plus hydrogen from "clean" sources propel BEV or fuel cell vehicles to protect climate (plus make travelers feel virtuous?)
- Shared assets – better service at lower cost per trip.
- Hyper connectivity – to make autonomy, low carbon and shared assets possible while addressing costs (plus fun?)

Are these just solutions in search of problems?

How Would Lean Thinkers Proceed?

Through A3 analysis!

- Grasp the situation.
- What precisely are the problems and opportunities?
- What is the root cause of the presenting problems?
- What are the most attractive countermeasures?
- How can we test these countermeasures with PDCA?
- What are the results?
- How do we adjust the mobility system toward 2.0?

But There Are a Few Challenges Lean Thinking

- No chief engineer (no one responsible for the A3, many competing players in mobility system.)
- No concept paper (the A3 itself, to grasp the situation, define problems and opportunities, and channel PDCA)
- No notion of compatibility between new system elements before completion of elements – instead a winner-take-all mentality about completing subsystems first to dominate total system! (Microsoft in the office, Google for search, Facebook for social media, within the new info/communication system which was never rigorously designed but worked, sort of.)

And a Few More Challenges:

- A multitude of players – legacy vehicle companies, new entrant vehicle companies, software companies, electronic hardware companies, regulators of many sorts from many countries, legacy energy providers, new-entrant energy providers, roadway providers, financial sources!
- Vast amounts of money/wealth in play.
- No concept of designing MVPs for components to test system compatibility.
- Winner-take-all mentality of many players (governments too.)

The Good News:

Some sort of Mobility 2.0 will be cobbled together:

- There are fundamentally new capabilities emerging.
- There are lots of real problems with Mobility 1.0.
- Lots of money available.
- Lots of founder cowboys on the case.

The Bad News:

Mobility 2.0 on its present course is likely to be sub-optimal as a system, even in the presence of brilliant components/ subsystems:

- Inferior system performance compared with what's possible.
- Taking much more time than necessary.
- Costing much more than necessary.

In short, just what one would expect in any development project in the absence of LPPD!

How Could We Do Better?

- Conventional approach: Enable/create a dictator with authority for the total system – alpha dog monopolist company; alpha dog government. (Think Standard Oil Trust or Apollo!)
- Not desirable or even possible in situation of emergent technology!
- Could LPPD provide a platform for open-source system design by taking responsibility with no authority and conducting an A3 process involving all of the players?
- “Lean System Design”, for an optimized, emergent Mobility 2.0?!

If We Truly Want to Design the Future:

- We as a community need to think big.
- And we need to think beyond mobility to include the other key systems supporting human life – food, shelter, health, communication/knowledge (as logistics merges with mobility.)
- In every case we need to think beyond brilliant system components operating in crummy systems to brilliant systems with brilliant components!

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