



# AUTOMOTIVE INFOTAINMENT

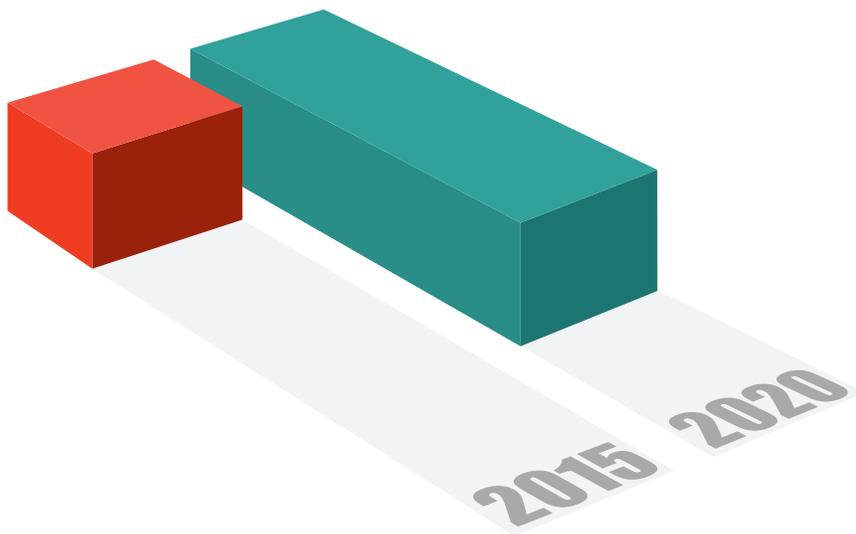
## SHOULD OEMs AND TIER ONEs RELY ON THIRD-PARTY SOFTWARE EXPERTISE?

### EXECUTIVE SUMMARY

*State of the Connected Infotainment Market and the Growing Opportunity for Third-party Software Suppliers*

### Market Potential and Market Issues

Two transformative trends will continue to dominate the automotive market over the next 10 years: automation and connectivity. This latter trend has already made its mark on the automotive industry, with connected infotainment having rapidly shifted from being the preserve of premium models to shipping mass market vehicles at very affordable prices. As systems expand in capacity and geographical coverage, the market value is expected to grow to US\$52.90 billion by 2020, up from US\$15.34 billion in 2015.



## CONNECTED INFOTAINMENT MARKET VALUE

Expected growth, US\$15.34 billion  
to US\$52.90 billion

However, the connected infotainment market faces a number of challenges. For many years, OEMs have failed to deliver systems that live up to demanding consumer expectations dictated by the parallel consumer electronics industry. Furthermore, multimedia experiences are becoming ever more standardized, a trend that, in tandem with the growing use of smartphone integration, risks transforming connected infotainment from a crucial brand differentiator into a fundamentally commoditized technology.

## Growing Opportunities

The automotive market is saturated with a number of OEMs, each vying for market share in a highly competitive market. Connected infotainment has been heavily leaned on as a key differentiator. When displays were first incorporated into head units, they added a new dimension to the in-vehicle multimedia experience, with the addition of connectivity bringing new and more varied content to the user. However, as is so often the case with fast-proliferating technologies, connected infotainment offerings are increasingly becoming homogenized, offering uniform multimedia experiences across premium and mass market vehicles alike. This trend has been furthered by the use of smartphone integration protocols, such as Android Auto and Apple CarPlay, to deliver familiar user experiences and interfaces at a lower cost, culminating with systems like the IntelliLink R4.0 shipping at price points in the region of €350.

Much of the effort by premium OEMs to offer unique solutions in the face of this commoditization of the dashboard has been hardware-centric, i.e., offering larger displays, more displays per vehicle, faster processors, etc. However, even in this regard, the potential for OEMs to differentiate is becoming ever more limited.

Going forward, OEMs will employ innovative software solutions alongside updated hardware to deliver new and unique experiences, to differentiate their brand image, and to close the gap with parallel consumer electronics, both in terms of innovation and implementation. However, there is some concern as to whether software solutions developed in-house by Tier One suppliers can meet OEM requirements with respect to new use cases, shorter design cycles, and lowering total cost of ownership; representing an important opportunity for third-party software vendors to help OEMs take infotainment to the next level.

*This whitepaper explains the significant movements in automotive software and why Tier One suppliers must engage with specialized third-party vendors of infotainment software solutions in order to supply OEMs with the next generation of infotainment system.*

# SIGNIFICANT MOVEMENTS IN AUTOMOTIVE SOFTWARE

*Money Talks*

## The Software-defined Cockpit and The Software-defined Car

Software is not only having a transformative effect on automotive infotainment, but on other vehicle functions as well, particularly in relation to automation. Recent investments and M&A in this area illustrate a growing awareness by Tier One suppliers of the importance of adding greater software expertise to their considerable hardware offering:

- **Continental-Elektrobit:** In July 2015, leading Tier One supplier Continental purchased Elektrobit (EB) Automotive, a supplier of embedded software solutions serving a range of use cases, including ADAS, HMI, and navigation. The US\$680 million deal saw Continental position EB as a standalone company supplying a range of vendors, including Continental's competitors, with the primary motivation behind the purchase being the ability to shape and invest in EB's strategic direction.
- **Harman-Symphony Teleca:** Harman's purchase of Symphony Teleca illustrates the growing importance of software to Tier One infotainment suppliers. The US\$780 million deal, completed in April 2015, saw Harman bolster its position in infotainment, adding software integration and engineering services honed in on mobile devices to its IVI solutions.
- **Visteon-AllGo Embedded:** Ever since the purchase of Johnson Controls' automotive electronics business in 2014, Visteon has been keen to position itself as a leading Tier One supplier of vehicle cockpit electronics. Its latest investment in 2016 to support this strategy was the purchase of AllGo Embedded, a comprehensive infotainment software solution vendor spanning multiple domains, including navigation, multimedia playback, and brought-in device connectivity. These capacities add a new dimension to Visteon's infotainment offering, with a team of 140 employees dedicated to innovating new user experiences, which, in turn, speeds up design cycles.

Further evidence of Visteon's commitment to expanding its infotainment software operations can be seen in its addition of 150 new employees to its software center based in Sofia, Bulgaria.

It is worth noting at this point that Tier Ones, much like the OEMs they supply, generally operate according to relatively tight margins and, therefore, do not make investments of this scale unless they feel it necessary to support their strategic direction.

## Software Services versus Software Solutions

It is also important to recognize the distinct, but equally important contribution of software service providers and software solution providers. Software solutions tend to be targeted at enabling specific features and new use cases, whereas software service providers operate according to a different business model, assisting Tier One suppliers with overall system development and implementation.

The difference between software solutions and software services may be nuanced, but it is nonetheless significant, particularly as third-party solution vendors have such an important role in innovating new use cases and providing unique selling points to OEMs. That said, the implementation of a new infotainment system is the result of widespread cooperation between vendors from across the vendor chain; therefore, software service and software solution providers both have an important role to play in infotainment over the coming years.

## THE BENEFITS OF SPECIALIZATION

*Addressing OEM Requirements with Software Solutions from Specialized Third-party Vendors*

### How Can Infotainment Move Forward?

As discussed above, despite enjoying impressive growth rates and representing significant market potential, connected infotainment is not without its problems. Even some of the most recent systems brought to market are criticized for being unreliable, feature-poor, and, most importantly, outdated relative to advances in parallel consumer electronics.

In order to offer consumers a next-generation infotainment experience, OEMs and their suppliers across the infotainment ecosystem need to deliver the following:



**New User Experiences and Features:** Ideally, this should go beyond simply mimicking the functionality of smartphones and other consumer devices, allowing OEMs to deliver infotainment experiences that are not only distinct from their competitors, but also from brought-in consumer devices.



**Shorter Design Cycles:** Narrowing the gap between automotive and CE design cycles will help infotainment systems keep up with demanding consumer expectations.

## How Specialized Vendors Address These Requirements

- **New User Experiences and Features:** Innovation is difficult to quantify, but there is a strong argument in favor of specialized vendors providing a highly favorable environment for the discussion and development of new ideas. A close-knit team of multimedia software experts provides the best combination of communication and experience to advance new use cases. Such vendors also have the nimbleness and flexibility to devote manpower and resources to developing these new features.

Of course, it is vital for such vendors to maintain close relationships with OEMs and the wider ecosystem to ensure that their own research and development ties in with the needs of the industry as a whole.

- **Shorter Design Cycles:** Specialized vendors have the necessary expertise and knowledge to develop scalable, reconfigurable solutions that cater to a number of different vehicle types. This high degree of product availability makes it far easier for a Tier One / OEM to incorporate features into new infotainment systems.

Depending on how conscious the specialized vendor is of compatibility when developing its solutions, Tier One / OEM suppliers may even be able to take the software solution with them as they upgrade hardware components, change operating systems, etc., facilitating faster overall system development.

Finally, if any OEM does require a specific new infotainment use case or wishes to incorporate new hardware that is not currently compatible with an existing software solution, specialized vendors have both the required expertise and the necessary flexibility to redeploy their internal resources to meet the OEM's needs.

A significant factor boosting time to market is the use of open source software standards, such as GENIVI, which provide open architectures and tools, and enable reuse of solutions to facilitate cooperation between ecosystem players. Such standards also reduce development costs and overall system complexity.

However, open standards do not lend themselves to innovation and new use cases, particularly as the framework can often shape system development in the direction of homogeneity. This is especially true of GENIVI, which is positioned as enabling familiar smartphone-esque experiences for consumers.

Though open source standards have achieved much in enabling swifter and cheaper implementation of established infotainment features and experiences, they may have achieved this at the expense of system innovation. In many ways, it is perhaps unreasonable to expect a Tier One and OEM supplying a number of automotive technologies to provide differentiated features through software according to open standards.

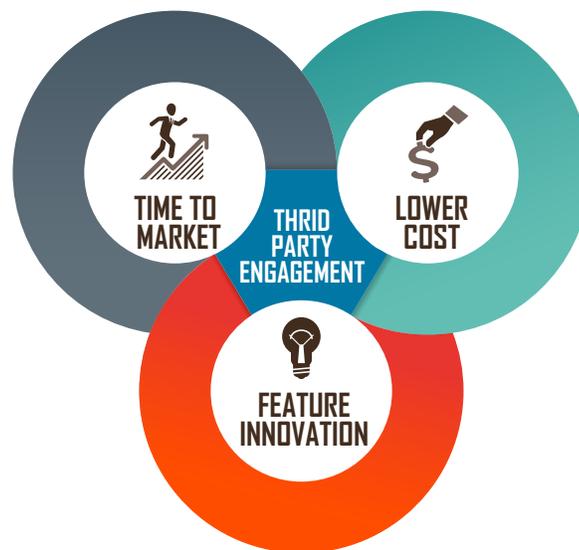
There is, therefore, considerable scope for specialized software solution vendors to enable OEMs and Tier One suppliers to provide distinct experiences unique to their own brand, restoring connected infotainment to the position of key brand differentiator in response to the creeping commoditization of the dashboard caused by smartphone integration and open source standards.

## Further Advantages of Working with Specialized Vendors: Lower Total Cost of Ownership

Engaging with specialized third-party vendors of software solutions can also bring about a lower total cost of ownership for the Tier One and, by extension, the OEM. In many ways, this is due to the intrinsic nature of specialized third parties being flexible enough and having access to the necessary expertise to pursue productivity gains.

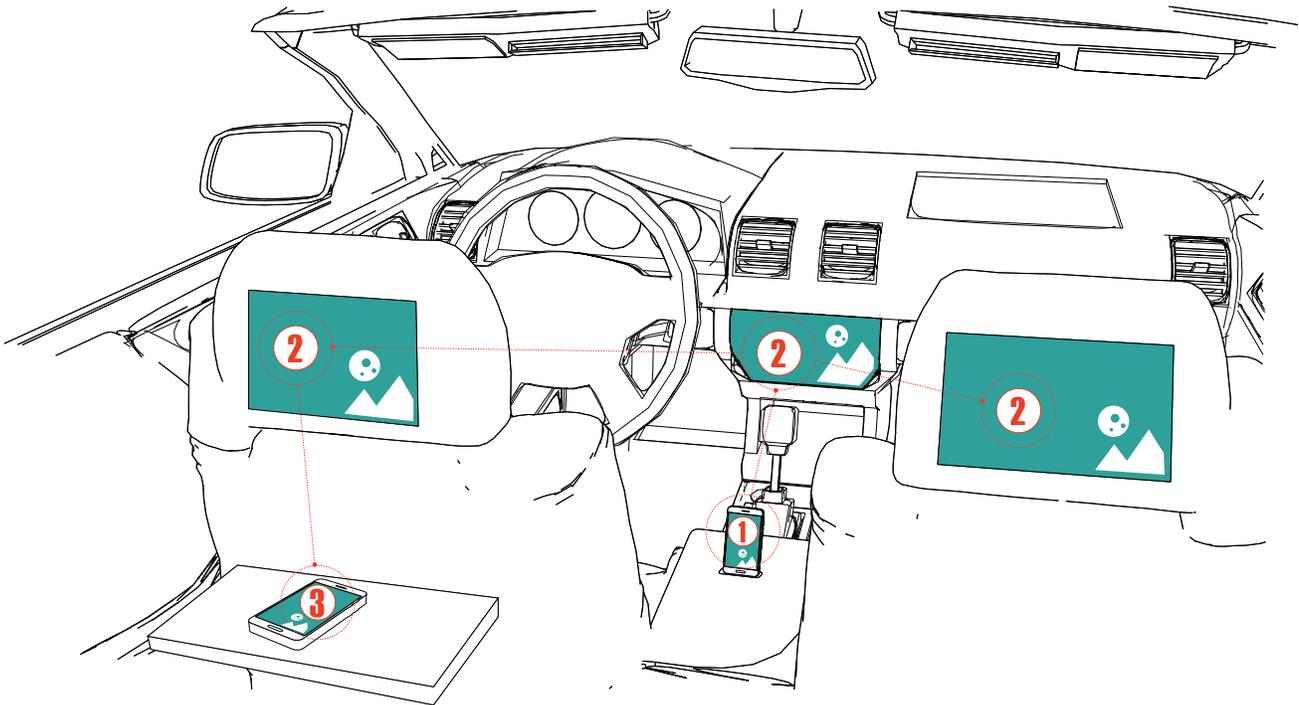
In the specific case of infotainment software, scalable software solutions have the advantage of offering higher product availability to Tier One suppliers, allowing them to add new features and use cases without lengthy and expensive software development processes. Similarly, because software solutions are developed according to these new use cases, independently of any single contract or supplier relationship, there are no additional costs incurred if a Tier One supplier has to abandon a project.

Finally, a specialized vendor is more likely to have the necessary experience and expertise to develop solutions that are robust and reliable, minimizing the risk of costly delays.



## An Example from the Industry: Cinemo's Distributed Playback

A good example of the sort of fresh use cases that specialized third-party vendors can bring is the Distributed Playback feature developed by leading infotainment software solution vendor Cinemo. This feature is a subset of Cinemo's multimedia middleware and enables convergence of brought-in devices and embedded infotainment. Whereas smartphone integration focuses on mirroring interfaces, Distributed Playback allows multimedia playback of content from one device across a number of other connected devices in the vehicle and embedded displays, including built-in and tablet-based rear seat entertainment systems. This system positions embedded infotainment as the central nexus of in-vehicle multimedia consumption, and allows OEMs to fully exploit the advantages of having an embedded system, as it relates to robust connectivity and integrated HMI.



Furthermore, Distributed Playback enables a shared multimedia experience beyond the capacities of current consumer devices, not only closing the gap between automotive infotainment and parallel consumer electronics, but also exceeding consumer expectations. This is just one example of how software solution vendors can bring functionality beyond the often repetitive system development by Tier One suppliers in-house according to open source standards.

# STRATEGIC IMPORTANCE, REQUIREMENTS, AND CONCLUSIONS

*The Importance of Software Solution Providers in the Infotainment Ecosystem*

## Strategic Recommendations for OEMs and Tier One Suppliers

As discussed above, the role of software in automotive and infotainment will only increase in significance in the years to come. Addressing software in-house as a secondary objective is not a promising strategy going forward. That said, ownership of software solution and service vendors as standalone subsidiaries that independently engage with other market vendors could provide a significant revenue growth opportunity. In either case, engaging with third-party software solution vendors is the best way to provide OEMs with systems that address their requirements to take connected infotainment to the next level, namely, new cases with shorter time to market.

## Cinemo's Potential in a Growing Infotainment Market

Given the requirements listed above, Cinemo is well placed to help OEM and Tier One suppliers meet the challenges of next-generation infotainment. Its middleware is highly compatible with devices and embedded hardware, and its infotainment solutions are compatible with a variety of operating systems, including GENIVI.

Its modular software architecture enables OEMs and Tier Ones to take Cinemo's solutions with them as they update hardware components, which means that OEMs can advance their infotainment systems on all fronts (hardware, software, use cases, and time to market). This modular approach is highly beneficial to the automotive industry, which is fundamentally iterative in its design.

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**Published August 2016**

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