

The future of the automotive industry: Trends and Implications

SAP Automotive Forum

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Top 10 Transformational Shifts Expected to Shape the Future of Mobility



Connected Vehicles



**New Mobility
Business Models**



**Manufacturing
Evolution**



**New Retailing
Models**



**Women
Empowerment**



**Health Wellness
and Well-being**



**Vehicle
Electrification**



Tech Invasion



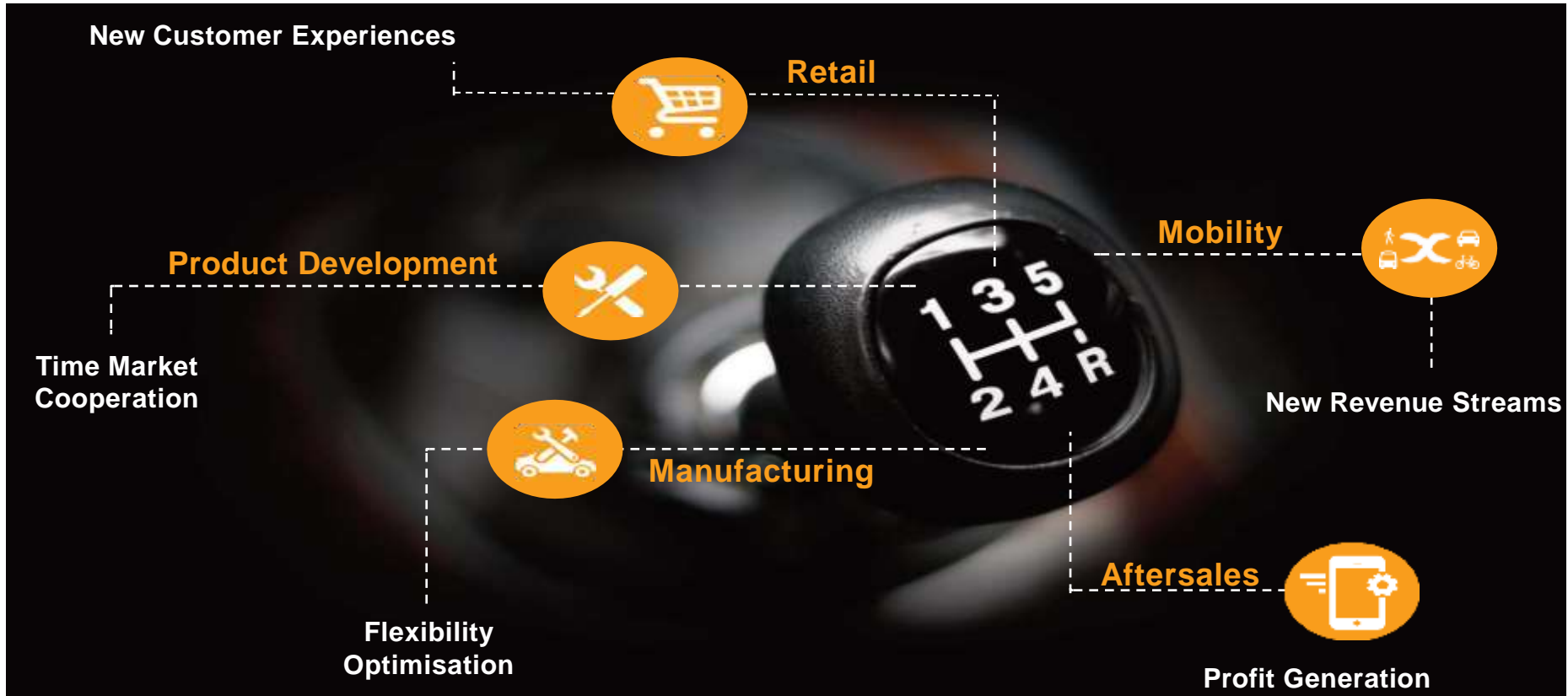
Cognitive Era



**Autonomous
Vehicles**

Source: Frost & Sullivan

Connectivity will Drive a Tsunami of Innovation across the Entire Automotive Industry – “behind challenges lie opportunities”



5G in Cars Will Make Our Cars Cognitive and Intelligent

European Commission has signed strategic deals with Asian market leaders in 5G technology, Japan and South Korea and China to rollout 5G by 2020

High to Fully Automated Driving



Over 2 Gb data needs to be harnessed at a given point.
Needs 5G speed

Over the Air Updates



Reducing the update time from 3-4 hours to less than 5 min requires 5G speeds

Augmented and Virtual Reality

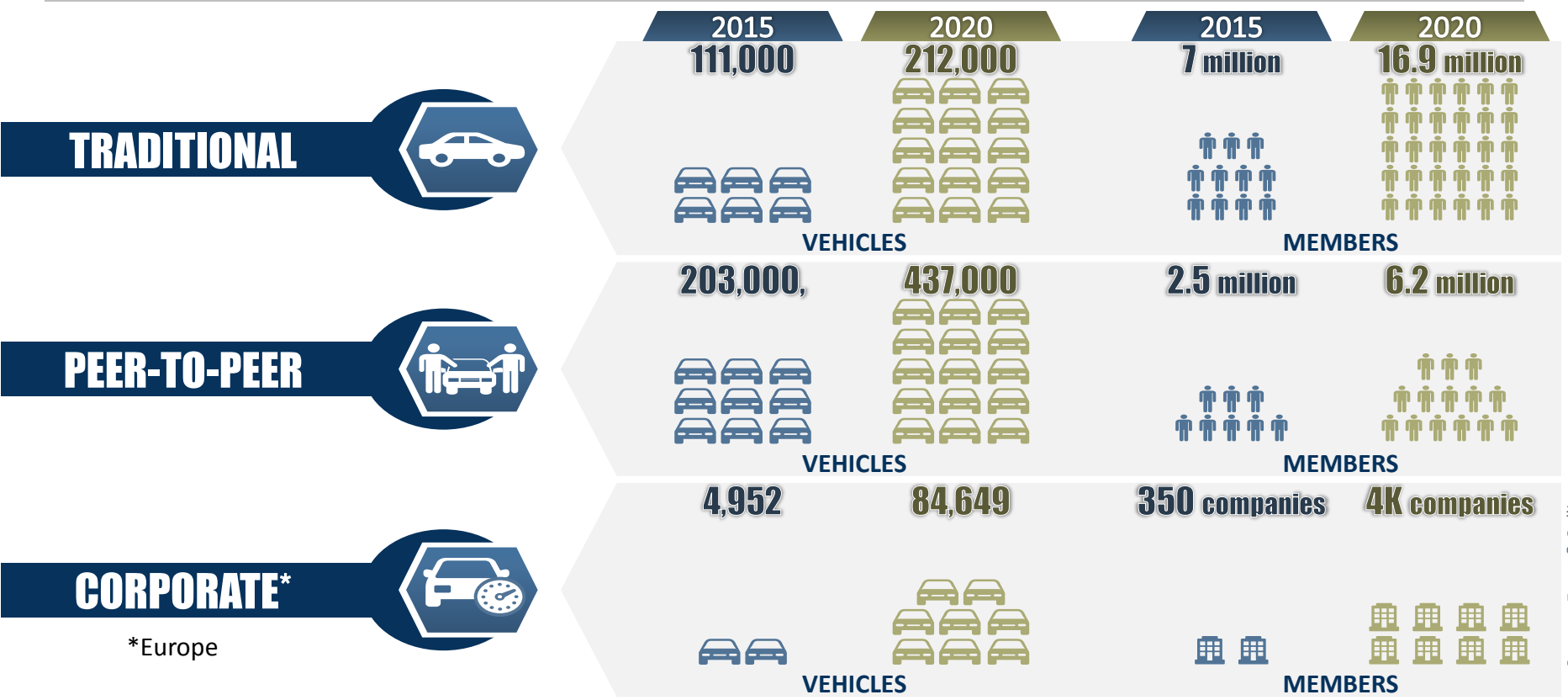


Continuous processing of real-time information to windshield

Source: Frost & Sullivan

New Business Models - Growth of Car Sharing

The global carsharing market is expected to cross 16.5 million by 2020.

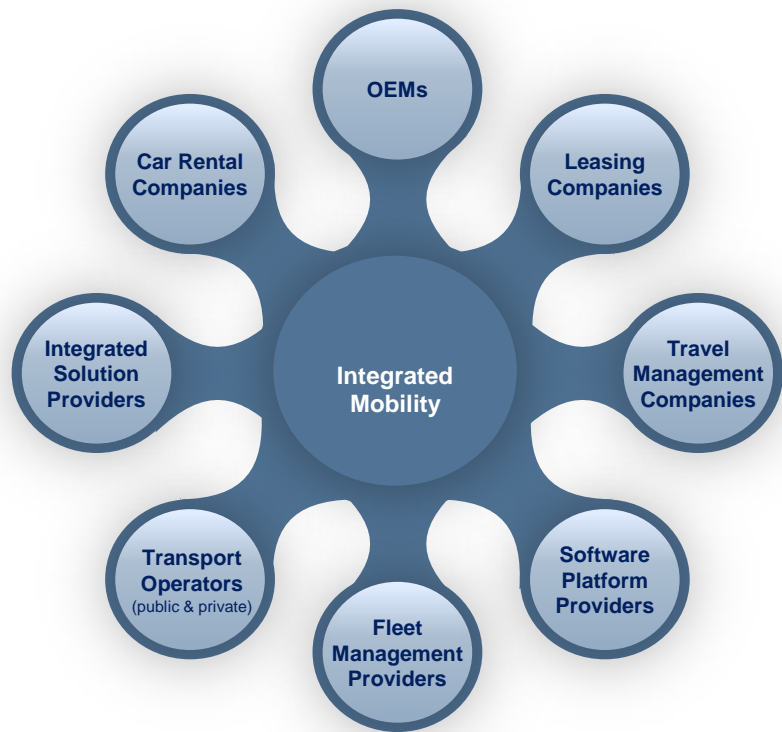


*Europe

Source: Frost & Sullivan

New Mobility Business Models & Partnerships Enable First/Last Mile

In both B2C and B2B environments customers are demanding intuitive services; many players investing significantly to deliver a seamless proposition & user experience for Integrated Mobility



	Taxi Services	U B E R	HAIL O	Xmytaxi
	Bike Sharing		Santander	velib'
	Micro-mobility	scoot	TOYOTA i-ROAD	twizy
	Car Sharing	zipcar	DriveNow	Enterprise CarShare
	Corporate Car-Sharing	AlphaCity	ubeeqo	
	Car Rental	Hertz	avis budget	
	Ridesharing	BlaBlaCar	liftshare	goCarShare
	Parking	JustPark	Parkopedia	
	E-Mobility	source LONDON	ChargeNow	
	Public Transport	DB	oyster	
	Integrated Mobility	moovel	moovit	Qixxit
				Citymapper

	Share Logistics	TGMMatrix	shuttl	Tiramizoo
		cargomatic	ROADIE	

Intense competition in product markets is set to create a surge in service opportunities across the automotive market. OEMs such as BMW, GM, Daimler have adopted innovations in auto manufacturing.

- Internet of Things
- Smart Clouds
- Wireless intelligence
- Integrated Industries
- IP centralization
- Big Data
- Distributed Manufacturing

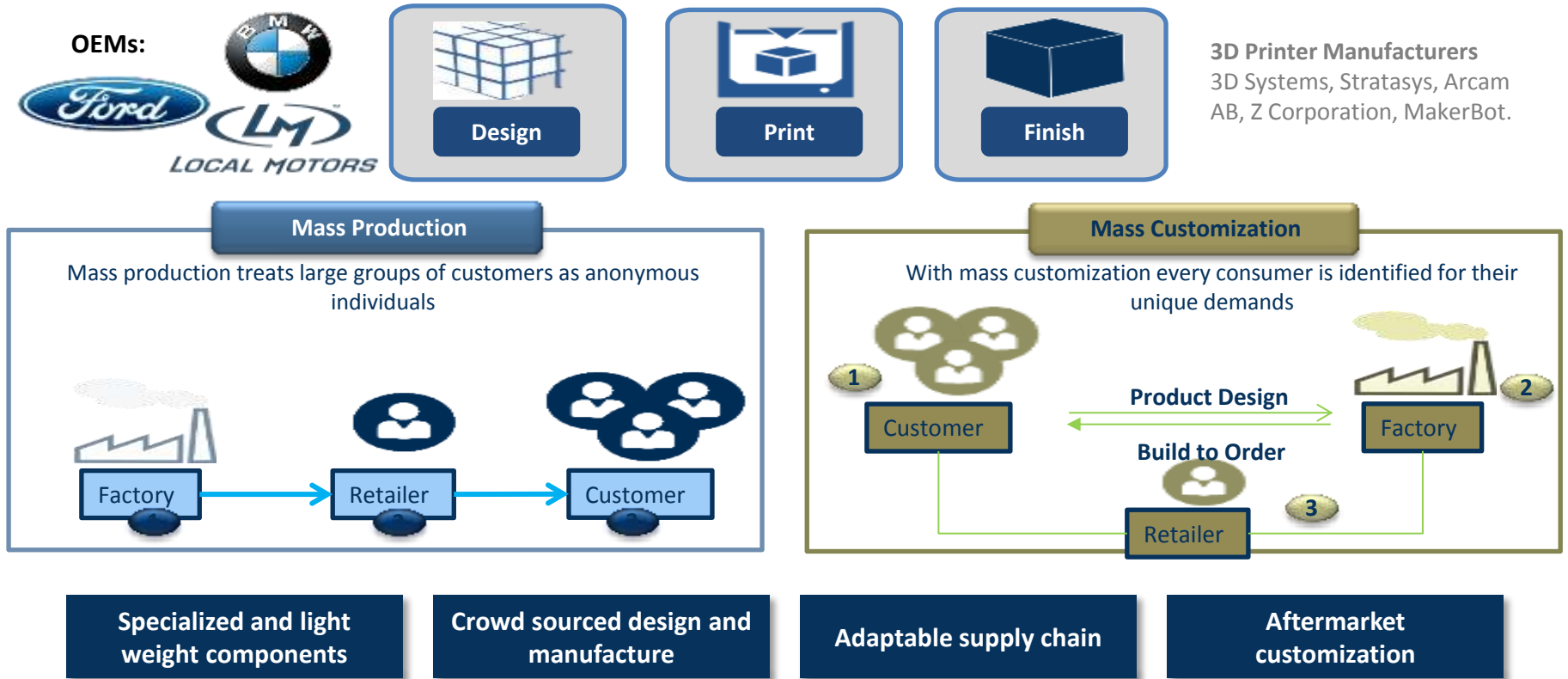


Reduced complexity

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3D Printing - The Broad Outlook

Additive Manufacturing in the automotive industry is poised to become a \$ 2.2 billion global business by 2020



The Future of Automotive Retailing

Transformational shift from a transactional model towards a more experience based model leveraging digital technology throughout the customer journey.



Future Stores

Smaller, Ephemeral,
and Urban



Omni channel Retailing

'Bricks and Clicks' Models



Connected Retailing

'on-the-go' seamless
shopping



New Business Models

Social Commerce, and new
retail models



Engaging Retailing

Era of customized targeting



Last Mile Retailing

Future of retail supply chain



Big Data Retailing

From selling products to
selling information

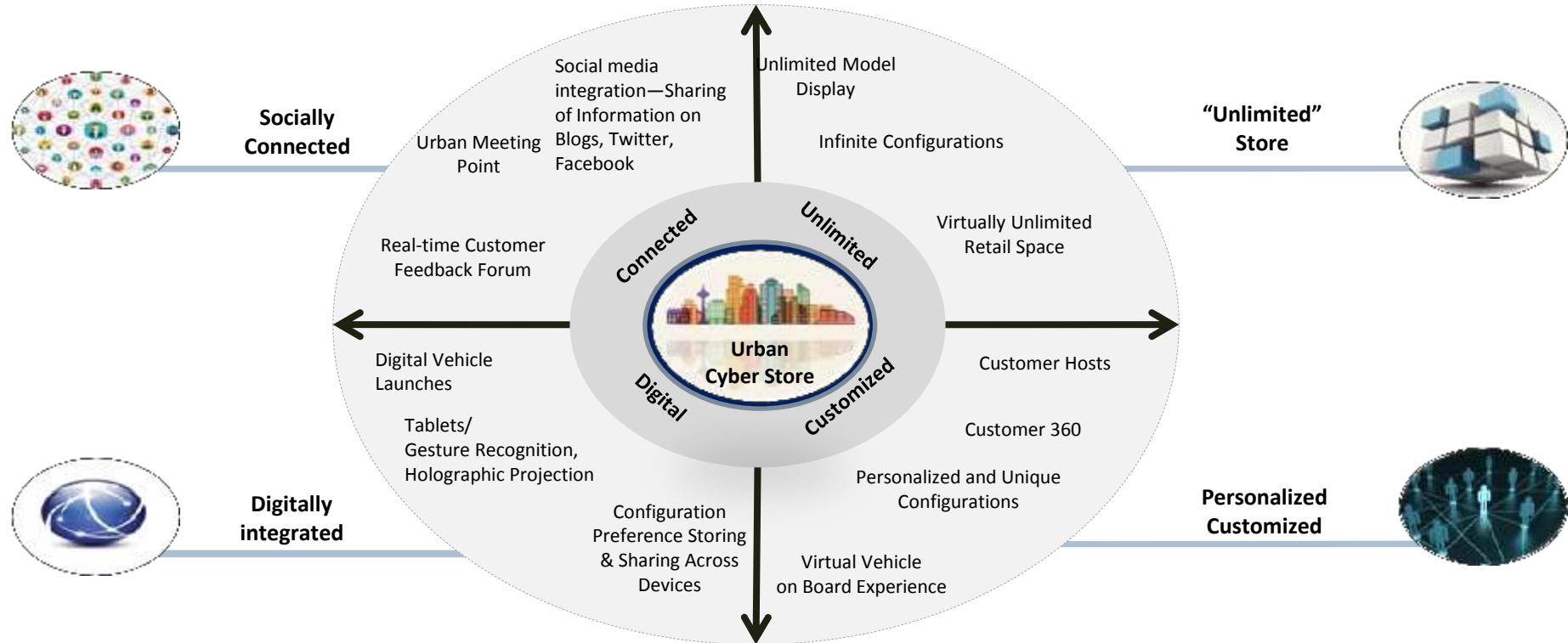


Women Empowerment

Emerging Retail Models for
Women

The Showroom of the Future

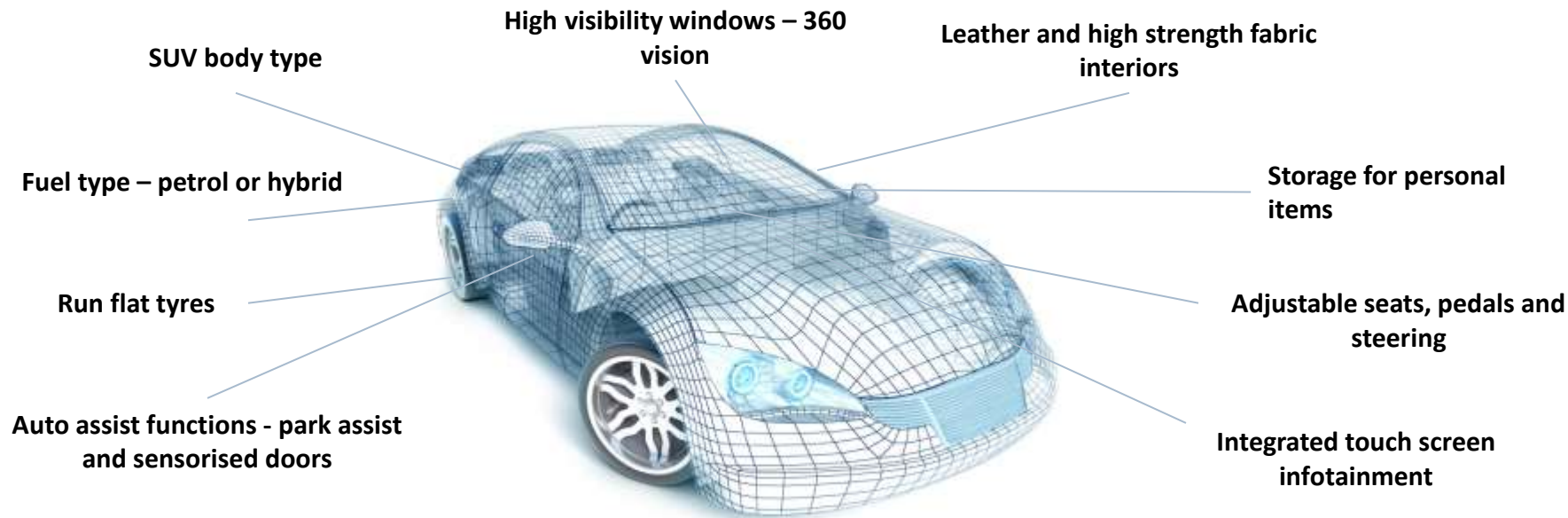
The digital showroom is strategically located in the heart of a mega city; equipped with digital tools, offering virtually unlimited models and configurations to customers.



Source: Frost & Sullivan

Women as Customers - What does a Cars for Women Should Look Like?

There is a market of vehicles designed for women. 1 in 5 want a car made for them while 2 out of 3 express a demand for personalisation options



Lease option

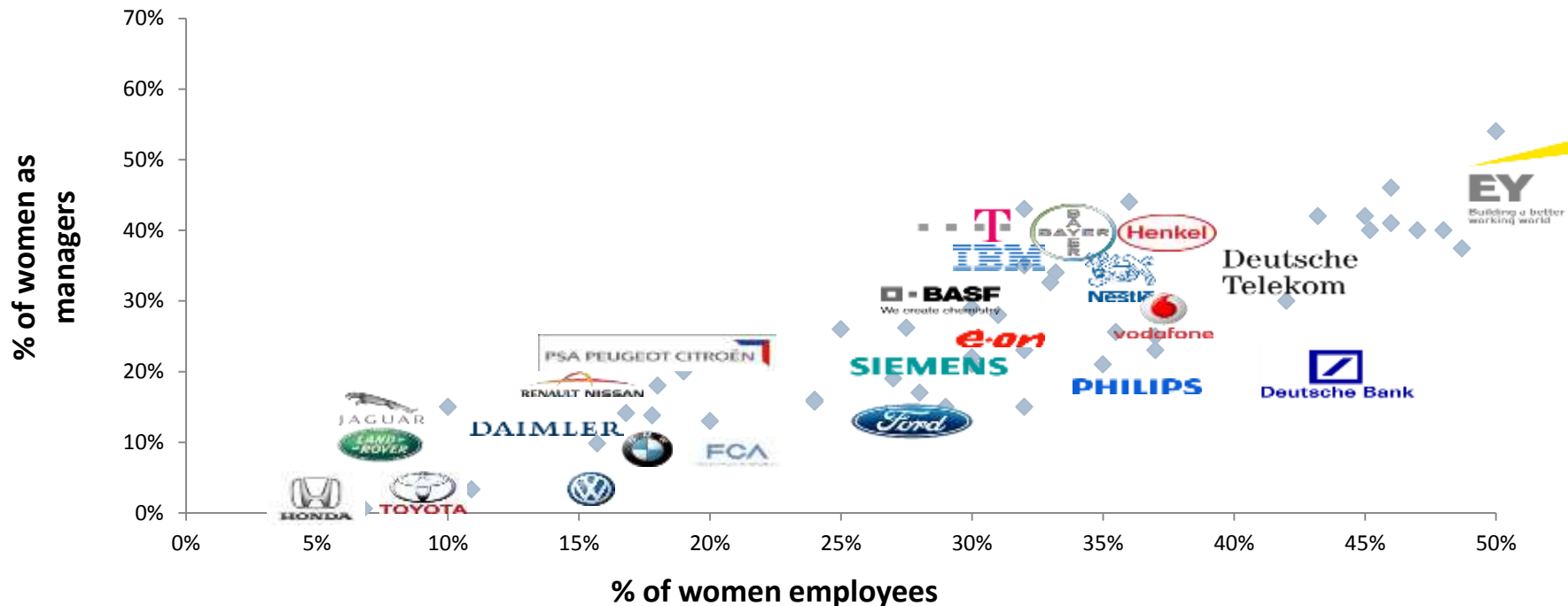
7 years+ warranty period

Maintenance and tyres package

Women in the Auto Industry – Both sides of the table

The Automotive industry has an average of 16% women in management positions, much lower than the market average of 26% across 7 industries ranging from ICT to healthcare to energy.

Auto Industry Lagging in Gender Diversity – Cultural Shift required



The 3 Cornerstones - The Body, Mind and Soul

Contribute To Humans Definition of Health, Wellness and Well Being



Health, Wellness and Wellbeing the Next Big Differentiation Factor for OEMs

Size, cost, and functionality trends around sensor technologies enable a wide spectrum of potential in-built passenger monitoring/tracking services.

**Built-in
(Embedded)**



**Brought-in
(Peripheral Integration)**



**Cloud-enabled
(Broadcast)**



Source: Frost & Sullivan

Key Powertrain Market Trends

Global emissions norms (EURO VI/VII, EPA, 2020 ACEA) and fuel economy standards (CAFE, CAFC) constantly encourage OEMs and the automotive value chain to innovate and adopt varying global powertrain strategies.

Turbo Engine Downsizing



2- and 3-cylinder engines, reduced engine displacement, down-speeding

Powertrain Modularity and Lightweighting



Aluminum, modular construction, parts commonality

Emission Reduction & Fuel-efficient ICE Technologies



DI, VVT, SCR, EGR, LNT, start-stop, cylinder deactivation, GPF

Drivers: Euro6, ACEA, EPA, CAFE

High-speed Transmissions



High-speed DCT, 8/9/10-speed

Emission Testing Procedures



Migration from NEDC to WLTP, RDE

Powertrain Electrification



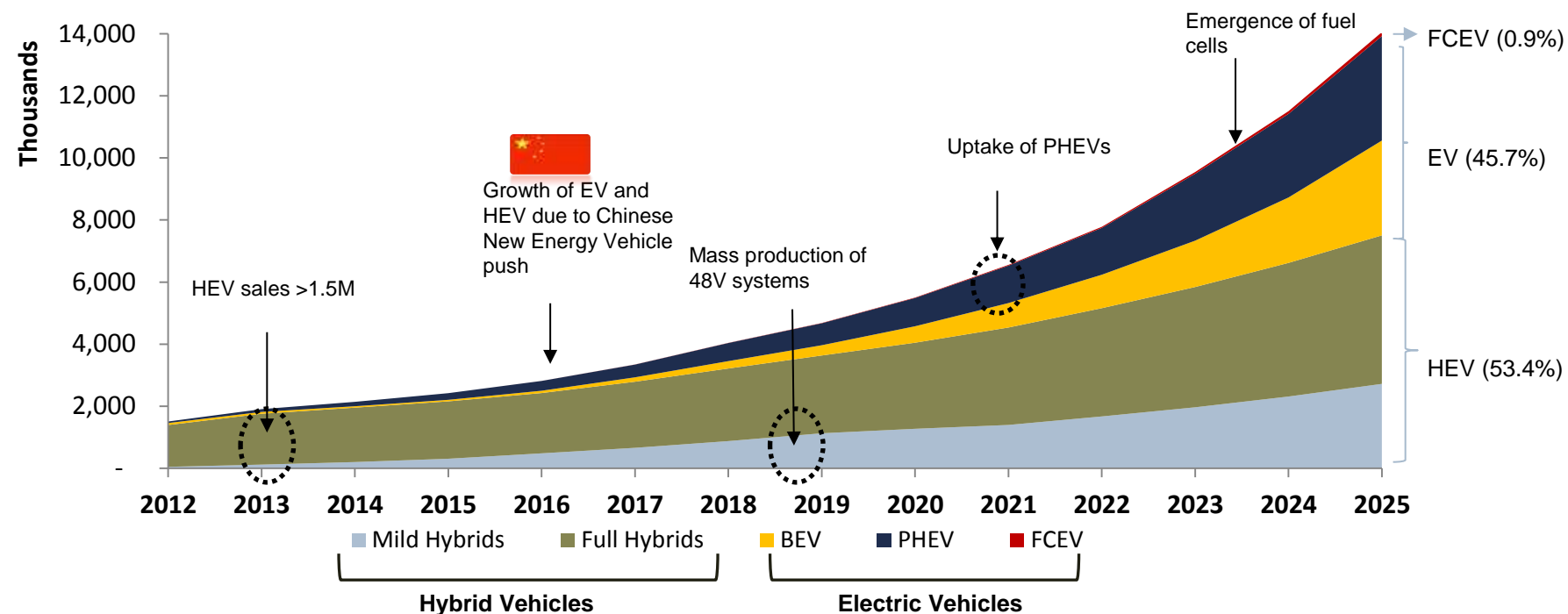
PHEVs, diesel hybrids, transmission electrification, EVs, range extenders

Source: Frost & Sullivan

Global Uptake of Electrification in Passenger Vehicles

Electrified Vehicles to go from 2.8 million in 2016 to about 14M units by 2025 (12% of global automotive sales)

Sales forecasts for hybrid, electric and fuel cell vehicles (Global), 2012-2025



Note: Regions include North America, Europe, China , Japan, India, South Korea and Australia

Tech Invasion – New Companies Entering the Automotive Space

New OEMs entering the Market will disrupt product lines

Next EV



Faraday

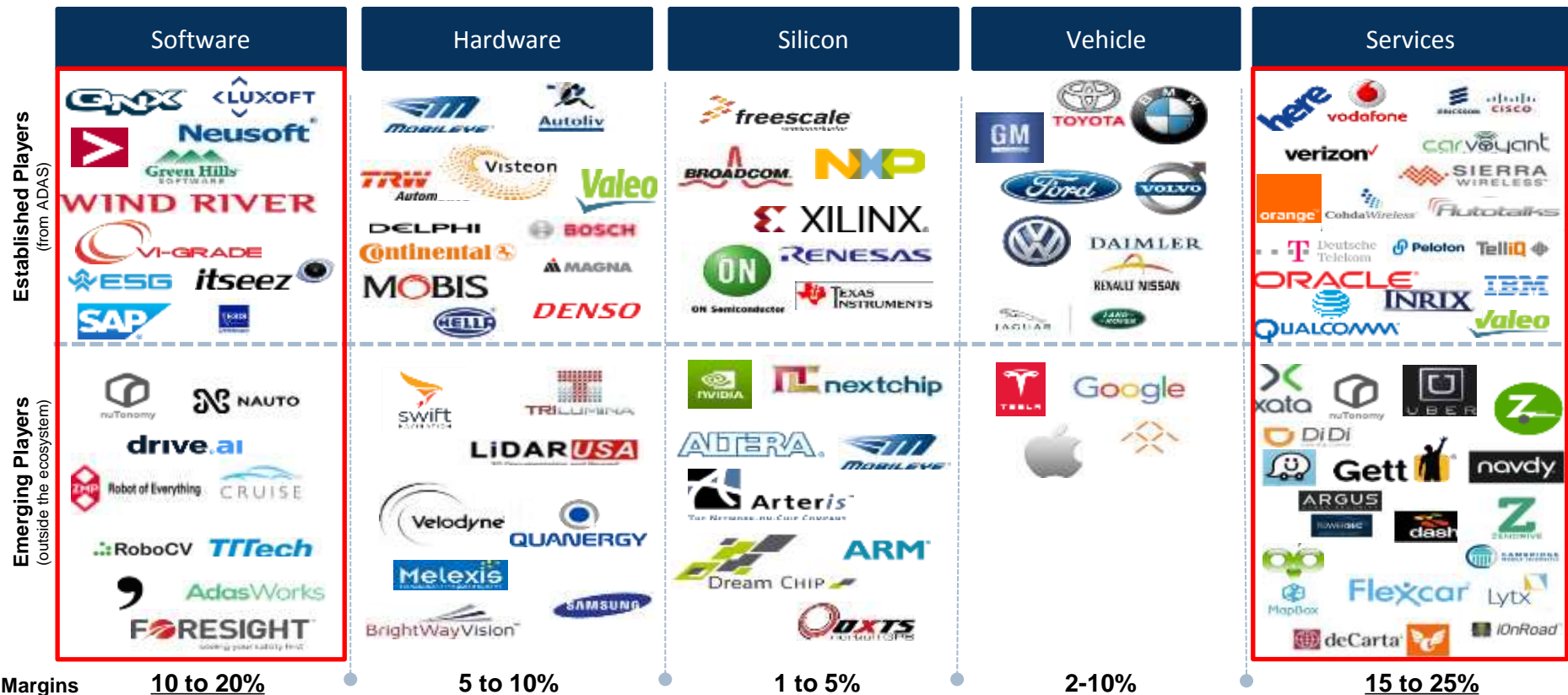


Apple



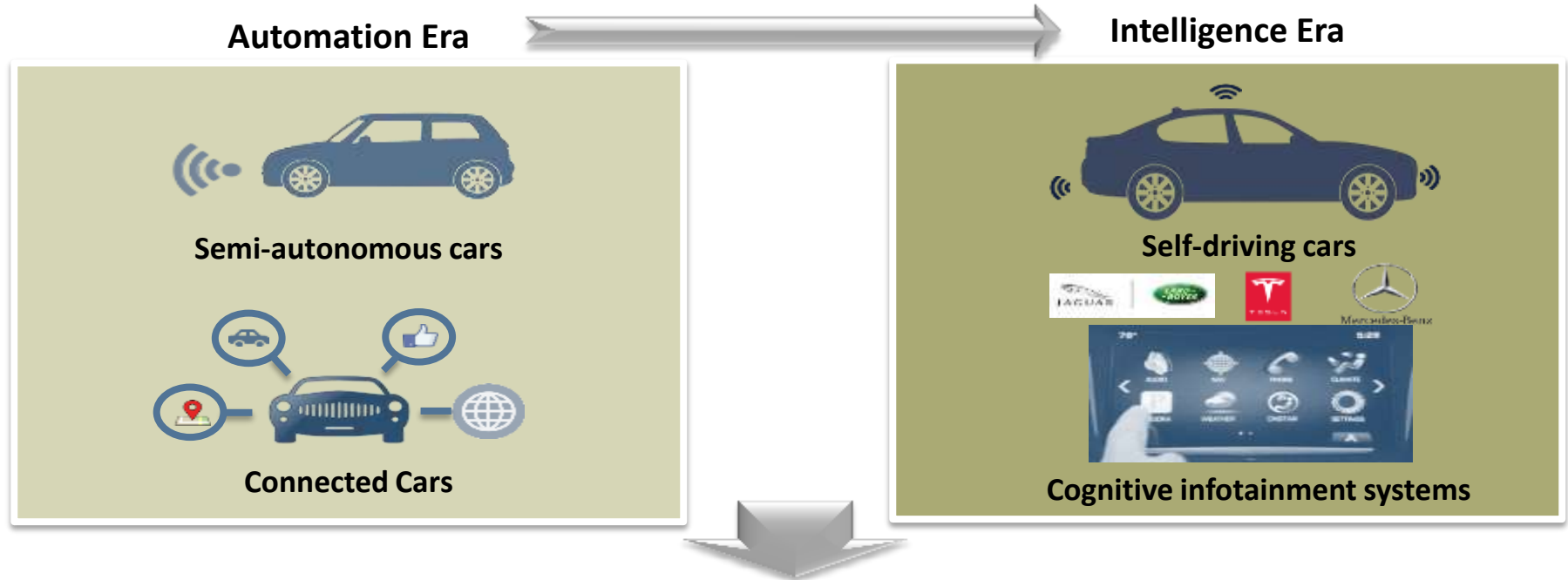
Tech Invasion – the Way Forward

The development of new mobility solutions and autonomous vehicles is driving a plethora of new market players set to disrupt the existing ecosystem and value creation model.



The Cognitive Era: Artificial Intelligence Driven Industry Transformation

From hands free to mind free – the market Value of artificial intelligence for enterprise application will reach more than \$11 billion by 2025



Evolution of Vehicle Manufacturers' Value Creation Model

Shift from developing and selling hardware to delivering services throughout the life cycle of the vehicle, and leverage “Asset Light” models

Car Independent



Integrated Mobility:
Journey Planning,
Booking & Payment

City Planners & Lifestyle

Energy creation & storage

Car Services



Carsharing &
Ride-Sharing

Parking &
Charging

On-demand
Features

Taxi &
Limousine

Automated
Driving

Car Ownership



Finance

Maintenance Contracts &
Warrant Extension

Connected Services
(Infotainment)

Vehicle Development, Sales & Aftersales

Evolution & Expansion of OEM Model

Thank You for Your Attention - Questions & Answers

Future of Mobility Video



Watch our latest Video on the Future of Mobility, filmed live at Frost & Sullivan's Annual Mobility Workshop

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