EVOLUTION AND TECHNOLOGY DRIVERS FOR NEXT-GENERATION ELECTRICAL AND ELECTRONIC ARCHITECTURES

E/E architecture decisions made now will be a vital part of meeting the autonomous, connected and mobility expectations of consumers 5-10 years from now.

From evolutionary decisions around **domain controllers, hypervisors, OTA** and **gateways**, to step-changes including **Service-Orientated Architecture (SOA), ethernet backbone** and **zonal architectures**, OEMs face critical decisions on if, how and when to adopt these next generation technologies in their future models, both volume and premium.

To help explain the features, functions and attributes of emerging E/E architecture solutions, and how they relate to the entire CASE design space, SBD Automotive is creating this report to inform, clarify and support your strategic E/E decisions.

Project Scope - Chapters & overviews

Chapter 1. Why Electrical & Electronic Architecture?	
Experiencing the Architecture.	In this section of the report, SBD will introduce the factors that should be considered by an E/E architect when planning the design of their next generation solution. With lots of examples, SBD will cover the factors that drive the overall electrical architecture.
What must be considered?	

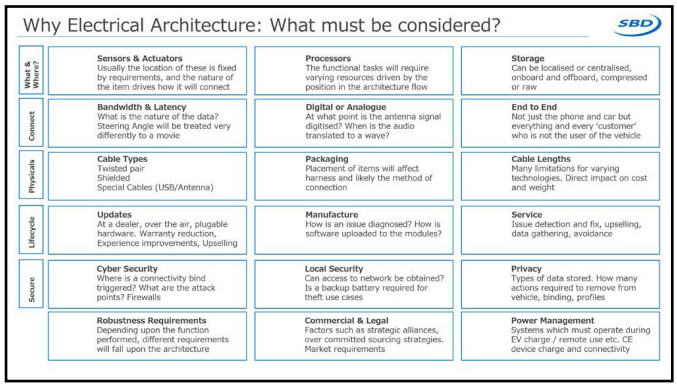
Chapter 2. State of the Art	
'Architypes'	This section will classify the E/E architectures adopted by 10-15 of the leading global OEMs, including model-level analysis for the major market segments. Here, SBD's experts will distil a large amount of architecture data into a series of **'Architypes'**, for example: • Domain-based architecture with ethernet backbone • Multiple CAN - single gateway • Zonal architecture. • Etc
Examples of details	
Matrix	

Chapter 3. Drivers of change	
Connected	A high-level review of connected, autonomous and shared mobility technologies, as well as the legal and commercial landscape changes. This section will focus on trends and examples to inform the reader ahead of the following chapters, which offer solutions to issues raised. Key topics include - • Trends • Landscape changes • Multiple screens • 5G • Remote driving
Autonomous	
Shared	
Electrified	
Manufacture	
Service	
Legal	
Commercial	

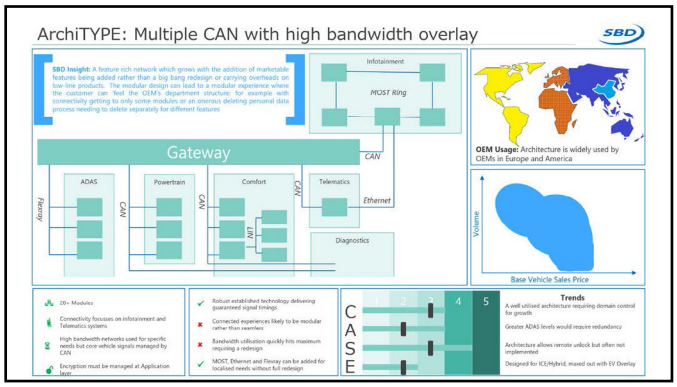
Chapter 4. Technical solutions	
Networks (Physical & Wireless)	A review of technologies: how they work, what they achieve and an indication, where possible, of levels of adoption. Some of these will be established technologies which will continue (e.g. LIN networks remain offering great value) and some will be newlyadopted technologies, such as **hypervisors** and containers. Cyber security solutions will be included. The routes taken to establish a **Service Orientated Architecture** will be discussed, including consideration of the spectrum and scale of how they can be implemented.
Software Virtualisation	
Service Orientated Architecture	

Chapter 5. Future outlook		
Common Pictorial Language		By this point in the report, as the reader will have a view of future trends, solutions and a thorough understanding of the state of the art, the report is able to review various players' view of the future and provide SBD's insight into how we see the market evolving. The spread of sources and views of the future will include OEMs, Tier 1s and, where appropriate, will draw from broader sources such as tool set providers, academia, governments and Tier 2s. Finally, SBD will provide insight to how these views come together into an overall outlook for the major market trends and technology winners and losers.
OEMs	Tier 1s	
Tier 2s	Tools	
Analysis		
Infographic with History		

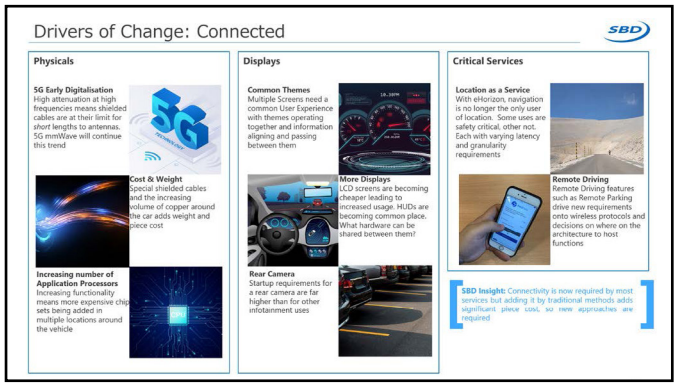
What must be considered?



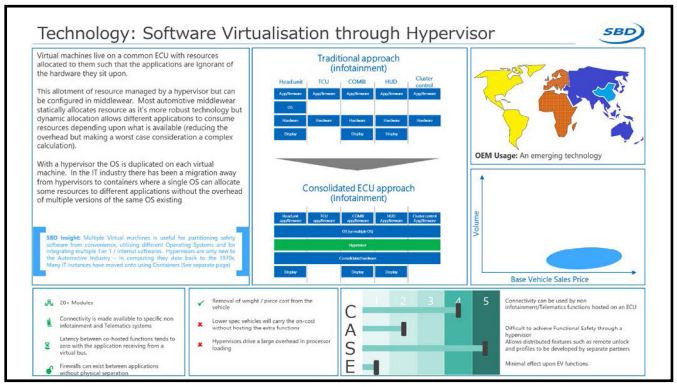
State of the art



Drivers of change



Technology solutions



OEMs face a significant number of (often contradictory) E/E architecture choices, including:

- Bespoke software platform – VW proposes 'vw.os', a Services-Orientated Architecture (SOA) for its 12 VW Group brands, from VW Up! to Audi A8
- New in-vehicle architectures – GM plans to roll out new Digital Vehicle Platform to most of its vehicles by 2023, whilst Aptiv and Altran propose alternative next-generation software platforms for connected and autonomous vehicles
- Domain controllers – Visteon powers MBUX's multiple screens with a cockpit domain controller, which can independently operate the infotainment system, cluster and other domains on one system-on-chip
- Hypervisors – A key building block for OEMs looking to integrate Android Automotive, Linux and/or RTOSs into their next gen IVIs
- AUTOSAR Adaptive – Ethernet-based ECUs can now be used as central application servers with the ability to update applications over a vehicle's entire life cycle and add new software functions at a later time
- Secure gateway – Will continue to play a leading role in preventing cyber attacks as a standalone component, as part of a connected gateway or consolidated into other ECUs/DCs

How do you know you have made the right choice?

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