MITI MALAYSIA
MINISTRY OF INTERNATIONAL TRADE AND INDUSTRY

MAI
Malaysia Automotive Institute

Transportation & Mobility - New Horizons for a Data-Driven Economy

NAP 2014: Towards Smart Engineering & Internet of Cars (IoC): Virtual System Integration

New Horizons for a Data-Driven Economy

The Malaysia Automotive Institute (MAI) is an agency of the Ministry of International Trade and Industry (MITI)

- We are a **think tank**, tasked with **strengthening** the Malaysian Automotive Industry
- An Intermediary between stakeholders in Malaysia's automotive community
- We **Formulate policies** & perform **research** on the industry
- We also **develop human capital** & coordinate between public and private sectors

- **Malaysia Government Driving Auto Industry Transformation**

NEW HORIZONS FOR A DATA-DRIVEN ECONOMY

THE rapid transformation of automotive mobility — from fossil fuel to hybrid and fully electric vehicles — is attributed to the creativity and innovativeness of the global automotive industrial community.
NAP 2014 **vision and strategy** is to prepare **Malaysian Automotive vendor, businesses and entrepreneurs** better for a **game changing of automotive global digital technology** and equip them with the knowledge and skills needed to compete and thrive.

Understand

- How new information technology developments are transforming the automotive global business landscape & technology.
- The new way of doing business in the Digital Age of Experience for Smart Engineering

Data-Driven Economy & Competitive ASEAN Automotive Industry

- Various existing initiatives to boost Digital Entrepreneurship, such as public policies, private initiatives and public-private partnerships
- Notably in some developed and emerging economies with very active “digital and technology policies” in place

Shape the **Malaysian vision** and **strategy**

- Supporting digital innovation – Smart Engineering, Virtual System Integration, Industry 4.0 & Internet of Cars
- Offering Malaysian SMEs new business opportunities and a leading place in the modern digital economy

Organisations within the local automotive industry at all levels, from parts and components manufacturing to aftermarket services, research and development (R&D) and marketing, also need to attain creative and innovative ability within their workforce to remain competitive on the global scene.

NATIONAL AUTOMOTIVE POLICY (NAP) 2014

Malaysia as regional hub for Energy Efficient Vehicles (EEV) with high technology uptake **(implementation of Industry 4.0 elements)** among industry players for domestic & international export.

DIRECTION

Investment	Technology & Engineering	Market Expansion & Outreach
❑ Hub for Energy Efficient Vehicles	❑ In line with Latest Technology	❑ Manufacturer & After Sales ❑ Managing vehicle car price

STRATEGIES

Supply Chain Development	Human Capital Development
❑ Global Efficiency and Effectiveness	❑ Adequate & competent manpower

Safety, Security & Environment

❑ Whole Type Vehicle Approval ❑ Anti Theft ❑ Telematics	❑ Carbon Reduction ❑ Fuel Efficiency ❑ Preserving Natural Resources

NAP THRUST & ROADMAP 2014

ASEAN HUB FOR AUTOMOTIVE MANUFACTURING

Development of Automotive Authorized Treatment Facilities Framework (ATFR)

Malaysia Automotive Remanufacturing Roadmap

AFTERMARKET

Malaysia Automotive Technology Roadmap (MATR)

Human Capital Dev. Roadmap (HCDR)

01 Market Expansion & Outreach

03 Technology & Engineering

05 Human Capital Development

MANUFACTURING

Malaysia Automotive Supply Chain Dev Roadmap

02 Investment

04 Supply Chain Development

Safety, Security & Environment

EEV

NAP 2014: TARGET 2020

	2020	As at 2016
Total Industry Volume (TIV)	1,000,000 units	666,674 units (End 2015)
Exports of Vehicles	150,000 units	27,909 units
Exports of Components	RM 20 billion	RM 9.8 billion
Employment	135,000 jobs	78,157 jobs
Supply Chain Development	Level 5: 180 companies Level 4: 330 companies Level 3: 430 companies	Level 5: 11 companies Level 4: 47 companies Level 3: 3077 companies

6,900 Designer

Outcome: 10% GDP contribution from automotive industry **by 2020**

Note:

Level 5: Product Design Capable, Level 4: Process Design Capable,

Level 3: Statistically Stable Process

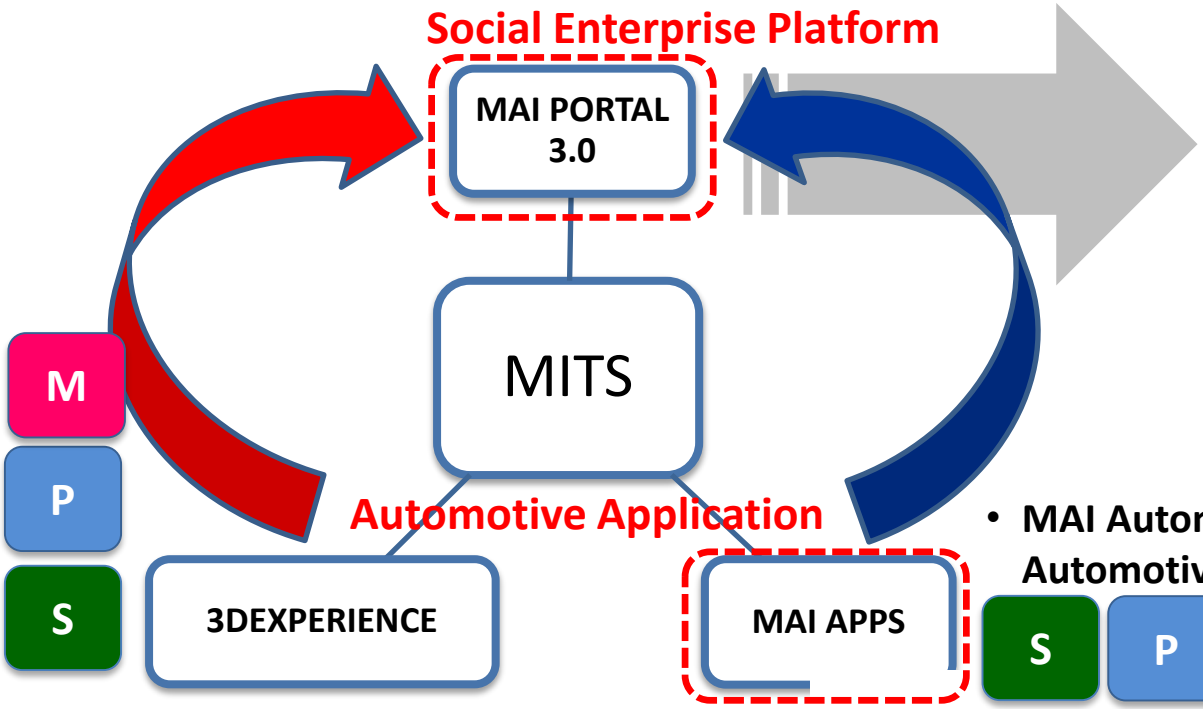
EEV = SMART ENGINEERING

Energy
Efficient
Vehicle

DRIVING INNOVATION IN THE AGE OF EXPERIENCE

MITS: MAI INTELLIGENT TECHNOLOGY SYSTEMS

EEV = **SMART ENGINEERING**
Energy Efficient Vehicle
+ INTERNET OF THINGS (IOT)



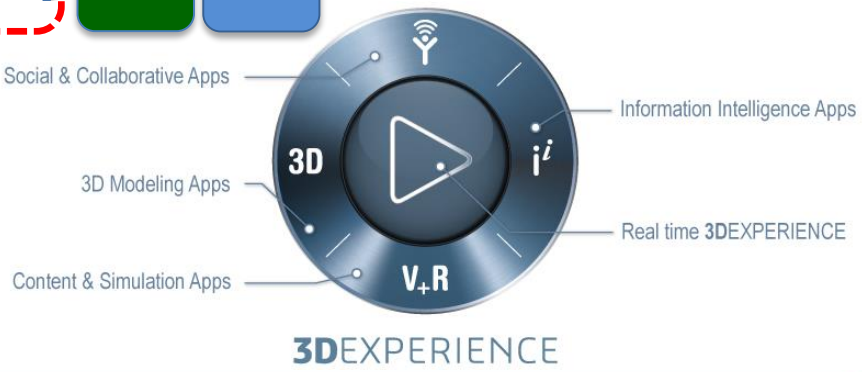
- **Intelligent information search-based technologies**
- **Social innovation capabilities**
- **Realistic 3D virtual experiences**

P BI

- **MAI Automotive Apps - Bringing Automotive Industry Solution.**

S P

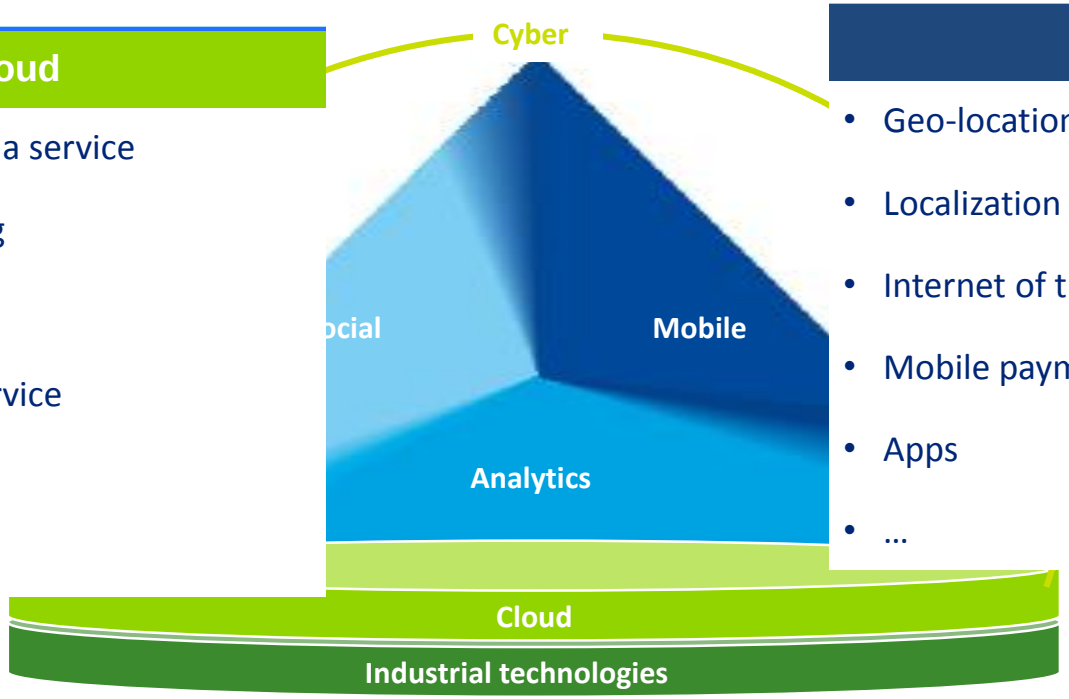
The 3DEXPERIENCE Platform - Harnessing the power of collaborative idea realization - **to enable our clients to create delightful EXPERIENCES for their ultimate customers or consumers.**



EXPERIENCE & DIGITAL FORCE

Cloud

- Infrastructure as a service
- Cloud accounting
- Virtualization
- Software as a service
- Hybrid clouds
- …



Mobile

- Geo-location marketing
- Localization
- Internet of things
- Mobile payment
- Apps
- …

Operating model

- Automation of processes
- Use of smart infrastructure
- Integration of physical goods into the digital world through embedded wireless devices
- Internal and external collaboration platforms
- Digital prototyping, testing, production and distribution
- Telecommuting or telework

Business model

- Virtual stores and companies
- Digital goods and services
- Smart cities
- Made-to-order, i.e. custom-made to the exact criteria and specifications of the customer

Customer & business insight

- Decisions through deeper analysis of increasing amounts of data
- Interaction at B2B, B2C and C2B level
- Social virtualisation
- Digital marketing

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NEW HORIZONS FOR A DATA-DRIVEN ECONOMY

National IoT Strategic Roadmap

National IoT Strategic Roadmap

IoT Malaysia

To create a national ECOSYSTEM to enable proliferation of use and industrialization of IoT as a new source of economic growth

Economy (RM million)		Job		SMEs		Efficiency Improvement
2014	2020	2014	2020	2014	2020	2020
771	**9,500**	**1,169**	**14,270**	**225**	**425**	**20%**

STRATEGIC

Agriculture

Economy (2020): **RM 1.4 B**

GROWTH

Healthcare

Economy (2020): **RM 1.8 B**

Manufacturing

Economy (2020): **RM 2.6 B**

COMMUNITY

Transportation

Economy (2020): **RM 1.0 B**

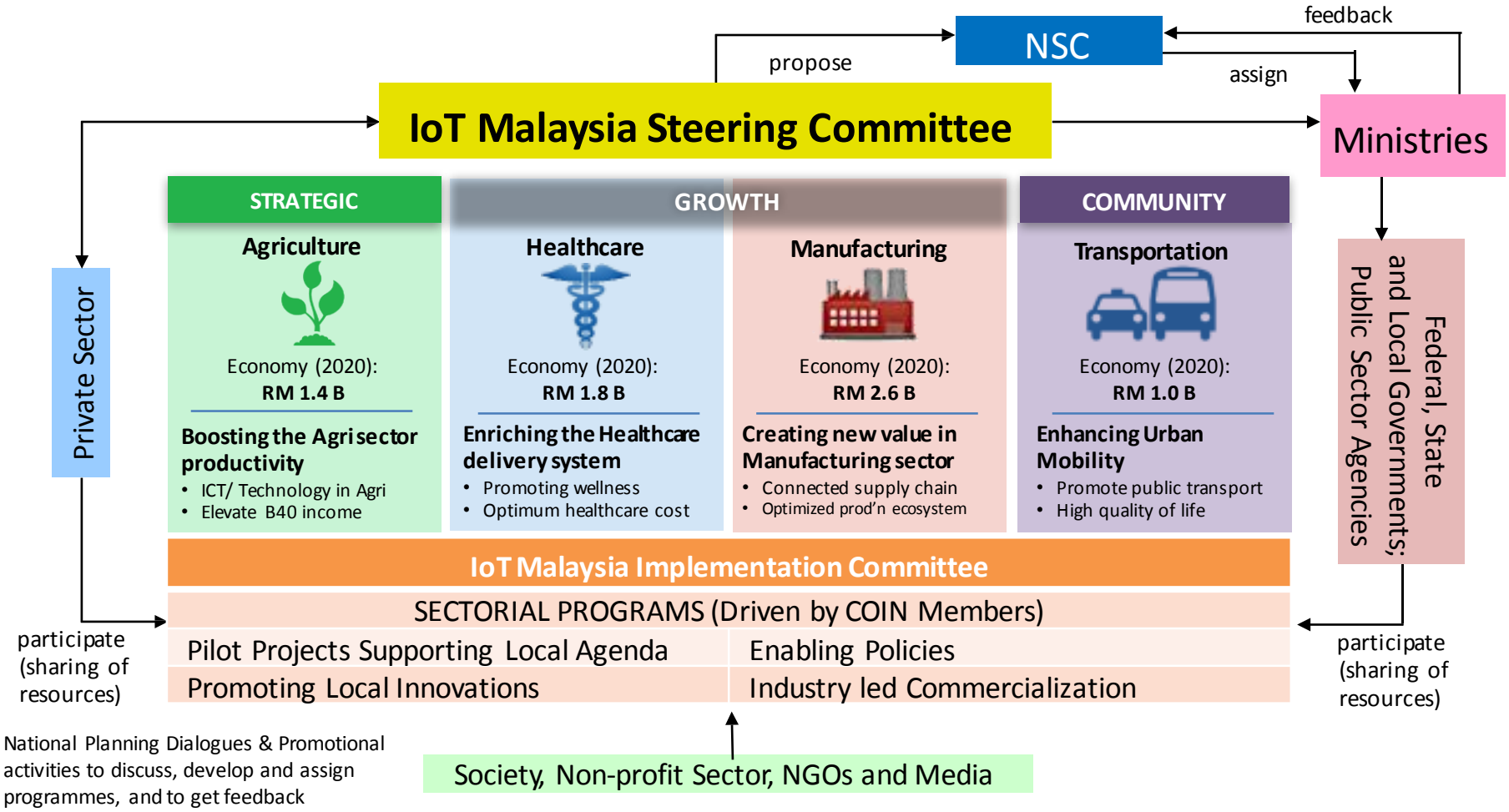
Other Economic Sectors

Retail
Utilities
Environment
Banking & Insurance
Hospitality & Tourism

Short Term Strategies	
Strengthening Technopreneurs	SMEs
	Startups
	Technology Leaders
Aligning to Existing Initiatives	

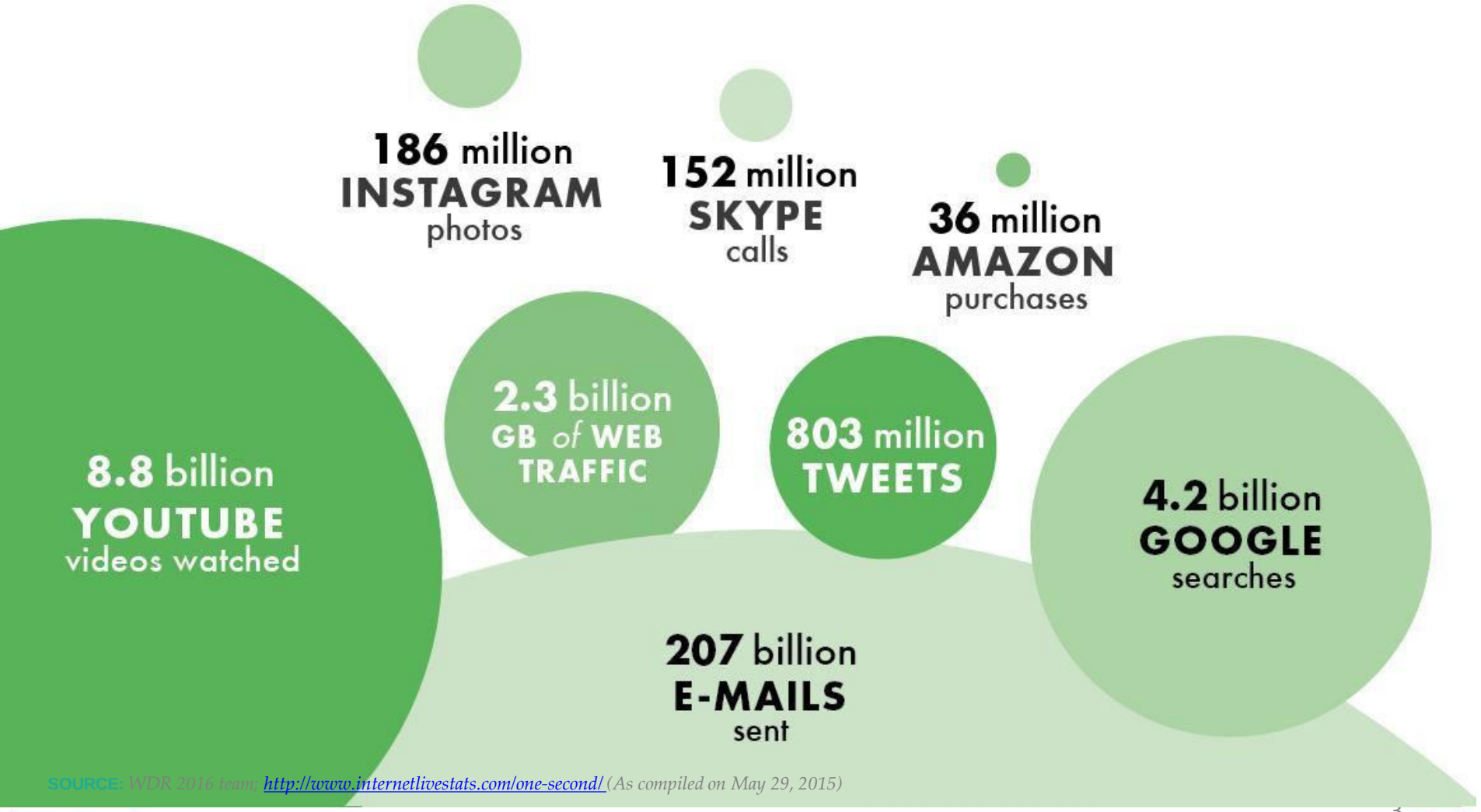
Long Term Strategies
IoT Malaysia Industry Development
Open Innovation Framework
Open Community Data

IoT Steering Committee



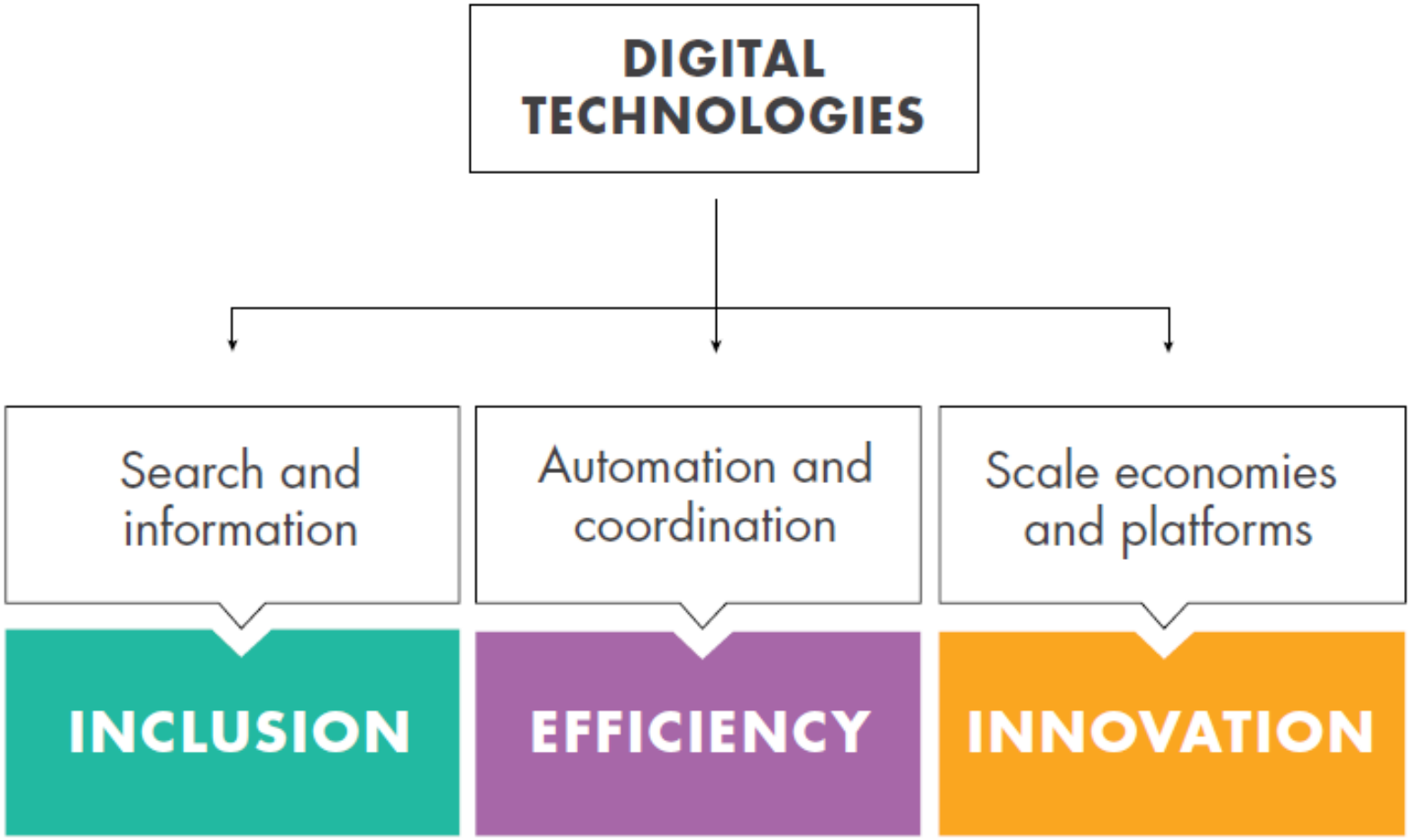
Digital revolution has brought many private benefits

A typical day in the life of the internet



SOURCE: *WDR 2016 team:* http://www.internetlivestats.com/one-second/ *(As compiled on May 29, 2015)*

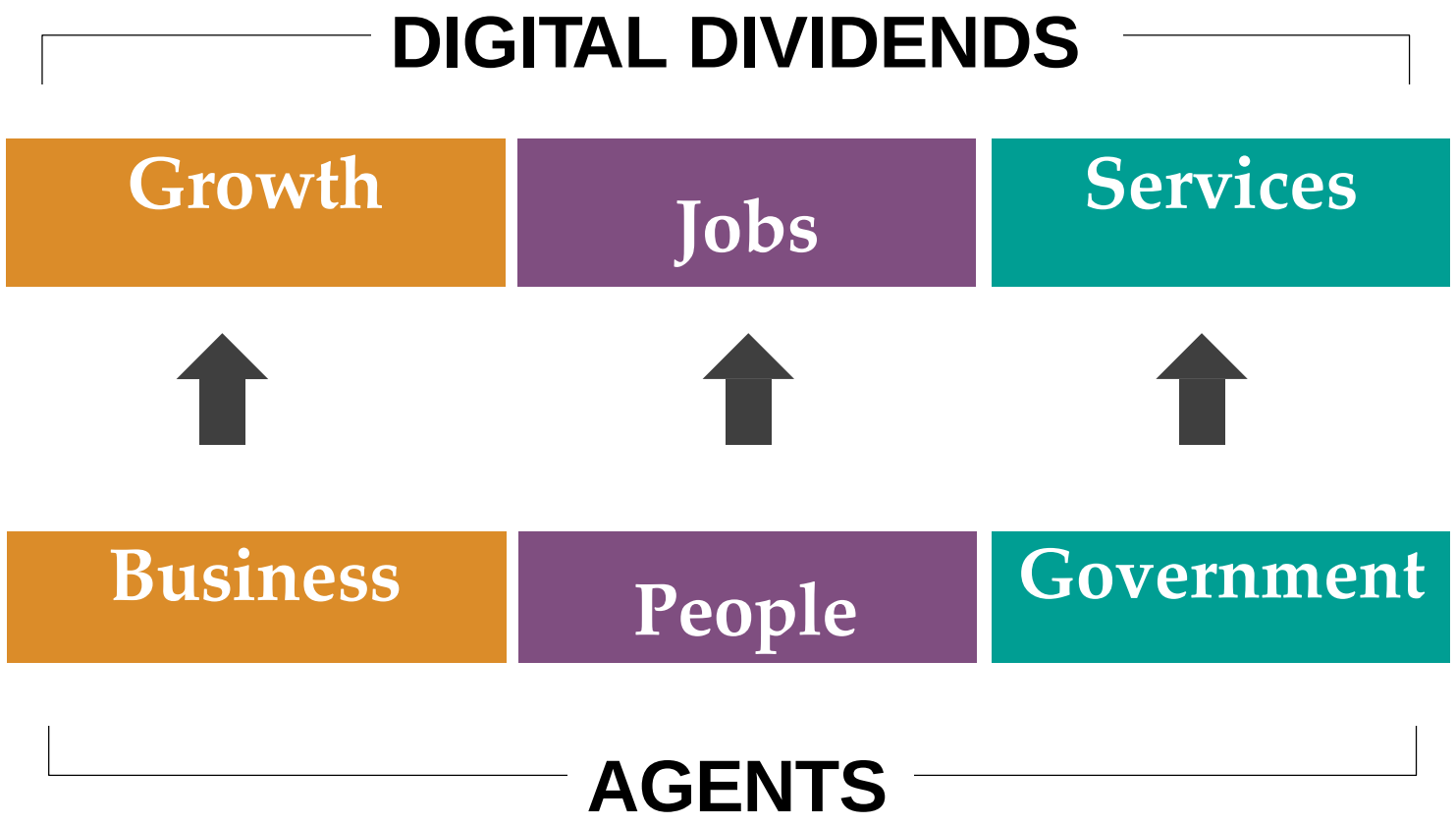
The main mechanisms to promote development



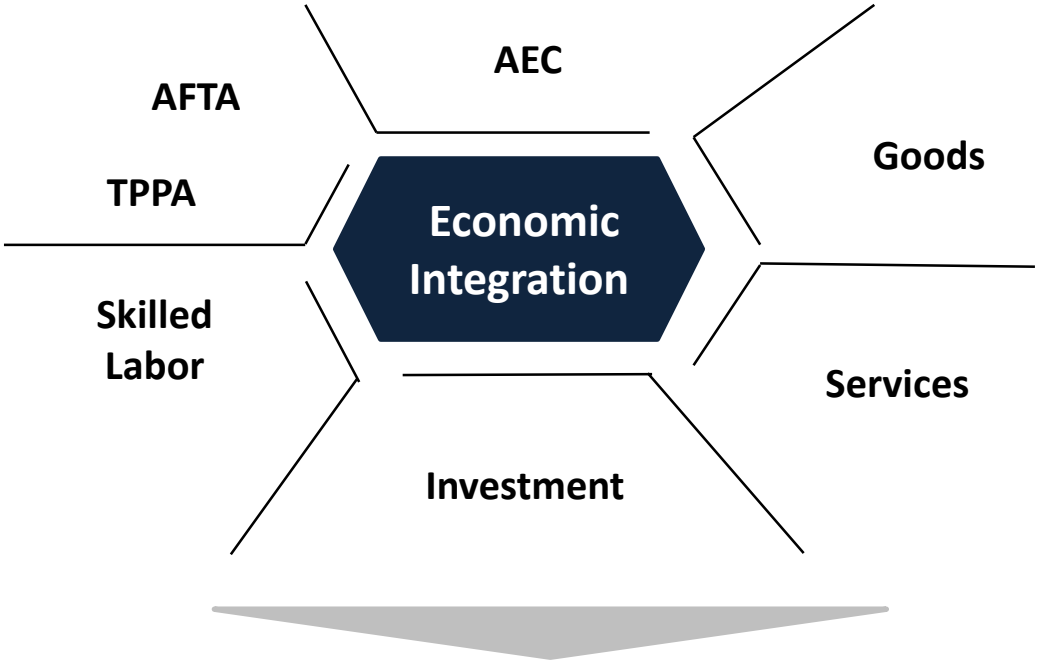
Expand the information base, lower information costs and create information goods

SOURCE: *WDR 2016*

But are economies reaping sizable digital dividends?



COMPETITIVE ASEAN AUTOMOTIVE INDUSTRY



Competitive ASEAN Automotive Industry

1 Economy of Scale

2 Higher Quality & Productivity

3 Innovation Driven

IoT Impact on Innovation Value Chain

Components/ Products

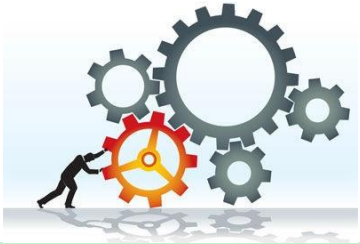
(Upstream)

- Raw Material/ component production
- Productivity and Efficiency

Systems

(Midstream)

- Packaging of products
- Integration of products
- Effective market reach (Logistics)
- Traceability



Solutions

(Downstream)

- End user/ Customer solution
- User Interface and Experience

Services

- Shared Services
- Information flow Mgmt.
- Value chain Orchestration
- Long term Feedback System
- Analytics
- Performance Mgmt.

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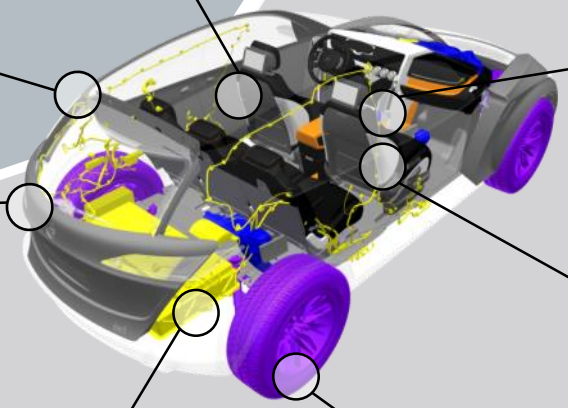
Virtual System Integration & Early Functional Validation in the Whole Vehicle

What does Transportation & Mobility Industry value the most?

Company Value

- Zero Defect
- Innovation driven Design
- Global/Local and Modular Production



Consumer Value

- Attractive, Intuitive & Friendly
- Safe for passengers and pedestrians
- Green & Sustainability
- Smart & Connected

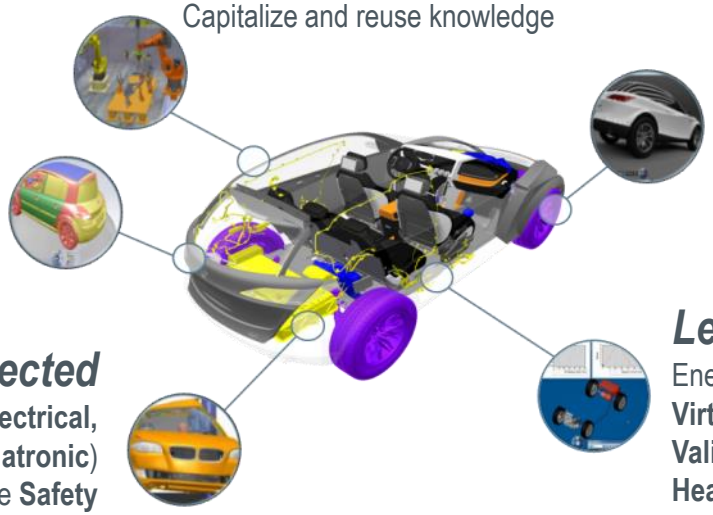
Automotive i-Cloud : T&M Solution Experiences

Target Zero Defect

Architecture and **Conceptual Engineering**
End-to-end processes (**Body, Chassis**, Interior/Exterior, **Powertrain, Final Assembly**)
Capitalize and reuse knowledge

Modular, Glocal & Secure

Vehicle Portfolio and Programs
Platforms and **Modules**
Configurations
BOMs & **DMU**
Supply chain Management
After Sales



My Car Experience

Consumer involvement
Social & Innovative Co-creation
Industrial Design
Virtual Experience

Smart, Safe & Connected

E/E Architecture (**Electronics, Electrical, Embedded Software, Mechatronic**)
Passive & Active **Safety** Systems **Tests**
Regulation (eg: ISO 26262)

Lean, Green & Compliant

Energy balance & **weight** optimization
Virtual and Physical Tests
Validation & Certification
Health & Environmental impact along the entire lifecycle of the Vehicle

MAI Automotive i-Cloud : Collaborative Platform

TRENDS IN THE AUTOMOBILE INDUSTRY

Control Systems are Core Technologies to Improve Safety

ACTIVE SAFETY	PASSIVE SAFETY
Historically almost no regulatory enforcement	Passive Safety Systems are very strongly promoted by (ECE, FMVSS)
Stronger consideration by ECE, FMVSS e.g.: <u>US:</u> - Electronic Stability Control (ESC) mandatory from 2010 <u>Europe:</u> - ESC from 2011, Brake Assist from 2011 for cars - ESC incl. roll over prevention from 2011 for trucks and trailers - Emergency brake for trucks from 2014 - Lane depature warning for trucks from 2016 - ABS for Motorcycles >125 cc from 2016	Historically 3 focus areas: 1. Body Structure and vehicle design - Vehicle structure - Vehicle interiors - Pedestrian protection 2. Seatbelts 3. Airbags

TRENDS IN THE AUTOMOBILE INDUSTRY

Control Systems are Core Technologies to Improve Safety

Adaptive Cruise Control

Front Collision Warning

Lane Departure Warning

Lane Keeping Assistance

Lane Change Warning

Parking Assistance Light

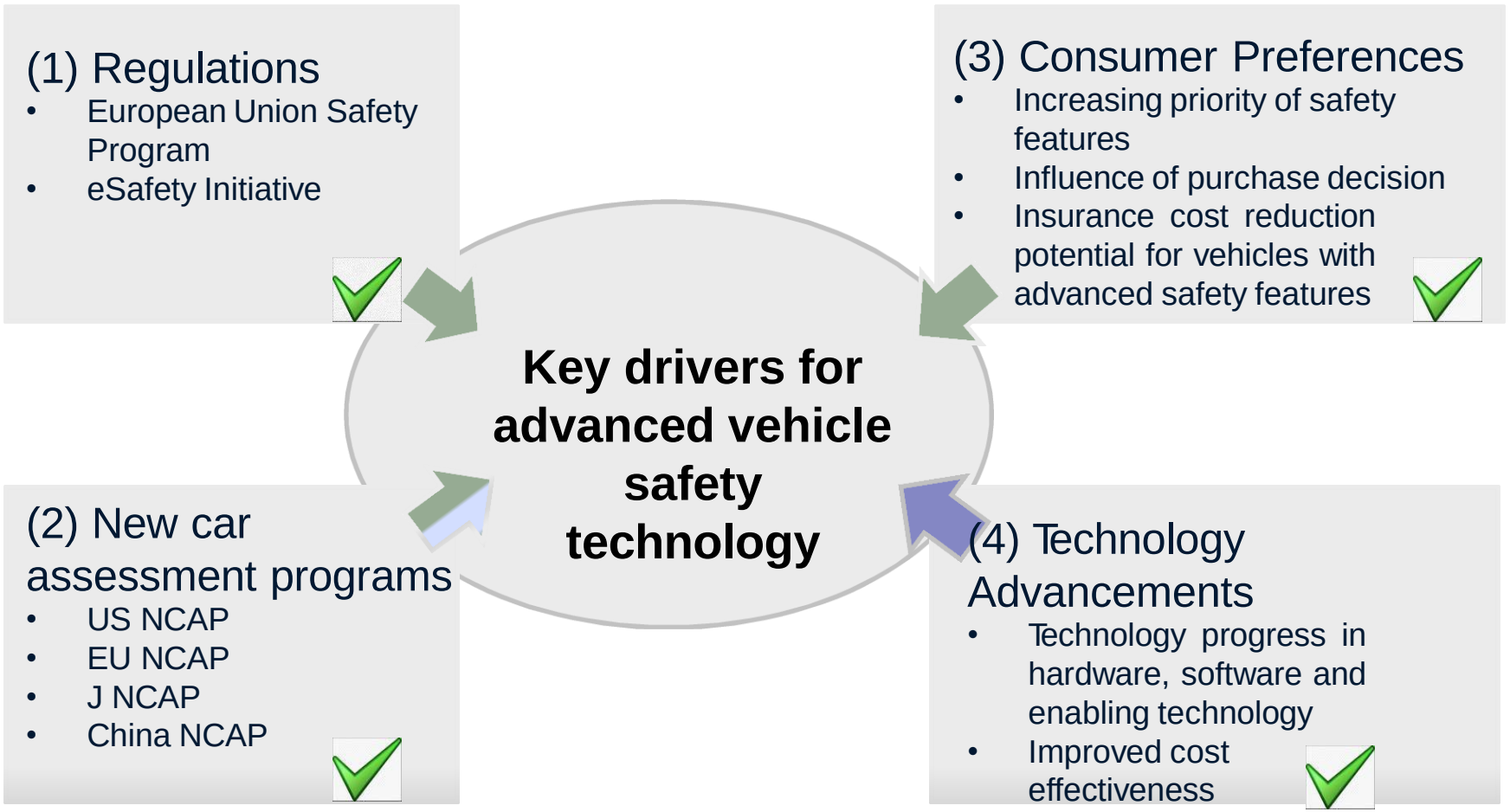
Assistance System

Night Vision Pedestrian Detection

Up to semi and highly automated driving

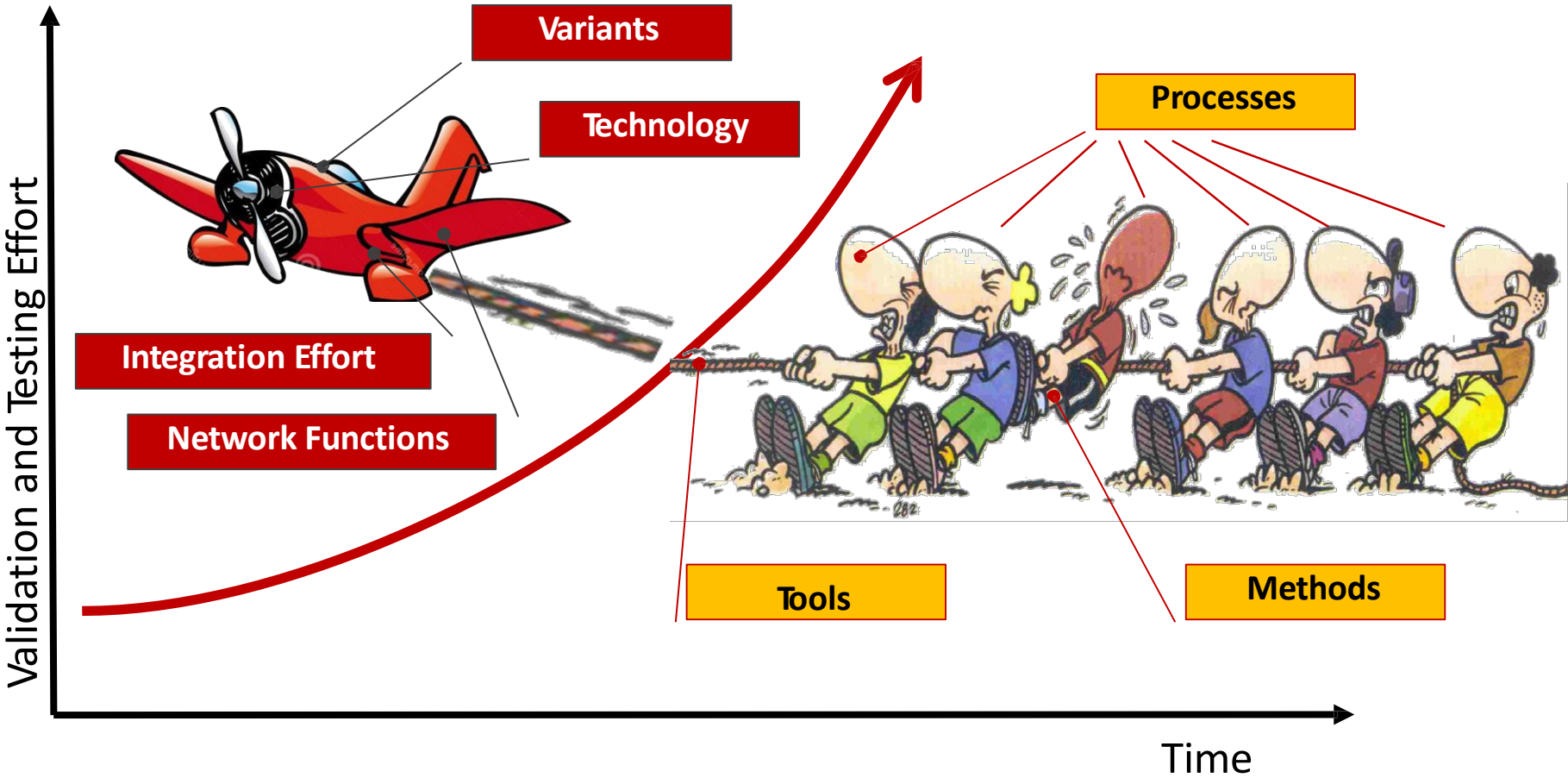
TRENDS IN THE AUTOMOBILE INDUSTRY

Key drivers for advanced vehicle safety technology



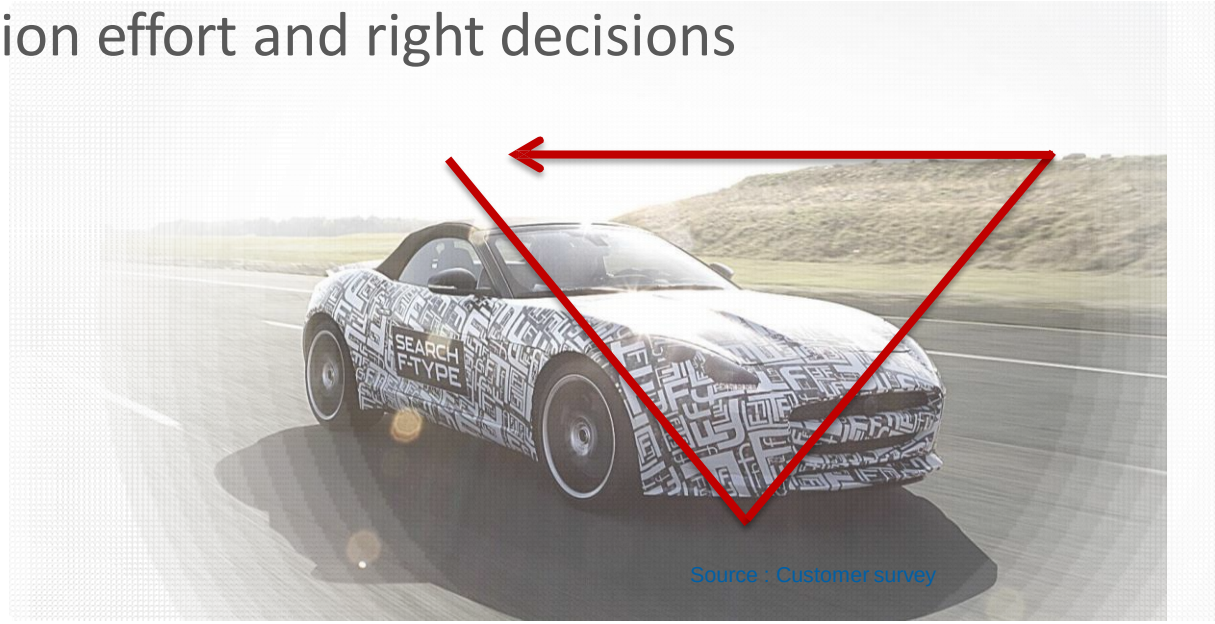
HOW TO CONTROL SYSTEM COMPLEXITY?

Tug of war for validation effort and right decisions



HOW TO CONTROL SYSTEM COMPLEXITY?

- Tug of war for validation effort and right decisions
- Approximately



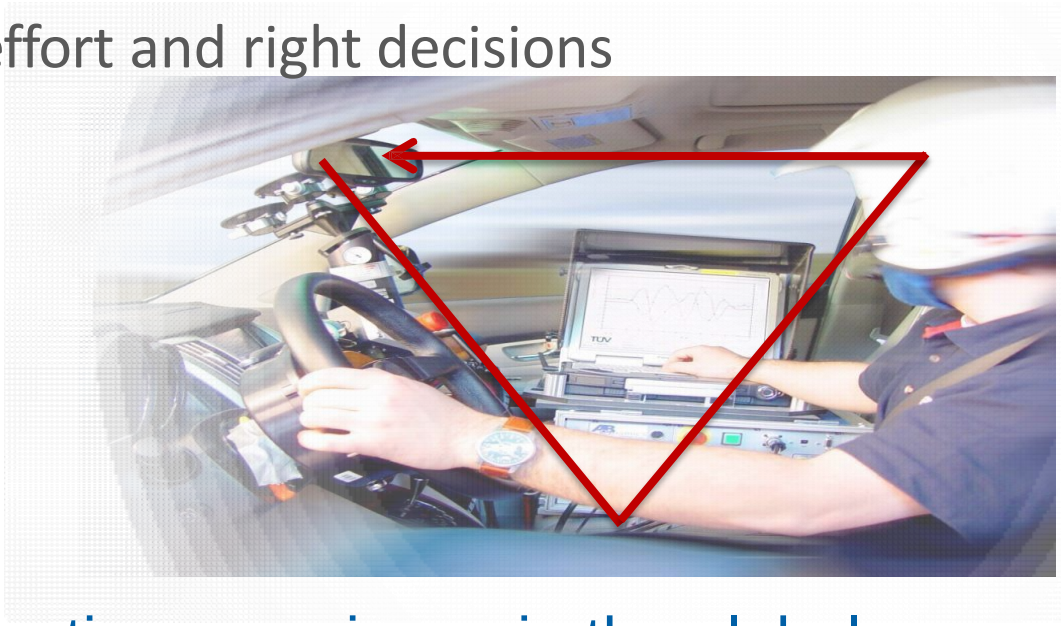
60%

of development time no real prototype is available!

How to achieve an earlier vehicle evaluation & validation?

HOW TO CONTROL SYSTEM COMPLEXITY?

- Tug of war for validation effort and right decisions
- Less than

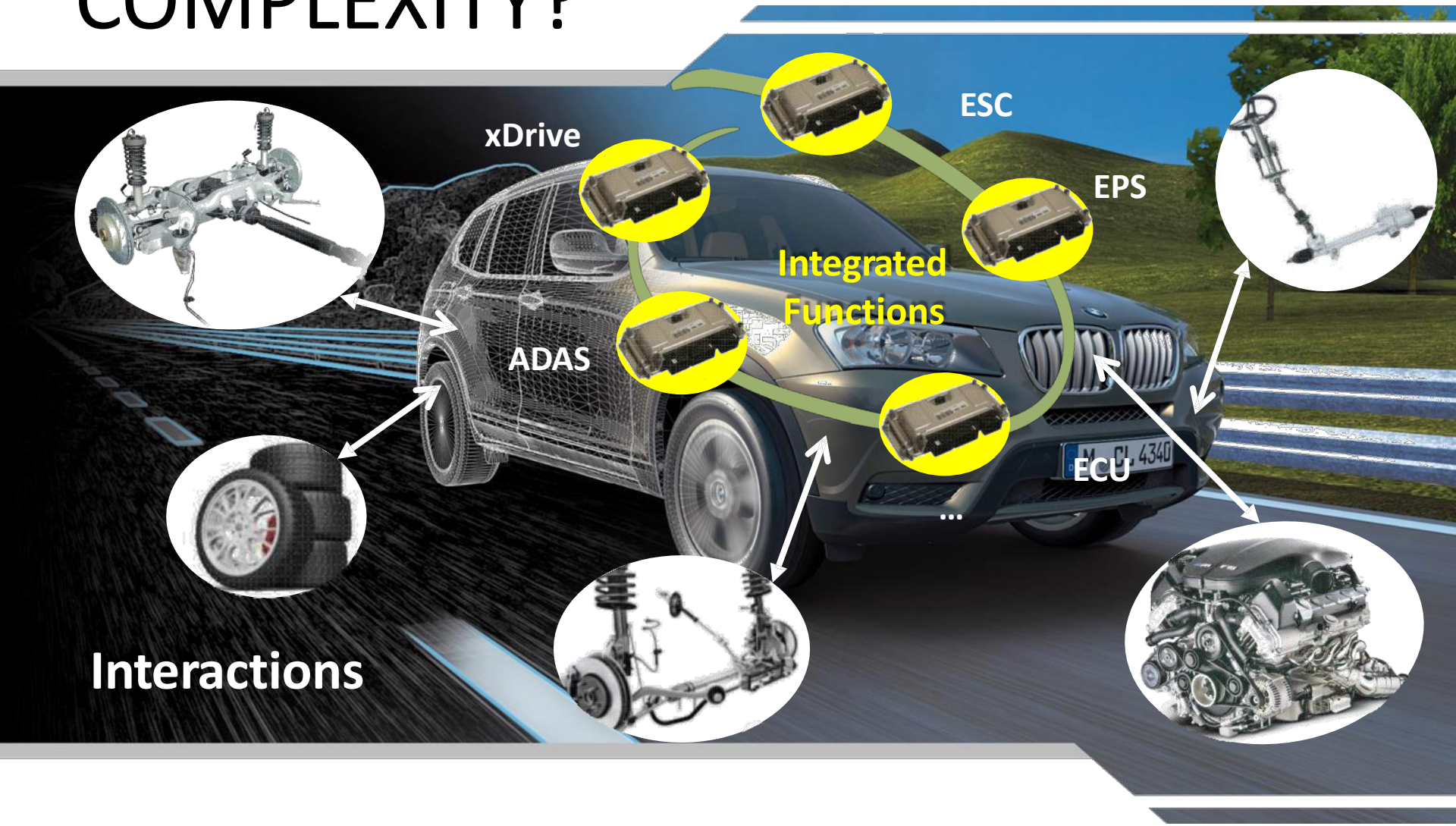


10%

of the engineers get evaluation experience in the global vehicle.

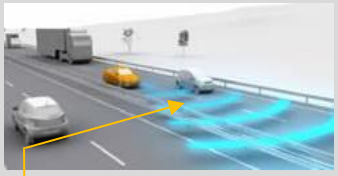
How can we enable engineers to validate in the global vehicle?

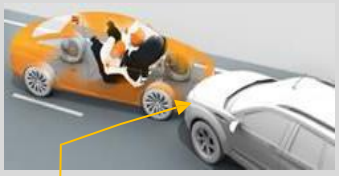
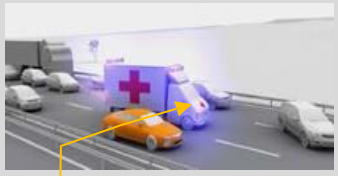
HOW TO CONTROL SYSTEM COMPLEXITY?



HOW TO CONTROL SYSTEM COMPLEXITY?

Functional interaction of multi-domain systems



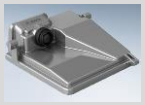




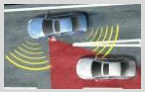
Normal Driving » Hazard » Pre-Crash » In-Crash » Post-Crash

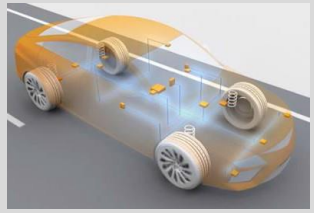
Environment Sensors | Environment Model & HMI | Brake & Steering & Controls | Passiv Safety Controls | e-Call Car2x

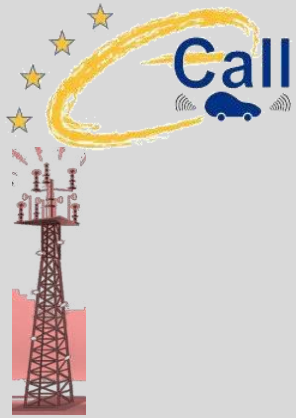

Radar

Lidar


Camera


Ultrasonic

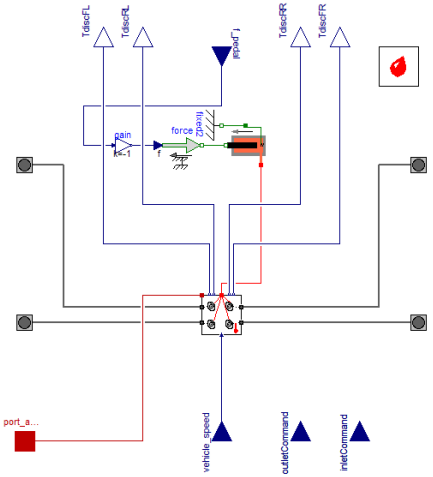


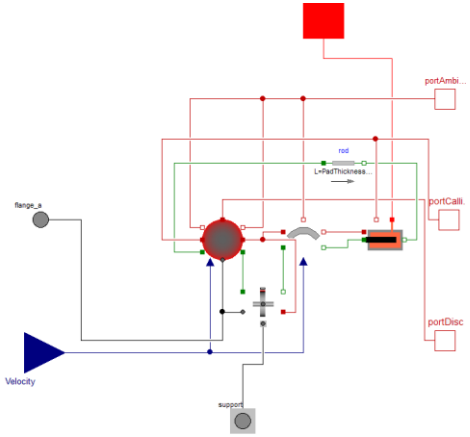


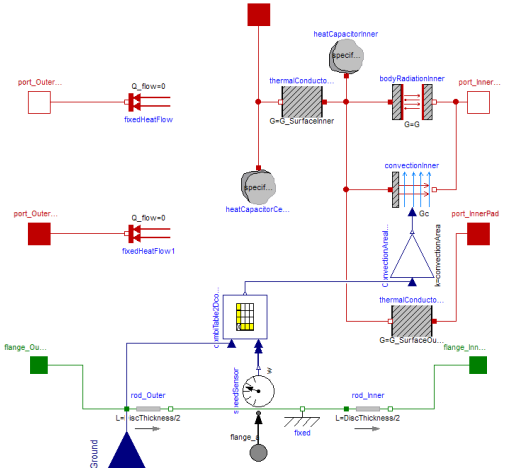
FUNCTIONAL MOCK-UP INTERFACE - FMI

Dymola model of a braking system for transient brake behavior

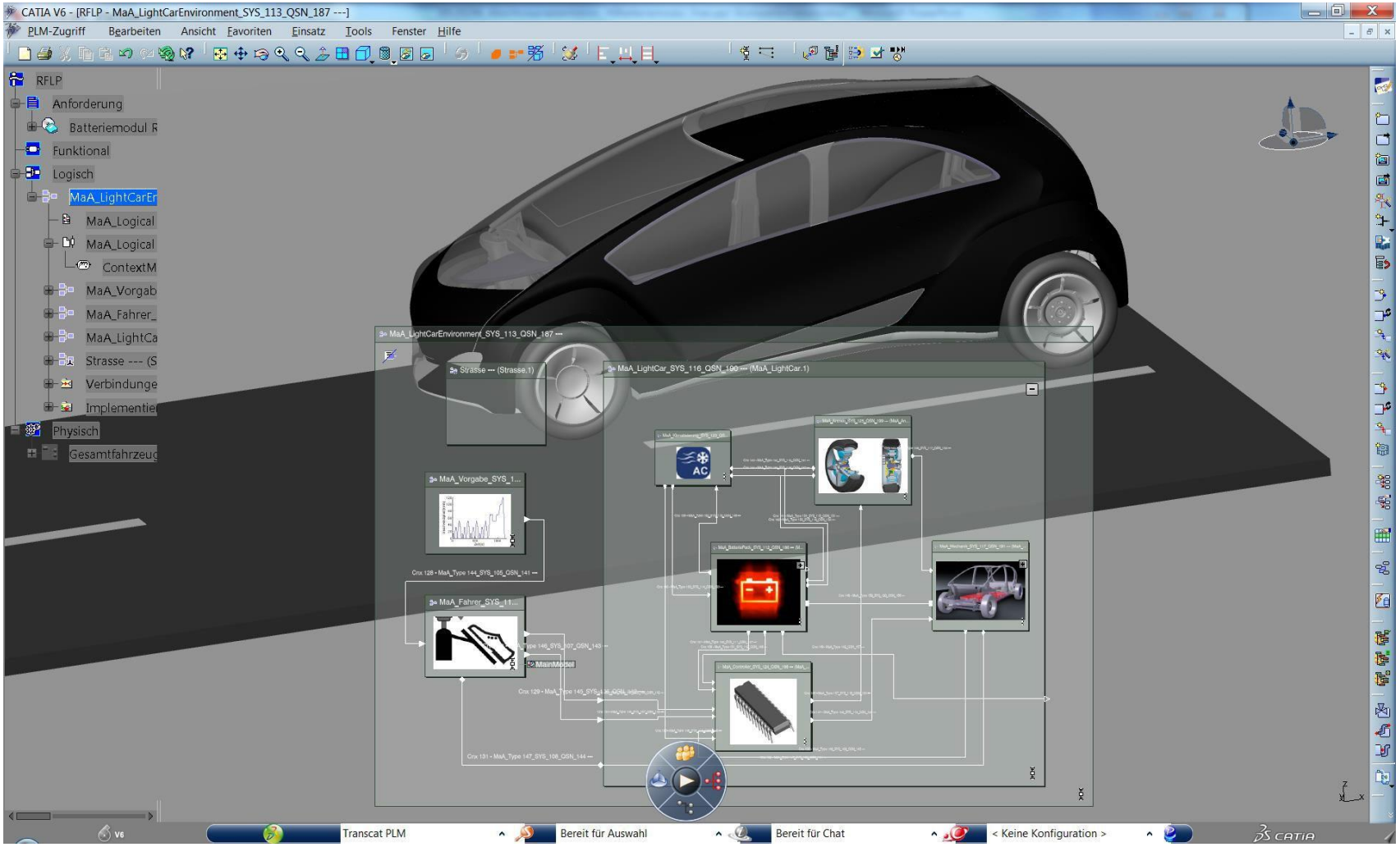
- 4 wheels, each with disc, pad, piston
- simplified hydraulically system
- cooling by pre-calculated CFD simulation
- braking torque and disk temperature > fading



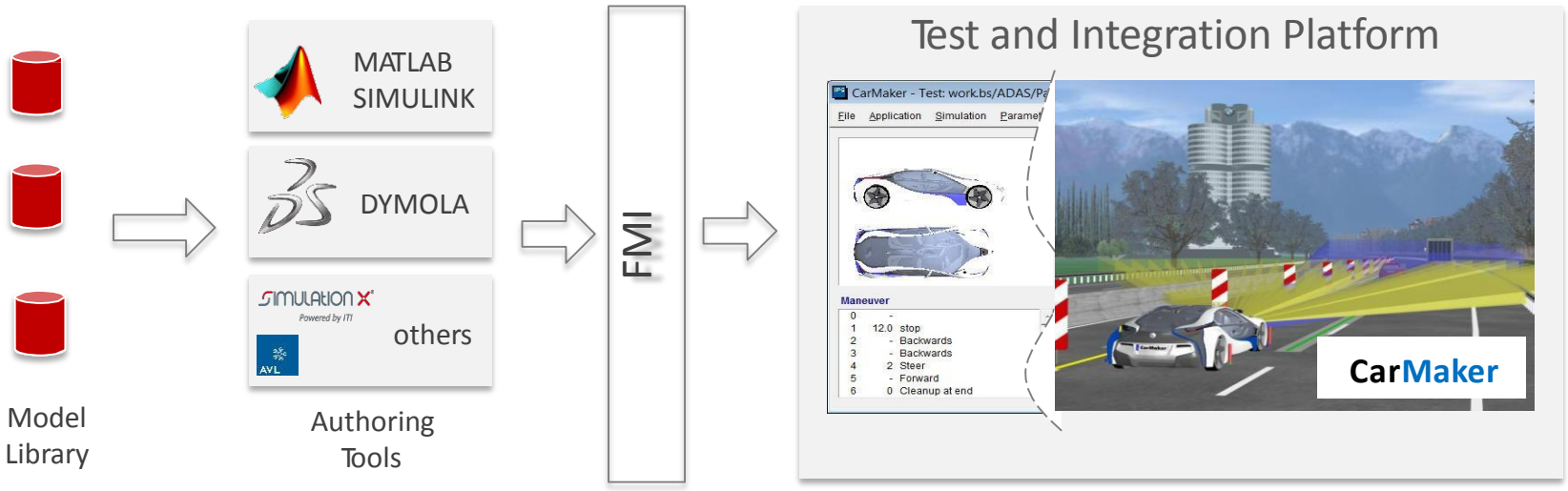




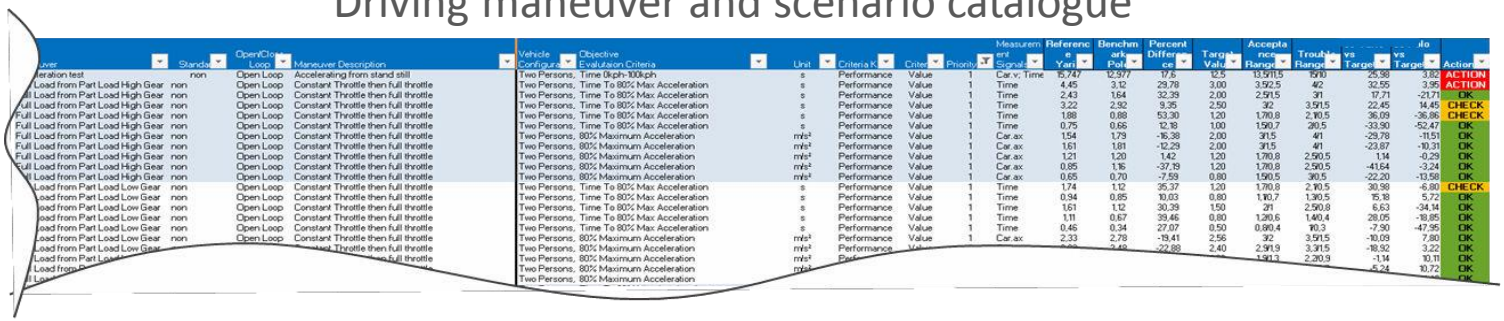
MAI 3DEXPERIENCE: DYMOLA - CATIA V6 SYSTEMS



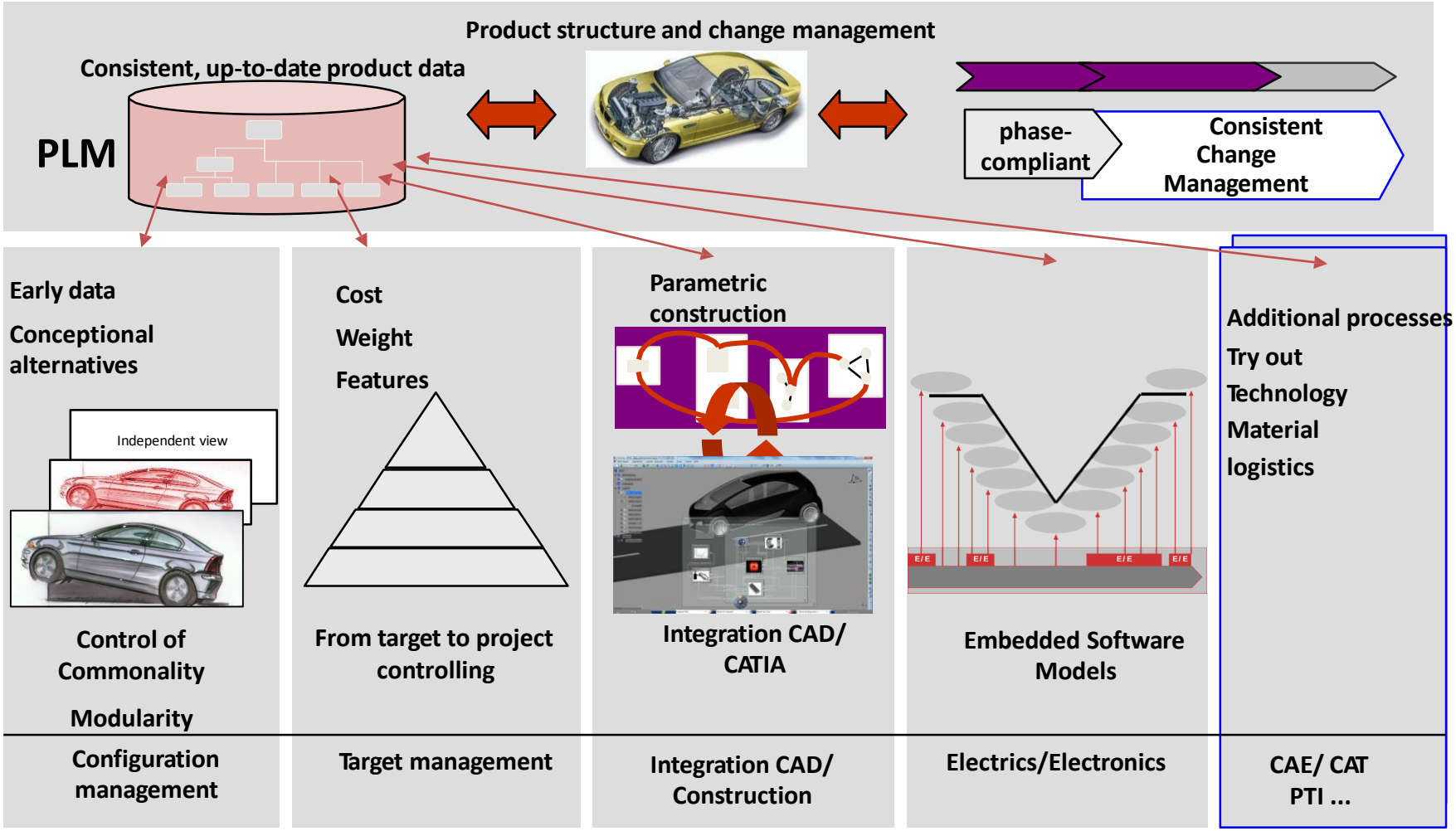
VIRTUAL INTEGRATION



Driving maneuver and scenario catalogue

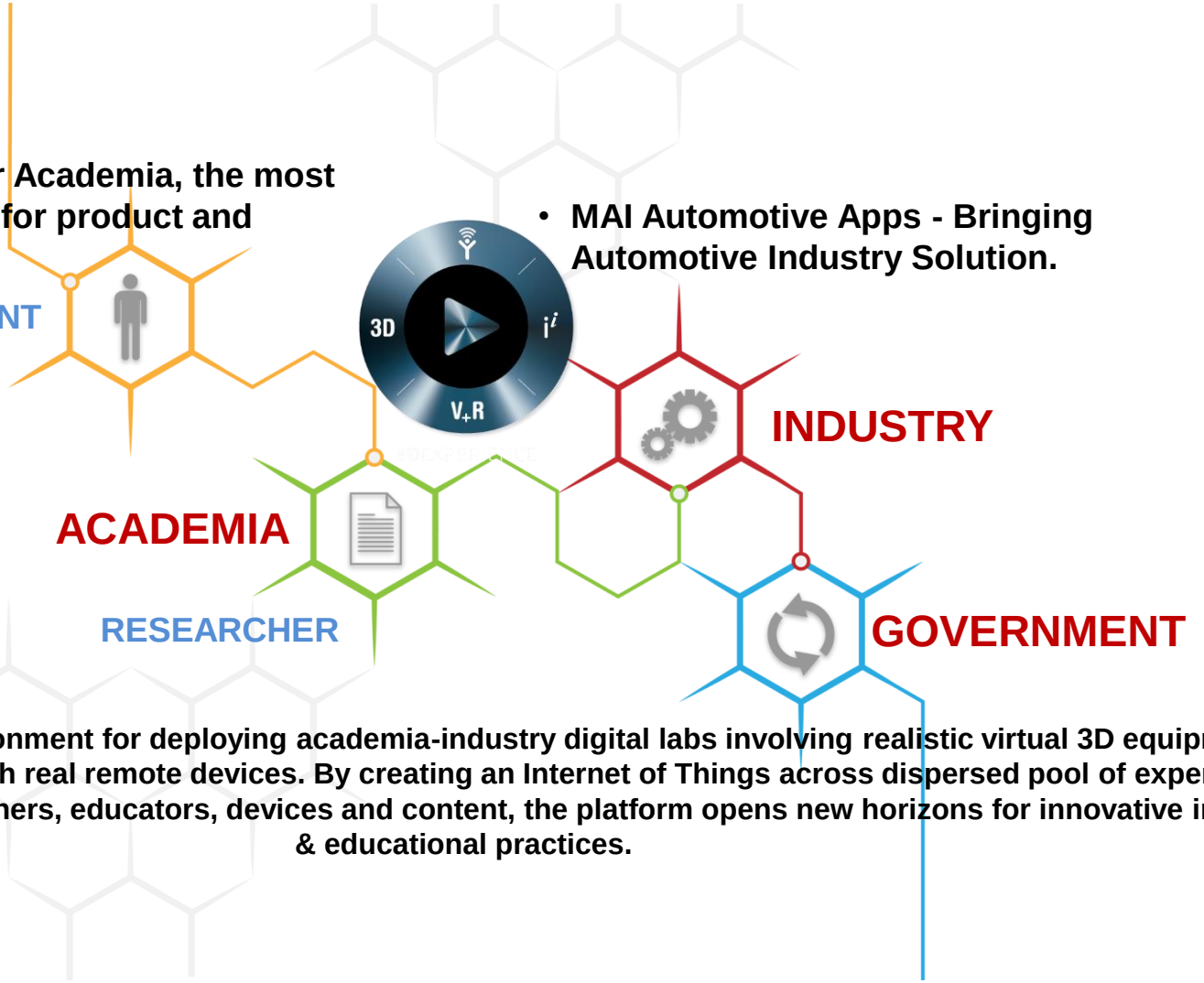


The different domains and disciplines have to converge



COLLABORATION PLATFORM FOR INDUSTRY-ACADEMIA ON THE CLOUD

- 3DEXPERIENCE for Academia, the most advanced software for product and learning innovation
- MAI Automotive Apps - Bringing Automotive Industry Solution.



Provides a proven environment for deploying academia-industry digital labs involving realistic virtual 3D equipment coupled bi-directionally with real remote devices. By creating an Internet of Things across dispersed pool of experts, real industry development, learners, educators, devices and content, the platform opens new horizons for innovative industry & educational practices.

Digital Engineering and Prototyping (DEP)

PLM
Product Lifecycle Management

DEP DASSAULT SYSTEMES

CAPE
Computer Aided Production Engineering

Altair

CAD
Computer Aided Design

CAM
Computer Aided Manufacturing

Market Offer

MAI Offer

Facilities

- Hardware & Software

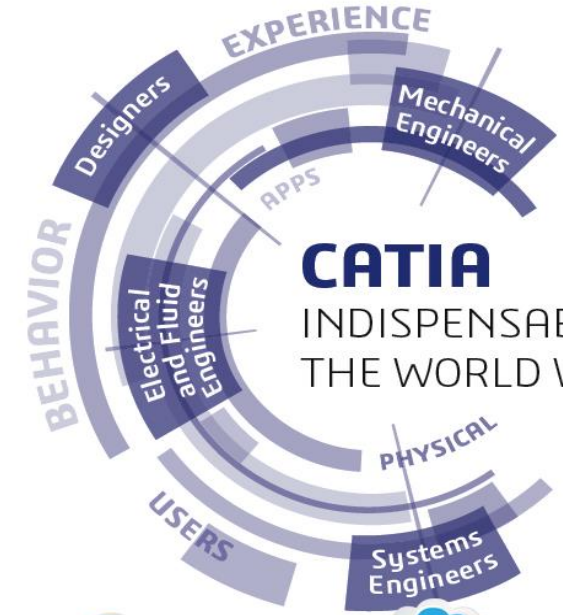
Terms & Condition

- Minimum leasing of 3 months applies

- Hardware & Software
- Office Setup Facilities
- High Speed Internet Access
- Control Data Access
- Tutor will be provided

- No minimal leasing period
- No Min. order Qty (MOQ)

COME & PLAY!



CATIA

INDISPENSABLE TO SHAPE
THE WORLD WE LIVE IN

MAI

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Automotive i-Cloud

Get it Now!

1 MONTH ACCESS to MAI 3DEXPERIENCE

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MINISTRY OF INTERNATIONAL TRADE AND INDUSTRY

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THE 4TH INDUSTRIAL REVOLUTION

MITS: MANUFACTURING – SMART ENGINEERING & OPTIMIZATION

DIGITAL ENABLEMENT ARCHITECTURE
Unified Automotive Platform (UAP)

MAI AUTOMOTIVE DATA OCEAN

MAI UII

CAD | CAE | PLM

CATIA DIGITAL PRODUCT EXPERIENCE

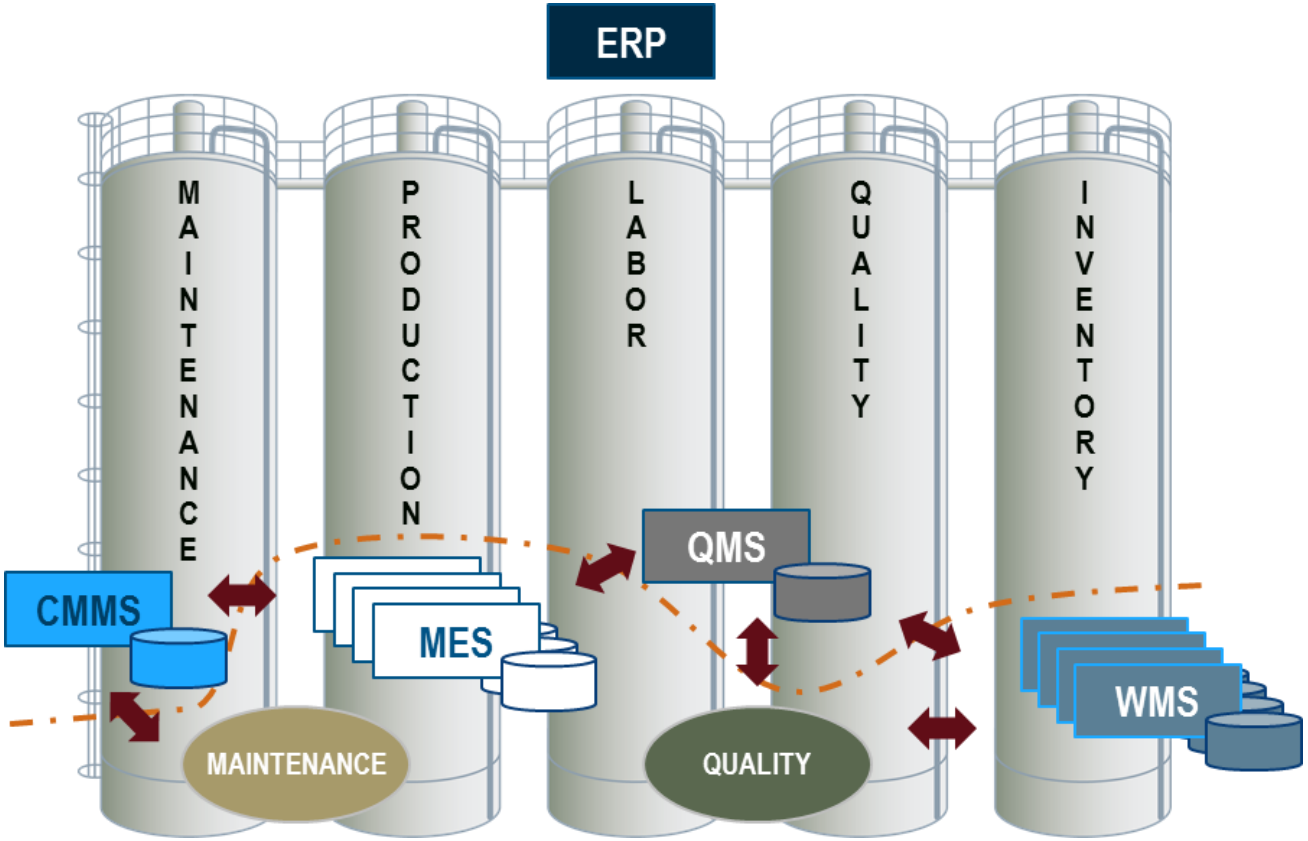
Altair

Level 5	Corporate Performance	BI
Level 4	Business Logistics Plant Production Scheduling, Shipping, Receiving, Inventory, etc.	ERP
Level 3	Manufacturing Execution System ispatching, Detailed Production Scheduling, Production Tracking …	MES
Level 2	Batch Production Control; Continuous Production Control; Discrete Production Control	PLC
Level 1		Sensors, Actuators

DELMIA DIGITAL MANUFACTURING

vMould

PROPOSED RECOMMENDATION/WAY FORWARD.



Computerized maintenance management system (**CMMS**)

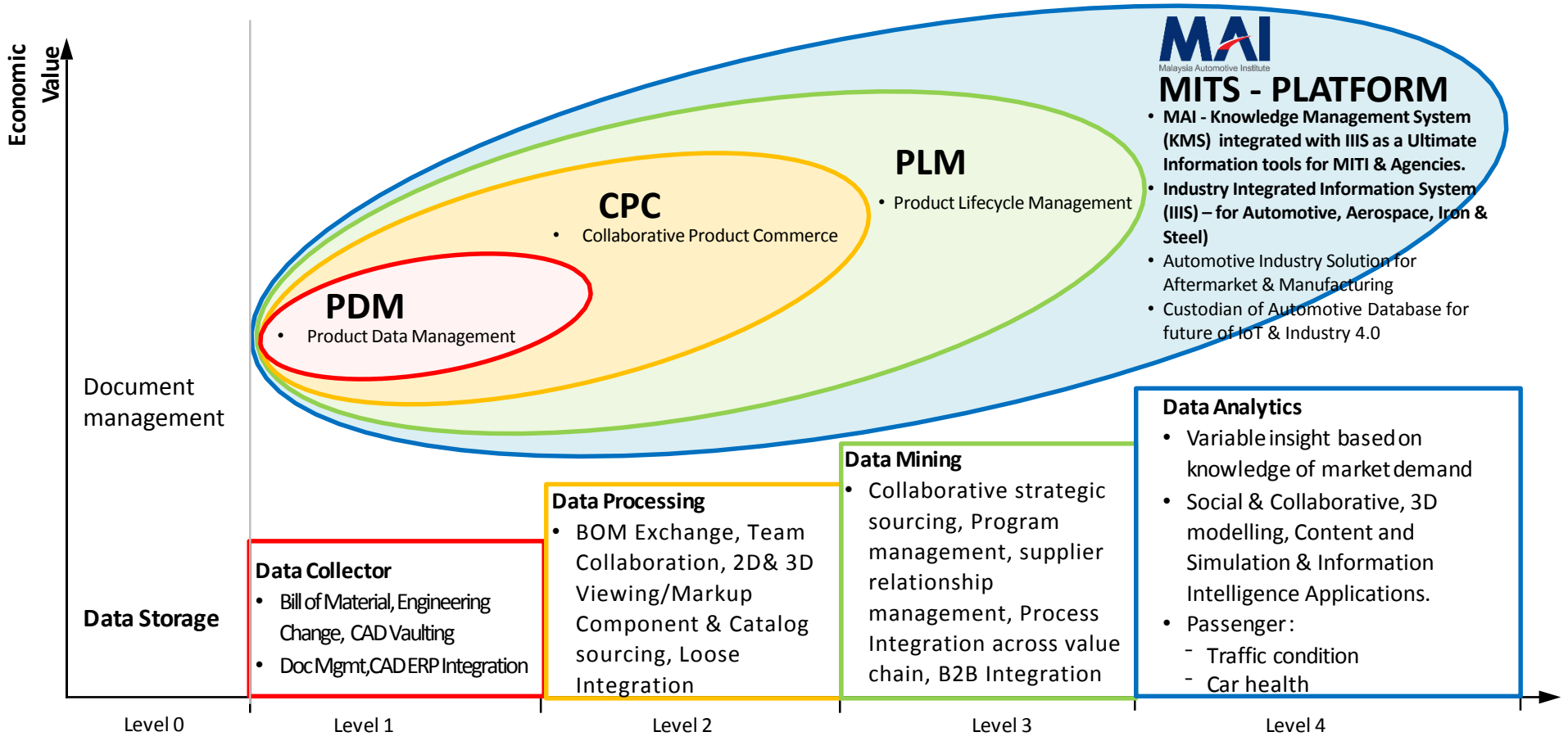
Manufacturing Execution System **(MES)**

Quality Management System **(QMS)**

Warehouse Management System **(WMS)**

Reality of Manufacturing Operations Today

How MITS : Transforming Automotive Industry



Automotive

GROWTH

Manufacturing

- Connected supply chain
- Optimized production ecosystem

Key Agenda:

- Moving towards complex and diverse products
- Enhancing productivity through automation
- Stimulating innovation growth
- Strengthening growth enablers
- Ramping up internationalisation

Malaysia Automotive Institute

Manufacturing

Creating new value in Manufacturing sector

Opportunities

Upstream

- Inbound Logistics
- Production floor Monitoring

Midstream

- Outbound Logistics
- Certification
- Traceability

Downstream

- Customer Order Mgmt.
- Order Prioritization

Services

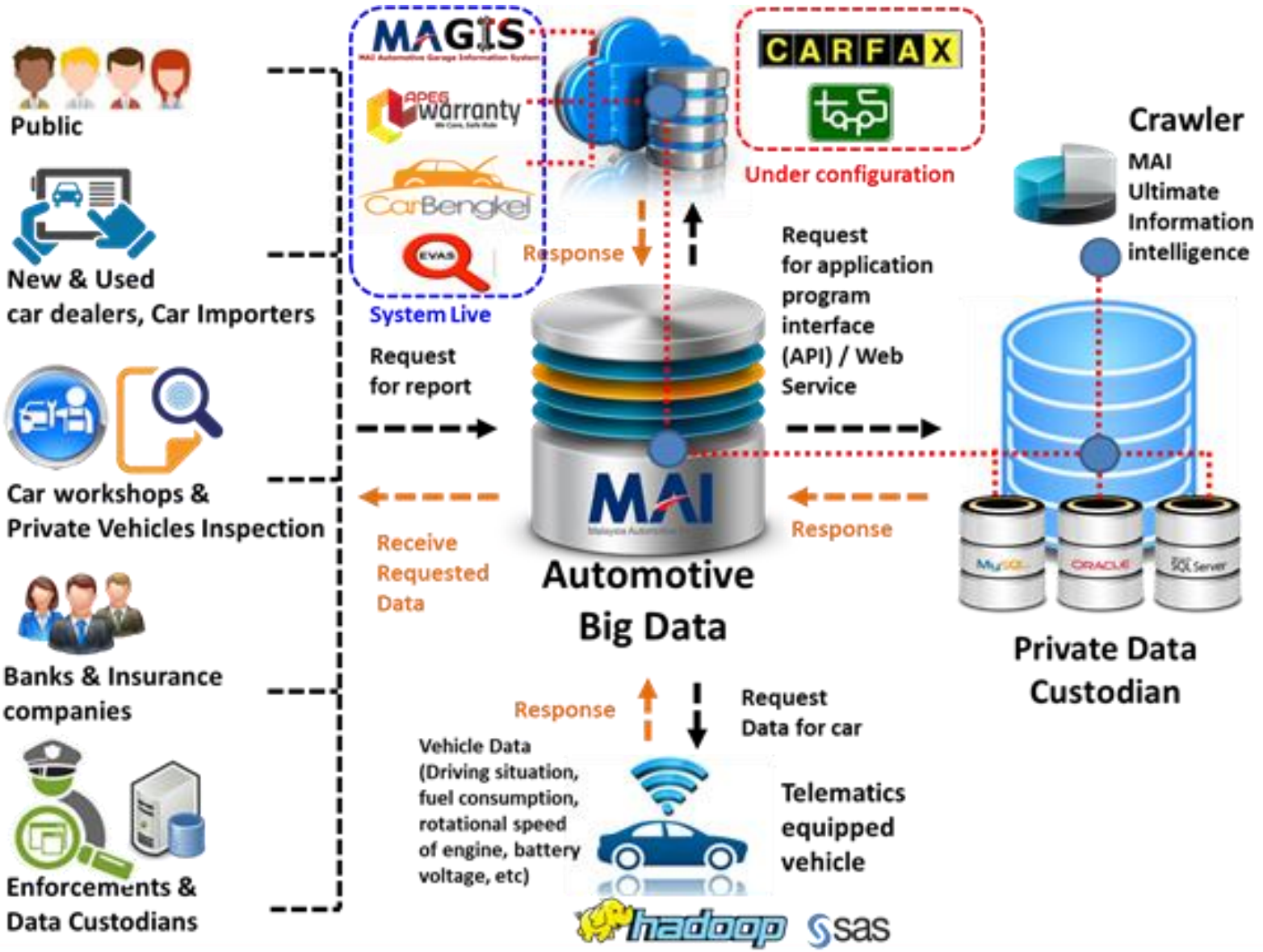
- Connected Supply Chain
- Remote Asset Mgmt.
- Smart Energy Mgmt.
- Proactive Maintenance
- Product Lifecycle
- Customer Lifecycle

MITI MALAYSIA
MINISTRY OF INTERNATIONAL TRADE AND INDUSTRY

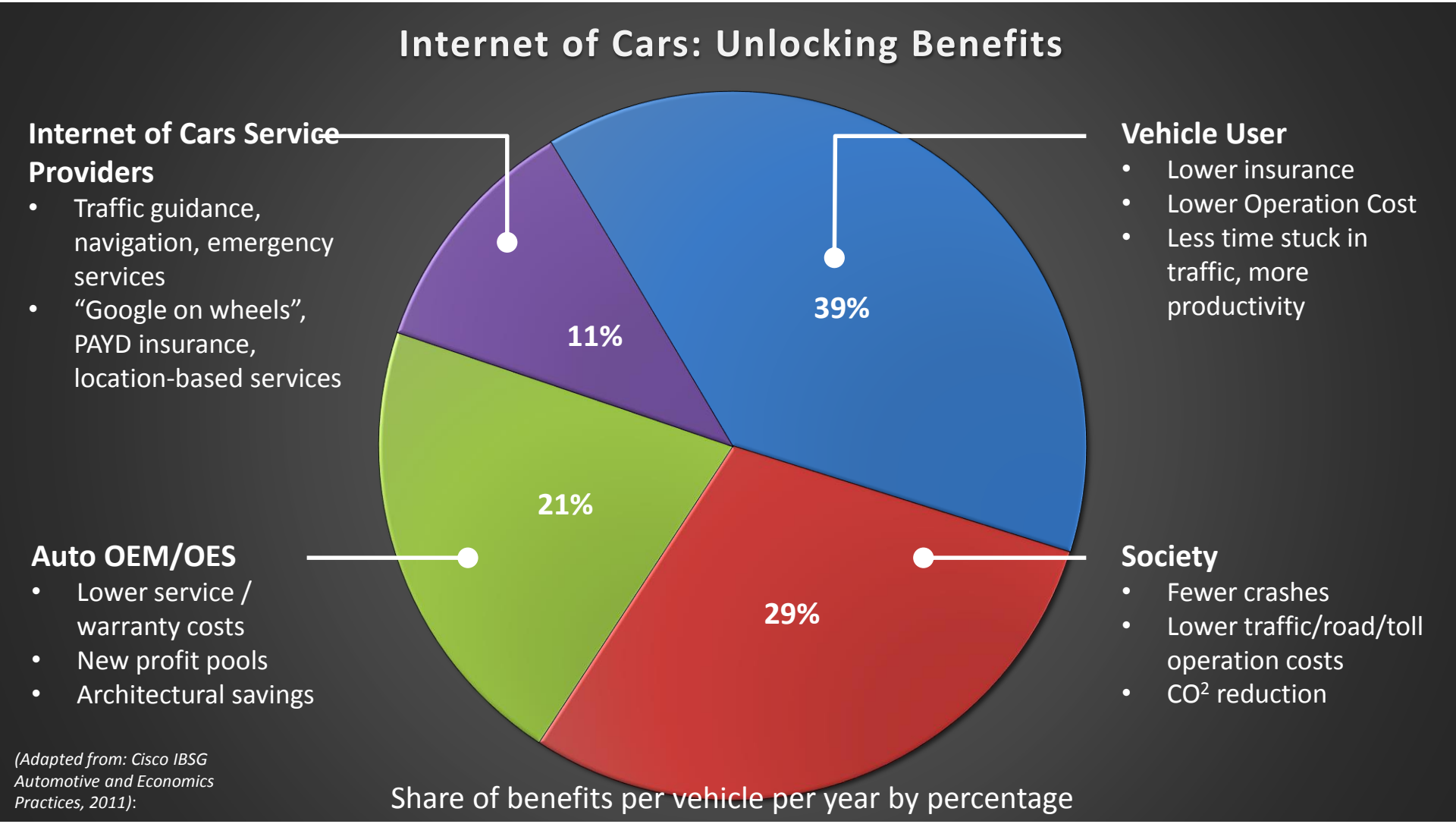
MAI Malaysia Automotive Institute

INTERNET OF CARS

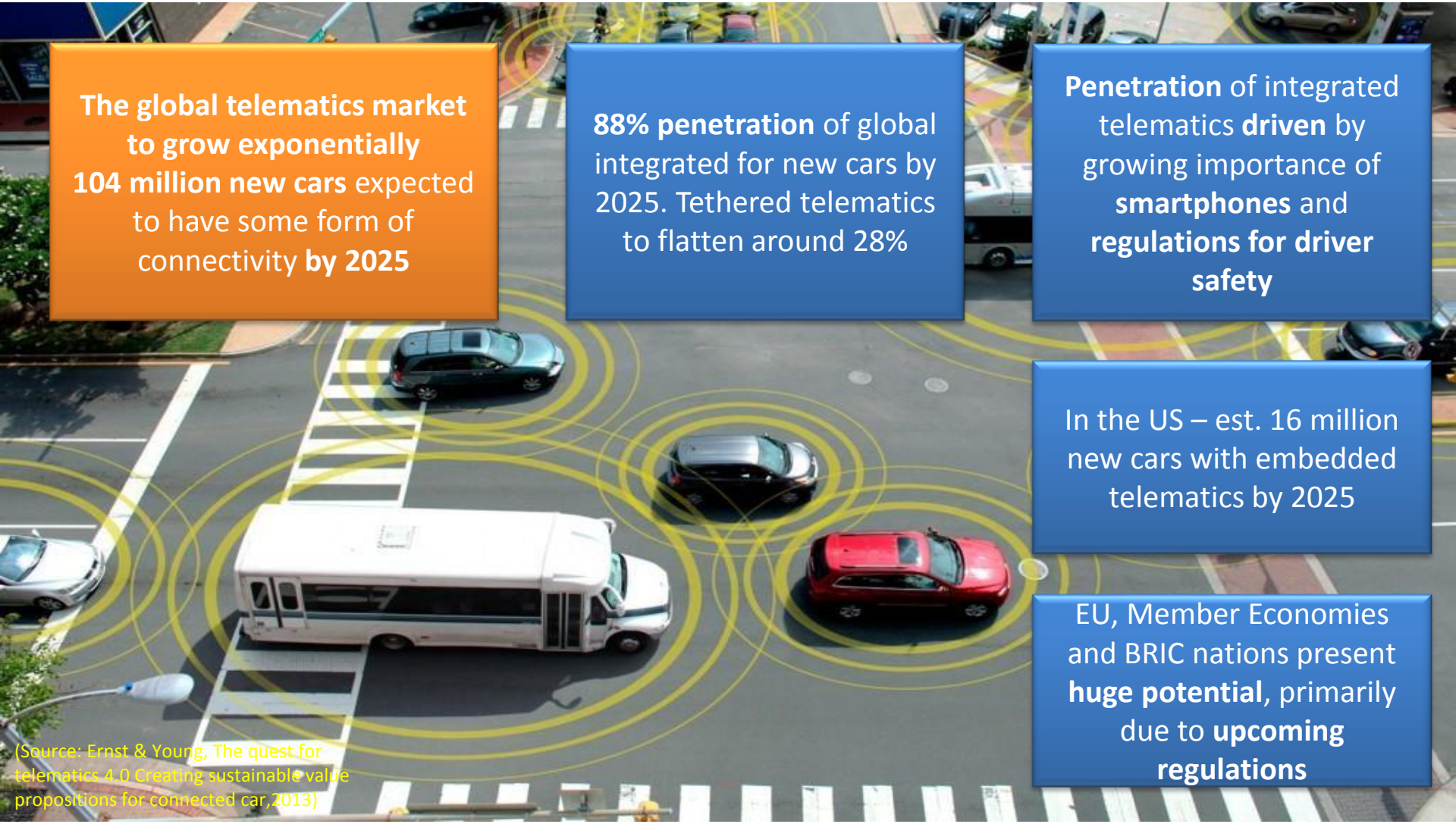
MITS: AFTERMARKET - BIG DATA & IOT



INTERNET OF CARS: UNLOCKING BENEFITS



THE GLOBAL TELEMATICS MARKET



The global telematics market to grow exponentially
104 million new cars expected to have some form of connectivity **by 2025**

88% penetration of global integrated for new cars by 2025. Tethered telematics to flatten around 28%

Penetration of integrated telematics **driven** by growing importance of **smartphones** and **regulations for driver safety**

In the US – est. 16 million new cars with embedded telematics by 2025

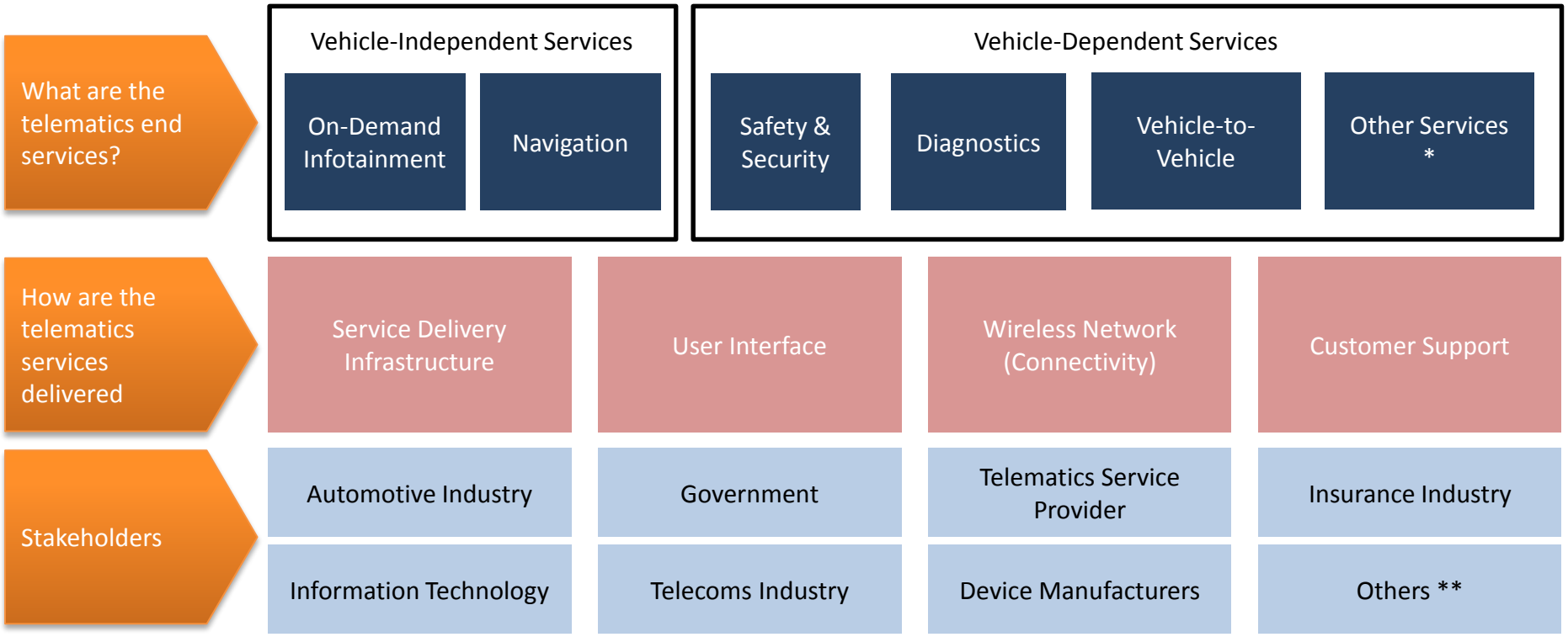
EU, Member Economies and BRIC nations present **huge potential**, primarily due to **upcoming regulations**

(Source: Ernst & Young, The quest for telematics 4.0 Creating sustainable value propositions for connected car,2013)

THE EVOLVING CONNECTED CAR ECOSYSTEM

The evolving connected car ecosystem

Effective delivery of connectivity-based services will require seamless integration of infrastructure by various stakeholders *(Source: Ernst & Young, The quest for telematics 4.0 Creating sustainable value propositions for connected car,2013)*



* Include usage-based insurance, fleet management and payment (tolling, parking), etc.
** Include BPO and roadside assistance providers

THE EVOLVING CONNECTED CAR ECOSYSTEM

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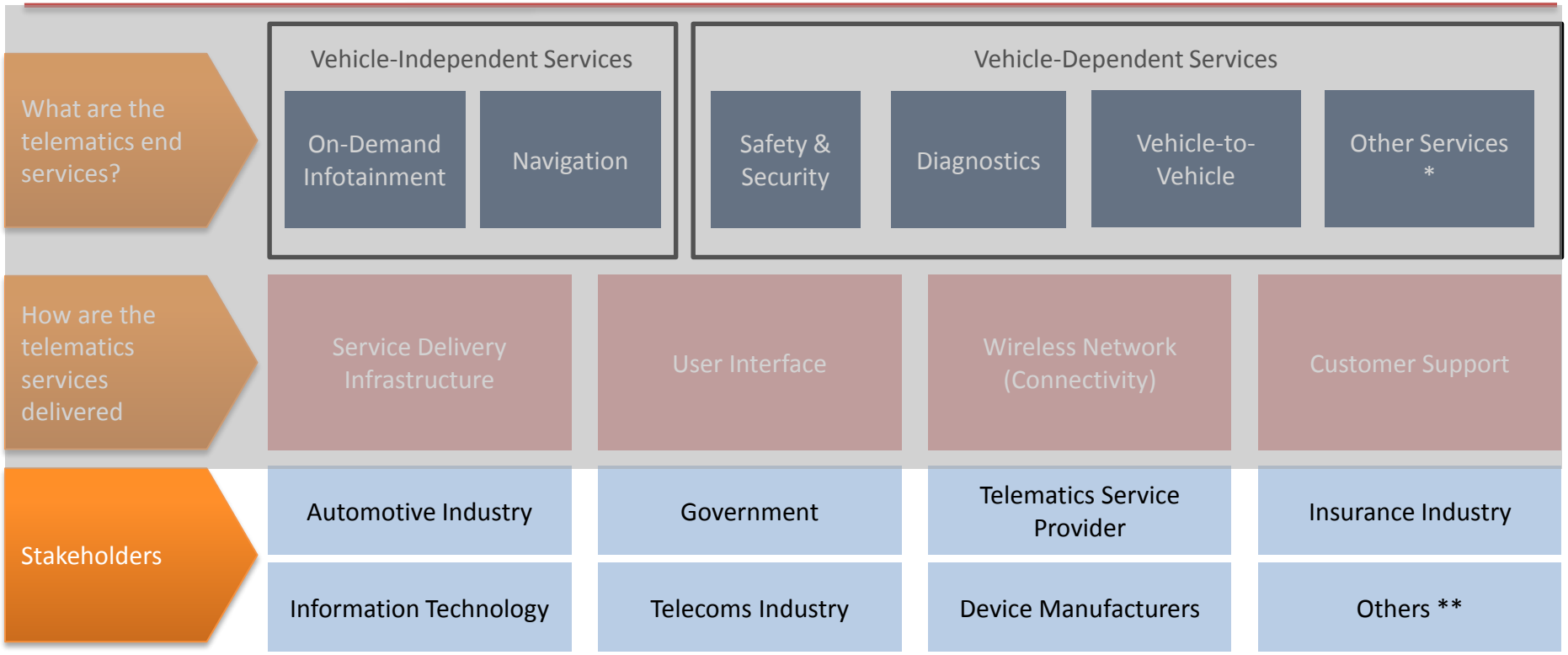
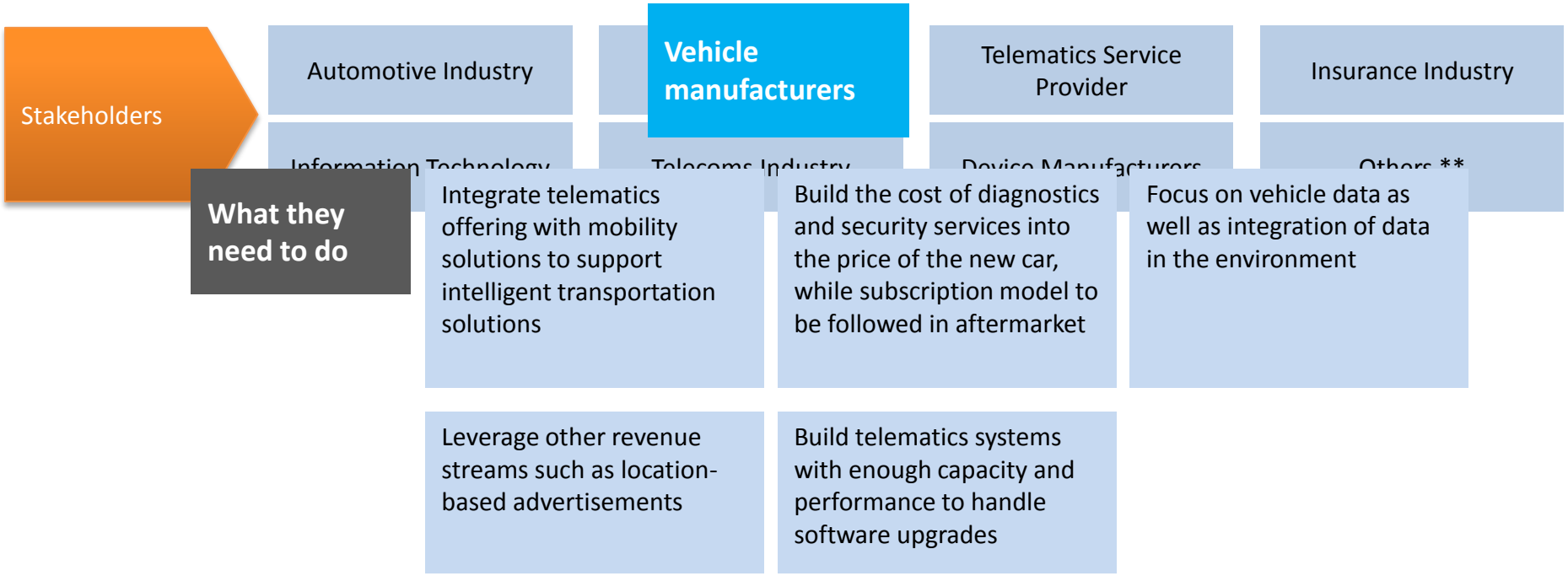


* Include usage-based insurance, fleet management and payment (tolling, parking), etc.
** Include BPO and roadside assistance providers

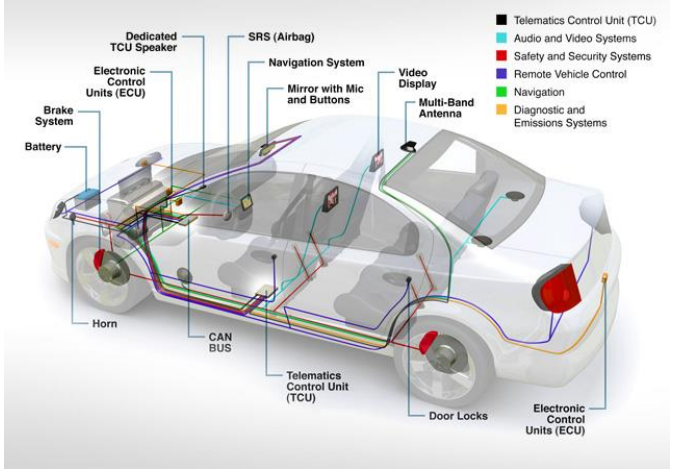
Considerations for key stakeholders



(Adapted from: Ernst & Young, The quest for telematics 4.0 Creating sustainable value propositions for connected car,2013)

Considerations for key stakeholders

Vehicle manufacturers	Why would they do it?



1

New revenue streams

Data / service subscription fees – customers, insurers, fleet managers (commercial & government) and other data consumers (advertisers, telcos, etc.)

2

Lower service / warranty costs

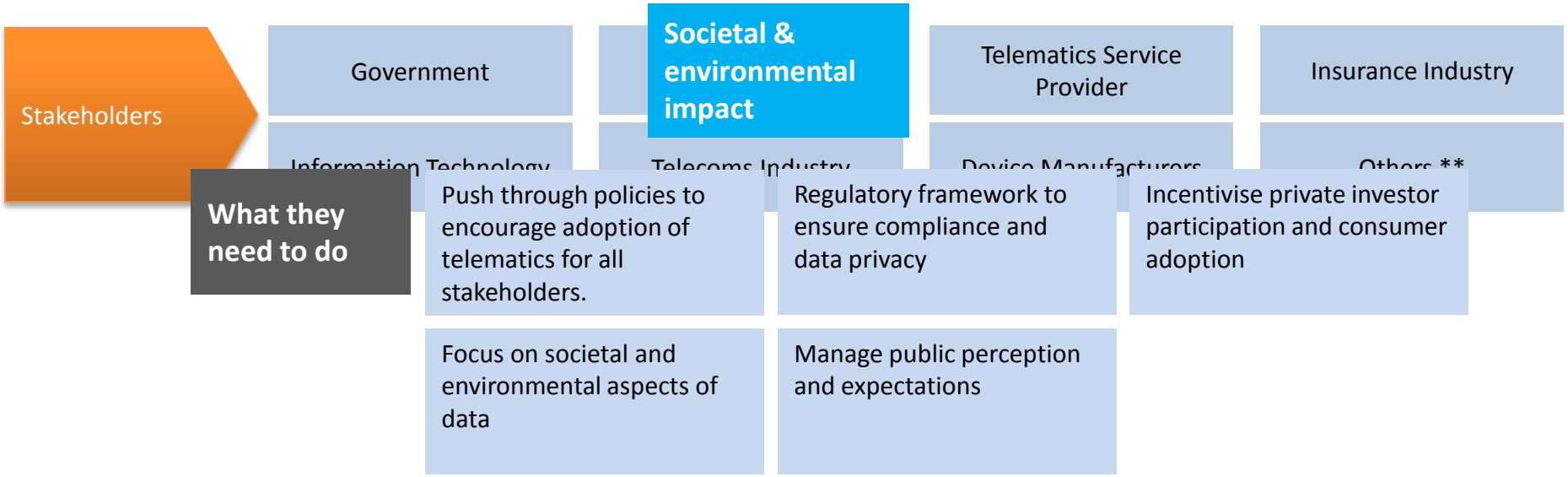
Cost savings / control– Capability to inform customer to service vehicle when service due, problem detected or problem projected

3

Customer experience management

- More customer touchpoints and interactions
- Branding & loyalty
- Customer satisfaction

Considerations for key stakeholders

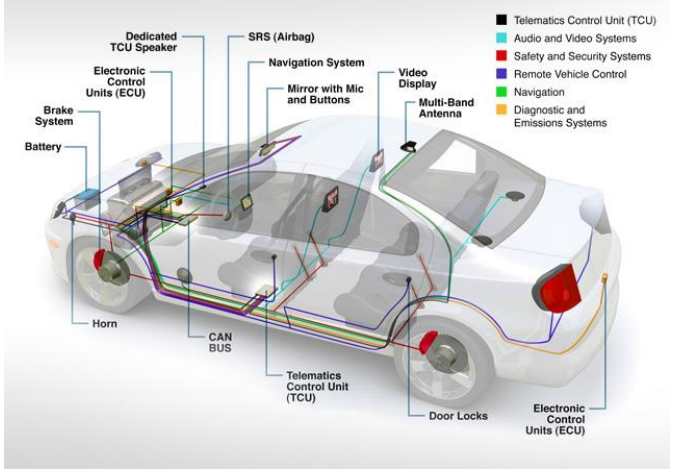


(Adapted from: Ernst & Young, The quest for telematics 4.0 Creating sustainable value propositions for connected car,2013)

Considerations for key stakeholders

Government

Why would they do it?



1

Smart traffic management

- Reduce traffic congestion – PAYD, smart traffic infrastructure
- Efficient public transportation (bus route optimization, on time services, etc.)

2

Safety and Security

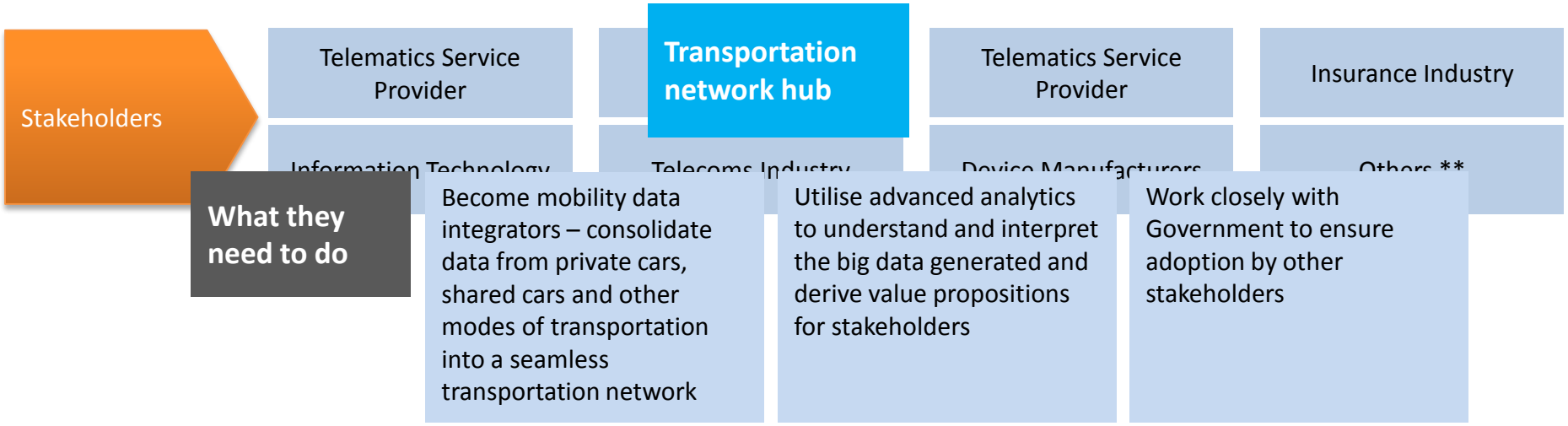
- Lower vehicle collision rates
- Insurance incentivized driver behavior (PHYD)
- Reduce fatal accidents – on-board safety & driver assist

3

Environmental impact

- Lower CO^2 emissions – eco-drive
- Smart road pricing / road tax – manages volume of vehicles on the road and encourages public transportation

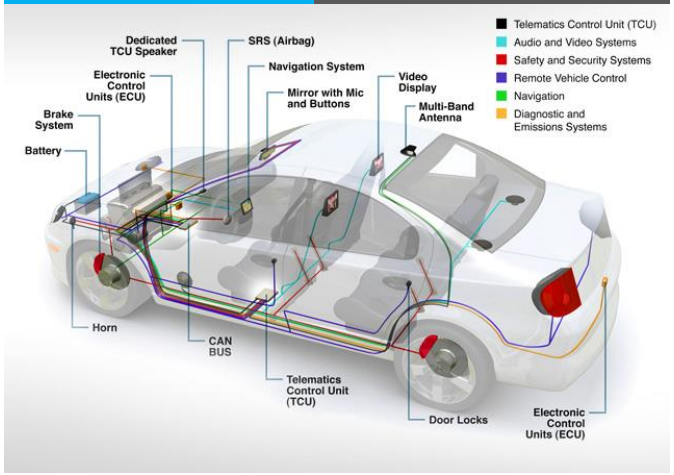
Considerations for key stakeholders



(Adapted from: Ernst & Young, The quest for telematics 4.0 Creating sustainable value propositions for connected car,2013)

Considerations for key stakeholders

Telematics Service Provider	Why would they do it?



1

Huge business potential

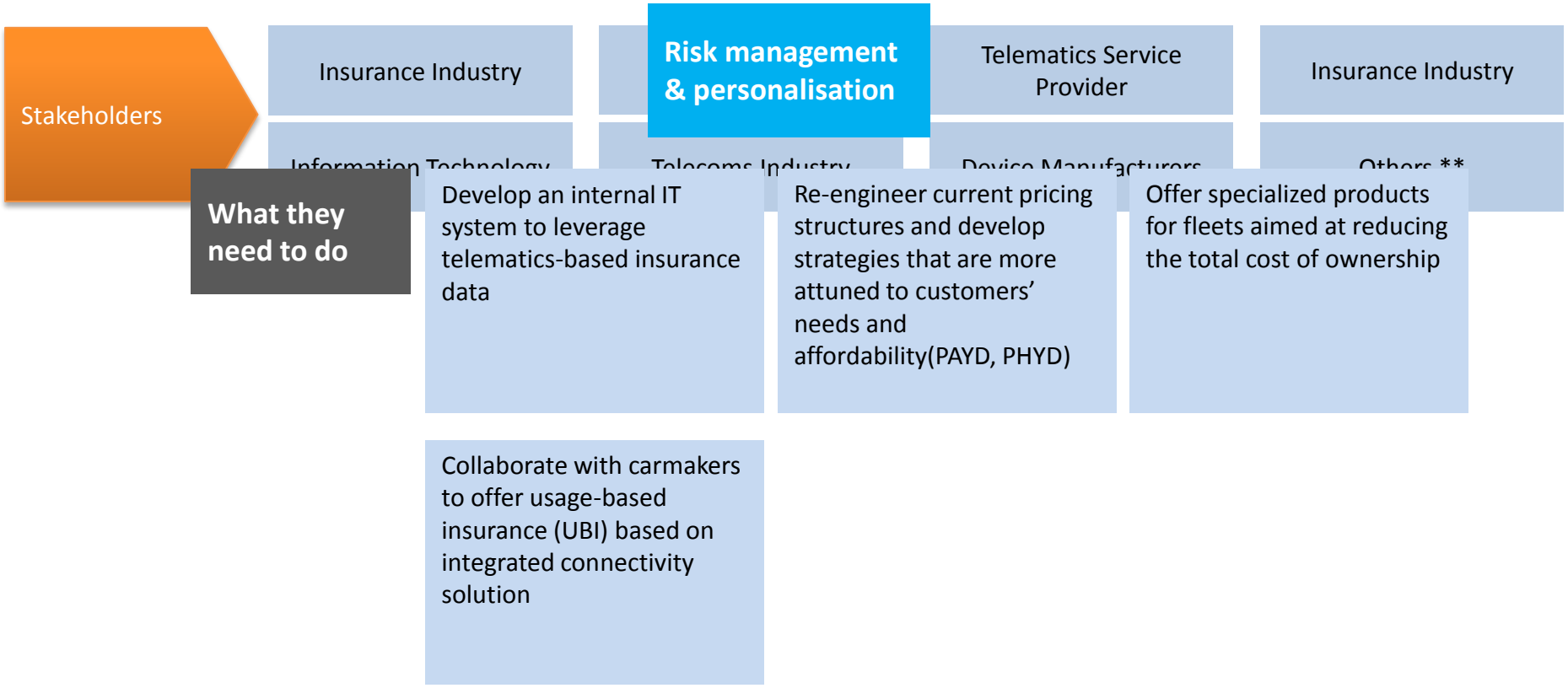
- Analysed data of combined telematics data from all sources becomes invaluable information to other stakeholders which they will pay for
- Incredible potential to scale as telematics becomes mainstream

2

Secure and sustainable future

- Continuous vehicle innovations will create more opportunities for the foreseeable future as more data is generated
- Government's societal and environmental policies will ensure a conducive environment to operate

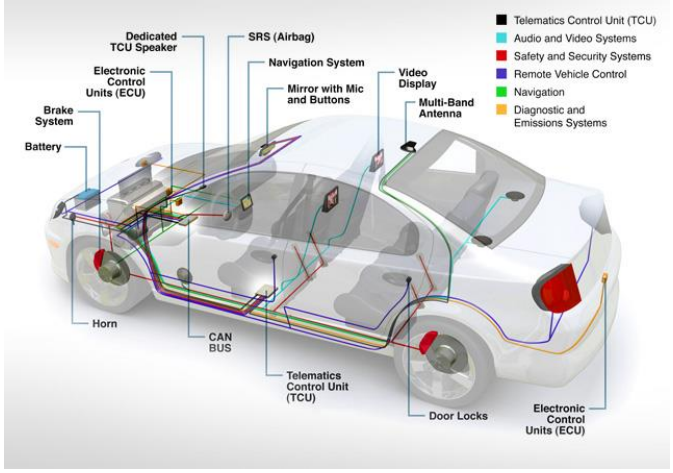
Considerations for key stakeholders



(Adapted from: Ernst & Young, The quest for telematics 4.0 Creating sustainable value propositions for connected car,2013)

Considerations for key stakeholders

Insurance Industry	Why would they do it?



1

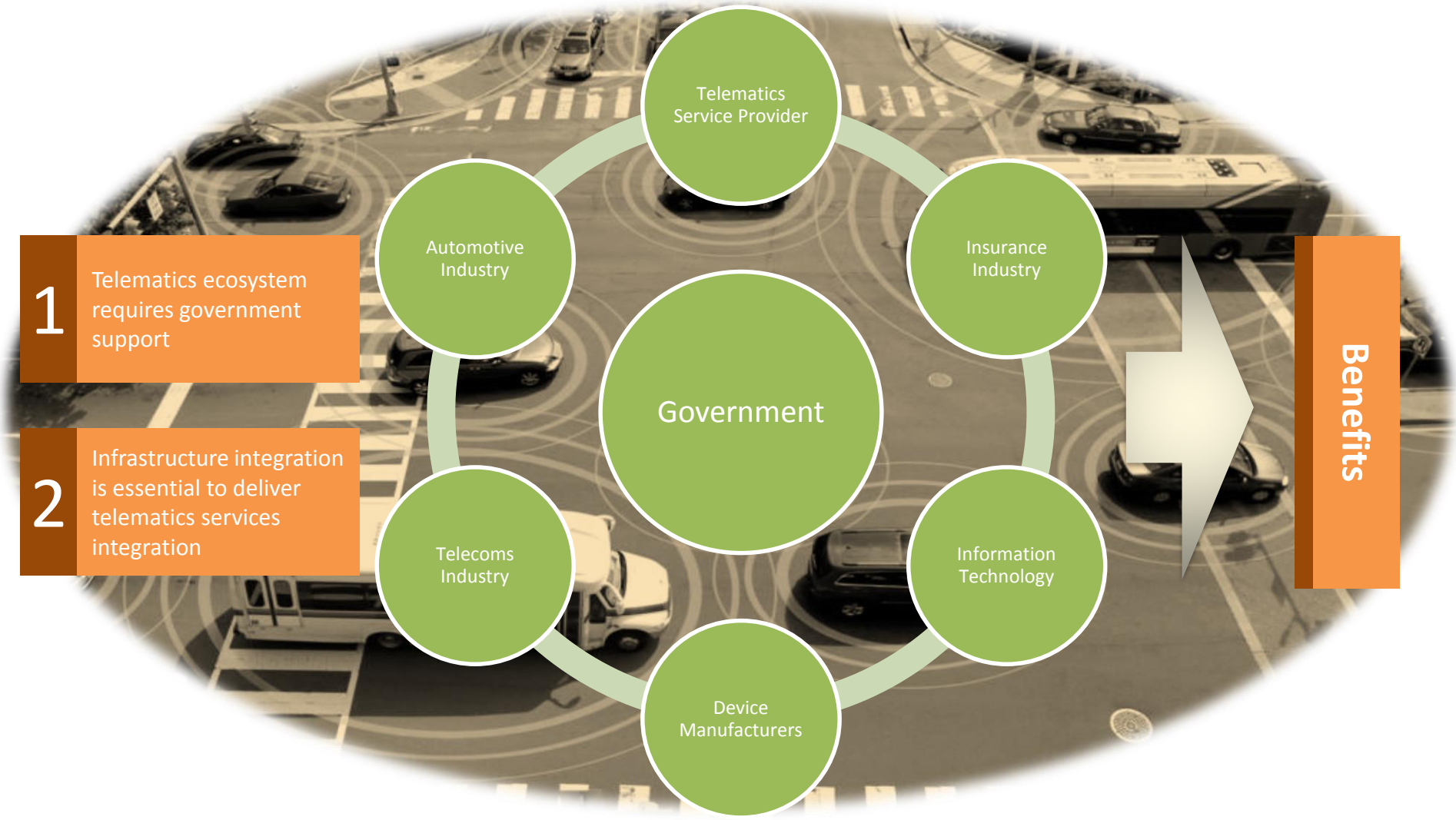
Telematics makes insurance tangible to the customer in an entirely new way, increasing the potential for better risk management and more consumer touch points

2

Motor insurers and brokers will gain access to richer individual and collective (descriptive) data than the sector has ever known. Allowing for:

- New products with individualized pricing (PHYD, PAYD)

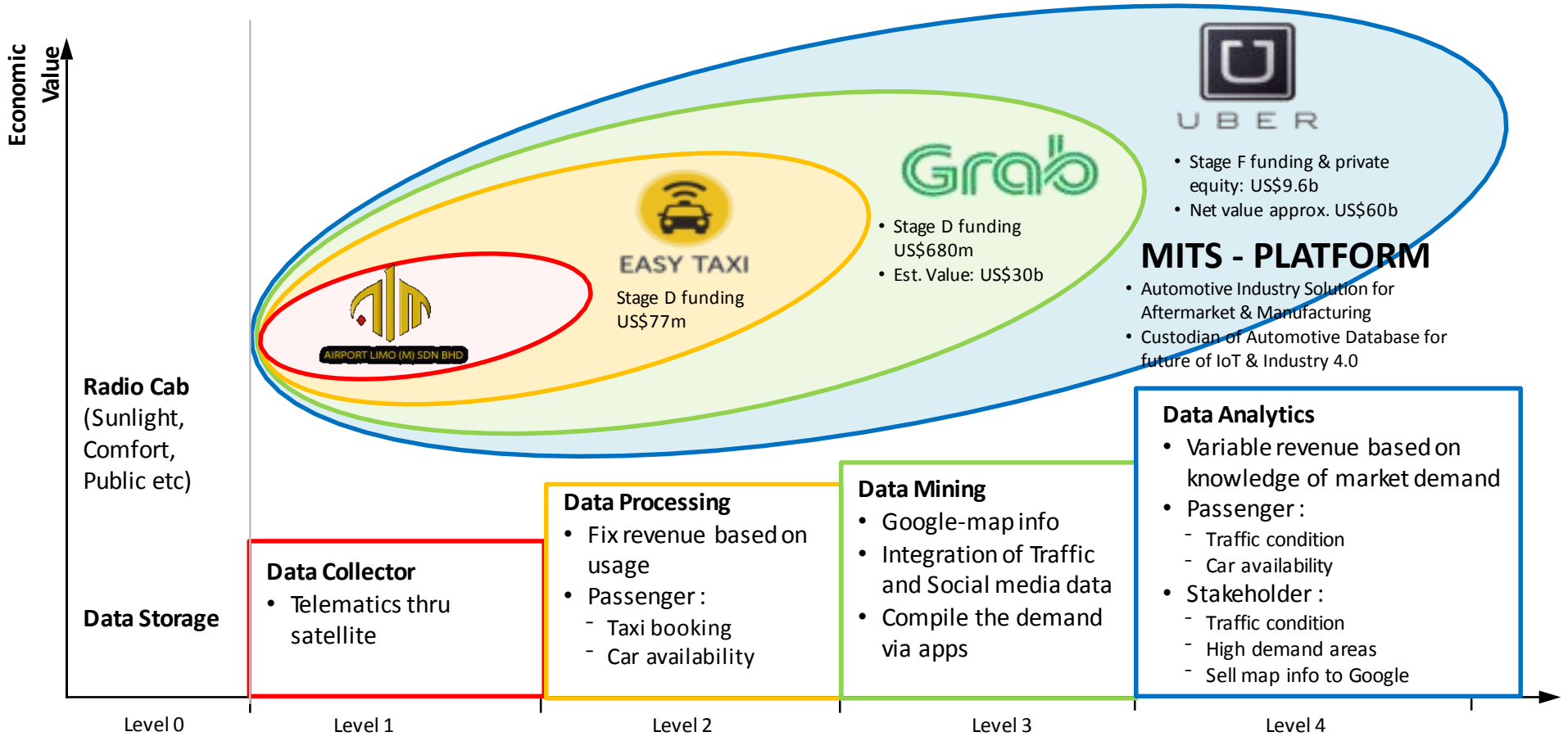
TELEMATICS ECOSYSTEM & INTEGRATION



1. Telematics ecosystem requires government support
2. Infrastructure integration is essential to deliver telematics services integration

How MITS : Transforming Automotive Industry

Case Study: How IoT Technology Transforming Malaysian Taxi Industry



Automotive Transportation

Enhancing Urban Mobility

Transportation

- Promote public transport
- High quality of life

Key Agenda:

- Enhancing connectivity across transport modes and regions
- Improving safety, efficiency and service levels of transport operations
- Strengthening regulatory and institutional framework for the transport industry

Opportunities

Upstream

- Route Planning & Control
- Asset Monitoring

Midstream

- Integrated Services Mgmt.
- Traffic Mgmt.

Downstream

- Integrated Ticketing
- Route Advisory
- Passenger Info System

Services

- Connected Supply Chain
- Remote Asset Mgmt.
- Smart Fuel Mgmt.
- Proactive Maintenance
- Customer Experience Mgmt.
- Value Add services

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MAI Malaysia Automotive Institute

SMART ENGINEERING
- MAIUnlimited

Altair CAE – www.maiunlimted.com.my

Virtual simulation replaces the multitude of physical testing and will assist engineer to decide the best performance for best product right at the first time.

With the embedded flow of optimization technology, an idea or concept can be determined right at the first time without repeating many trial & errors besides fueling innovative culture in product design and development

HPC SERVER – HYPERWORKS UNLIMITED

Front impact analysis of full vehicle using high performance computing server namely HyperWorks Unlimited. Radioss solver was used to compute analysis with 96 cores. Total running time was less than 45 minutes.

No.	No. of CPU (Cores)	Running Time
1	8 CPUs	7 hrs 5 mins 6 secs
2	16 CPUs	3 hrs 57 mins 23 secs
3	24 CPUs	2 hrs 35 mins 45 secs
4	32 CPUs	1 hr 50 mins 55 sec
5	48 CPUs	1 hr 16 mins 59 secs
6	96 CPUs	43 mins 19 secs

HPC SERVER – HYPERWORKS UNLIMITED

Altair Innovation Intelligence®

SECURE DOMAIN FOR PUBLIC ACCESS
https://www.maiunlimited.com.my

Compute Manager™

High Performance Innovation in the Cloud

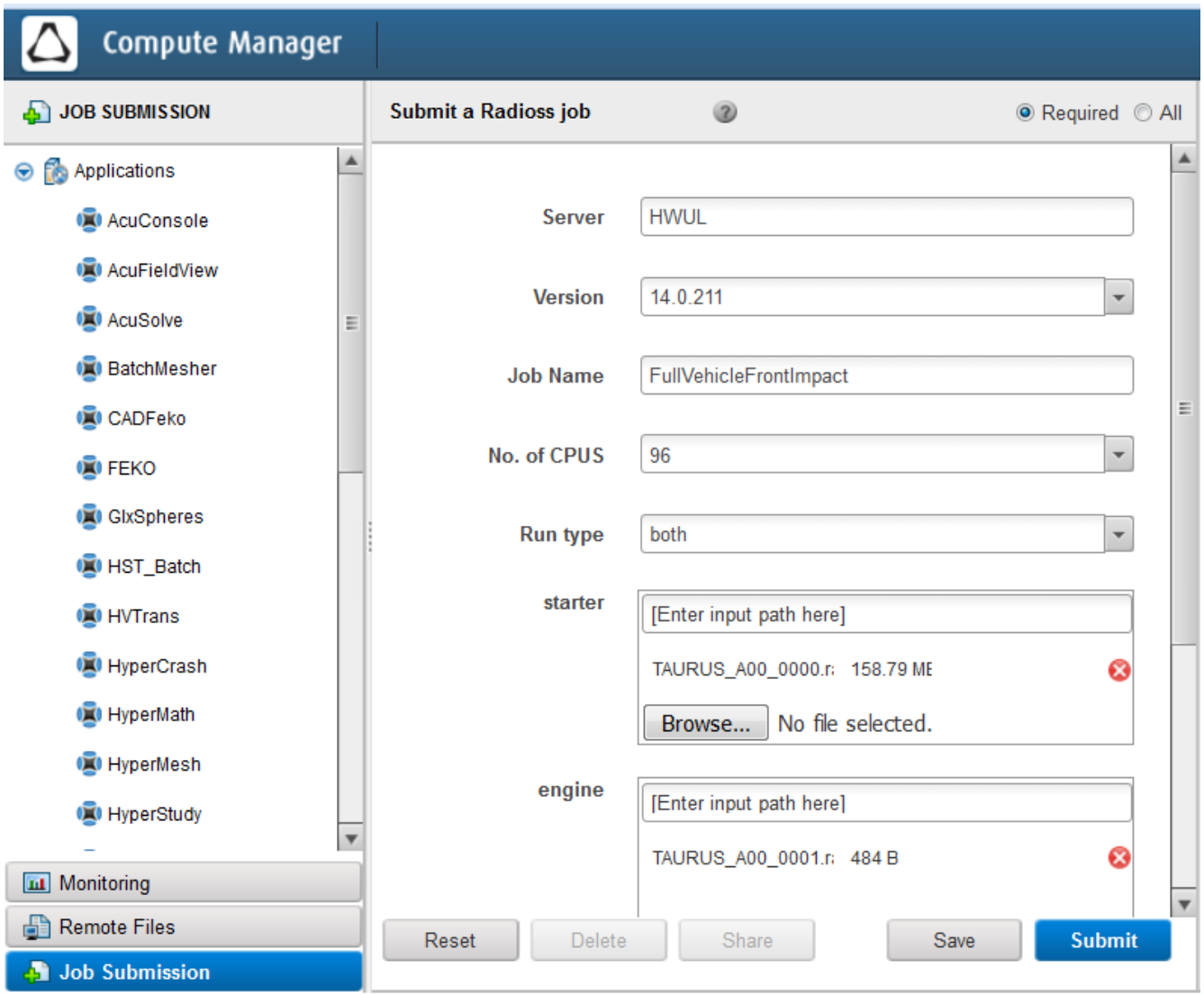
Compute Manager is a High Performance Computing solution for design innovation "in the Cloud". It leverages the patented Altair licensing system and provides access to best-in-class HyperWorks software through a modern, secure, and efficient web-based platform.

username | password | Login

Compute Manager ™ Display Manager ™ Access Manager

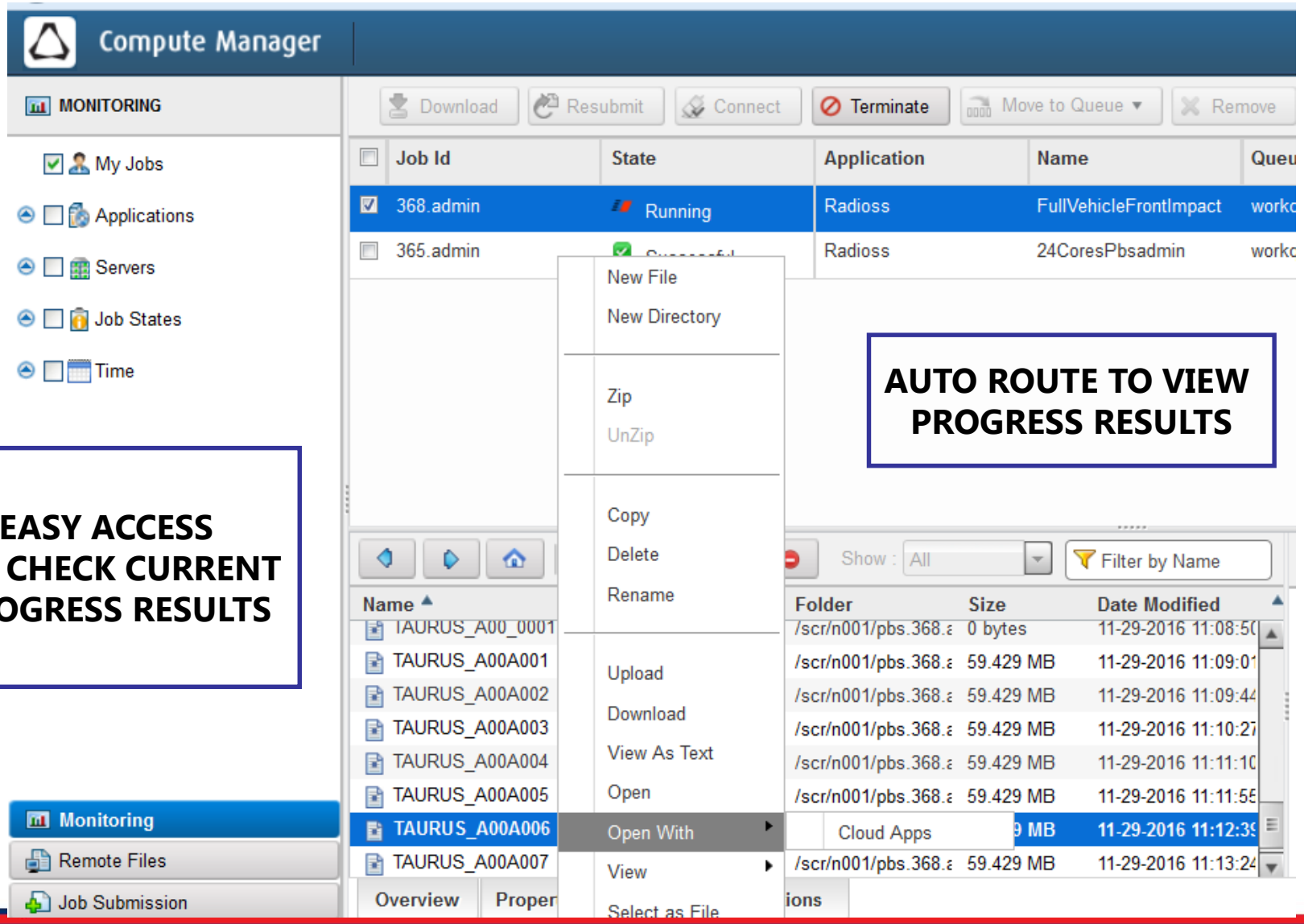
HyperWorks | Altair ProductDesign | PBS Works | HiQube | solidThinking | TOGGLED | Altair Partner Alliance | th!nklabs
Contact | Privacy

HPC SERVER – HYPERWORKS UNLIMITED

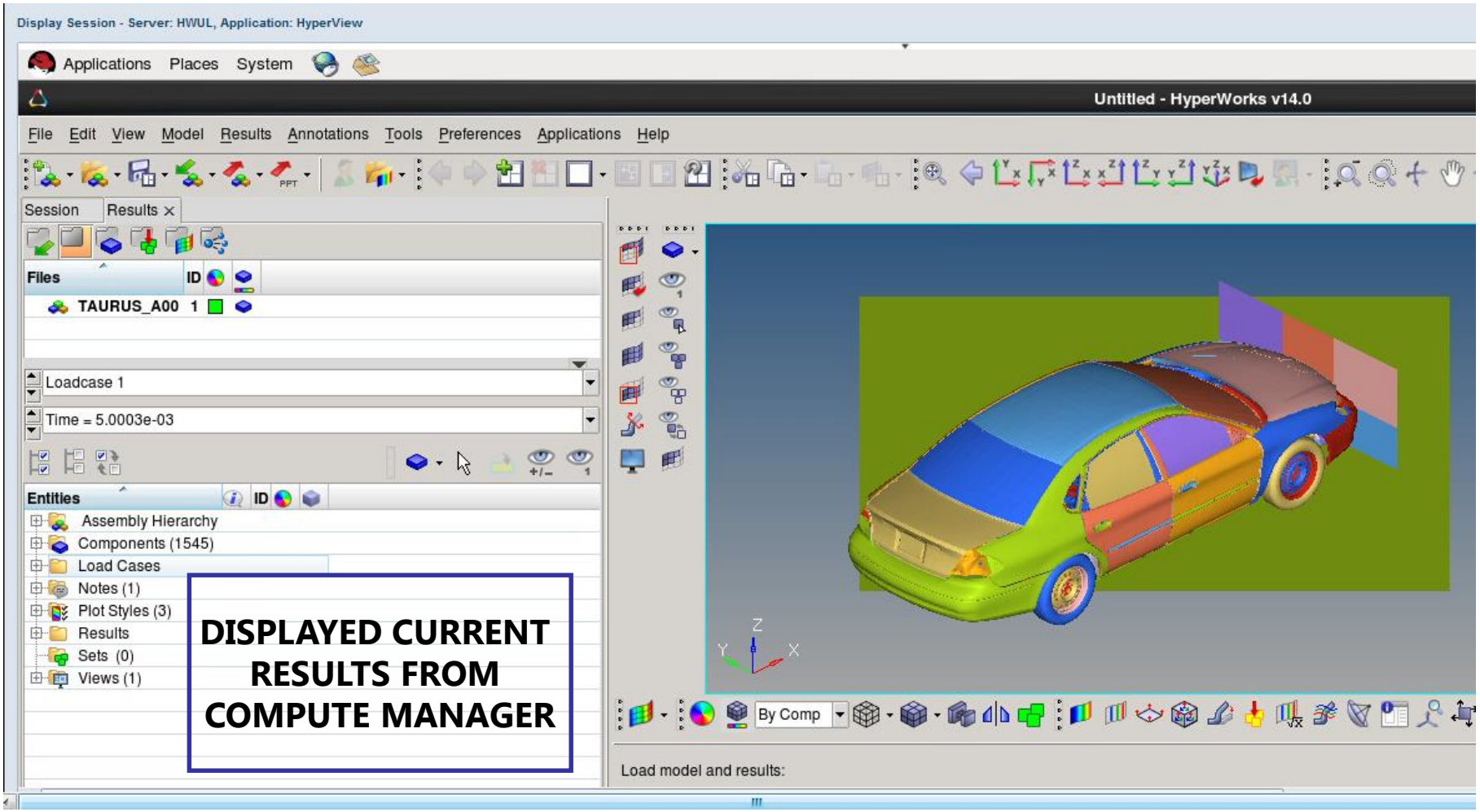


COMPUTE MANAGER
USER FRIENDLY INTERFACE FOR JOB SUBMISSION

HPC SERVER – HYPERWORKS UNLIMITED



HPC SERVER – MAI UNLIMITED



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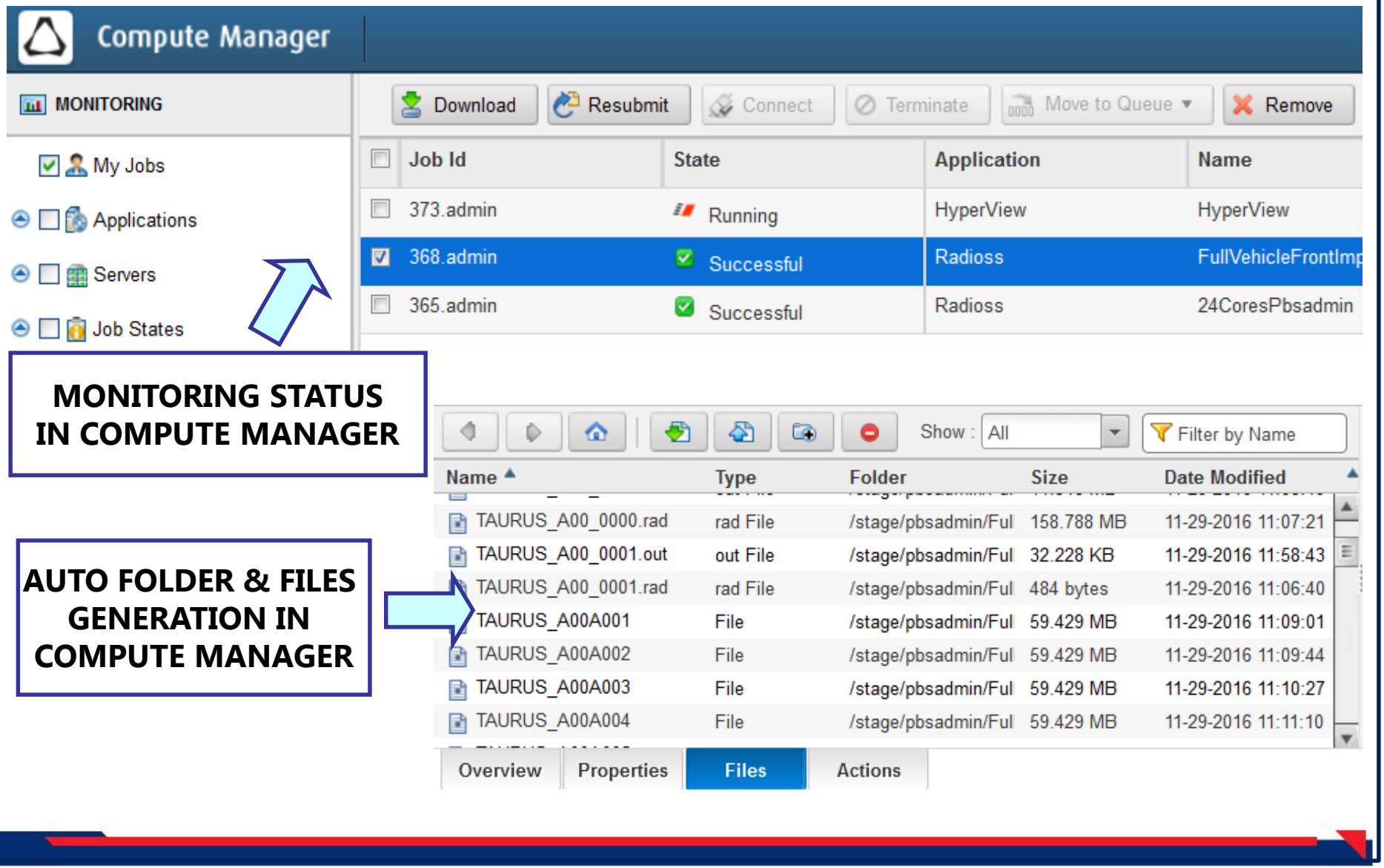

HPC SERVER – MAI UNLIMITED

ACCESS FOR REVIEW SIMULATION RESULTS IN A SINGLE DOMAIN

Altair Innovation Intelligence®

Display Manager™

Altair's Display Manager enables high-performance remote display of applications over the network.

username | password | Login

Compute Manager ™ | **Display Manager ™** | Access Manager

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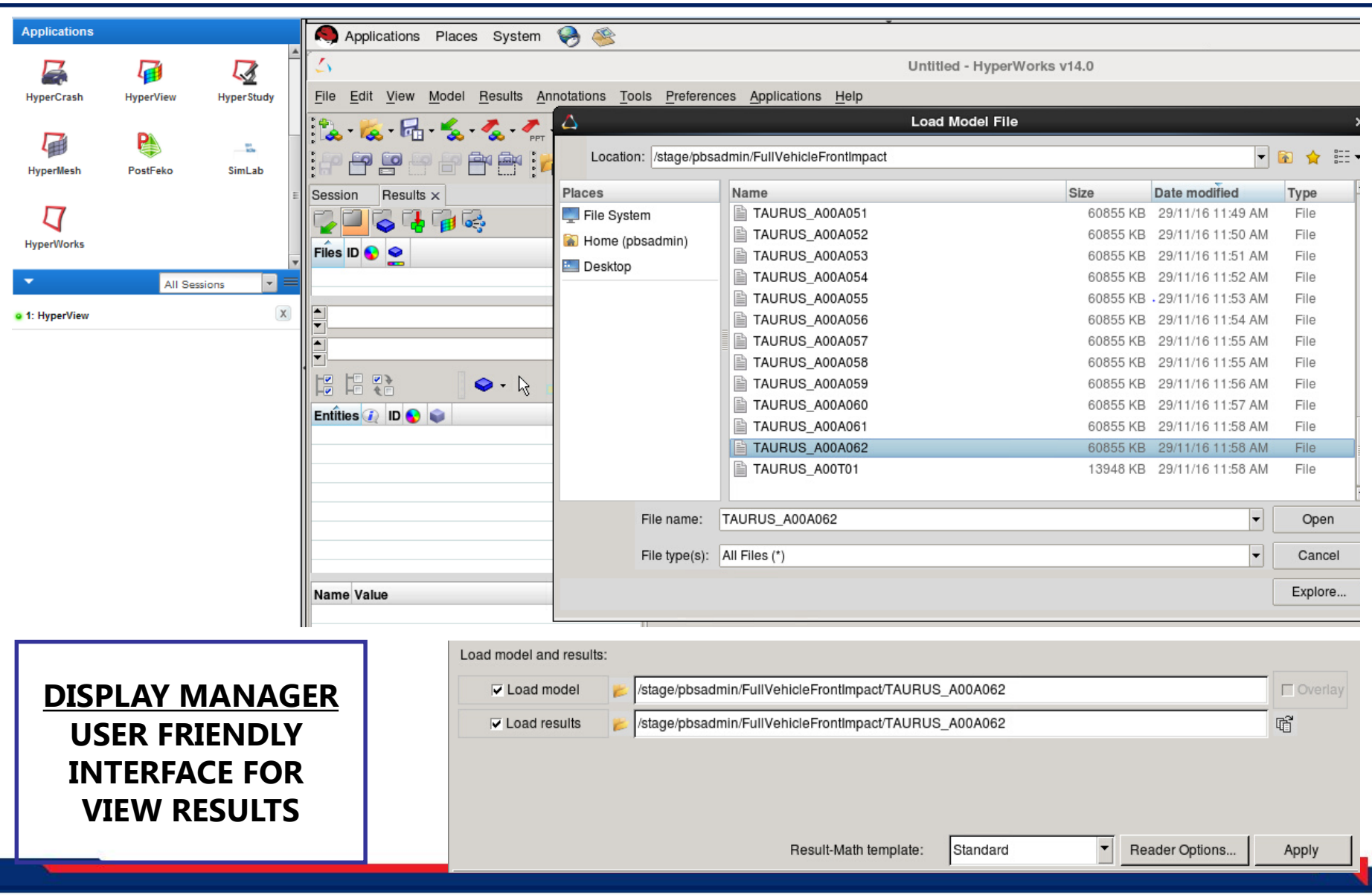
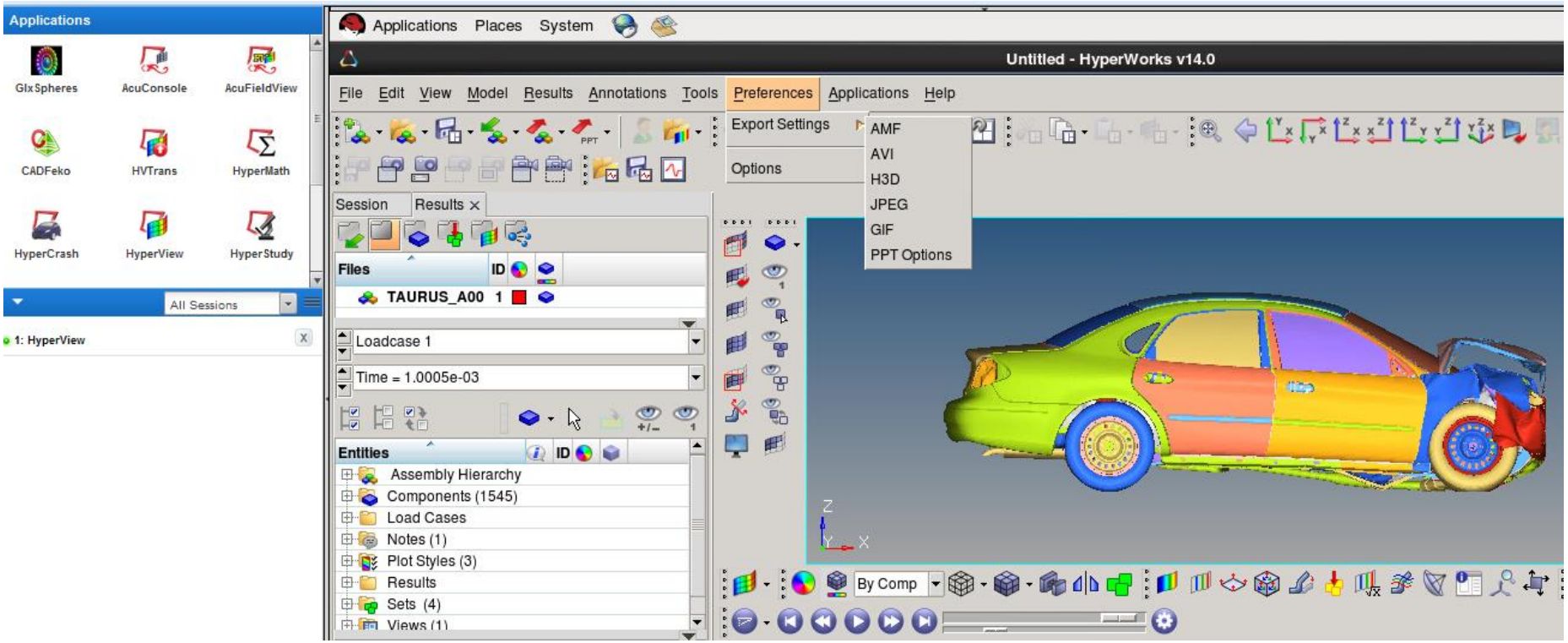


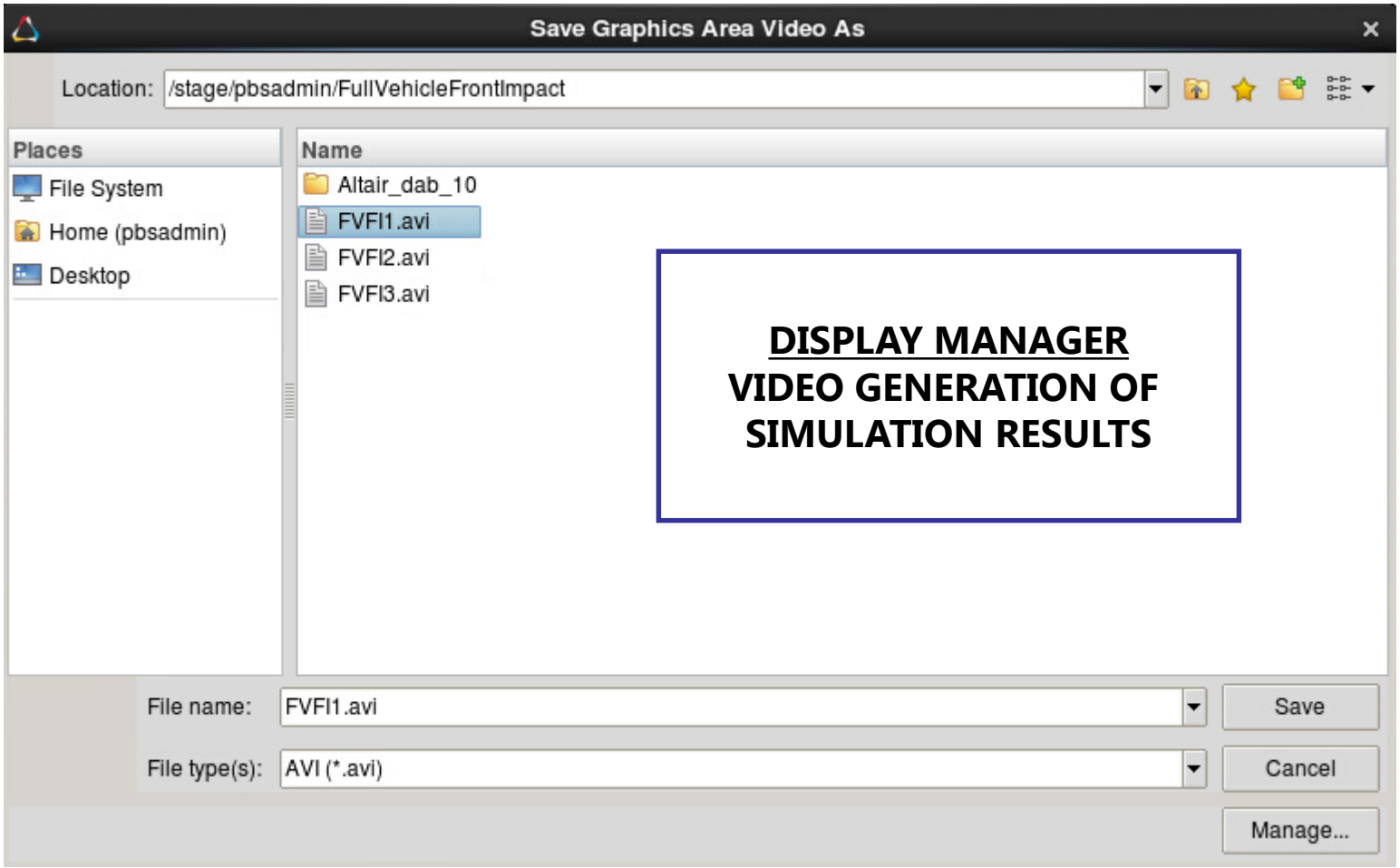
DISPLAY MANAGER
USER FRIENDLY INTERFACE FOR VIEW RESULTS

HPC SERVER – MAI UNLIMITED



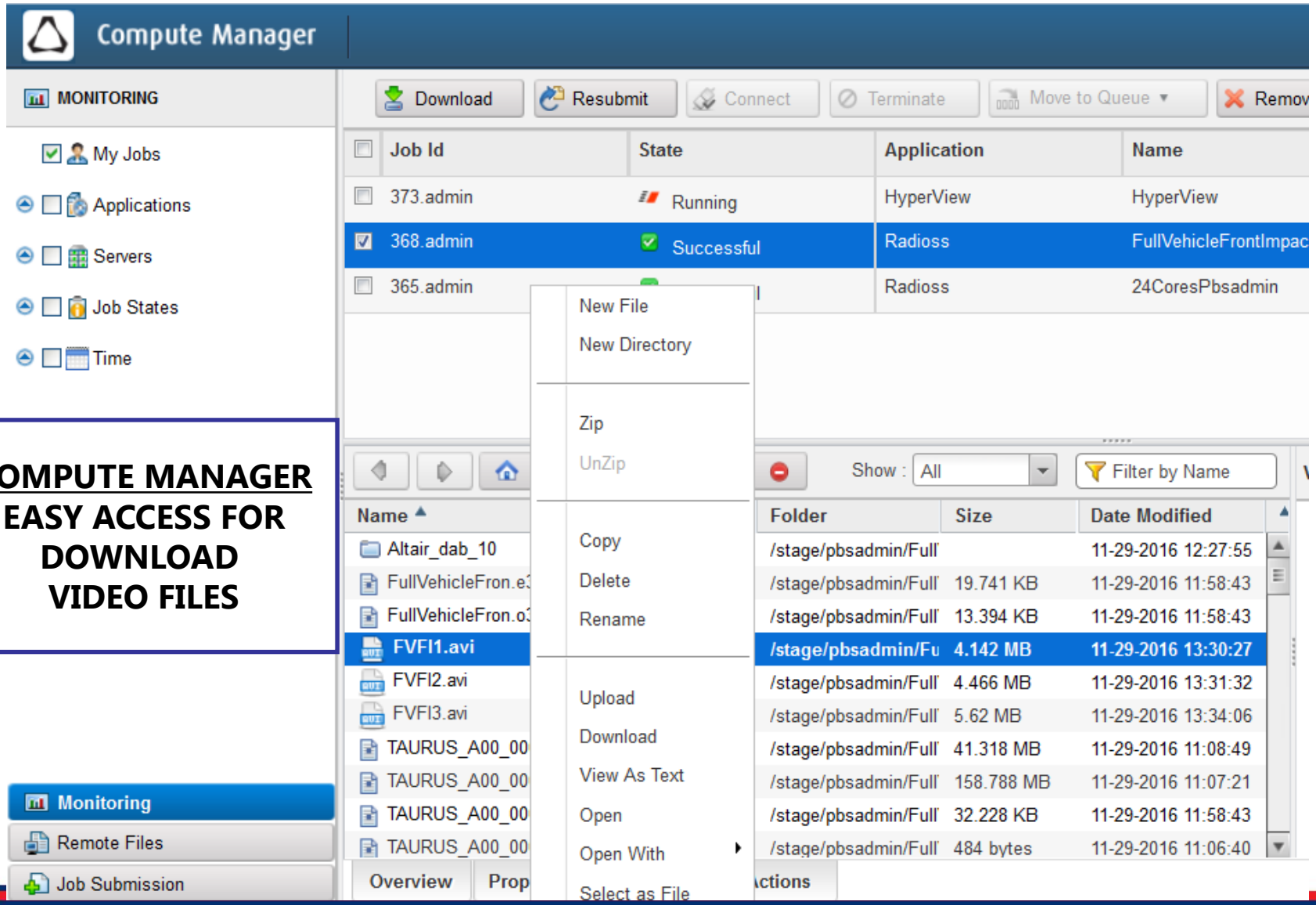
DISPLAY MANAGER
INTERACTIVE FUNCTIONS FOR REVIEW SIMULATION RESULTS

HPC SERVER – MAI UNLIMITED



DISPLAY MANAGER
VIDEO GENERATION OF SIMULATION RESULTS

HPC SERVER – MAI UNLIMITED

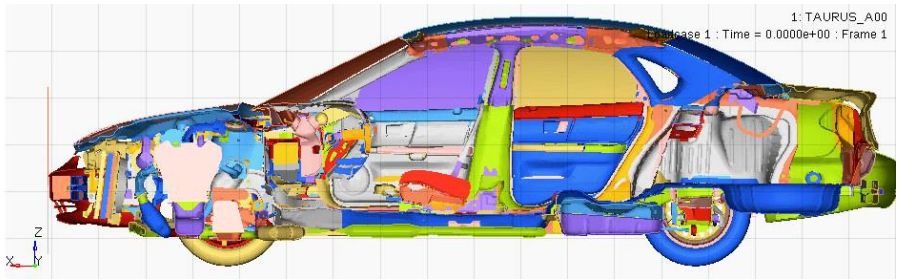


COMPUTE MANAGER
EASY ACCESS FOR DOWNLOAD VIDEO FILES

HPC SERVER – MAI UNLIMITED

DIRECT PLAY SIMULATION VIDEOS FROM USER LAPTOP, PC & WORKSTATION

HPC SERVER – MAI UNLIMITED



Solves a Full Vehicle Frontal Crash Simulation with More Than One Million Elements in

Less Than 44 Minutes

MITS Simulation Appliance is a private cloud solution with fully configured hardware and software, offering unlimited use of all Altair software within the appliance. Malaysia Automotive Institute (MAI) offer best-in-class application software, HPC workload management tools, and industry leading licensing and business model to fit your growing simulation needs

Benefits

Fully Integrated, Plug And Innovate HPC Cluster:
Delivered as turnkey system, loaded with HyperWorks software applications and HPC tools for simplified deployment.

Agility
Simulate Everywhere- remote modeling, job management / monitoring, visualization & data management.

Reliable
- Pre- package, fully configured CAE cloud solutions
- MAI managed, No IT support needed
- Unlimited HyperWorks solvers products per node

Value
Dynamically scales to support varying CAE demand

Single Source
Simulation software, high performance computing, visualization, reporting, engineering consultation, infrastructure: all integrated at one source.

Secure
Remote access and highest level of security.

Compute Manager | Run. Monitor . Manage

HPC App-aware Cloud Portal Tuned for End-Users

Simplify HPC Services

- Drag-and-drop input decks to submit HPC work
- Watch progress & view intermediate results
- Post-process and visualize remote results

Display Manager | Visualize. Access . Collaborate

- Remote Visualization of Big Data within a Single Portal Visualize Your Datasets for Rapid Collaboration and Innovation

HyperWorks Unlimited Features

(4) Compute Nodes-Expilicit Simulation Codes 20 cores(per node), Intel E5-2670V2, 2.5 GHz:
128 GB RAM DDR3 Memory DIMMs
QDR infiniBand connectivity and integrated on board GbE
1 TB Hard Drive (7200 RPM SATA)

Head Node* - Include with all configurations 6 cores, Intel Xeon 5-2630v2, 2.6 GHz:
64 GB RAM DDR3 Memory DIMMS
24 TB 7200 RPM SAS HDDs
1 dual -port 10 Gbe card w/ SR optics
1 QDR infiniBand card
1 internal RW DVD-ROM

Compute Manager: View Result in Situ

Display Manager: High-end 3D Remote Visualization

Malaysia Automotive Institute, Block 2280, Jalan Usahawan 2, Cyber 6, 63000 Cyberjaya, Selangor. Malaysia
Tel: 03 8318 7742 website www.mai.org.my

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MINISTRY OF INTERNATIONAL TRADE AND INDUSTRY

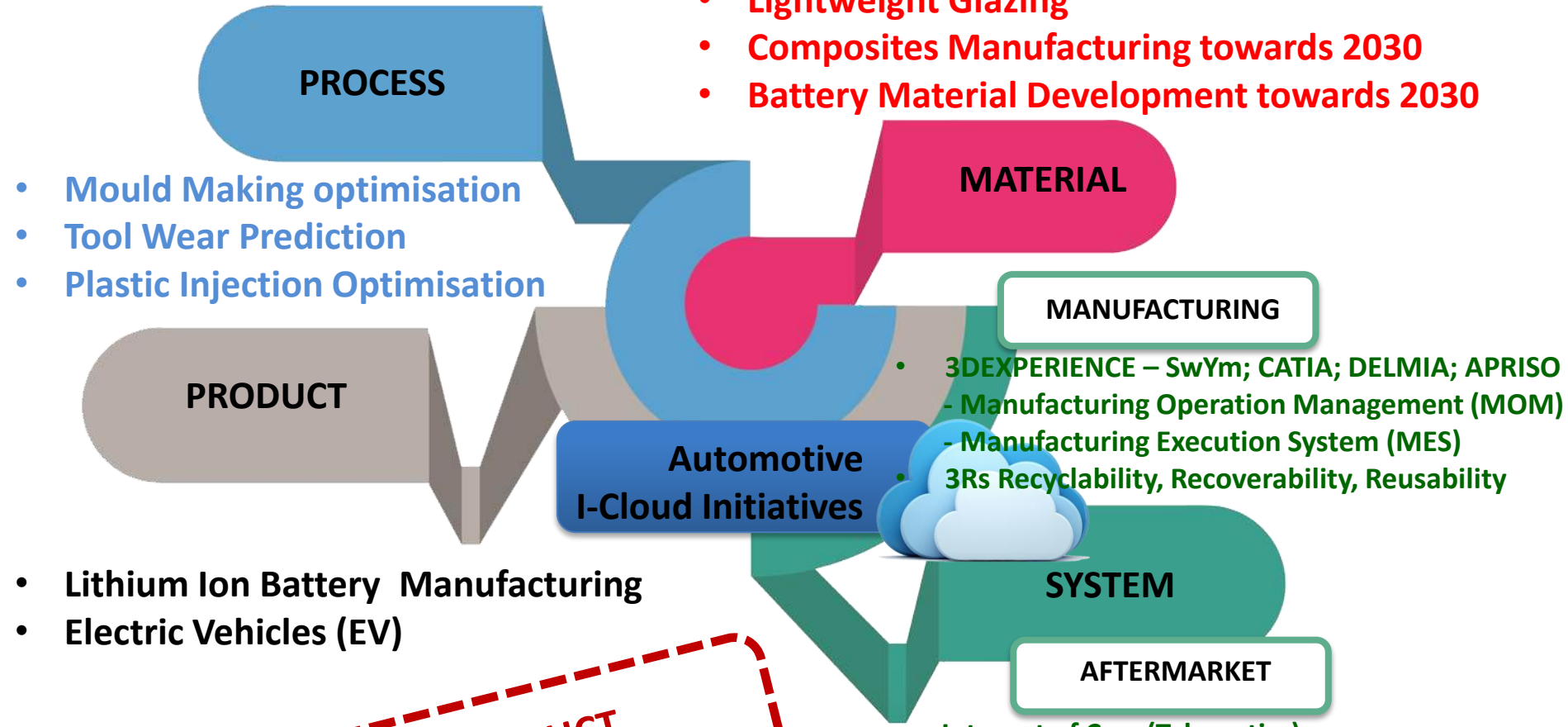
MAI Malaysia Automotive Institute

TRANSPORTATION & MOBILITY - STATUS UPDATES

IOT & BIG DATA MANAGEMENT (BDM)

TECHNOLOGY COLLABORATION

- Flexible Roll Forming
- Lightweight Glazing
- Composites Manufacturing towards 2030
- Battery Material Development towards 2030



- Mould Making optimisation
- Tool Wear Prediction
- Plastic Injection Optimisation

- 3DEXPERIENCE – SwYm; CATIA; DELMIA; APRISO
  - Manufacturing Operation Management (MOM)
  - Manufacturing Execution System (MES)
- 3Rs Recyclability, Recoverability, Reusability

- Lithium Ion Battery Manufacturing
- Electric Vehicles (EV)

PRODUCT COMMERCIALIZATION

- Internet of Cars (Telematics)
- Workshop Management System
- Quality Parts (QP Portal)
- 4R2S

TECHNOLOGY COLLABORATION

DIGITAL PRODUCT DESIGN

CUTTING EDGE 3D COLLABORATION

STATISTICAL APPLICATION

STATISTICAL ANALYSIS AT THE DESIGN STAGE ENHANCES

3DEXPERIENCE

HARNESSING THE POWER OF COLLABORATIVE IDEA REALIZATION

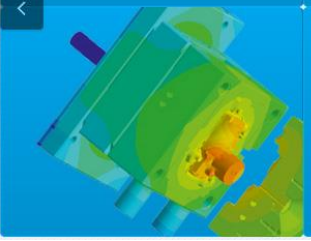
LAYOUT PROCESS OPTIMIZATION

SEAMLESS PRODUCT REALIZATION THROUGH

PLASTIC INJECTION VIRTUAL MOULD OPTIMIZATION

TOOL WEAR PREDICTION OF STAMPING

INNOVATING TOOL LIFE PREDICTION MODELS



3RS

RECYCLABILITY
RECOVERABILITY
REUSABILITY

AFTER MARKET SOLUTIONS

ONE STOP ONLINE RESOURCE FOR AFTER MARKET SUPPORT

PRODUCT COMMERCIALIZATION

MITS:

MAI INTELLIGENT TECHNOLOGY SYSTEMS

4TH INDUSTRIAL REVOLUTION: CURRENT PROGRAMMES & INITIATIVES

VALIDATION PLAN :
MAI Intelligent Technology solution (MITS) – Smart Manufacturing (Industry 4.0)

2013 - 2014 H1

Objective : Deploy Operations Intelligence for Automotive suppliers in Malaysia for Industry 4.0 with quality improvement and waste reduction

Operations Intelligence

OPERATION INTELLIGENCE (OI)

Operations Intelligence to Reduce scrap & rework Scale up production volume Identify Best Practice rules and risk situations in manufacturing processes

2014 H2 - 2015

Objective: Enable the adoption of relevant Industry 4.0 Solutions to enable OEM and Suppliers in Malaysia to establish sustainable product development practices

Industry Solution Experiences for Transportation & Mobility (T&M)

SMART ENGINEERING

T&M Solution Experiences to enable Malaysian Automotive Industry with best practices and processes for sustainable product development and manufacturing

2016 and beyond

Objective: Deploy **3D**EXPERIENCE Platform & T&M Solution Experiences for sustainable development of Automotive community in Malaysia

3DEXPERIENCE Platform as the collaborative platform for Automotive industry in Malaysia

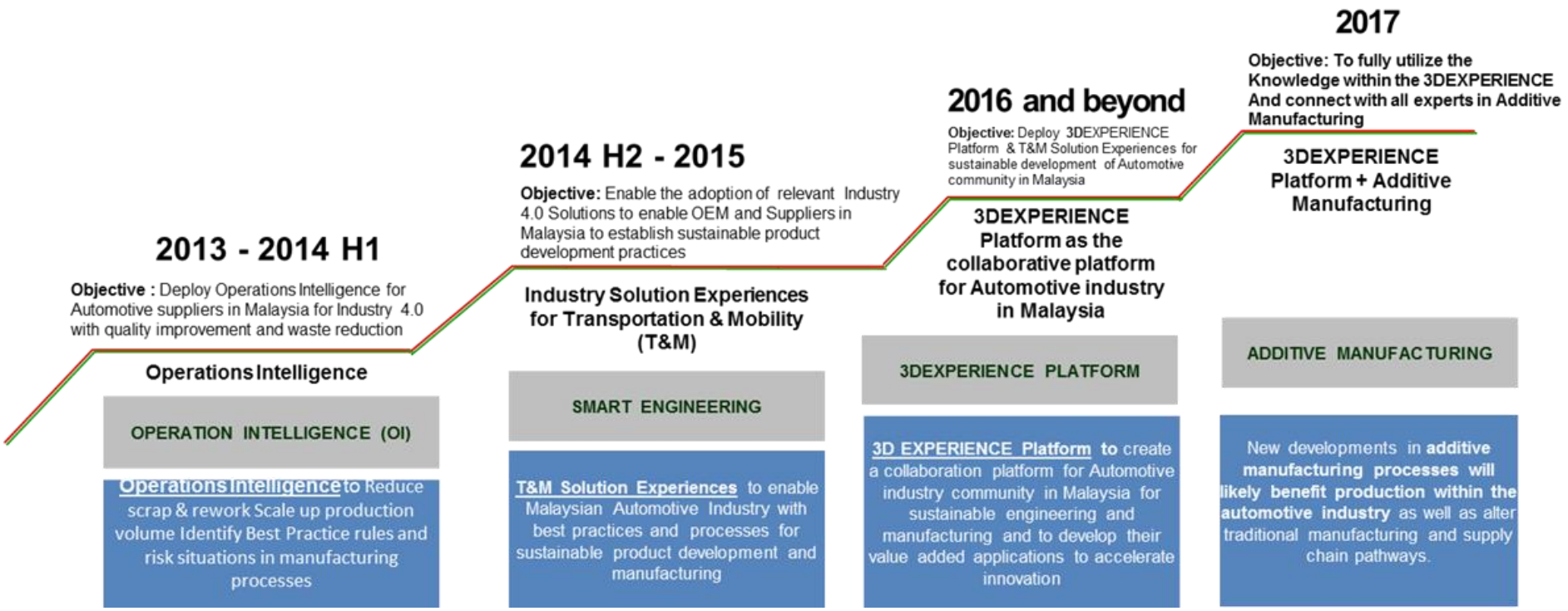
3DEXPERIENCE PLATFORM

3D EXPERIENCE Platform to create a collaboration platform for Automotive industry community in Malaysia for sustainable engineering and manufacturing and to develop their value added applications to accelerate innovation

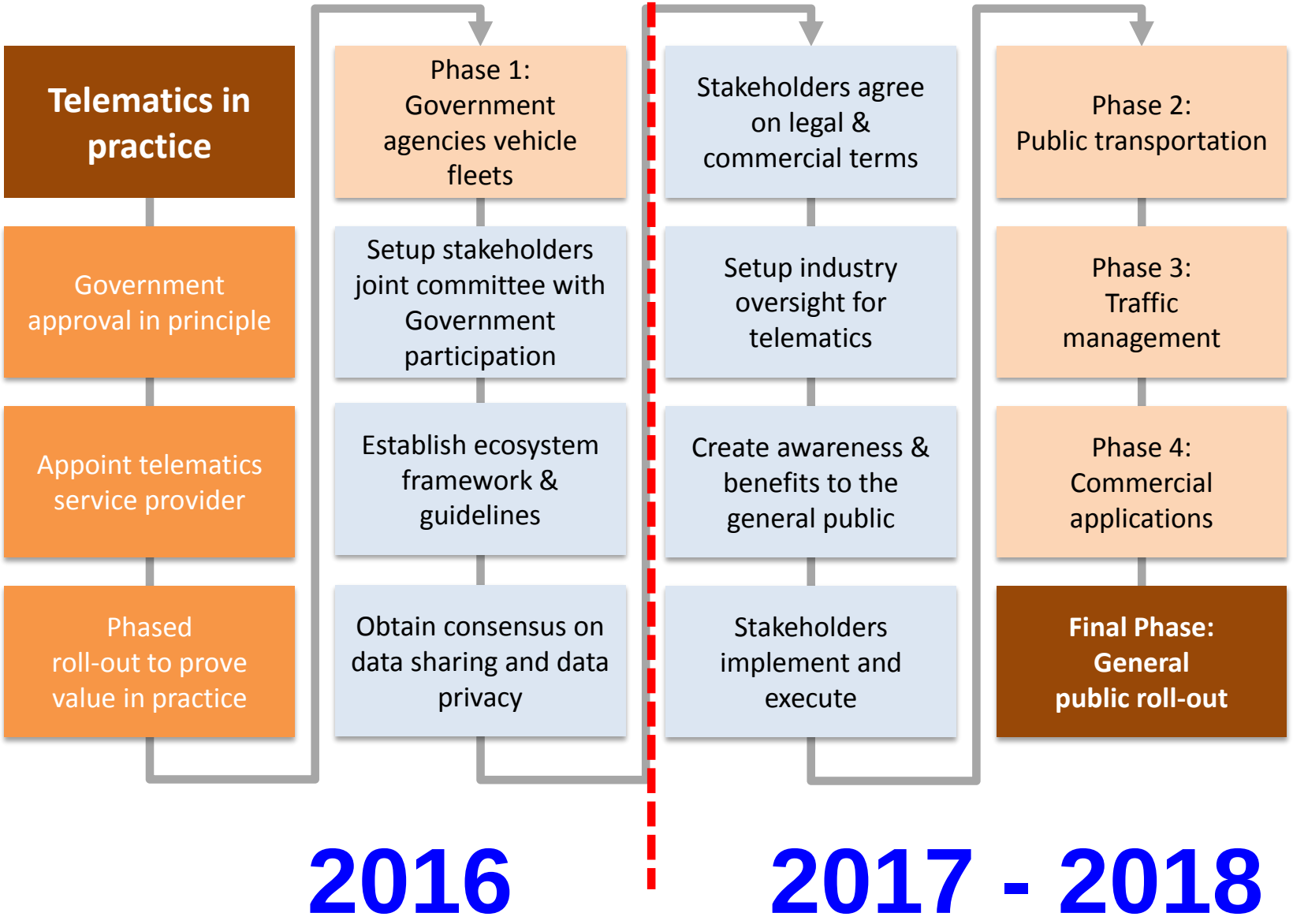
4TH INDUSTRIAL REVOLUTION: CURRENT PROGRAMMES & INITIATIVES

VALIDATION PLAN :

MAI Intelligent Technology solution (MITS) – Smart Manufacturing (Industry 4.0)



INTERNET OF CARS: TELEMATICS ROLLOUT



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