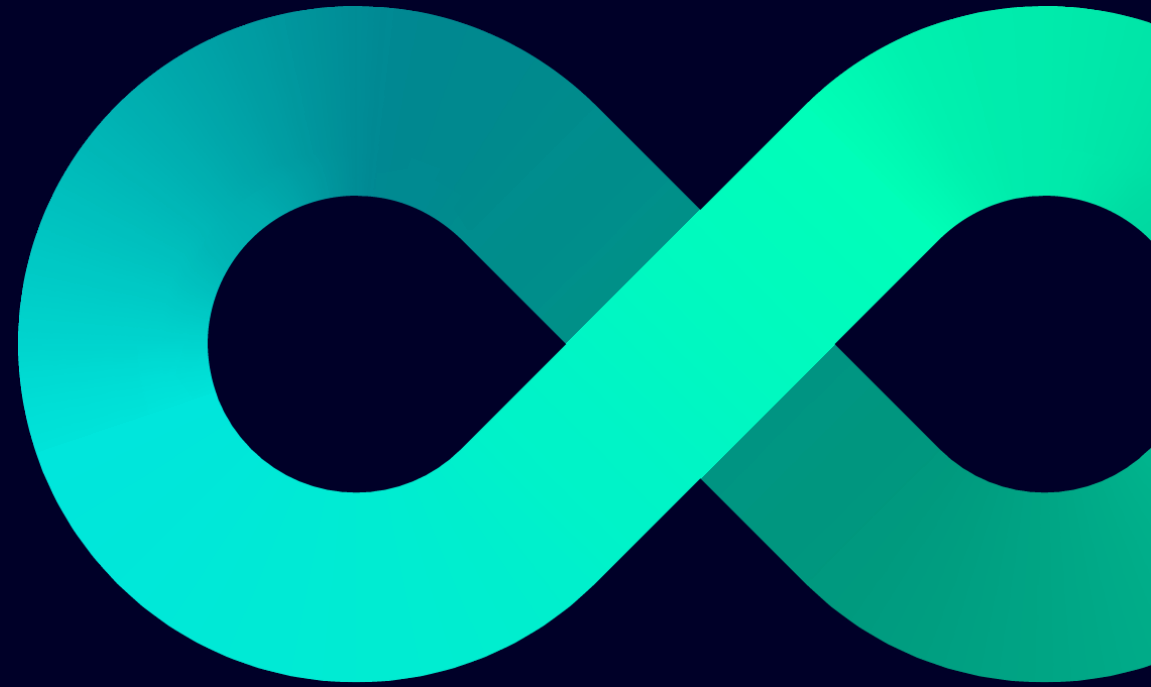
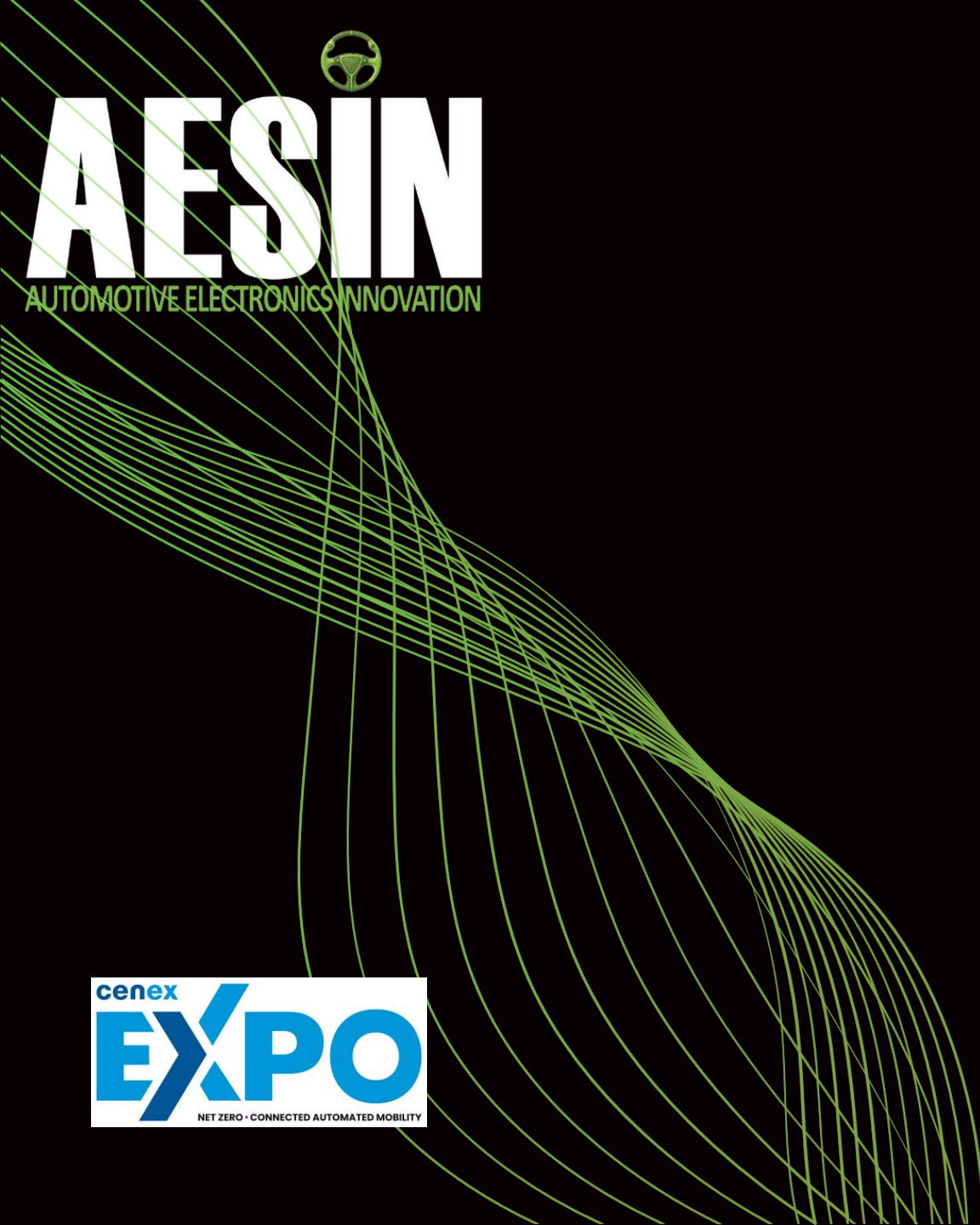


A look at how and why the Automotive industry is embracing new development processes in **software factories**



Software Defined Vehicles





Automotive Electronics Systems Innovation Network

Brendan Morris
Chair
SDV Special Interest Group



Community



Collaboration



Thought Leadership



Speaker



Brendan Morris

Senior Technical Marketing Engineer
Lifecycle Collaboration Software – LCS Capital
DI SW LCS

Siemens Digital Industries Software



Chair

Software Defined Vehicle Special Interest Group
SDV SIG

AESIN


Techworks Collaborative Communities




AESIN - Driving Innovation through Collaboration

An outstanding member-based community committed to supporting the creation of the **next generation** of UK-centric automotive **electronics technologies** and **supply chains**.


Leading thought and impact for ingenious, sustainable, efficient, safe, and resilient mobility through the **innovative application of electronic systems**.




Perception Sensors for CAM




Security & Resilience




Systems Engineering for Cyber Physical Systems



Power Electronics and Control Systems



Software Defined Vehicle (SDV)



Research and Innovation

Special Interest Groups



70+ Members, 20+ Events per Year, AESIN Annual Conference Premium Industry Event



Voice of the Industry, Partnerships with National and International Bodies

Agenda



SDV introduction

Software Defined Vehicles

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Industry disruption

More complex software faster

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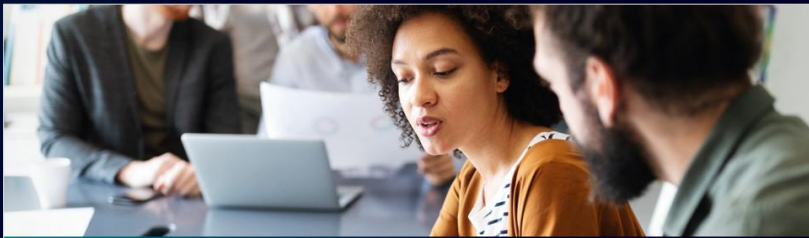


Development processes

Software over life – Continuous processes

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Conclusions and Summary

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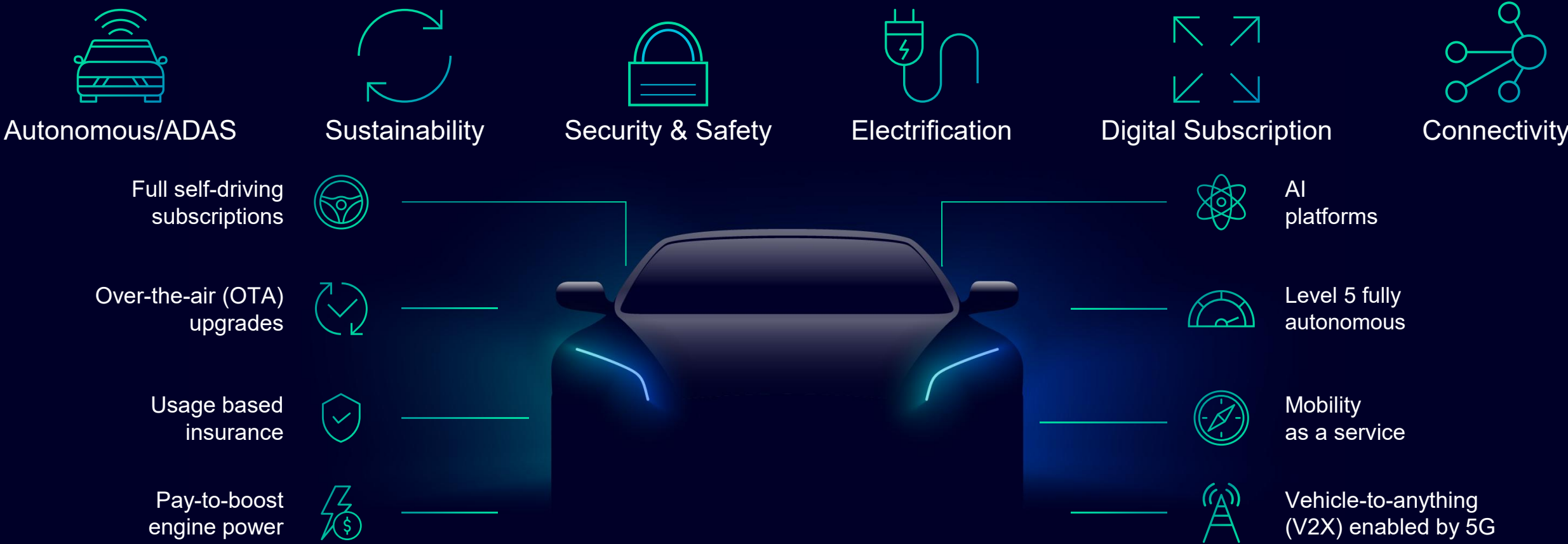


SDV introduction

Software Defined Vehicles

Automotive industry is transforming

Rapidly emerging into software-driven innovations



“Software will account for 90% of future innovations in the car”

Dr. Herbert Diess, Volkswagen

Architecture transformations: Software Defined Vehicle

Targeted E/E architecture characteristics & function consolidation goals



E/E architecture evolution

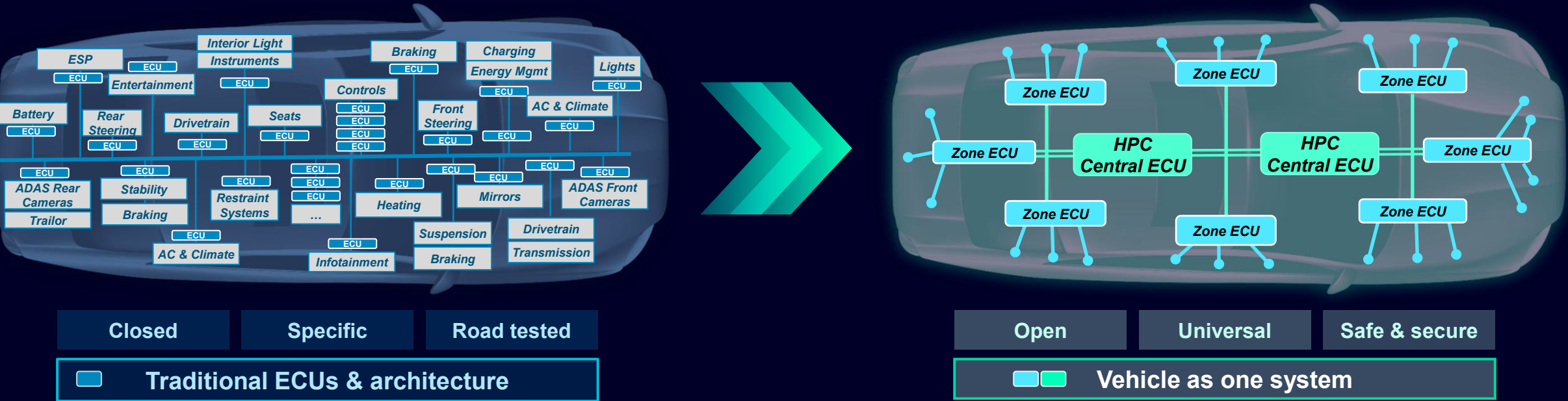
Software centric architecture
Decouple HW & SW development
Centralized, scalable HPC hardware
OTA enabled frontend & cloud backend
Zonal & local IO concentrators
Deterministic real-time IO





Function consolidation

Function separation, redundancy
Device & network connectivity
Network & software bandwidth
Software performance, memory
Electrical load, heat, EMI, EMC
Mechanical space, weight



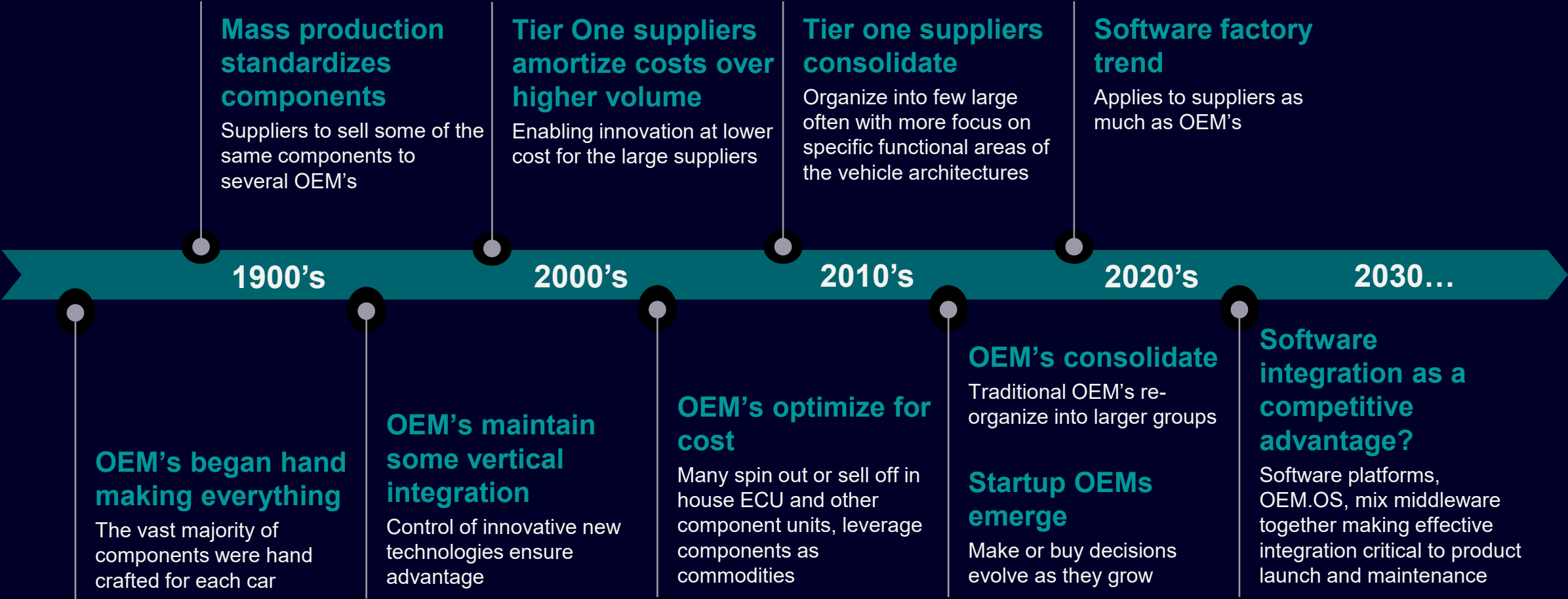


Industry disruption

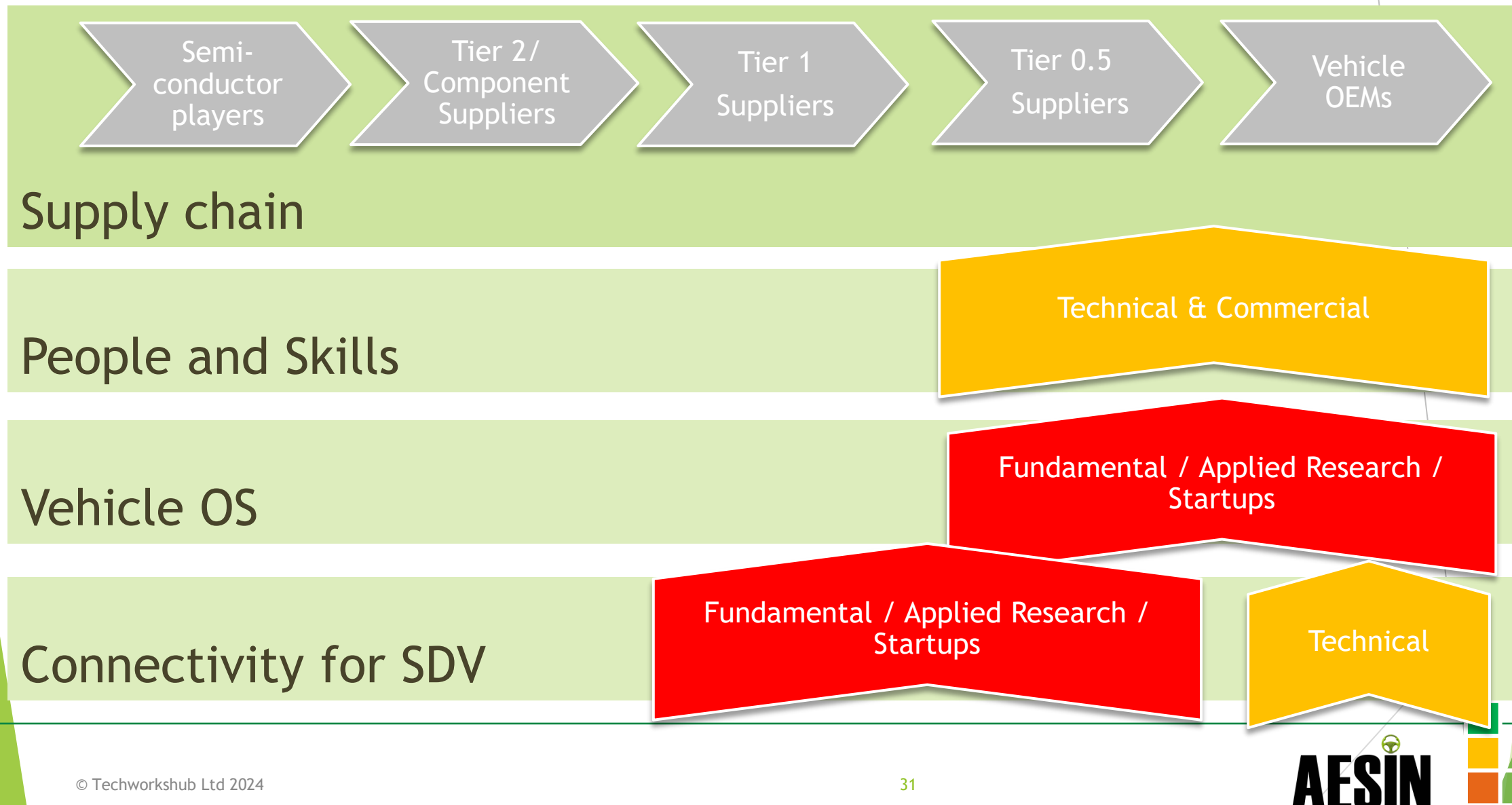
More complex software faster

Vertical Integration at OEMs

A brief history



UK value chain



Software factories

Standards collaborations















Features-as-a-service Subscriptions



Examples :-

Heated seats in winter months

Additional media capability for a family holiday

Added performance for a driving tour road trip

Race track guidance for a track day

Off road maps for an off road adventure

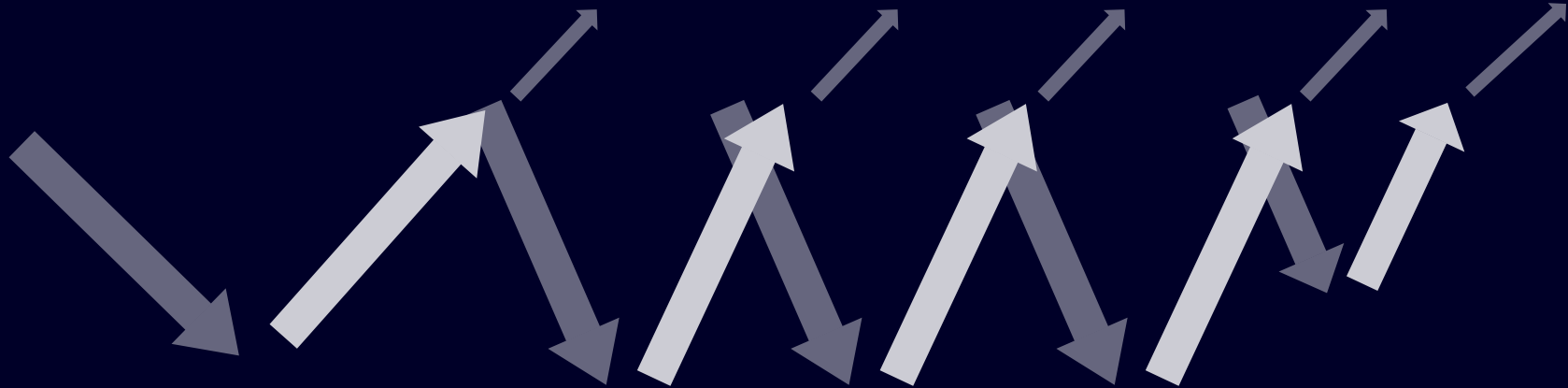


Development processes

Software over life – Continuous processes

SDV Lifecycle

Waterfall hardware and ‘V’ cycle software processes



NB: Simplified illustration only

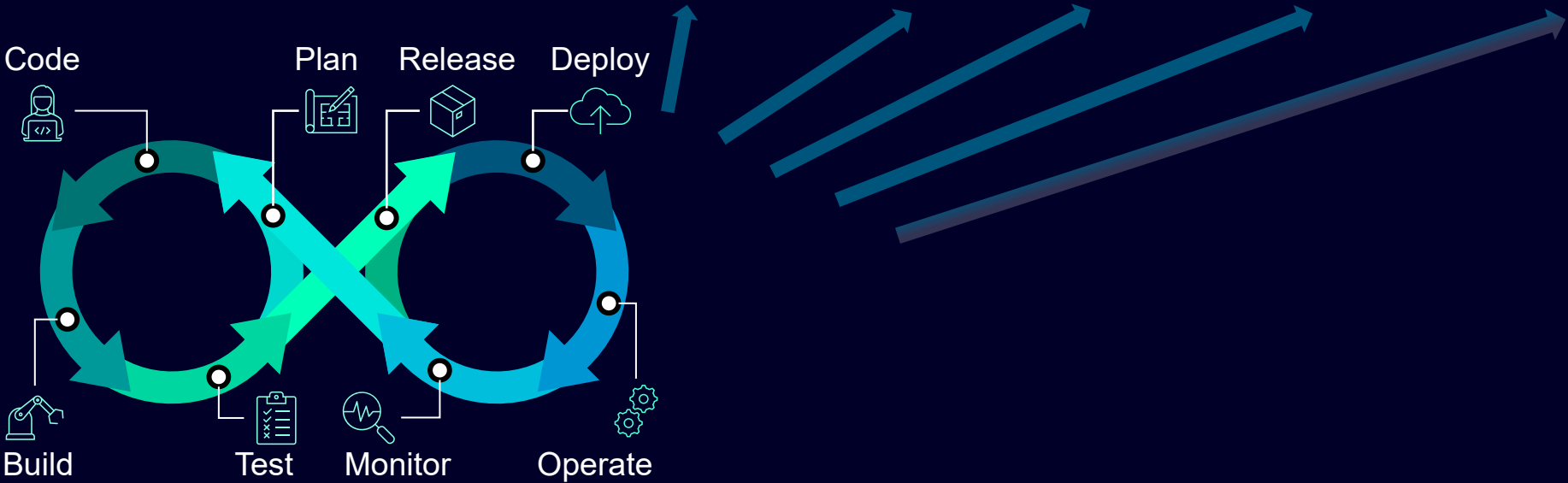
SDV Lifecycle

Deploying software to a carpark of vehicles over life

MY25	Platform	E/E	ADAS	Infotainment	Screens	Hybrid	EV	EU	US
MY26	Platform	E/E	ADAS	Infotainment	Screens	Hybrid	EV	EU	US
MY27	Platform	E/E Platform	ADAS	Infotainment	Screens	Hybrid	EV	EU	US
Small	AC	Low-21	Min	Base	1	O		O	
Small Crossover	AC	Low-21	Min	Base	1	O		O	O
Family	AC	Low-21	Min / Mid	Base / Mid	1 / 2	O		O	
Family Crossover	AC	Low-24	Min / Mid	Mid	1 / 2 / 3	O	O	O	O
Premium Family Crossover	AC	High-20	Mid	Mid / High	2 / 3 / 5	O	O	O	O
Executive	DE	High-23	Mid / High	High	2 / 3 / 5	O		O	O
Executive Crossover	DE	High-23	Mid / High	Mid / High	3 / 5	O	O	O	O
SUV	DE	High-20	Mid / High	Mid / High	2 / 3 / 5	O	O	O	O
Van	AC	Low-21	Min	Base / Mid	1 / 2	O	O	O	O
Pickup	T	Low-24	Min	Base / Mid	1 / 2	O		O	O

SDV Lifecycle

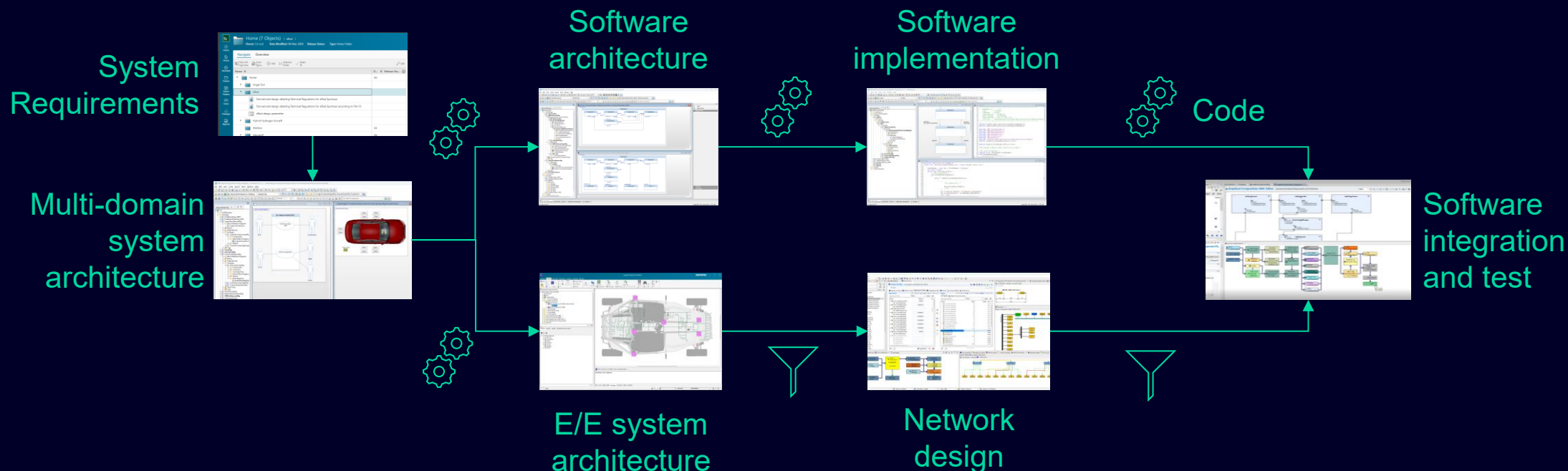
Waterfall hardware and continuous software processes



NB: Simplified illustration only

Development processes

An end-to-end software design flow in E/E context for AUTOSAR and beyond

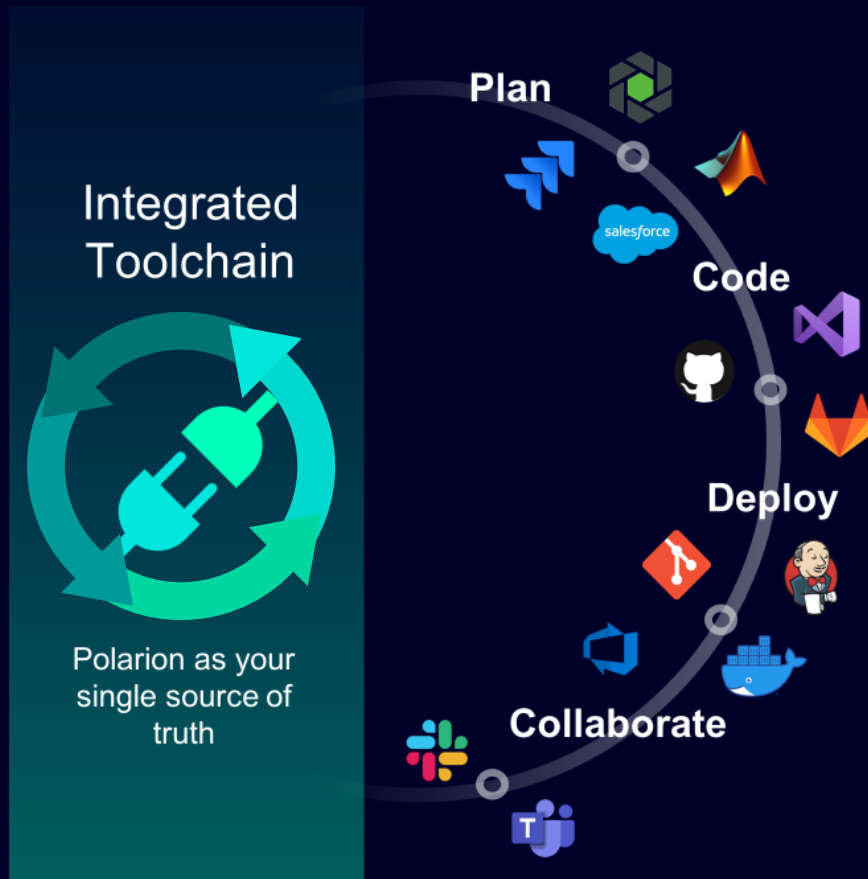


While the entire flow provides most value, customers can start enjoying the benefits at any point in the flow alone...

...for example, in software integration and test.

Capital Embedded AR Classic

Support for cloud-based build and tool automation



Continuous software integration for the SDV

Supports Windows/Linux based Polarion ALM environments

Connects to version control, CI systems and build environments (e.g. Git, Jenkins, GNU make)

Requirements tracing artefacts as part of the project to be versioned and open for further processing

Provides code generation, automatic configuration, scripting and other valuable ECU integration automation

Collaboration - SDV SIG - Themes

Skills

Cyber Security & Functional Safety
Commercial
Research



Innovation

Software Factory
Vehicle OS

Business

Start-ups, Scale-ups and SME's
Large company inward investment
Cross industry learning



Conclusions and Summary

Summary

Software Defined Vehicle and Software Factories

SDV's are leading to increased **Vertical Integration** at OEM's

Tier 1 suppliers **adapting business models**

Tier 0.5 working closely with OEM's on design are increasing



Software development in Automotive is embracing **IT methods**, enhancing them to deliver the needed **quality**, **Functional Safety** and **Cyber Security**

CI/CD processes are on the rise



Software Factories enable updates over life by supporting:

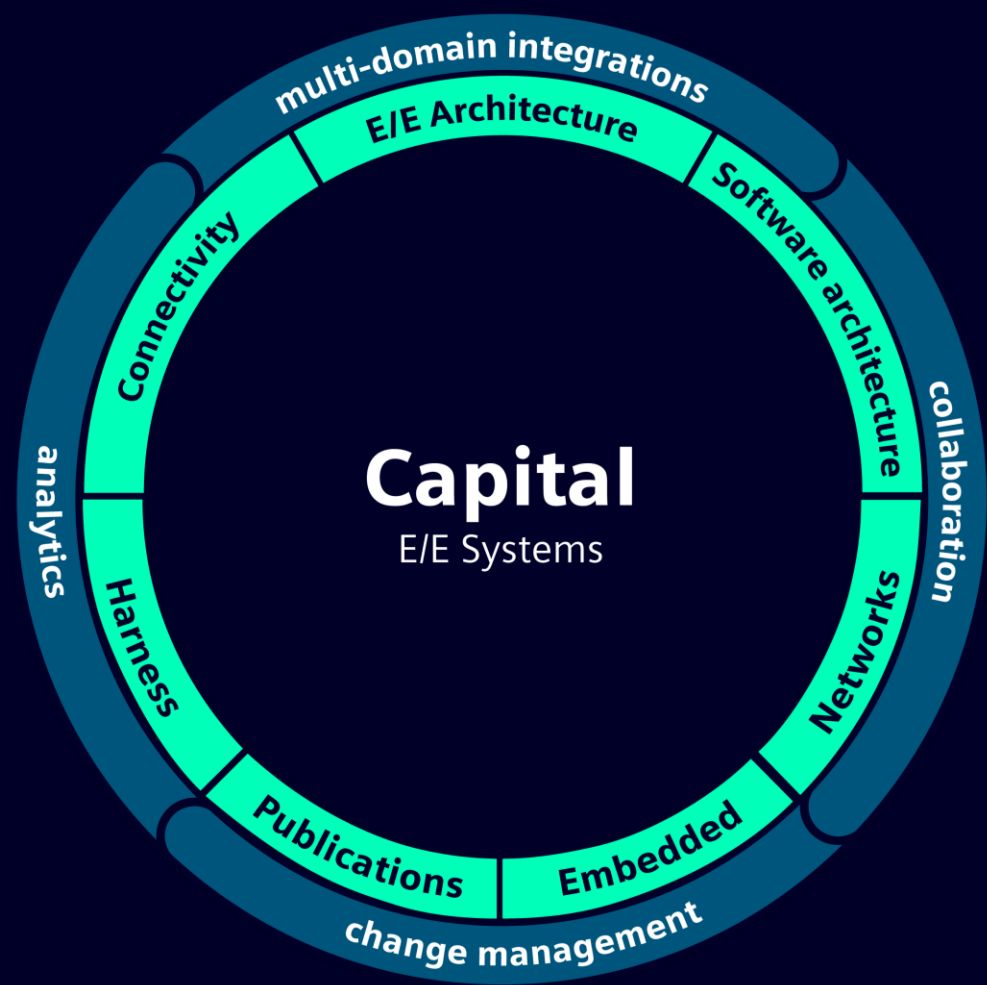
Software **skills** recruitment and retainment

Software optimized **processes and tools**

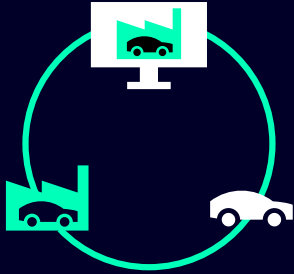
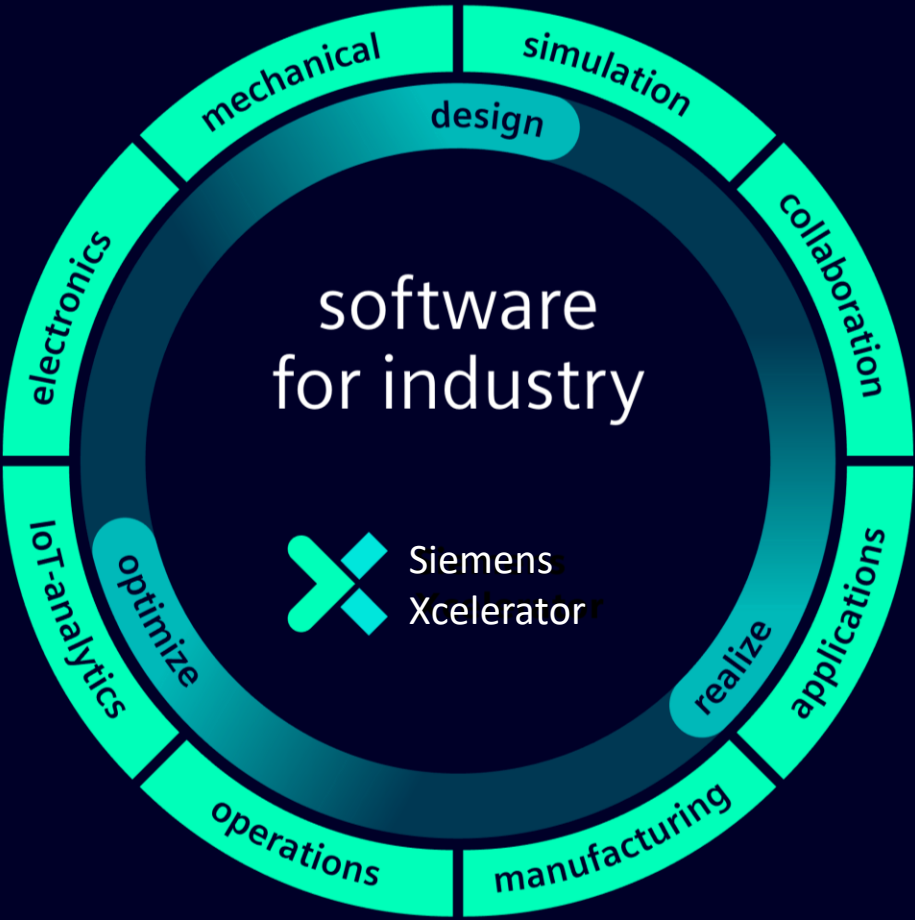


...supported by
Siemens Xcelerator

Capital is a key part of Siemens Xcelerator



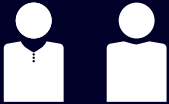
Siemens Xcelerator and the three competitive advantages



**Comprehensive
digital twin**

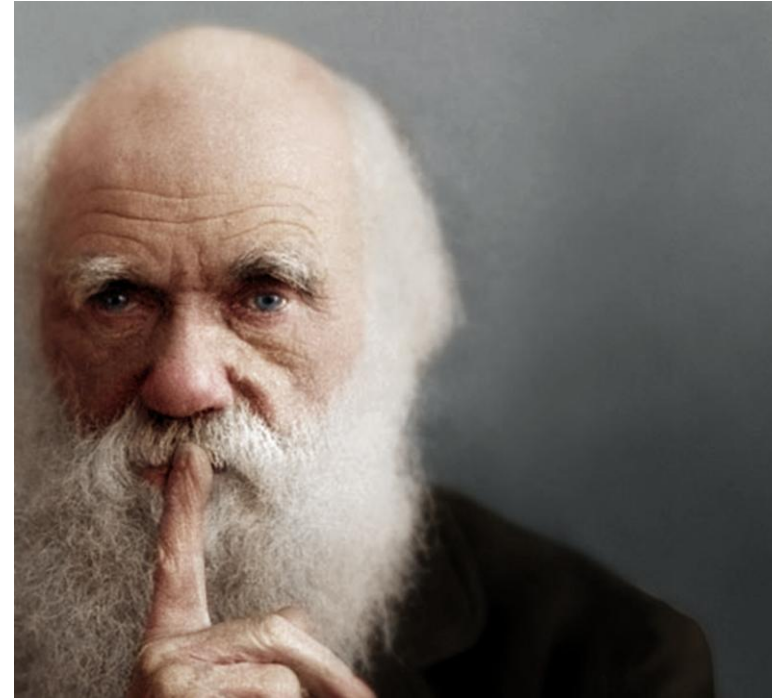


**Personalized
Adaptable / Modern**



**Flexible / Open
ecosystem**

- ▶ "It is not the strongest of the species that survives, nor the most intelligent that survives. **It is the one that is most adaptable to change.**"
- ▶ *Charles Darwin*



Contact

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