

ACMA Start-up Initiative

1st Workshop

12th July 2021



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Opening address ...

Working Committee Chairperson and Co-Chairperson



Satish Machani
Working Committee Chairperson



Kiran Deshmukh
Working Committee Co-Chairperson

1st Workshop

Agenda : 12th July 2021 (1-5 PM)

Sl	Session	Details	Speakers	Duration
1	Opening session	<ul style="list-style-type: none"> Working committee chairperson and co-chairperson welcome members PwC details the agenda and structure of the workshop 	Mr. Satish Machani Mr. Kiran Deshmukh Mr. Kavan Mukhtyar	15 mins
2	Trends in automotive & mobility and the role of start-ups	<ul style="list-style-type: none"> PwC team: Trends in automotive & mobility industry; how players are trying to traverse trends Peer experience: Use cases where start-ups are functioning Murali Talasila: Overall start-up ecosystem, challenges they face, how to meaningfully engage 	Mr. Kiran Deshmukh Mr. Todd Morgan Mr. Akhilesh Rai Mr. Murali Talasila PwC Team	75 mins
		Break		15 mins
3	Engaging with start-ups; capabilities required to win	<ul style="list-style-type: none"> PwC team: How have automotive players engaged with start-ups Peer experience: Learnings & challenges while engaging with start-ups PwC team: Capabilities required to effectively engage with start-ups 	Mr. Satish Machani Mr. Prashanth Nayak Mr. Siddharth Manoharan PwC Team	60 mins
		Break		15 mins
4	Priority areas that program should cover	<ul style="list-style-type: none"> PwC team: results from the ACMA Start-up Initiative: Survey for pilot members 	Working Comm. Members PwC Team	20 mins
5	Brainstorming and theme finalization; next steps	<p>PwC will facilitate finalization of themes: Outcome –</p> <p>(1) <i>Investment Themes (wave 1 and wave 2)- 3 themes per wave</i></p> <p>(2) <i>Areas for efficiency track (wave 1 and wave 2) – 3 areas per wave</i></p> <p>PwC intimates next steps. Vote of thanks by Mr. Kiran Deshmukh</p>	Mr. Satish Machani Mr. Kiran Deshmukh Working Comm. Members PwC Team	40 mins

PwC team today...



Kavan Mukhtyar
Partner, Automotive Sector
Leader, PwC India



Murali Talasila
Partner, Start-ups and Innovation
Leader, PwC India



Amit Dakshini
Director



Yogesh Thakar
Senior Manager



Somnath Chatterjee
Senior Manager



Faisal Khan
Project Team Member



Sophia Dsouza
Project Team Member

A few ground rules during the workshop

- Kindly keep yourself on mute when not engaging during the sessions
- If you have any questions during the middle of a session, please share them in the chat box
- After breaks, please re-join the sessions on time
- Let's have an interactive session and learn together!

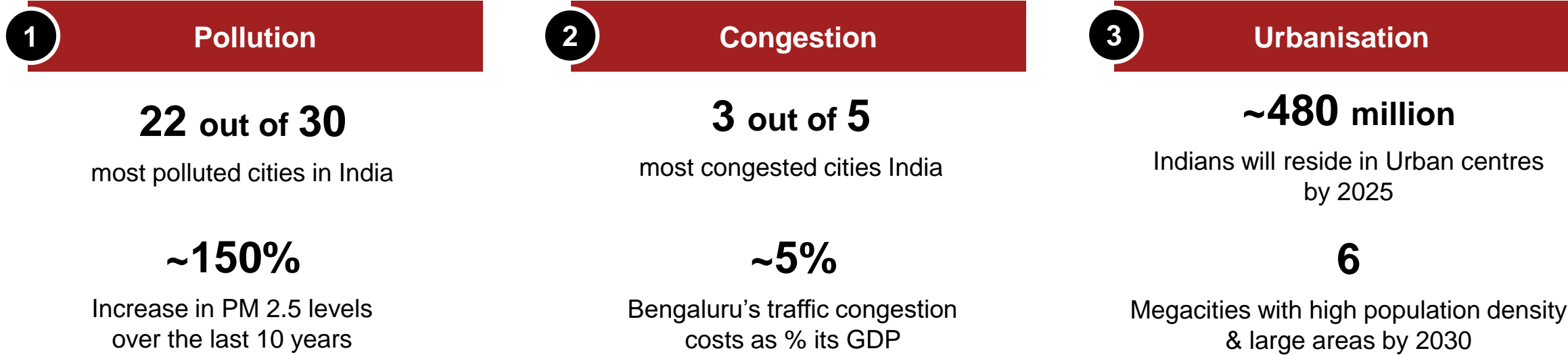
Agenda

Topic

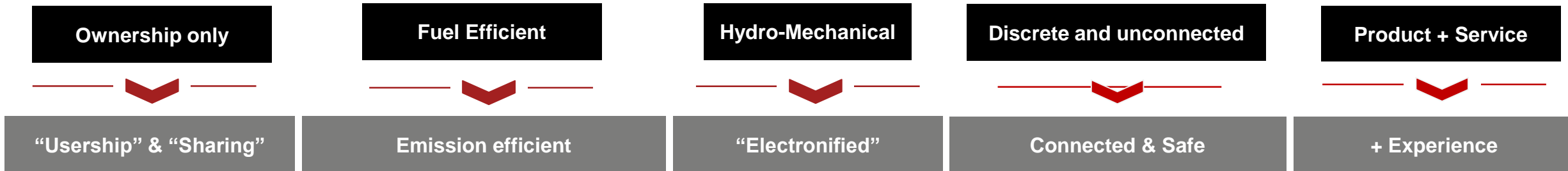
Duration

- | | | |
|----------|--|---------|
| 1 | Trends in automotive & mobility; role of start-ups | 75 mins |
| 2 | Engaging with start-ups; capabilities required | 60 mins |
| 3 | Priority areas that the program should cover | 20 mins |
| 4 | Brainstorming and theme finalization | 20 mins |
| 5 | Next Steps | 20 mins |

3 externalities are transforming the Automotive industry and the *mobility patterns* ...



Business shifts



Source: World health Organization (WHO), System of Air Quality and Weather Forecasting and Research (SAFAR), TomTom Traffic Research, PwC Research

.....leading to a dynamic *regulatory scenario*, while changing the market outlook for the future of mobility

Non- Exhaustive

Automotive and Components :



- **FAME II** - extension of scheme
- Rationalization of **import duty** EVs, battery packs & cells
- PMP (Phased Manufacturing Program) **focus on localization**

Battery & Charging Infrastructure :



- **De-licensed ; Standards** defined
- Tariff for **private charging** stations capped at 15%

Safety features



- **Bharat New Vehicle Safety Assessment Program:** Electronic Stability Control (ESC) and Autonomous Emergency Braking (AEB) by 2022-23

Emission Norms



- **Bharat Stage VI:** mandatory from April 1, 2020
- **CAFÉ** : Target **lower CO₂ emissions** through periodic improvements

Connected Car regulations:



- **AIS 140 (ARAI Standard)** released for *vehicle tracking system, camera surveillance system, and emergency request button.*

Privacy and data protection laws:



- "**Personal Data Protection Bill, 2018**" in consideration - similar to EU GDPR



Electric



Connected, Autonomous



Emissions



Safety

The *‘future of mobility’* is characterised by the ‘CASE’ disruption

Business + Customer shifts

“Usership” “Sharing”

Emission efficient

Connected & Safe

“Electronified”

+ Experience

Connected

Autonomous

Shared

Electric

Global

- **5G enabled** vehicles are expected to **dominate** sales by **2030**

- Automated driving tech. market for cars to be worth **\$270 billion** by **2030**

- **Shared mobility models** expected to account for **15-24%** of vehicle-based mobility by 2030

- **Range anxiety** still a concern. **FCEV** can smoothen transition

India

- **New entrants** in India offering “**connected**” services reported **superior sales**

- **Level 1/Level 2** autonomous vehicles to hit Indian roads **circa 2027**

- **Micro-mobility start-ups** increasing acceptability in India

- **e – 3Wheelers** leading adoption in India – **83%** of total sales in FY19

Source: PwC research & analysis , PwC Strategy& 2019 Digital Auto Report

1

Conected &
Autonomous

2

Shared
Mobility

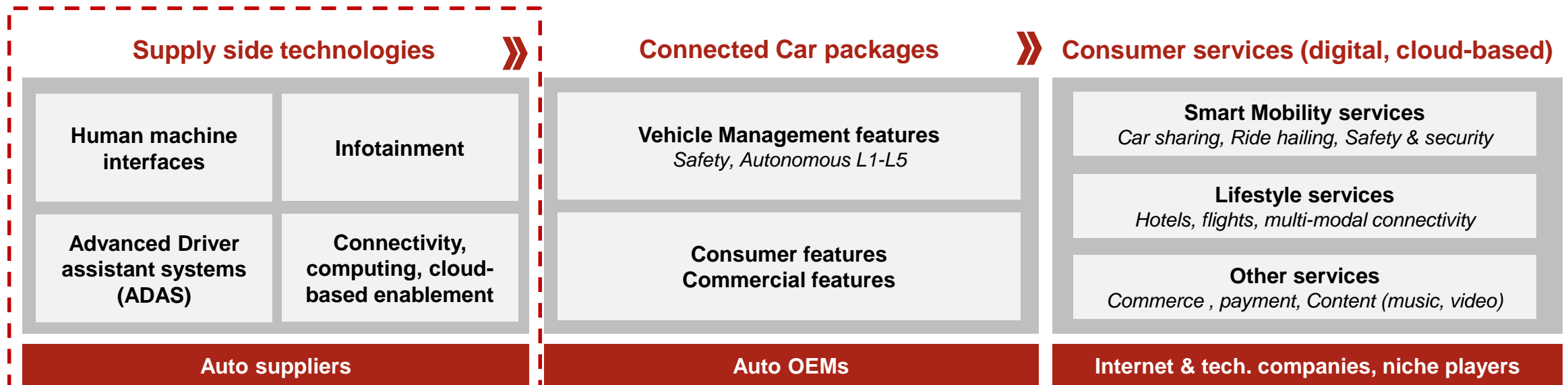
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Electric

Connected vehicles

“Connected vehicles are those that have access to the Internet and a variety of sensors, and that are thus able to send and receive signals, sense the physical environment around them, and interact with other vehicles or entities”
 – PwC Connected Car Report, 2016

Full range of connected car technologies & services



Most relevant to ACMA members

Increasing focus on *in-vehicle experience, data usage & mobility regulations* will drive multi-fold growth in the Indian connected vehicles market

Connected vehicle market drivers in India

Passenger vehicle



Key drivers

- **Mass adoption of smartphones**, coupled with low data costs ; proliferation of connectivity features
- Increasing deployment of Connected & ADAS features ; Recent activity - **“Suzuki Connect” , Hyundai Blue-link , Honda connect many more...**

Connected vehicle market drivers in India

Commercial vehicle



Key drivers






- Government regulations for driver safety and accident prevention , directives to fleet operators on **AIS140**
- **Bharat New Vehicle Safety Assessment Program** implemented - Electronic Stability Control (ESC) and Autonomous Emergency Braking (AEB) (2022-23)

Key drivers

- Per capita mobile data consumption : **38x jump** in last 5 years
- **5G** Commercial launch in 2021-22
- Govt. directive on conforming to **AIS 140** for public transport (buses) - effective April'18

The Indian *market is evolving* - while most players ‘wait & watch’, new entrants use it for differentiation; however, some of these services *may become commoditized*

Comparison of the OEMs offering connected services

OEM	Live Car Location	Stolen Vehicle Tracking	Geo-Fence Alert	Contextual Speeding Alert	Auto Crash / Emergency Alert	Unauthorized Access Alert	Idle Alert	Find my car	RSA	SOS Alert	Stolen Vehicle Immobilization	Valet Alert	Fuel Monitor	Battery Alert	Driver Scoring/ Behavior	Malfunction alert	Service History	Tire Deflation Status	Service Scheduler	Vehicle Health	Remote TPMS	Remote Car Start & Stop	Remote AC on & off	Remote Car & Boot Lock & Unlock	Live Traffic Information	Remote Vehicle Status	Remote Window & Sunroof Open / Close	Concierge Service	Voice Controls	Third Party services	
 Honda											x	x								x	x				x	x	x	x			
 Hyundai						x								x		x		x						x				x			
 Maruti		x				x		x			x	x		x		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x
 Kia						x								x		x		x													x
 MG						x	x		x	x	x	x	x	x	x	x	x	x	x						x	x	x	x			

Examples of commonly available services

Source : PwC research, Company websites, Aug 2020

Currently in India, *connected vehicle services* are around *three major usage-based clusters* - vehicle management, mobility & security management

8 usage-based clusters of functionalities

1 Vehicle Management

- Vehicle health diagnostic
- OTA updates
- Service notifications

3 Security

- Data security (Personal, vehicle)
- Cyber threats

5 Well-being

- Driver monitoring systems
- Fatigue protection

7 Home Integration

- Vehicle to grid (V2G)
- Smart home connection

2 Mobility Management

- Traffic updates
- Parking assists

4 Safety

- Collision avoidance
- Hazard warning signals,
- Lane departure warning signals

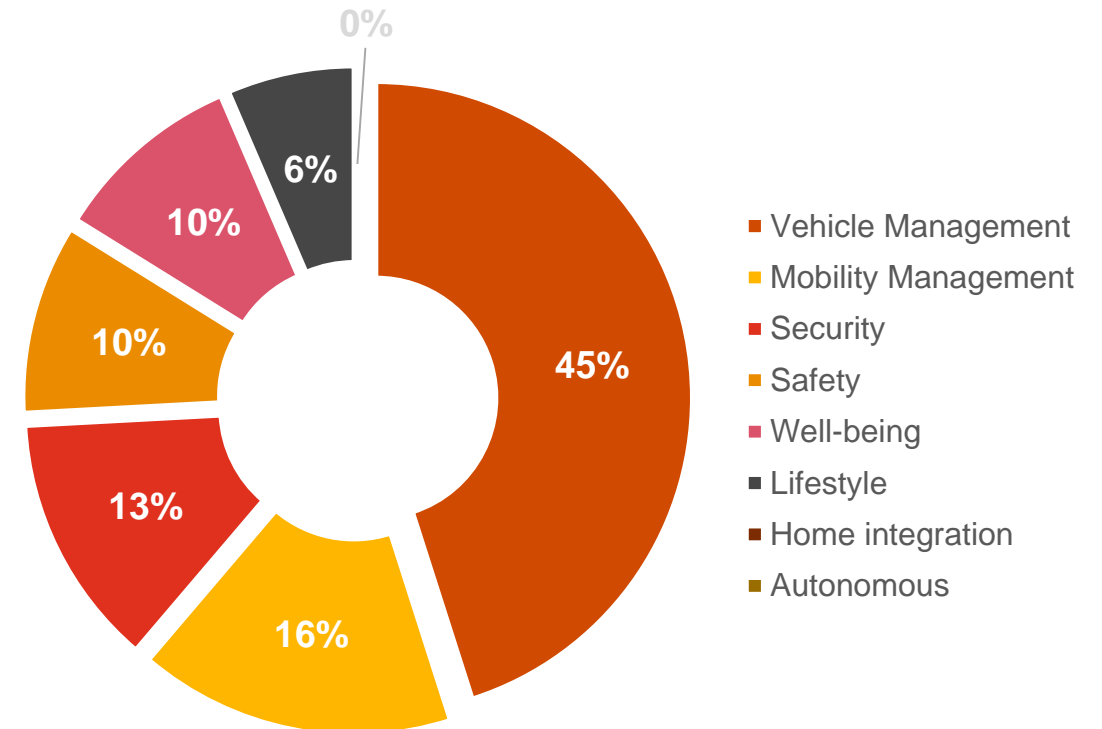
6 Lifestyle

- Infotainment
- Social networks, internet
- Mobile Office

8 Autonomous

- Distance / park / motorway assistant
- Distance / park / motorway pilot

Split of features offered today : Indian market



Source : PwC research, Company websites, Aug 2020

Similarly, OEMs are *driving localized ADAS solutions*; focusing on a practical and tiered roadmap with ‘safety’ being the major theme

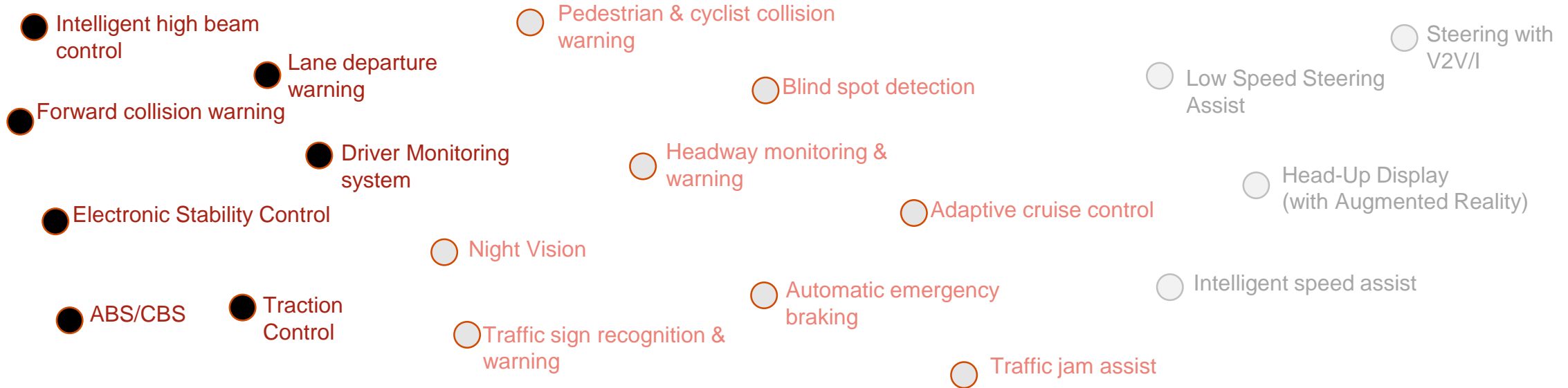
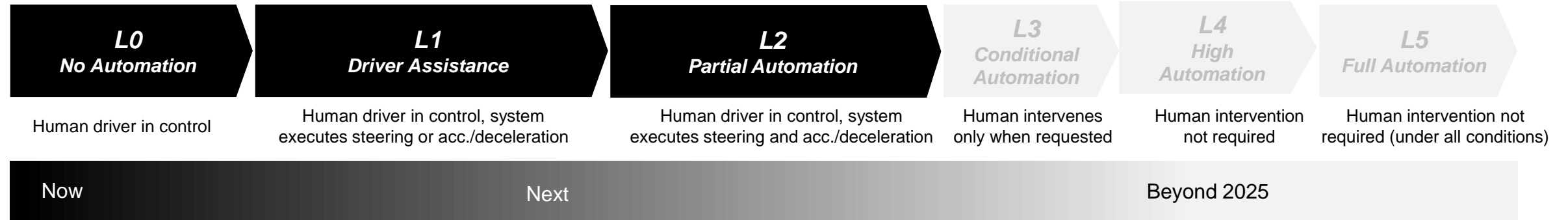
NON-EXHAUSTIVE

Advanced driver assistance system (ADAS)

Human driver monitors environment

Autonomous

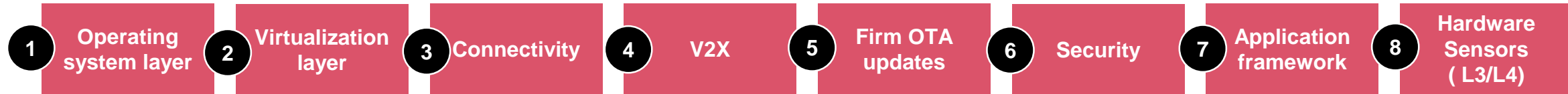
Vehicle system monitors environment



Connected & Autonomous : Where could be the start-up play ?

Product /Service Blocks

NON-EXHAUSTIVE



Brief description

- | | | | | | | | |
|---|---|--|--|---|--|--|---|
| <ul style="list-style-type: none"> Provides functionality like scheduling, memory management Linux, QNX, Android, VxWorks, auto industry has been traditionally dominated by OS like QNX due to its reliability | <ul style="list-style-type: none"> ECU consolidation where multiple functions like IVI, Connected Car Gateway, and Digital instrument cluster are integrated into a single ECU | <ul style="list-style-type: none"> Long range connectivity modems (LTE) and short range connectivity modems (Wi-Fi) Positional tracking systems like GPS | <ul style="list-style-type: none"> Helps in real-time communications New LTE standard (LTE-V) looking to standardize long and short-range communications | <ul style="list-style-type: none"> Software updates needed to fix issues like security vulnerabilities uncovered from time to time Helps keep software in unit up-to-date | <ul style="list-style-type: none"> Implements various mechanisms like access restrictions/privilege control to secure connected car gateway | <ul style="list-style-type: none"> Allows 3rd parties to develop applications Enables ecosystem development for services like UBI, E-Comm etc | <ul style="list-style-type: none"> I/O devices (e.g., sensors, 4K/8K displays, HUDs, HMIs), (ADAS) sensors, such as high-resolution stereo and/or mono cameras, RADAR, and LIDAR |
|---|---|--|--|---|--|--|---|

Start-up play

Moderate High Low Low Moderate High Moderate

Considerations

- | | | | | | |
|--|---|--|---|---|--|
| <ul style="list-style-type: none"> Core: Algorithm and OS that connect all devices Customizations driven by OEMs High barriers to entry for start-ups Automotive consortiums working towards standardizing OS : Standardize the non-differentiating middleware | <ul style="list-style-type: none"> Core: GPS system to connect the devices used by the application. Growing demand for telematics Start-ups creating value-added solutions | <ul style="list-style-type: none"> Telecom manufacturers with existing set-up, capabilities have advantage Start-ups find it difficult to find capital and set-up facilities | <ul style="list-style-type: none"> Similar to Algorithm and OS to connect devices Driven by OEMS High barriers to entry for start-ups Many system integrators | <ul style="list-style-type: none"> Space is fragmented Scope for start-ups to aggregate point-of-interests (PoIs) by building application framework | <ul style="list-style-type: none"> Capital intensive; but given there is technology know-how synergy possible from access to manufacturing facility |
|--|---|--|---|---|--|

1

Connected &
Autonomous

2

Shared
Mobility

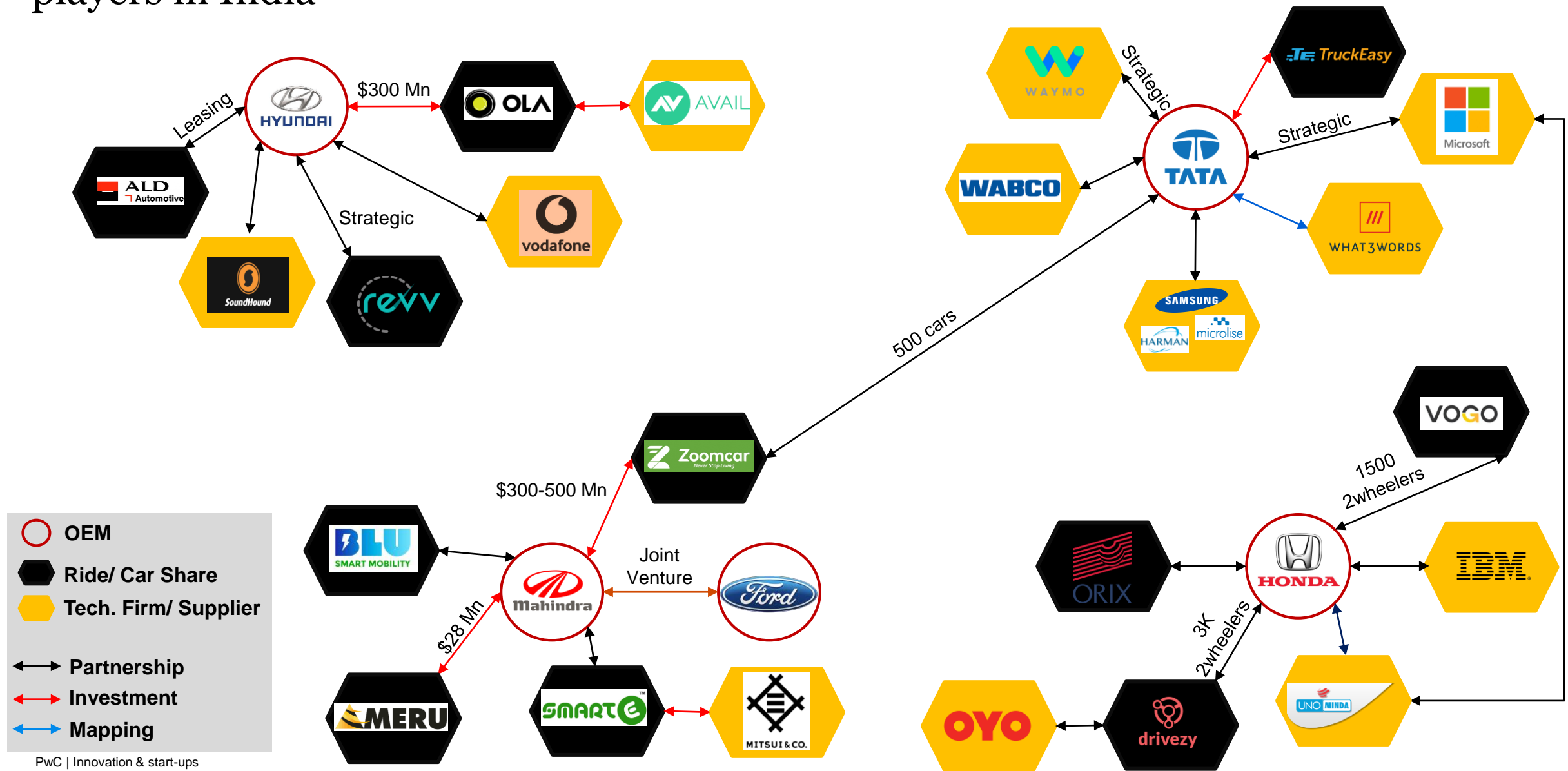
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Electric

There are seven major segments for *Mobility-as-a-Service* providers

Market Segment	1 Ride sourcing/ Ride hailing	2 Ride Splitting	3 Car Rental	4 Mass Transit	5 Car sharing/ Car hailing	6 Car Subscription	7 Fleet/Car leasing
Attributes							
Driving	Driver Driven				Self Driven		
Route	Point to point & Dynamic		Point to point		Dynamic Route		
Tenure	Few hours to full day		Hourly, Daily	Few Hours	Hours to Days	Months to years	Years
Customer Segments							
B2B2C	Employee pick up & drop		Employee pick up & drop	Employee pick up & drop			Corporate/ Govt. leasing
B2C	Personal use	Personal use	Personal use	Public utilities	Personal use	Personal use	Personal use
India Examples	-Ola -Uber	- UberPool - OlaShare	- Meru - MoveInSync	- Shuttl - Public trans.	- Revv - Zoomcar	-Revv -ZAPSubscribe	- Avis - Orix
Global Examples	- Grab - Lyft	- Lyft Shared - Careem SAWA		- Via - GrabShuttle	- ZipCar - Sixt	- FlexDrive - Fair	- Hertz

An illustrative view of the *“interconnected”* and *“collaborative”* network of mobility players in India



1

Connected &
Autonomous

2

Shared
Mobility

3

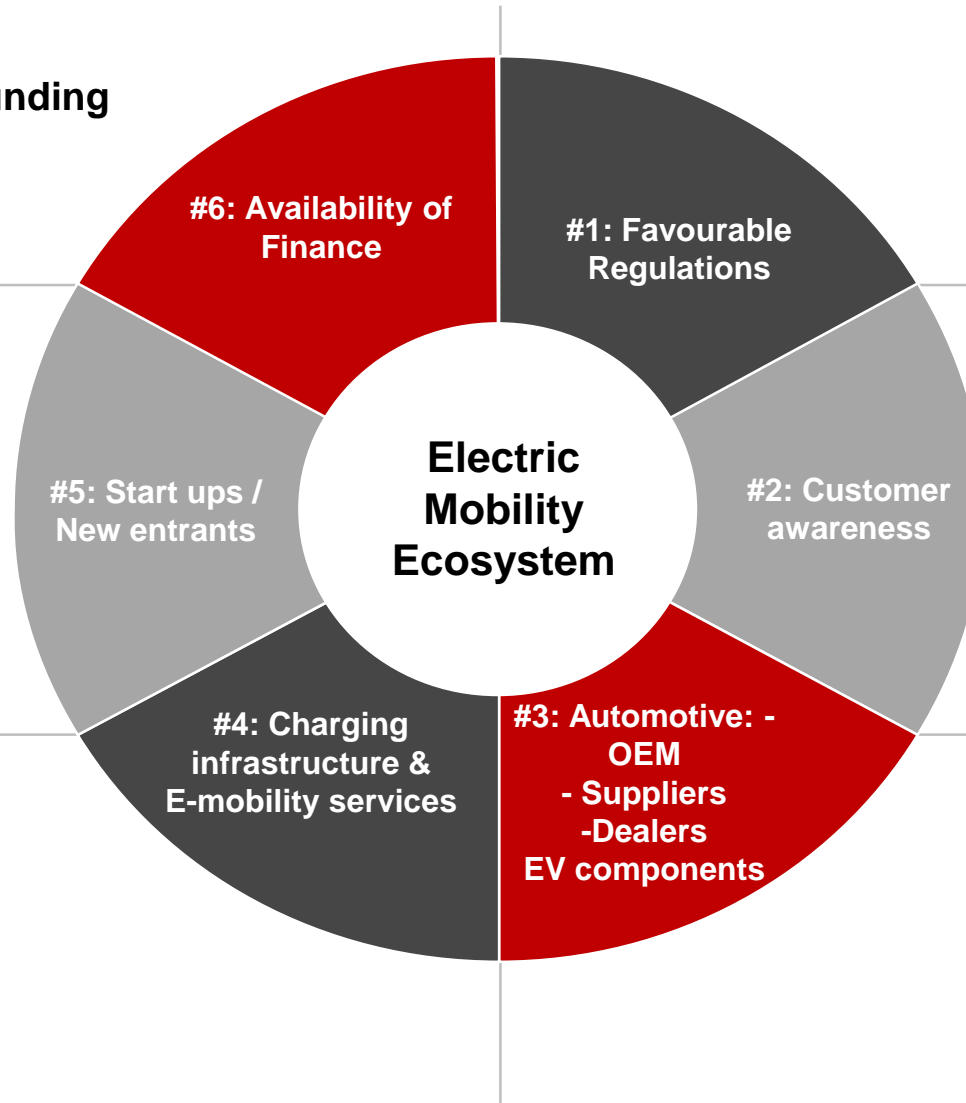
Electric

A holistic approach will push *e-mobility* towards *sustained adoption*

- Banking for vehicle purchase
- Angel/ Venture/ Private Equity funding
- Project financing
- Risk mitigation

- Ease of doing business
- Level playing field
- Catalyst projects
- Collaboration with Academia
- R&D grants

- Bankable PPP Contracts
- Financial viability
- New business models
- Payment and Information



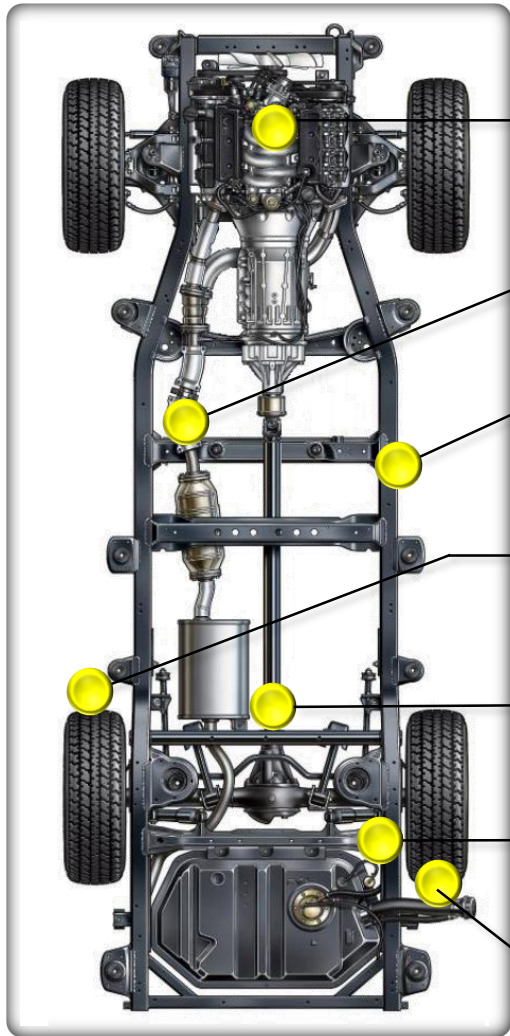
- Demand creation incentives/ differential Tax
- State regulations
- Investment promotion policy
- Make in India











- Economic rationale
- Creating awareness
- Catalyst projects
- Shared mobility
- Public transport

- Socio Economic impact
- Skill Gap
- Impact on Local suppliers
- Technology & RM availability

EV changes will manifest in different **products** across vehicle segments

Replaced sub-systems, redesigned modules, use of new technology, light-weighting and so on

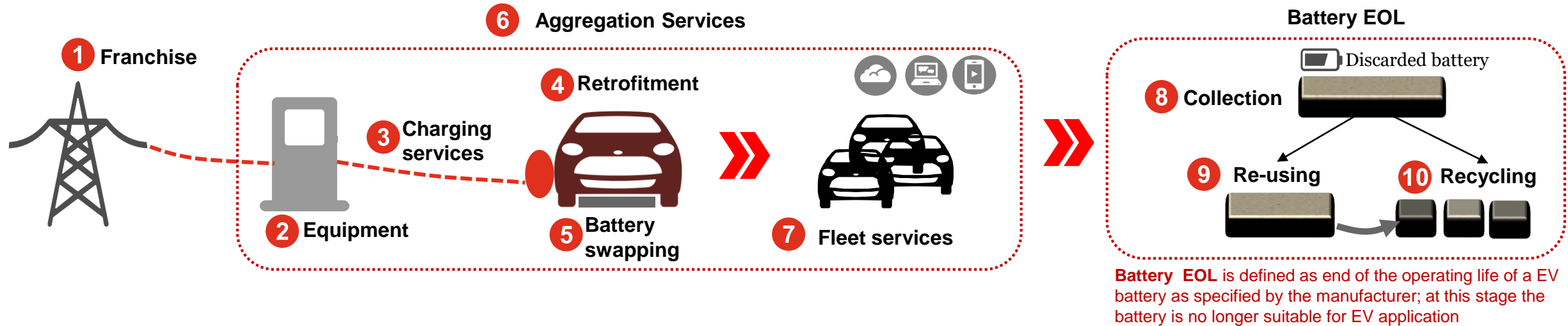


Sub-system	BEV	Changes to the sub-system
I.C. Engine	● ○ ○	 On-board charger  Battery pack  BMS  Power electronics  Motor
Exhaust	● ○ ○	Applicable Only for Hybrids
Interiors & HVAC	○ ● ○	 Electric compressor NVH & BSR Enhanced specs
Braking	○ ● ○	 Electro-mechanical brake boost  Aluminium disc braking
Transmission	○ ● ○	 One/Two speed low NVH gearbox, may / may not be Integrated with motor (BEV)
Chassis	○ ● ○	Complete redesign for new weight distribution pattern
Wheels	○ ● ○	 Redesigned wheels to accommodate In Wheel Motors / Hub Motors

ILLUSTRATIVE, NON-EXHAUSTIVE

● ○ ○ Not applicable ○ ● ○ Moderately applicable ○ ○ ● Highly applicable

Similarly, plethora of opportunities will open in *EV services* (direct & ancillary)



1 Franchise

Private players can become franchises of Discoms to sell electricity for charging

2 Equipment

EV charging equipment manufacturing/ supply for the domestic market

3 Charging services

Provision of charging facilities to the customers – involves installation, maintenance and operating charging infra as a primary business

4 Retrofitment

Retrofitting the existing/new vehicles with the EV powertrain kits

5 Battery swapping

Battery swapping system as an alternative to spot charging

6 Aggregation Services

Cloud, software or application based services for aggregating the EV services

7 Fleet services

Operating a EV fleet- point to point or leasing

8 Collection

Establishment of used EV batteries collection infrastructure and making them available for the disposal process

9 Re-using

Repacking used EV batteries to make a smaller batteries suitable for stationary applications such as inverters etc,

10 Recycling

Recycling batteries to retrieve usable contents, thus minimizing the environmental impact of the dumped batteries

E-Mobility : Where could be the start-up play ?

Product /Service Blocks

NON-EXHAUSTIVE



Brief description	1 Motor	2 Battery	3 Battery Mgmt. System	4 On board charger	5 Inverter, reducer	6 Low voltage DC-DC Converter	7 Vehicle Control Unit	8 EV Services
	<ul style="list-style-type: none"> • Players using different types • Toyota, Ford: Permanent magnet synchronous motor • Tesla: Induction motor 	<ul style="list-style-type: none"> • Assemblers mostly today in India • Different types of batteries being used like Li-on, Nickel-metal hydride, lead-acid battery 	<ul style="list-style-type: none"> • Manages the battery's many cells so that they can operate as a single entity 	<ul style="list-style-type: none"> • Used to convert AC current from slow chargers/portable chargers to DC current 	<ul style="list-style-type: none"> • Inverter: responsible for executing acceleration and deceleration • Reducer: effectively conveys motor's power to wheel by reducing rpm 	<ul style="list-style-type: none"> • Converts high voltage electricity from battery into low voltage and supplies to various electronic systems 	<ul style="list-style-type: none"> • Oversees nearly all of the vehicle's power control mechanisms like motor control, regenerative braking etc. 	<ul style="list-style-type: none"> • Battery Swapping, EV Charging Infrastructure etc.

Start-up play	High	Moderate	High	Minimum to Low	Moderate	High
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Considerations	High	Moderate	High	Minimum to Low	Moderate	High
	<ul style="list-style-type: none"> • Capital intensive • However, start-ups offering expertise in design and development • Technology choice :DC Series, BLDC, PMSM, 3Ph-IM, SRM 	<ul style="list-style-type: none"> • Traction in identifying alternate materials for designing batteries • Research ongoing to reduce reliance on li-on battery 	<ul style="list-style-type: none"> • Core: Algorithm to monitor and enhance battery performance and life • Start-ups functioning in this space 	<ul style="list-style-type: none"> • Core: Circuit design (standard item) • Need to achieve Economies of scale critical to lower cost 	<ul style="list-style-type: none"> • Requires niche expertise to write algorithms • At the core is the chip. Very few companies like Bosch have capabilities 	<ul style="list-style-type: none"> • Battery swapping models being tested by some start-ups • Low cost EV-charging models also being tested

On enterprise front, technology will enable multiple use cases across value chain functions aligned to our *efficiency track objectives*

NON-EXHAUSTIVE

	R&D	Sourcing	Manufacturing	Sales & Distribution	HR	IT	Finance
Efficiency track Objectives	Time & cost reduction for NPD,	Digital supply chain for real time visibility, Tier-N Supplier risk	Conversion costs, efficiencies, product quality, dynamic demand	Enhance digital presence, CRM, transparency	Employee experience, digital ways of collaboration, paperless	Security, Data quality, Performance Visibility, ERM	Transaction automation, Cost optimization
AI / ML	Crash Test Simulation, ECU parameter configuration	Resilient Sourcing, Vendor selection and spend visibility	Smart Factory& Predictive Maintenance, Warranty Analytics	Inventory & Pricing Optimization, Sentiment Analysis	Conversational AI, Workforce Planning, Attrition Analytics	Data & AI Governance, Risk & Controls	Prescriptive business insights, fraud analytics
Cyber Security	Vehicle safety & control, Prototype protection, espionage	TISAX, Tier-N Suppliers vulnerability	General phishing	Omnichannel defense, Customer & Vehicle Data protection	GDPR, PDP obligations	Penetration Testing ITGC control testing Access Control	Identify thefts, software vulnerabilities, misinformation
IoT	Collaborative design, 3D Design engr., Additive manufacturing	Procurement 4.0	IIoT, MES, Predictive maintenance, In-line QC, eLogbook, RFID	Automated warehouse, telematics, B2C apps, Call center	Helplines, Shared services, Command center	Digital TAM	
AR/VR/MR/XR	Design concept in CAVE (Cave Automatic Virtual Environment)	Virtual components testing and verification	AR/VR to provide remote instructions and increase productivity	AR/VR headsets to provide immersive product experience & info	VR headsets to provide immersive employee training		
RPA	<ul style="list-style-type: none"> •Research report search and download •Automated statistical analysis 	<ul style="list-style-type: none"> -PR/ PO Creation •Vendor Master Maintenance 	<ul style="list-style-type: none"> -Streamline Bill of Materials -Inventory Tracking 	<ul style="list-style-type: none"> •Sales reconciliation -Lead generation •Reporting 	<ul style="list-style-type: none"> -Optimized Talent Search -Employee Onboarding -Touchless L&D 	<ul style="list-style-type: none"> -Identity and access management -Incident management -patch management 	<ul style="list-style-type: none"> •Invoice Processing -Payment processing -Bank Reconciliation -Cash Application

Industry 4.0 / Smart Manufacturing : Where could be the start-up play ?

NON-EXHAUSTIVE



Brief description

- PLC, CNC data Capturing (Serial, ethernet etc).
- Data capturing from multiple protocols
- Cloud Gateways
- Edge computing
- Data Management / WH
- Control systems/applications
- Training ML models
- BI Dashboard, Apps etc.

IoT solution for energy and asset management.

Connecting sensors to a central IoT platform across plants

AI and Camera Sensors for Quality Inspection

Platforms for defect detection and quality assurance

Deployment of meters and other important wireless actuators, sensors (e.g., temperature, humidity), at various levels including machine level

1. Block of material which is then broken into the shape required (lot of material wastage, high cost)
2. Additive: shape created by adding material (zero wastage, time taking)

Various forms of Graphene and Carbon Nanotubes - nano powder, nanomaterials, nanocomposites, nanoalloys, nanowires, graphene

Design consultations

Start-up play

High

High

High

High

Moderate

Moderate

Considerations

The core of these technologies is the platform to connect the devices that will be used by the application. Given the growing demand for Industry 4.0, and the low entry cost to set up systems, lot of start-ups fight in this space

Many integrators in this space who get the hardware available in the market to link it with the platform available

Either find start-ups that have become very efficient at 3D printing huge quantities
OR
3D printer to make fixture (eg. component in place) that helps in manufacturing of components (save lead time, operational efficiency)

Given the possible use cases, auto-component players are collaborating with other mobility players, including start-ups to *develop capabilities (1/2)*

Global Examples

NON-EXHAUSTIVE

Use Case	Company	Start-up	Description
Autonomous (Environment Perception)	ZF Friedrichshafen	Ibeo	Majority stake to expand capabilities in LiDAR sensors and associated products
	Denso	Thinci	Investment agreement with deep-learning vision processing start-up
Cybersecurity	Magna International	Argus Security	Partnership to address cybersecurity concerns in connected vehicles
Artificial Intelligence	Continental AG	Cartica AI	Minority stake in start-up that develops algorithms to accelerate machine learning
	Sumimoto Corp.	Anagog	Stake in start-up providing edge computing AI solution addressing privacy

Given the possible use cases, auto-component players are collaborating with other mobility players, including start-ups to *develop capabilities (2/2)*

Indian Examples

NON-EXHAUSTIVE

Use Case	Company	Start-up	Description
Fleet Management and utilization analytics	Bosch	Routematic	Invested \$2 Million in platform
	Varroc	CarlQ	Acquired 74% stake in connected vehicle solution provider
	Wabco	Asset Trackr	Acquired telematics start-up to expand fleet management solution
Vehicle Operations	Hella India	Pitstop	Partnered with full-stack vehicle service provider for multi-brand workshops
E-Mobility Value Chain	Greaves Cotton	Ampere	Acquired to expand presence in the electric mobility space
	Bharat Forge	Tork Motors	Made additional investment in electric vehicle (EV) start-up
	Bosch	Sun Mobility	Minority stake to tap new opportunities in the electric mobility space
Electric Vehicle Components	Ucal Systems	Grinntech Energy	Investment in start-up that manufactures Li-on batteries for electric vehicles

Experience sharing (15 mins)



Kiran Deshmukh
Chief Technology Officer
Sona Comstar



Todd Morgan
Chief Technology & Innovation
Officer
Lumax Group



Akhilesh Rai
Chief Strategy Officer
Suprajit Group

- Use cases where start-ups are functioning globally
- Experiences engaging with start-ups in India and abroad

Thus, we see these megatrends demand a *faster pace of innovation* from auto-component manufacturers

Key areas of disruption – auto & mobility

Changing customer needs
Ownership to 'Usership'

New business models
ACES impact

Automation & Digital
Industry 4.0, RPA, Remote working

New genre of competition
Technology players entering the space

Evolving Marketplace
Product to Service

Dynamic regulations
Safe, Clean & Green (Emission, Traceability etc.)

- Need for *Rapid Innovation*
- *Engagement with start-ups* is thus seen as one of the key levers of innovation



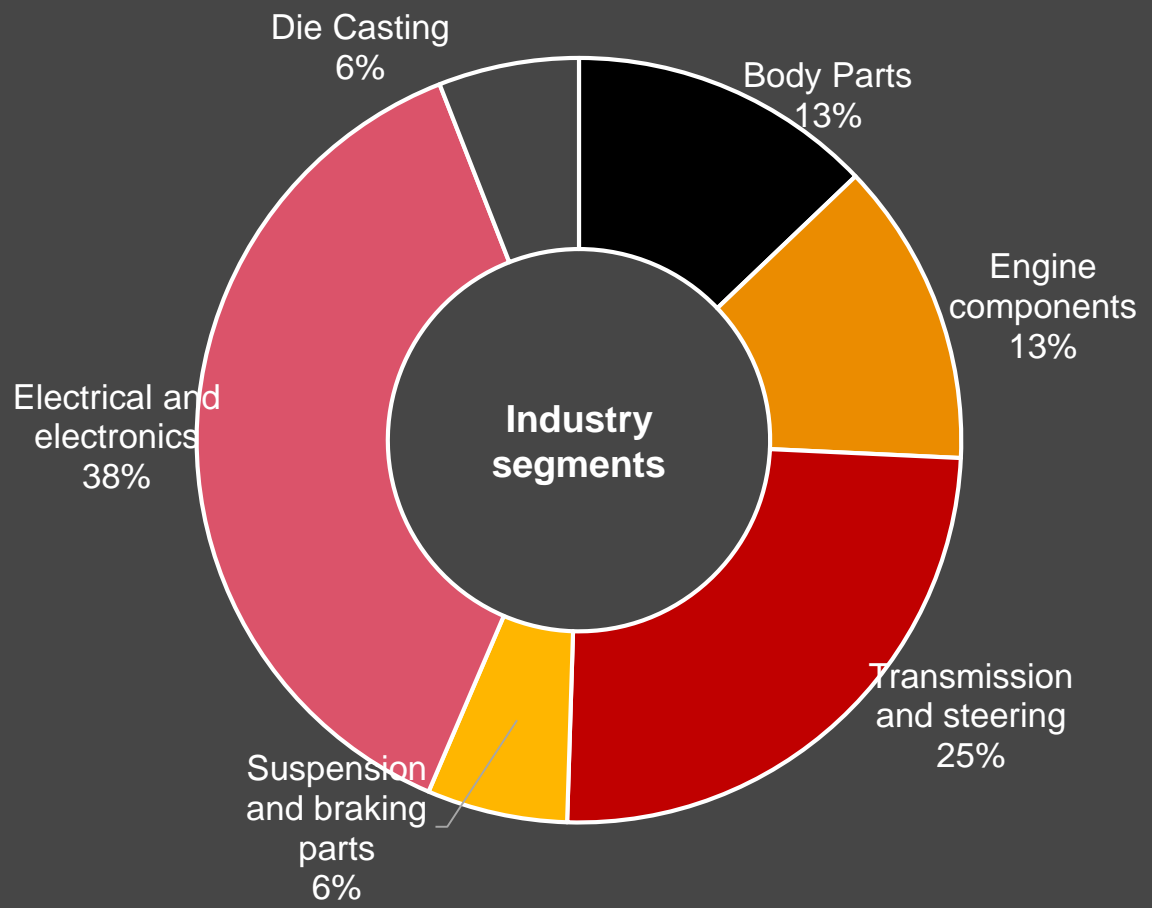
*So, what exactly are **start-ups**?*

What can we expect by engaging with them?

All 16 ACMA pilot members participated in the online survey



Respondents by industry segment

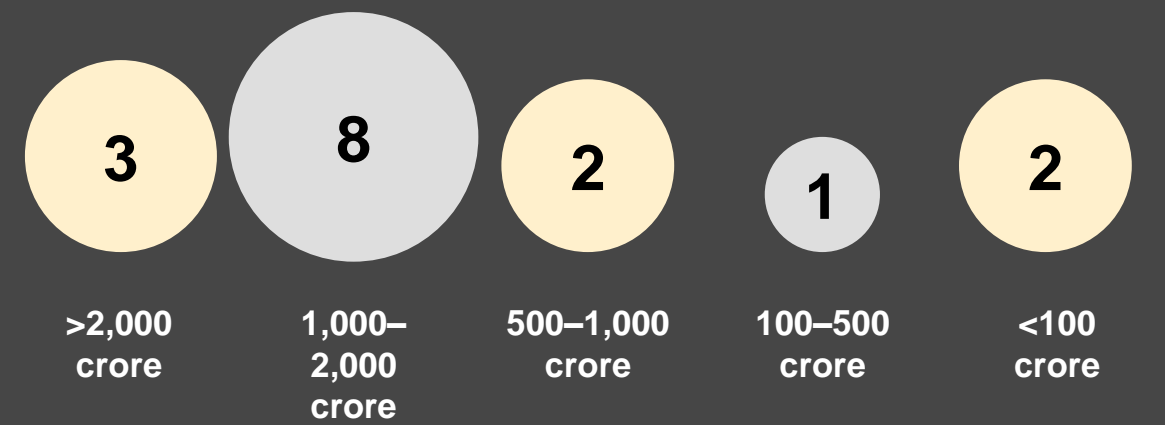


Respondents by function

CEO/MD/JMD	CFO
President	CTO
Chief Strategy Officer	Business Head – Automotive OE
AVP Engineering	Senior Mobility Consultant



Respondents by revenue size (INR)

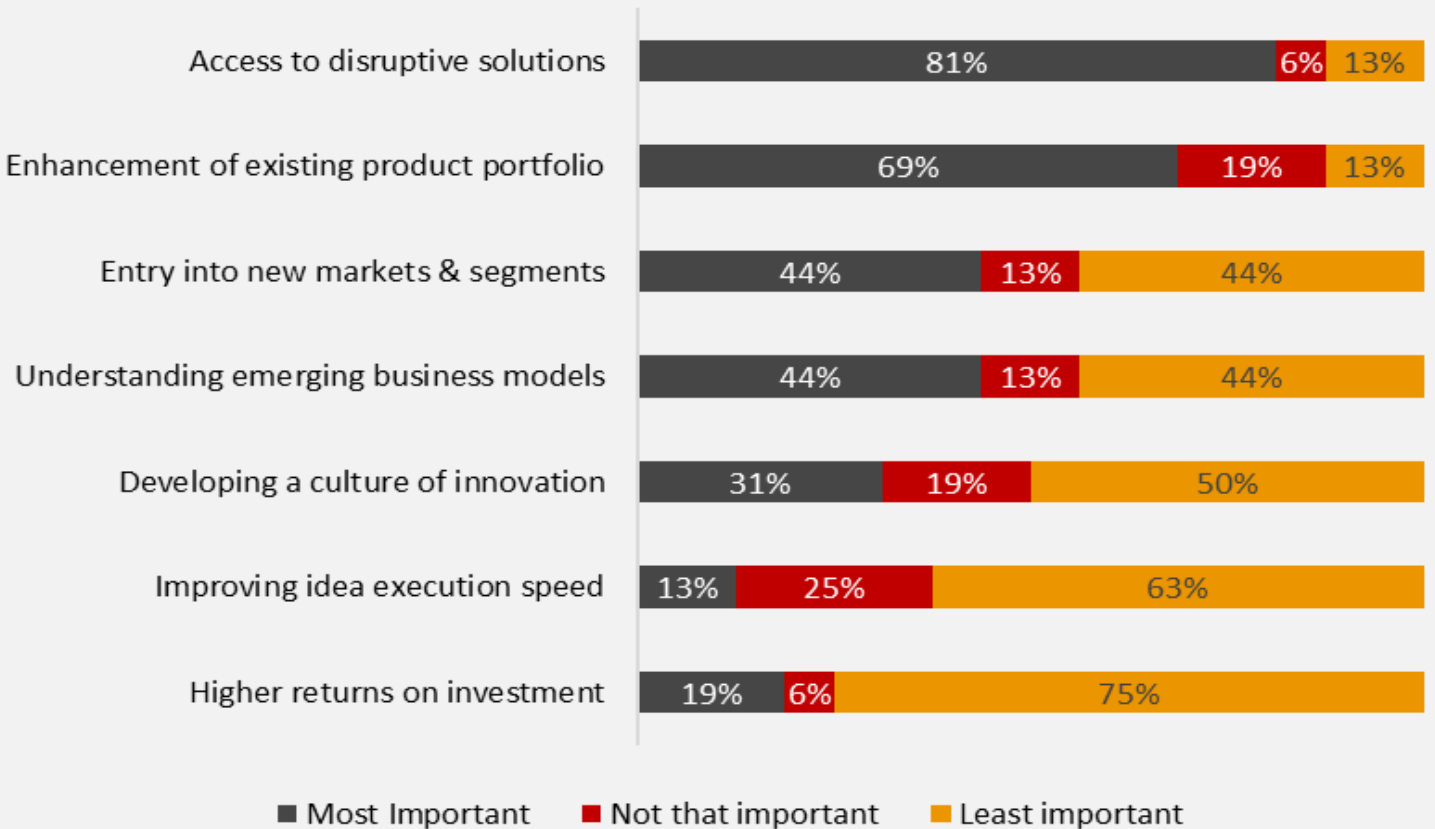


Top benefits : Access to disruptive solutions , enhancing portfolio

What do you think are/would be the top benefits of collaborating with start-ups?



Top benefits of collaborating with start-ups



This group's expectations from engaging with start-ups

- Getting **access to disruptive solutions** that help address existing and emerging business challenges **most important benefit with more than 4/5th pilot members ranking it in their top 3**
- Generating **higher returns on investment** not considered an important benefit with **3/4th pilot members ranking it amongst the least important benefits** that can be expected

How do we define a start-up in this program's context

As per the Ministry of Commerce & Industry, Gov:

- Entity working towards **innovation**, development or **improvement of products or processes or services**
- Not formed by splitting up or reconstruction of an existing business
- **Period of existence** and operation should **not be exceeding 10 years**
- **Turnover has not exceeded INR 100 Cr** for any of the financial year since incorporation

We take the government's definition as base and contextualize for the ACMA Start-up Initiative

- Entity has a **unique and disruptive solution** (For e.g., new type of EV motor design rather than a slightly modified electronic power control (EPC) unit)
- Has achieved at least minimum marketable product (**MMP**)/ minimum viable product (**MVP**) **level maturity**
- **Period of existence** not exceeding **10 years**, some exceptions will be made if great fit for program

Other considerations

- Has auto-specific use cases and clients (+ve)
- Is a subsidiary/partner/tightly-coupled to established companies (-ve)

Session speaker: Mr. Murali Talasila



Murali Talasila

*Partner, Start-ups and Innovation
Leader, PwC India*

Murali leads the Innovation practice at PwC India

He also leads PwC India's start-up practice where he plays a key role in identifying start-ups and structuring and refining their investment models

He has over 22 years of experience spanning 3 continents, in the faculties of innovation, technology, new media and community creation

Select Experiences

- **T-Hub Partnership:** Set up the innovation hub at T-Hub. Organized themed hackathons, accelerator programs, community connect and corporate innovation programs
- **Elevate 100:** Assisted the Karnataka Government with the overall conduct of the program. Played the role of knowledge partner, business mentor and strategy consultant to the start-up community

Session speaker: Mr. Murali Talasila



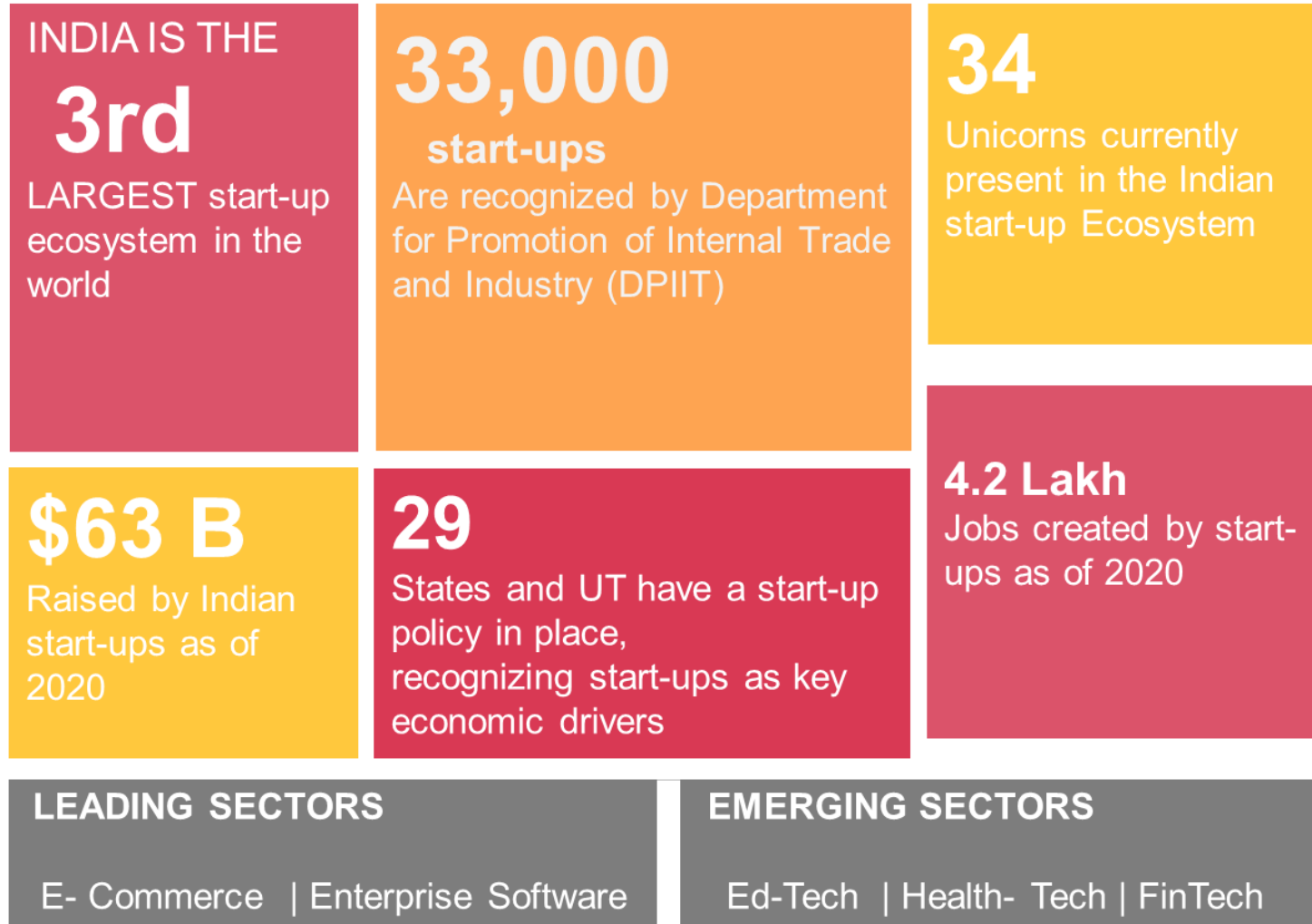
Murali Talasila

*Partner, Start-ups and Innovation
Leader, PwC India*

Agenda for today (20 mins)

- **How is the Indian start-up ecosystem structured?**
- **What are the challenges that start-ups face over their journey and when dealing with different stakeholders?**
- **What are the gaps in engagement with start-ups?**
- **How can ACMA pilot members meaningfully engage with start-ups?**

India has a budding start-up ecosystem with a growing share of automotive & mobility start-ups

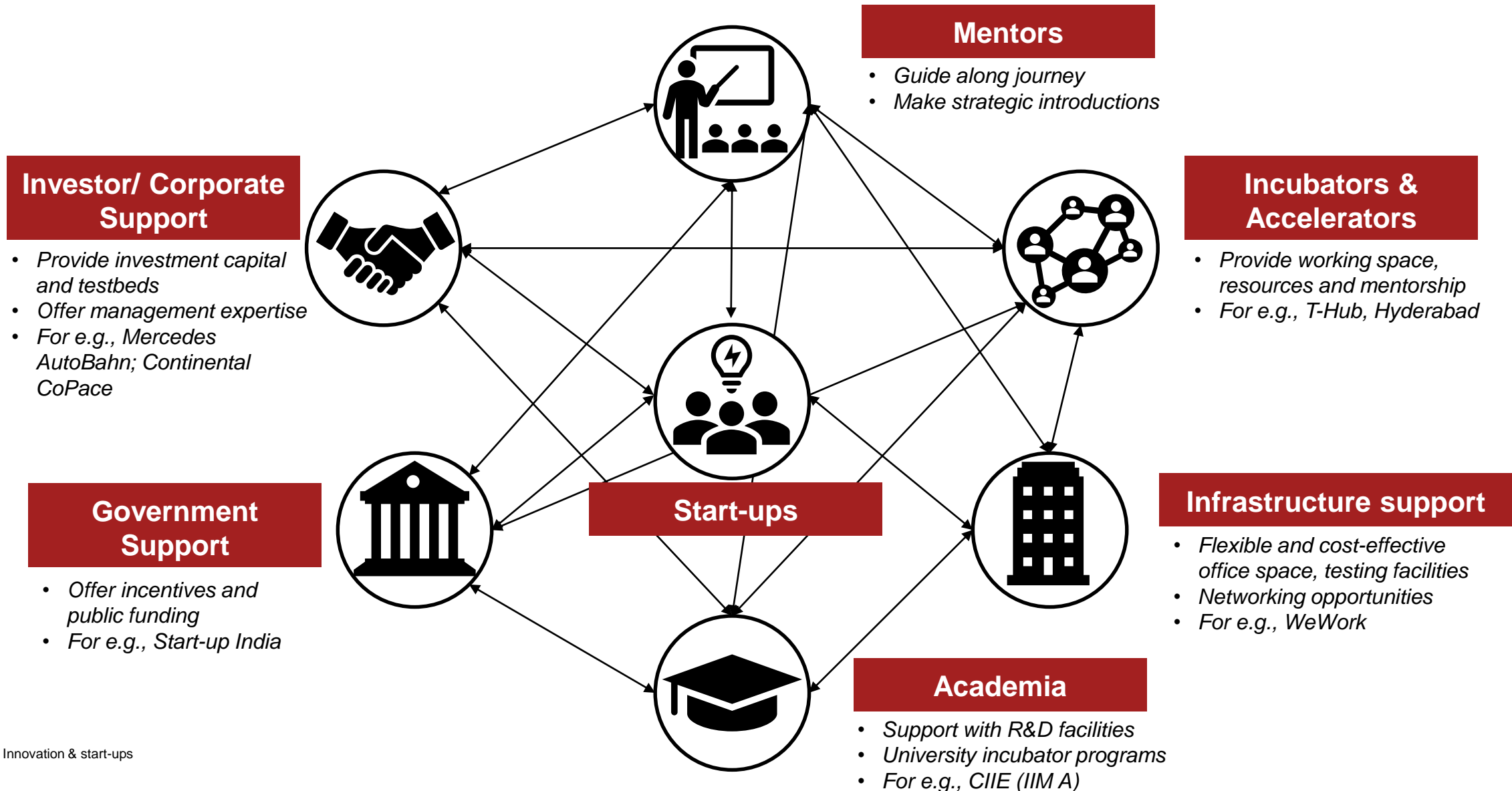


Share of automotive and mobility start-ups



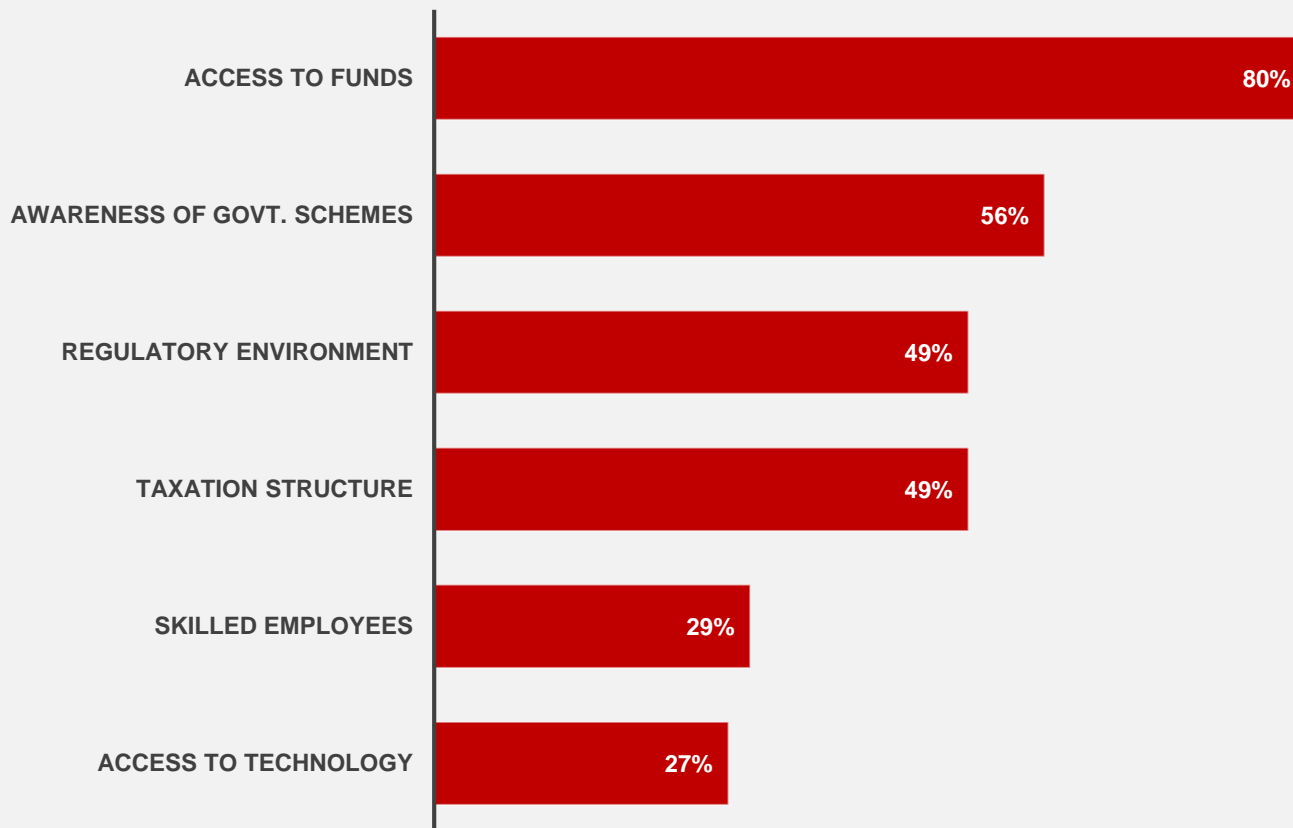
Source: PwC analysis, government portals

The start-up ecosystem comprises of different stakeholders that engage with and support start-ups along their journey



Major inhibitors of success for start-ups

PwC surveyed 120+ Indian start-ups to understand and identify their most pressing concerns



- **4/5th of start-ups** surveyed considered **access to funds** to be the **biggest inhibitor** to their success
- **Lack of awareness of government support schemes** another important inhibitor of success with nearly **3/5th** of surveyed start-ups highlighting it as a concern

Open house for Q&A ...

Let's take a 15 mins breather

Agenda

Topic

Duration

- | | | |
|---|--|---------|
| 1 | Trends in automotive & mobility; role of start-ups | 75 mins |
| 2 | Engaging with start-ups; capabilities required | 60 mins |
| 3 | Priority areas that the program should cover | 20 mins |
| 4 | Brainstorming and theme finalization | 20 mins |
| 5 | Next Steps | 20 mins |

This is a **Strong Community** ...

~ 1000 years of combined experience

Representation from all major aggregate categories

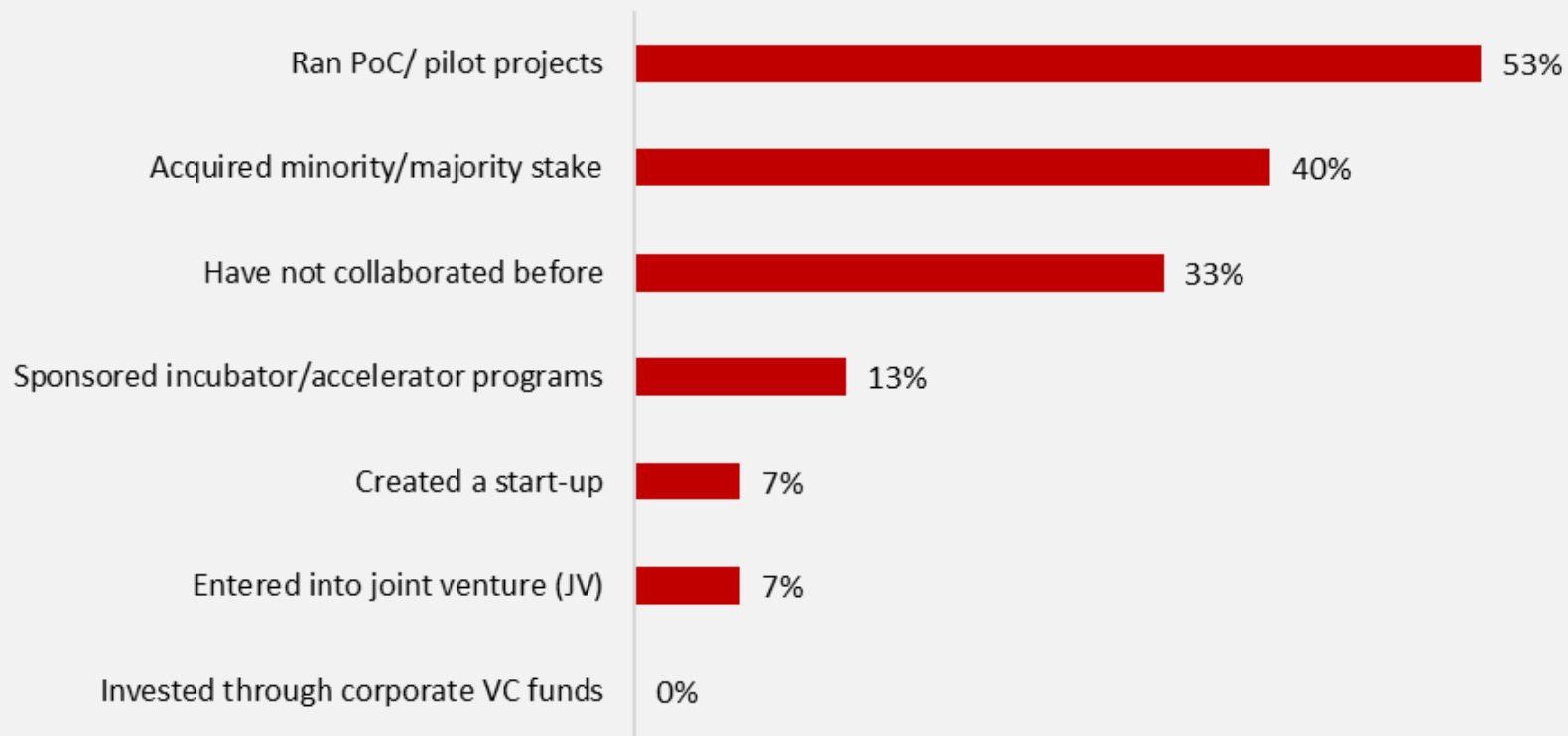
*Combined operating revenues >INR 30,000 Crs**

How about the group's experience on start-up front?

2/3rd of pilot members engaged with start-ups before

If your organization has engaged with start-ups before, what was the mode of engagement?

Prior experience engaging with start-ups



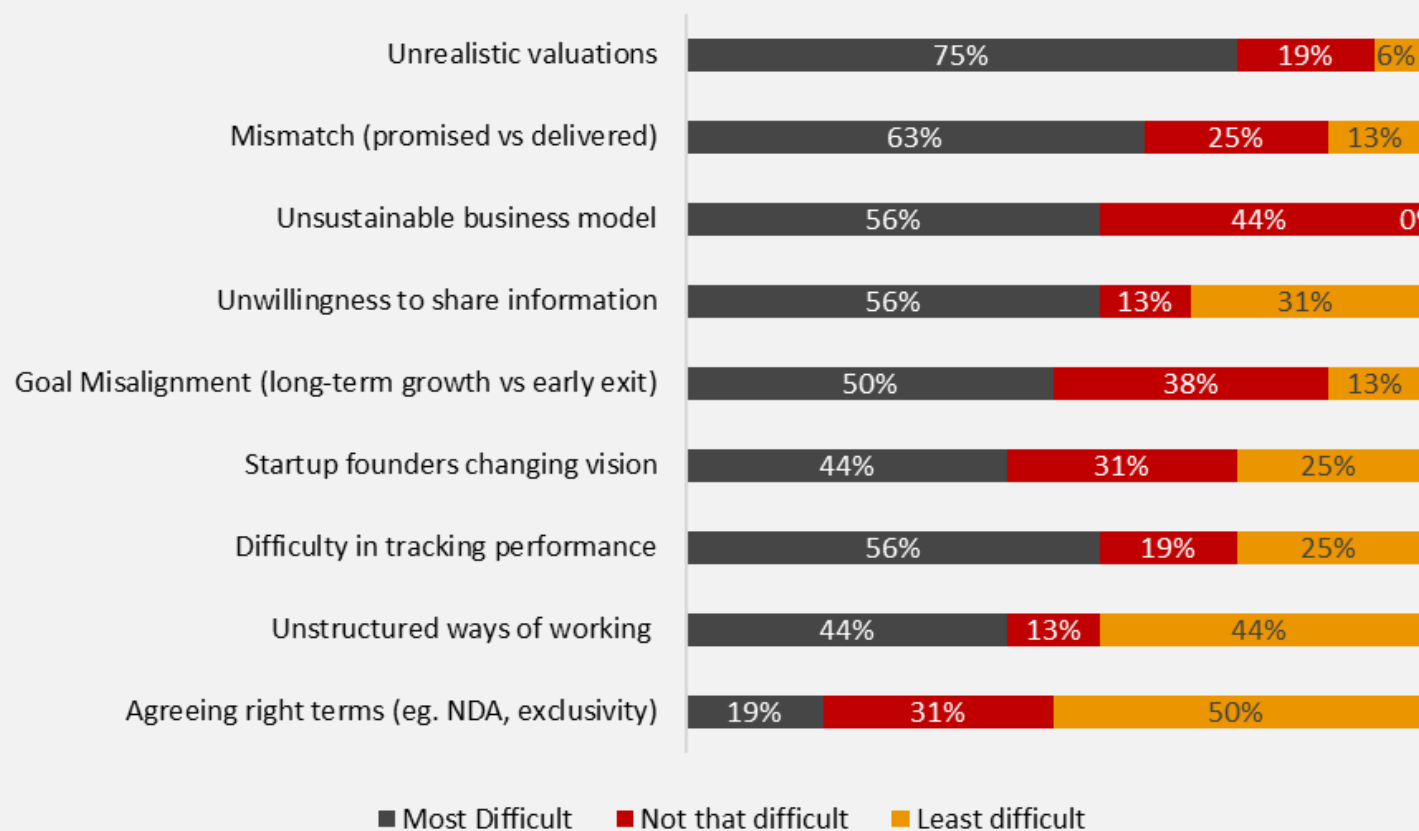
Previous modes of start-up engagement

- Running **proof-of-concepts/ pilot projects** are the most frequently used modes of engagement with start-ups
- **Acquiring minority/majority stake** is next, with > 1/3rd pilot members having engaged through this mode

3/4th pilot members consider unrealistic valuations to be most difficult

Please rate difficulty in overcoming the below challenges faced when engaging with start-ups

Challenges during engagement with start-ups



Difficulty in overcoming challenges during engagement

- **Trust** an important **factor** that determines engagement outcomes; gets built over the course of the engagement
- While a start-up's unwillingness to share information during initial conversations is a big challenge with majority of members highlighting it as a concern
- **Agreeing on NDAs, exclusivity rights** are not considered that much of a challenge with **50% of pilot members** reporting it as the **least difficult challenge**

Unrealistic valuations & inability to deliver as promised biggest reasons why engagements fail

In your view, top 3 reasons that collaborations betn. traditional auto companies & start-ups fail?

Lack of prior experience working with start-ups

Lack of product fit

Non-adherence to agreed timelines

Expectations

Fear of failure

Mismatch

Inability to convert idea into business model

Unwilling to share information

Unrealistic Valuation

Inadequate communication

Why do collaborations fail?

- **Lack of prior experience** engaging with start-ups is also a **big hurdle affecting ability to effectively collaborate**, with pilot members highlighting internal challenges like:
 - Having a fixed mindset
 - Inability to evaluate start-up's capabilities
 - Slow decision making

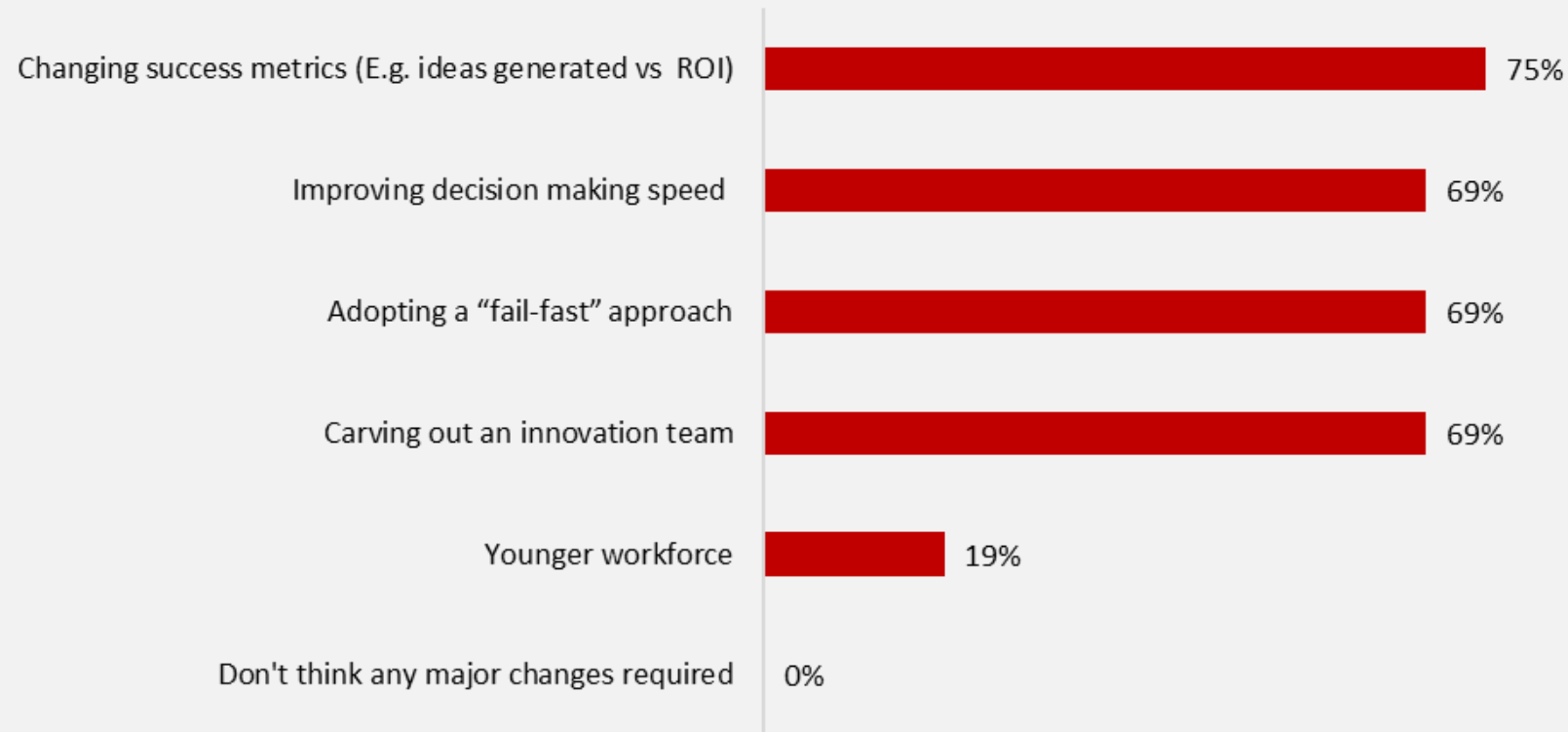
*What steps can we take to **engage better?***

Adopting success metrics less focused on ROI & improving decision making speed key to improvement

What are the *3 key changes required within traditional automotive* companies that would enable better engagement with start-ups?



Ways to better engage with start-ups



How to better engage with start-ups?

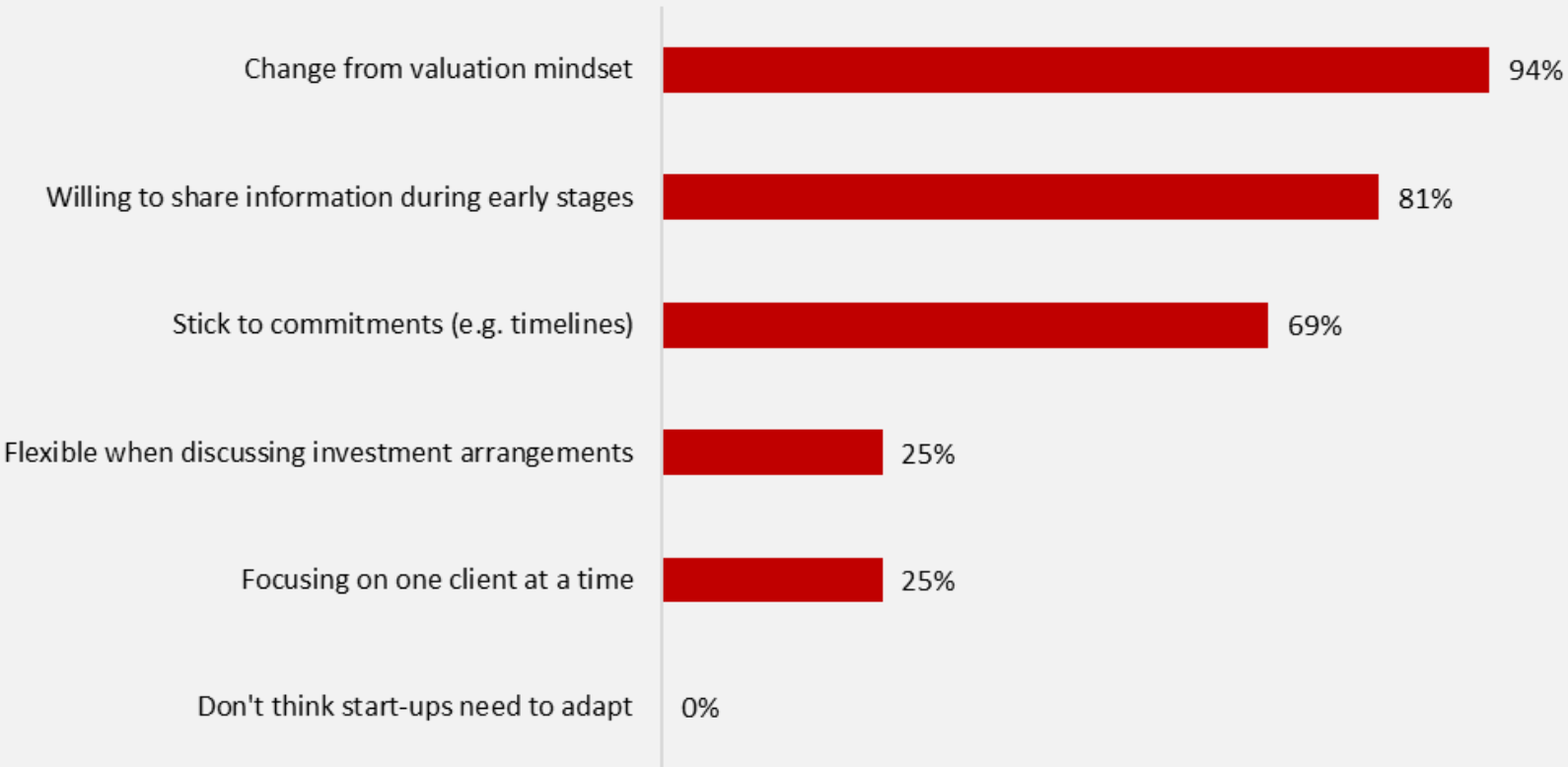
- **All pilot members agree that they need to make some changes in their ways-of-working** if they are to improve engagement with start-ups

Letting go of valuation mindset & being open to sharing information can facilitate meaningful engagement

To engage meaningfully, in your opinion what are the *3 main ways start-ups should adapt* when collaborating with traditional auto companies?



Ways start-ups can adapt to better engage



How should start-ups adapt to collaborate better?

- **All pilot members agree that start-ups need to adapt** to allow for more meaningful engagement
- **Nearly all pilot members agree that start-ups should stop focusing on valuation** and start focusing on building a sustainable business model
- **More than 2/3rd members agree that sticking to commitments** agreed at the start of the project **will enable start-ups to build trust**

Building bridges: The 11 tenets of engagement

Parameters	Traditional Companies	Start-up
1 Measure of success	Returns, growth <i>ROI/ROCE/ Stock Price</i>	Valuations <i>Multiples, exit strategies</i>
2 Operating approach	Standardized processes <i>Repeatability, scalability</i>	Agile, chaotic, iterative <i>Move fast and break things</i>
3 Key characteristics	Operations excellence <i>Six sigma, lean principles</i>	Unique solution to a customer problem <i>Personalized, customized</i>
4 Performance metrics	On time, on budget, on specification <i>First time right every time</i>	Try new things, new ways, flexible <i>Scrums, sprints</i>
5 Value creation	Technology-process <i>Dependent on process continuity</i>	People <i>Dependent on thought capital</i>

Building bridges: The 11 tenets of engagement

Parameters	Traditional Companies	Start-up
6 Validation	Failure not an option <i>Testing, validation, PPAP</i>	Fail fast, learn fast <i>PoCs/ pilots, experiments</i>
7 Pricing	Cost + profit based <i>Focus on cost reduction</i>	Intellectual property based <i>Focus on value maximization</i>
8 Leadership	Reward & recognition <i>Consistent satisfaction</i>	Aspirational, purpose driven <i>Delayed gratification</i>
9 Culture	Hierarchy driven <i>Top-down flow</i>	Founder and ideas driven <i>Primarily flat</i>
10 Decision Making	Stage gate approval process <i>Focus on risk mitigation</i>	Fast and flat <i>Risk taking</i>
11 Planning Time Horizon	Short, medium, and long term <i>Vision based</i>	Short term <i>Frequently changing, opportunistic</i>

Experience sharing (15 mins)



Satish Machani
Chairman & MD
SSS Springs



Prashanth Nayak
Managing Director
Yazaki India



Siddharth Manoharan
Head – Strategy & Special Projects
Pricol

- **Learnings and challenges when engaging with start-ups**
- **How to better engage with start-ups**

Open house for Q&A ...

Let's take a 15 mins breather

Agenda

Topic

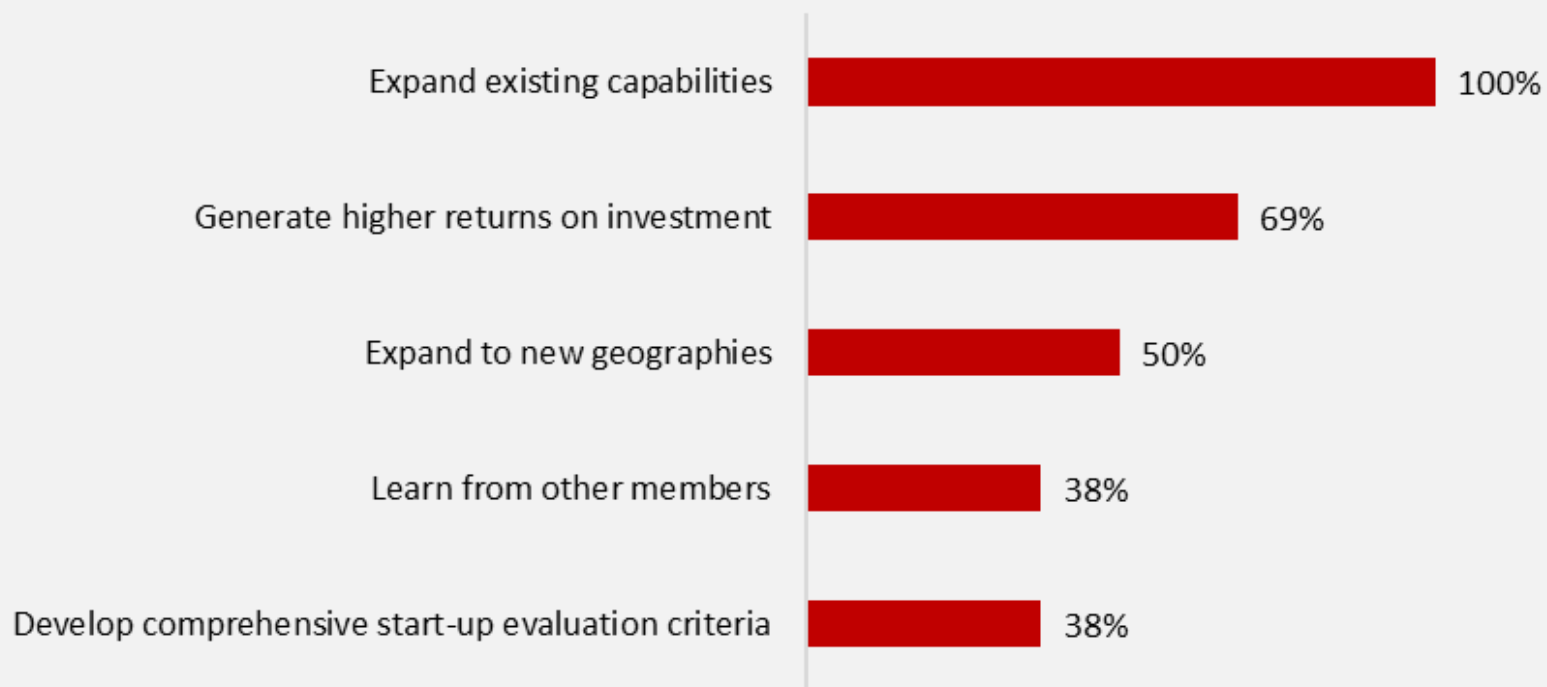
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Top objectives : expanding existing capabilities ; higher Rol

What are the top 3 objectives that you hope to achieve through the investment track?

Top objectives for the investment track

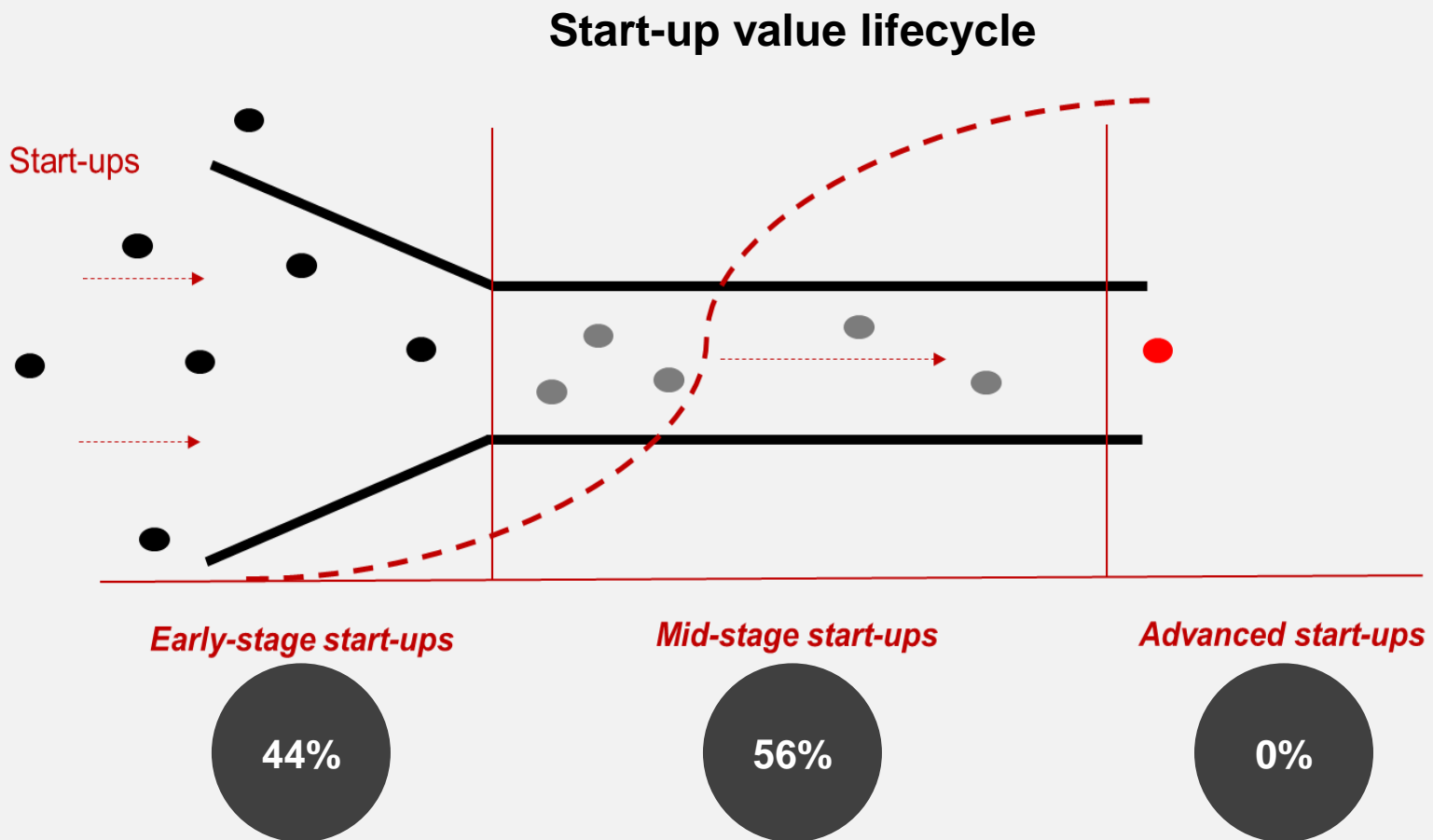


Top investment objectives

- **Expanding existing capabilities** is the **top objective** that all members hope to achieve through the investment track
- **50%** of pilot members looking to **expand their foreign presence**
- While **~3/4th of pilot members** consider **generating higher returns** to be the **least important benefit when engaging with start-ups**, more than **2/3rd of the same respondents** consider generating returns amongst their **top objectives** for the investment track

Majority open to **investing in mid & early-stage** start-ups

For the investment track, what would be the current stage of financial maturity of start-ups that your organization would be interested in investing in?



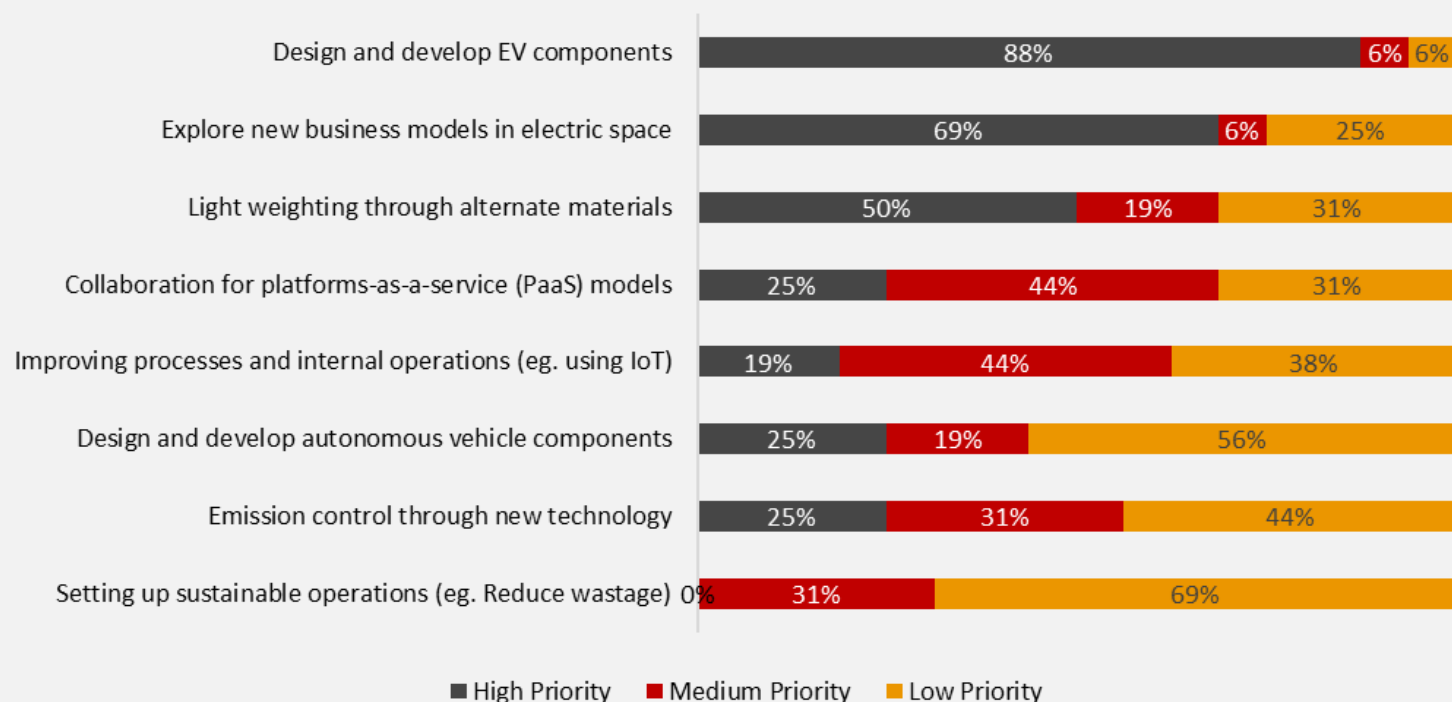
Preferred stage for investment

- Majority of pilot members open to investing in **mid-stage start-ups**
- Pilot members think that the **ACMA pilot group** should have a median **investment range of INR 7.5 – 50 crores**
- **~1/5th of pilot** members are open to the idea of the group **investing more than 100 crores** in shortlisted start-ups

Top themes: Developing capabilities in the EV space

What are your top priority areas in terms of this program?

Top priority areas for pilot members



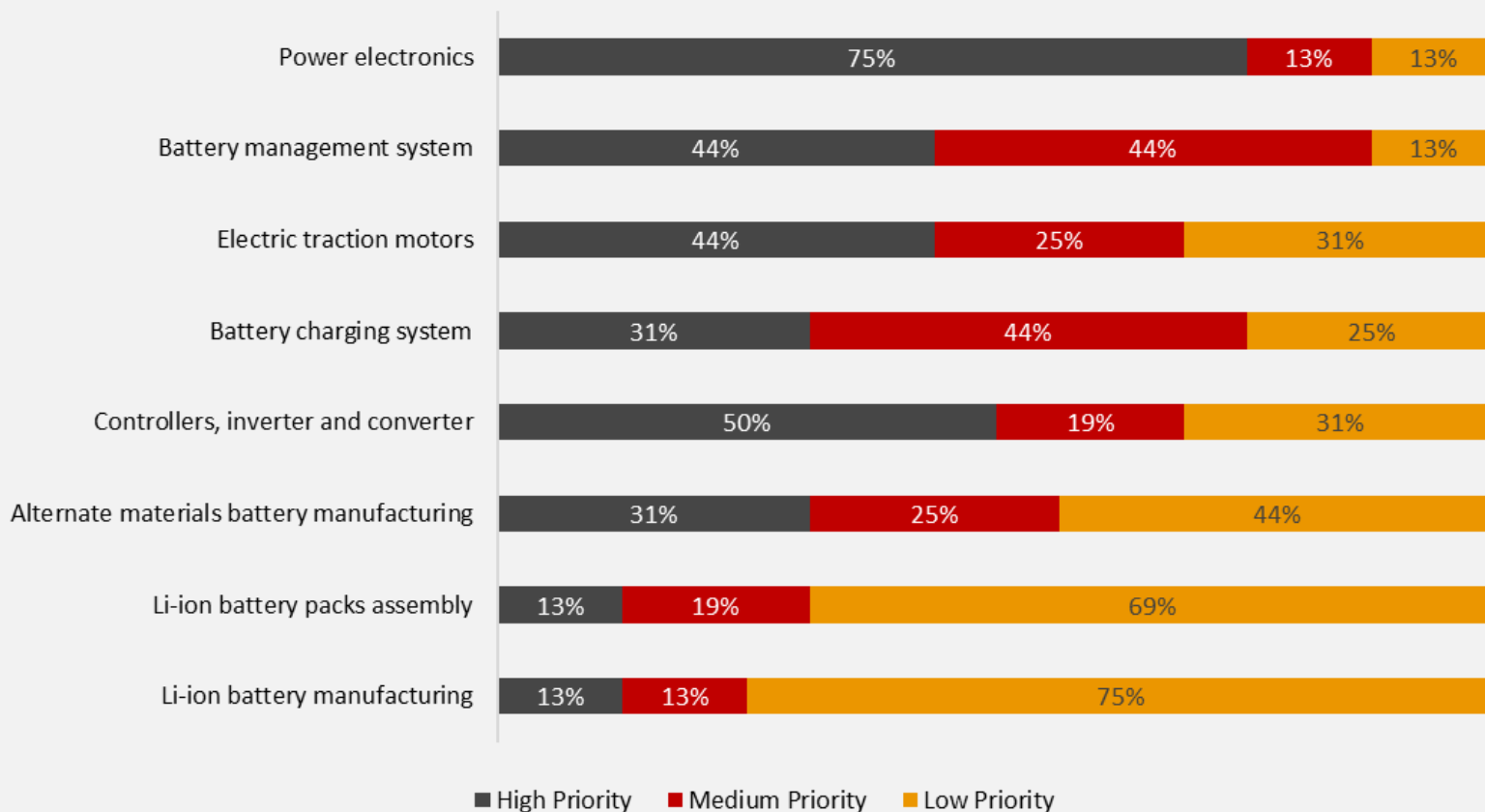
Top priority areas for pilot members

- **Building EV component design and development capabilities is the top priority with more than 3/4th pilot members ranking it in their top 2.**
- Members also interested in **exploring new e-mobility value chain models** such as retro-fitment and battery swapping with more than 2/3rd pilot members ranking it in their top 2

EV space preference: capabilities in power electronics and BMS

What are the top priorities when it comes to developing capabilities for Electric Vehicles?

Priorities in the EV space



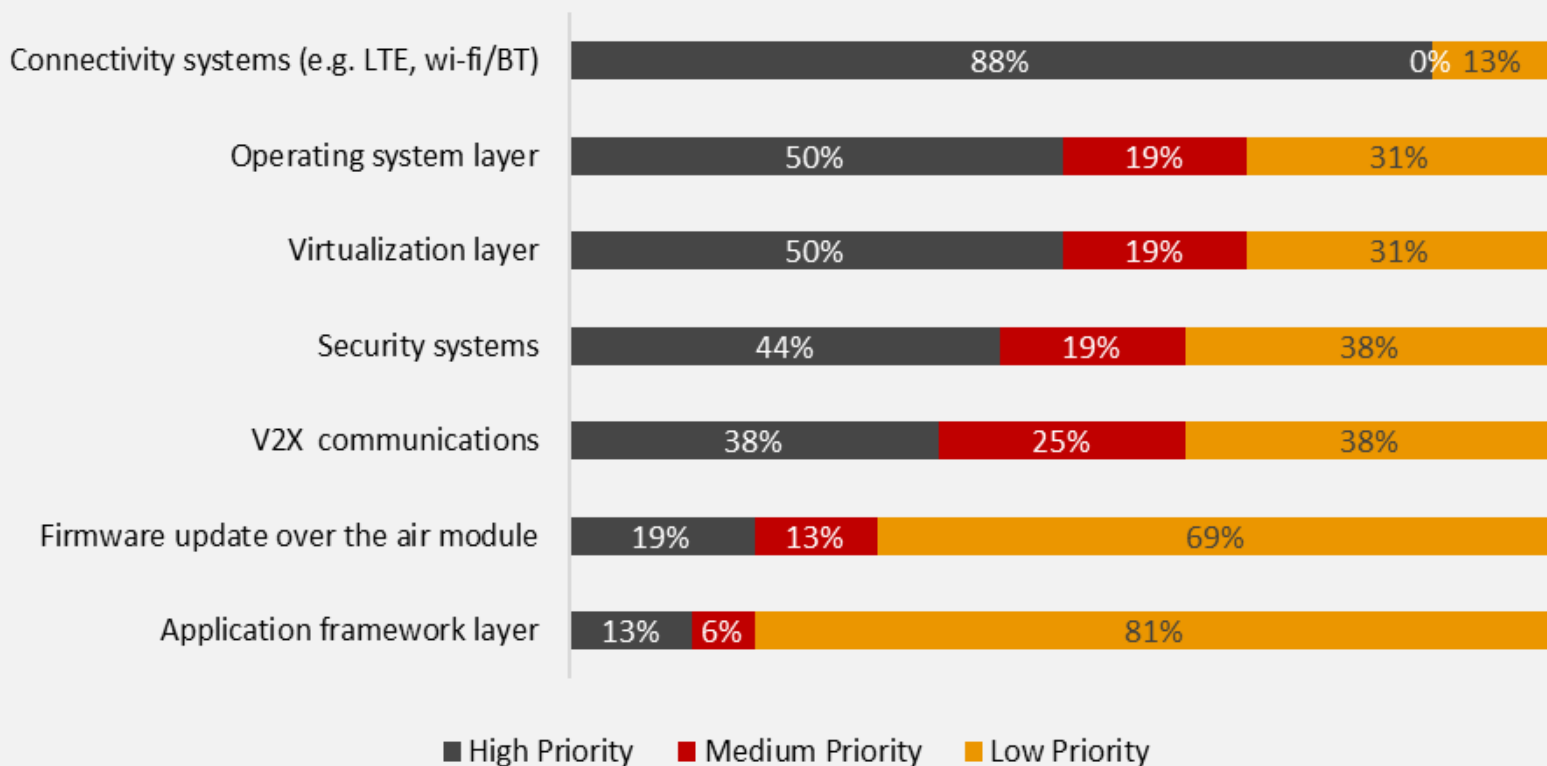
Priorities for Electric Vehicles

- Building **EV component design and development** capabilities is the top priority.
- Within EV components, building capabilities in **power electronics most important priority** with **3/4th** of pilot members ranking it in their top 3
- Manufacturing and pack assembly of **Li-ion batteries a low priority** with **3/4th** of members ranking it in their bottom 3

Connected space preference: capabilities in connectivity area

What are the top priorities when it comes to developing capabilities for Connected Vehicle?

Priorities in the connected space



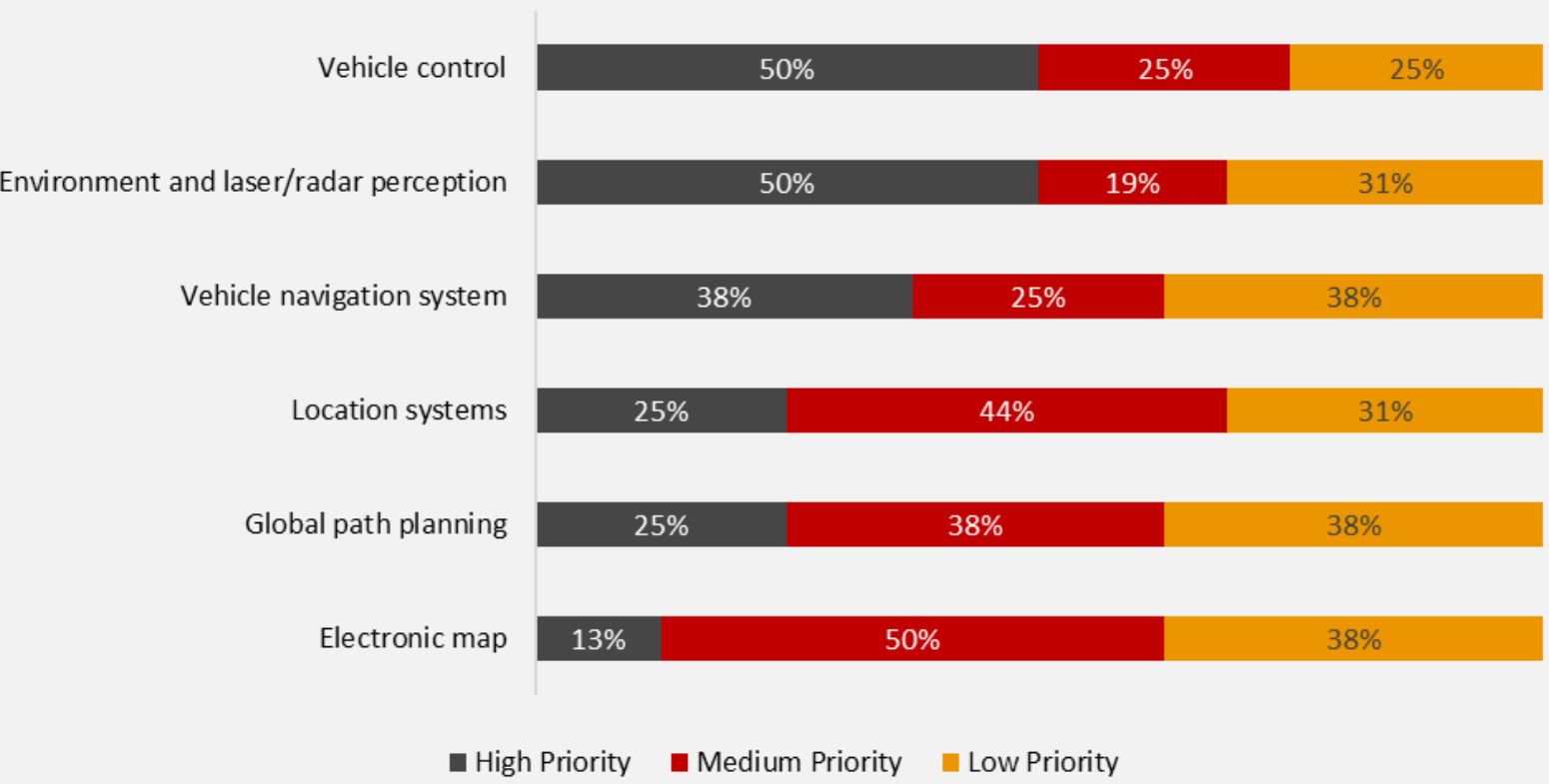
Priorities for Connected Vehicles

- Like in the EV space, pilot members have **clear priorities** when it comes to capabilities they want to develop in the connected space
- Developing capabilities in the **operating system and virtualization layer** are amongst top priorities with **50% of members** ranking it in their **top 3**

Autonomous preferences: vehicle control, environment perception

What are the top priorities when it comes to developing components for Autonomous Vehicles?

Priorities in autonomous space



Priorities for Autonomous Vehicles

- While members seem to have clarity in terms of top priorities in the connected and electric space, there is more **ambiguity** when it comes to the **autonomous space**
- Developing capabilities in **vehicle control and environment perception** are the **only areas where nearly 50%** of members **agree** on them being important priorities

Agenda

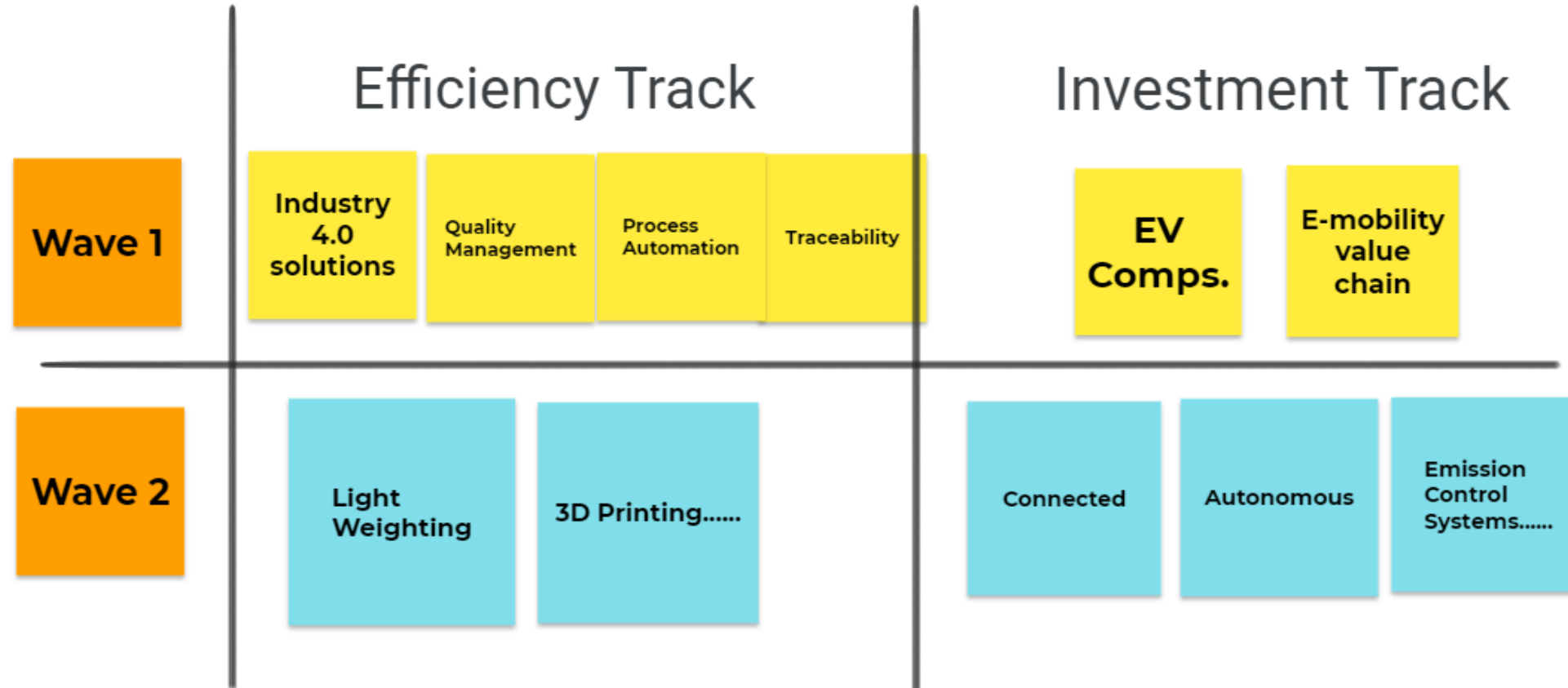
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Finalization of priority areas and investment themes

Initial going in view



Source: ACMA Start-up Initiative – Survey for pilot members, 1:1 meetings

Agenda

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2nd Workshop

Agenda : 28th July 2021 (1-5 PM)

Sl	Session	Details	Speaker	Duration
1	Opening session	<ul style="list-style-type: none"> Working committee chairperson and co-chairperson welcome members Recap of workshop 1 PwC details the agenda and structure of the workshop 	Mr. Satish Machani Mr. Kiran Deshmukh Mr. Kavan Mukhtyar	15 mins
2	Challenge rounds roadmap; initial start-up assessment	<ul style="list-style-type: none"> PwC team: How the challenge rounds will be conducted ACMA: web portal walkthrough PwC team: Initial start-up outreach results, sample profile of start-ups being evaluated 	ACMA Portal Vendor PwC Team	60 mins
		Break		15 mins
3	Evaluating and screening start-ups	<ul style="list-style-type: none"> PwC team: how is start-up evaluation and screening different from that for more established companies Learnings & challenges when evaluating and screening start-ups PwC team: best practices when evaluating start-ups 	Pilot members PwC Team	60 mins
		Break		15 mins
4	Modes of start-up engagement; due diligence	<ul style="list-style-type: none"> PwC team: what are the modes of engagement with start-ups Challenges when conducting due diligence PwC team: best practices that can be followed during due diligence 	Pilot members PwC Team	60 mins
5	Next steps	PwC intimates next steps. Vote of thanks by Mr. Kiran Deshmukh	Mr. Kiran Deshmukh PwC Team	15 mins

Open house for Q&A ...

Thank you

In case of any queries, please contact:



Kavan Mukhtyar
Partner, Automotive Sector
Leader, PwC India



Somnath Chatterjee
Senior Manager, PwC

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