

THE NEW MOBILITY: OPPORTUNITIES AND CHALLENGES

November 17, 2018 -- Tokyo, Japan

sponsored by:

Program on Vehicle and Mobility Innovation (PVMI)
Mack Institute for Innovation Mgmt, Wharton School, U. Pennsylvania

Manufacturing Management Research Center (MMRC)
University of Tokyo

Institute for Innovation and Entrepreneurship
London Business School

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*Management Department, Wharton and
Director, PVMI*

PVMI: Remembering Its Roots in IMVP

The Program on Vehicle and Mobility Innovations (PVMI) joined Wharton's Mack Institute in 2013, but its roots lie in the International Motor Vehicle Program (IMVP), founded in 1985 at MIT.

PVMI is the new name and provides the new direction for the IMVP network, and Wharton/Mack Institute is its home!

What You Should Know about IMVP

History: International Motor Vehicle Program (IMVP), founded at M.I.T., operated continuously for over 25 years.

Mission: IMVP is an international network of faculty, doctoral students, and other researchers delivering knowledge and insight to practitioners in the global automotive industry and advancing industry studies research.

Organization: Sponsors contribute funds to IMVP, which channels resources to researchers. Researchers write papers and present findings and insights to sponsors at meetings and sponsor briefings.

Collaborative Research: IMVP organizes international teams of researchers to examine topics throughout the automotive value chain.

Events: IMVP organizes general and sponsor-specific meetings for researchers and sponsors to discuss and advance IMVP knowledge.

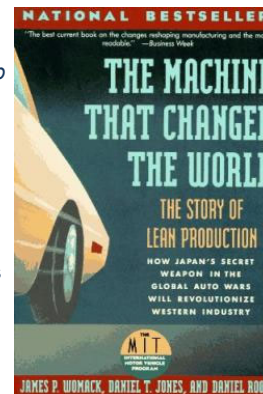


KNOWLEDGE FOR INNOVATION

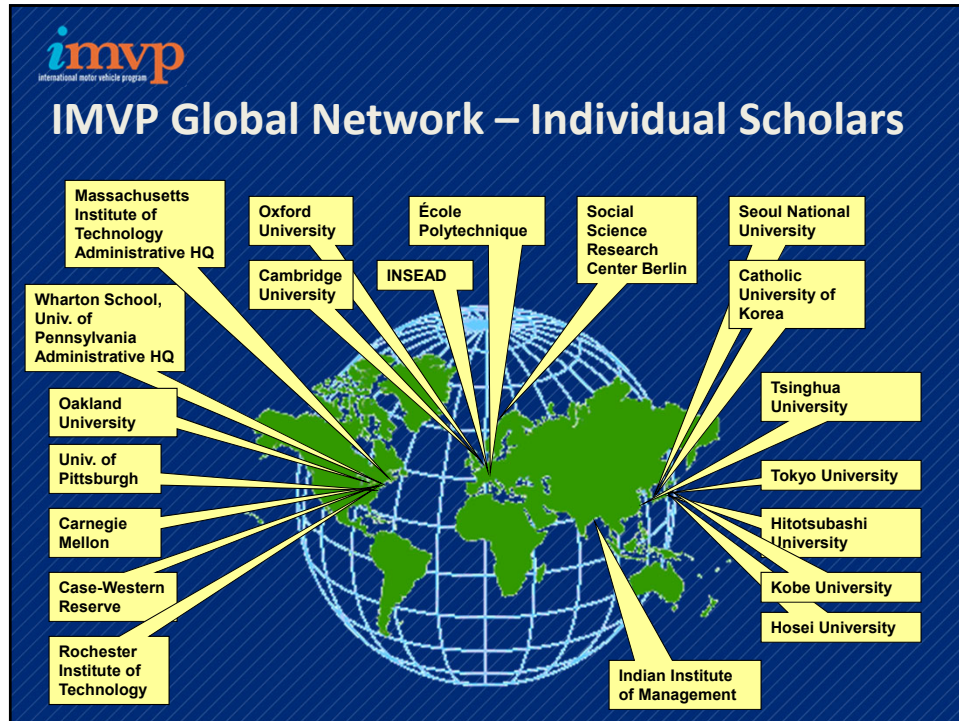
PVMI Research Meeting 2018

IMVP is best known for introducing “lean production” and its competitive advantages over mass production

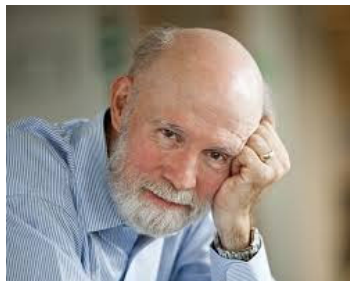
- “Lean” – *“because it uses less of everything compared to mass production – half the human effort in the factory, half the investment in tools, half the engineering hours to develop a new product in half the time, and far less than half the needed inventory on site.”*
- “Production system” -- from Product Development and Supply Chain to Manufacturing and Distribution
- Comparing and contrasting the logic and philosophy of mass vs. lean as well as their management practices
- Performance differences documented through primary data collection and global benchmarking



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We Have Two of IMVP's Past Leaders Here Today



Jim Womack
Research Director 1979-1991

Author (w/ Jones & Roos) of
Machine That Changed the World

Founder and Past President,
Lean Enterprise Institute



Charlie Fine
Research Director 1991-2001

Chrysler Leaders for Manufacturing
Professor, MIT Sloan

Founding President and Dean,
Asia School of Business, Kuala Lumpur

IMVP Is Now PVMI



PVMI PROGRAM *on* VEHICLE
and MOBILITY INNOVATION

PVMI Global Network - Clusters



These Scholars Keep PVMI's Activities Going



Takahiro Fujimoto, U. Tokyo



John Paul MacDuffie, Wharton



Christophe Midler,
Ecole Polytechnique



Michael Jacobides,
London Business
School



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What's New, What Endures



- **A new university home** (de facto administrative hub for IMVP for many years)
- **A new research affiliation** (Mack Institute expertise on emerging technologies and industries, managing uncertainty, models of innovation)
- **New themes** (more focus on innovation; vehicles and mobility; cross-industry comparisons)
- **Enduring links among global network of auto industry scholars** (plus adding links to Mack scholars)
- **Enduring commitment to field-based research, systemic viewpoint, primary data collection, insight for industry**



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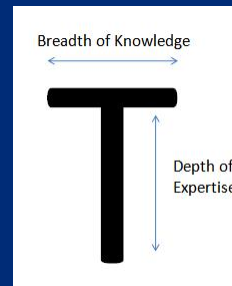
IMVP Developed Deep Expertise in an Industry Vertical

A
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R&D
Advanced Engineering
Product Development
Supply Chain
Manufacturing
Sales and Marketing
Distribution

PVMI Takes T-shaped Approach

- *Depth on auto industry*
- *Breadth to incorporate:*
 - *Disruptive technologies – EVs & AVs*
 - *Mobility-as-a-service -- innovation in business models*
 - *Policy issues, esp. vis-à-vis cities*



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From Jacobides, MacDuffie, and Tae (2013): Auto's first century ends with value stasis and structural stability

- **Sometimes industry structure changes dramatically as value migrates from one subsector to another, e.g. computers**

Disruptive technological change is one precondition, but not sufficient

Open industry standards, modular product architecture, rapid changes in who are the end users and what they want/need – all were essential

- **Sometimes value doesn't migrate and industry structure stays relatively stable, e.g. automobiles**

OEMs are irreplaceable in the role of system integrator, quality and brand guarantor, accountable party for legal liability and regulatory requirements

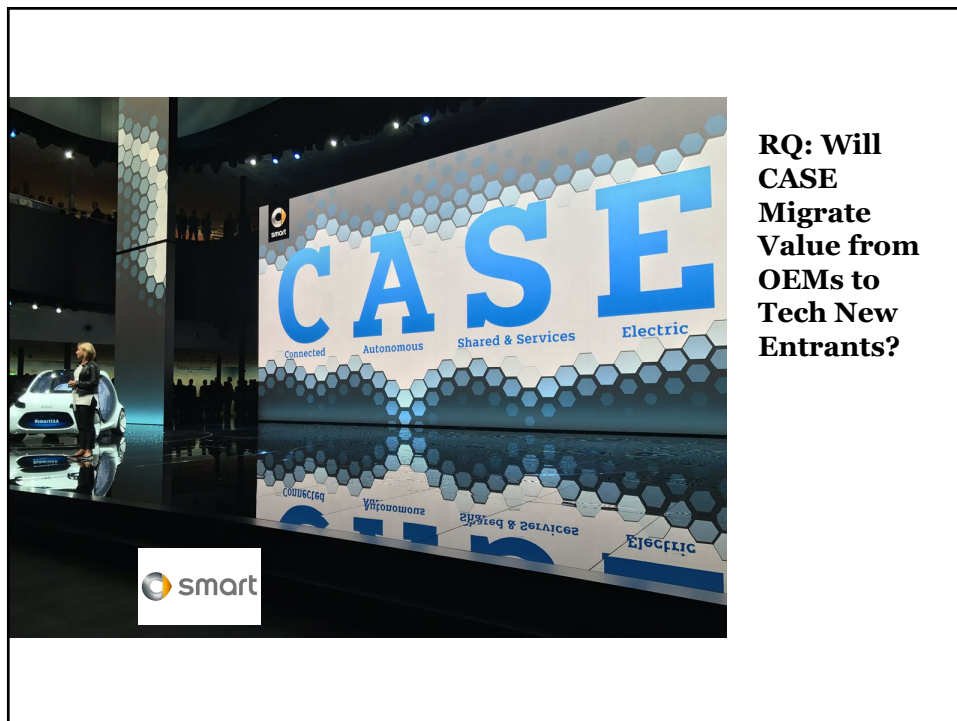
Closed integral product architecture, kept that way by OEM strategic choice

OEMs insist on retaining dominant role vis-à-vis suppliers

Relative stability in the identity and needs of consumers

Disruptive Technologies/Business Models (fast pace, separately and together as CASE)

- **C:** “Connected car” – within-vehicle network; vehicle-to-vehicle (V2V); vehicle-to-infrastructure (V2I); infotainment services
- **A:** Autonomous vehicle – “driver assist” (Levels 1 & 2) to “primary vehicle control” (Level 3) to “full vehicle control” (Levels 4 and 5)
- **S:** Shared -- New mobility services, w/high asset utilization strategies (car-sharing/ ride-hailing) that reduce vehicle ownership
- **E:** Electric vehicles (advanced ICE, HEV, PHEV, BEV, fuel cell) and new fuel sources (electricity, hydrogen, ethanol, biodiesel)



Current Research Topics for PVMI (partial list)

Strategies for managing a portfolio of technologies (electric drive trains; alternate fuel sources; autonomous vehicles) – new approaches to program management

Digitalization of vehicle technologies and the implications for vehicle architecture and industry structure

“Last gasp” (spurt of innovation in incumbent technologies when threatened by replacement or obsolescence)

Competition and collaboration between automotive incumbents and tech entrants

Ecosystems -- emergence, orchestration, and impact on competitive dynamics

Mobility services (products + services) tied to new & disruptive business models

Governments (esp. cities) as customers, experimenters, rule-setters, investors

PVMI Organizes Events, Activities to Foster Dialogue between Practitioners and Scholars


Series of Conferences:

- June 2017: “Connected Truck, Connected Car” conference at Wharton/ Mack
- November 2017: “Reshaping Mobility Ecosystems” conference at London Business School
- October 2017: “Next Generation Trucking” conference at Penn Engineering
- November 2018: “The New Mobility: Challenges & Opportunities, in Tokyo
- ???


Workshops and Plenary Presentations at Major Academic Conferences

Technology Forecasting Challenges on Vehicle & Mobility Innovations, with Good Judgment Inc.:

- 2016, 2017-18 Challenges completed
- 2018-19 Challenge launched Friday!



the 2018-2019 Vehicle Innovations Challenge!



2018-2019 Vehicle Innovations Challenge

CLOSING
Jan 1, 2020 02:59AM (1 year)
[About](#)

The auto industry is in the midst of a dramatic transformation: from total reliance on internal combustion engines to growing acceptance of electric vehicles; from driven to driverless cars; from vehicle ownership to vehicle sharing and pay-for-usage ride-hailing -- and everything in between.

The Program on Vehicle and Mobility Innovation (PVMI) at the Wharton School, University of Pennsylvania, in collaboration with [Wharton's Mack Institute for Innovation Management](#), brings you the third iteration of a forecasting competition focused on the shifts -- both seismic and incremental -- that are shaping the future of the automotive industry. Like last two years' challenges, the 2018-2019 Vehicle Innovations Challenge will track developments in technology, automaker strategies, the competitive landscape and the regulatory environment to inform forecasters about these new issues while involving them in a global crowd-sourced effort to anticipate the trajectory of an industry in upheaval.

For more information on results from last two Vehicle Innovations Challenges, see The Mack Institute's post mortem analyses for the [2016 Challenge](#) and the [2017-18 Challenge](#).

[Click here for help](#)

The New Mobility: Agenda (morning)

9:00-9:05 Welcome and Introduction

9:05-9:40 "Connecting the Ground and the High Sky: Competition and Collaboration in the Integration of Digital and Physical Technologies"
Takahiro Fujimoto, U. Tokyo and Executive Director, MMRC
John Paul MacDuffie, Wharton School, U. Penn., Executive Director, PVMI

9:40-10:20 "From Electromobility to Autonomous Mobility in Europe: What Is Ahead?"
Prof. Christophe Midler and Prof. Remi Maniak, Centre de Recherche en Gestion (CRG), Ecole Polytechnique

10:20-10:40 Coffee Break

10:40-11:20 "Honda's Initiative on Automated Driving - Current Status & the Future",
Yoichi Sugimoto, Senior Chief Engineer, Automobile R&D, Honda Motor Co.

11:20-12:00 "The Five Most Critical Research Questions in Mobility"
James P. Womack, Founder and former President, Lean Enterprise Institute
Charles Fine, MIT Sloan School and Dean of the Asia School of Business

12:00-1:00pm

LUNCH

The New Mobility: Agenda (afternoon)

1:00-1:30 “What are Ecosystems and Why Should We Care?”
Michael G. Jacobides, London Business School

1:30-2:30 OEM Partnerships in Urban Mobility Ecosystems
Moderator: Nina Teng, London Business School
Dominic Ong, Head of Automotive Partnerships, Grab
David K. Goh, General Manager, Daimler Mobility Services
Klaus Meder, President, Robert Bosch Japan

2:30-2:45 Coffee Break

2:45-3:45 New Mobility Services Beyond Ride-Hailing
Moderator: Michael G. Jacobides, London Business School
Emilie Potvin, Head of Public Policy & Gov’t Relations, North Asia, Uber
Hamid Akbari, CEO, Velocia
Kay Woo, CEO, TADA

3:45-4:45 Public-Private Partnerships in Urban Mobility Ecosystems
Moderator: John Paul MacDuffie, Wharton School, U. Penn.
Yiting Lin, Regional Director of Japan, Singapore EDB
Hidetada Higashi, Associate Professor, Yamanashi Gakuin University
Johan Wallin, Managing Partner, Synocus Group
Tatsuro Imai, Senior Deputy Director, City Bureau of MLIT Japan

4:45-5:00 Wrap-up Taka Fujimoto, John Paul MacDuffie, and Michael Jacobides

5:00-6:30 RECEPTION