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Software-defined vehicles: An identity crisis for the industry?

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Calum MacRae
S&P Global
Supply Chain and Technology, Automotive

Throughout the past hundred years or so, vehicles have largely been defined by their brand and all the engineering effort that is wrapped up in creating that equity. Software-defined vehicles represent a sea-change in vehicle development processes and challenge the industry's core competencies and hard fought brand identities.

We are entering an era where vehicles will be defined by their software. Think of that statement. In isolation, it says a lot. Throughout the past hundred years or so, vehicles have largely been defined by their brand. Alfred Sloan built a whole company on this principle. Today, Carlos Tavares, with Stellantis, has built a house of brands that appeal to different parts of the market with varying degrees of overlap. The brand of car we drove defined who we were as people. Driving a Volvo defined one as a "steady Eddie." Brands even defined whole professions. Saab? Ergo, must be a dentist.

In the era of the software-defined vehicle (SDV) all that history and car culture is in danger of being jettisoned. We have been here before and only recently. At one juncture electric vehicles threatened homogeneity and erosion of brand identity. SDVs will mean a vehicle is only as good as its software. There is a danger that the understanding of physics and engineering that had served a brand's DNA for decades will count for less. The components and systems that make a vehicle steer, stop and start could become off-the-shelf commodities in the new world of SDVs. Already, at CES 2024 we saw signs that mechanical components are being decontented in the SDV era, with the thought that software will be able to mask any intrinsic shortcomings of lower-functioning components.

The industry will argue that the SDV will allow vehicles to be anything that the customer wants to experience. Want your vehicle set up for a track day? Want to maximize your vehicle's energy efficiency? Want to upgrade your vehicle's infotainment or connectivity? "Certainly, sir or madam. Just make a one-time payment or subscribe here." However, to deliver an experience in keeping with a brand it could mean that differentiating hardware is retained, watering down the benefits of SDVs. Otherwise, the experience will only be as good as the software; will the software be able to provide a facsimile of a brand's historic equity?

And herein lies the problem. Software moving center stage in the world of automotive is inherently risky. It lies outside the sector's core competencies. It will define companies in the future, and it is doing so now. Think of the Fisker Ocean and the software problems that are detracting from an otherwise sound vehicle. Remember the issues with Volkswagen's first ID vehicles? These issues and many more will escalate in the future. For the US market, data compiled by the National Highway Traffic Safety Administration shows that software-related recalls have increased from a 10% share in 2019 to 15% in 2023.

The industry's brand equity equations are being redefined and under threat. And that threatens the established order. SDVs' advantages are often drawn alongside those of the smartphone. But there are other, more ominous, portents in the mobile phone world. Failing at SDVs could leave some on the side of Nokia, while those who succeed become the next Apple.

Look carefully and the signs are already there. Much of the change in the Chinese market in the past few years (international brands that are not Tesla nor premium have seen market share slide) has been ascribed to Chinese brands' EV presence and the head start gifted to them by benevolent government policies. They are part of the market change, but there is more to it.

The Chinese market is still relatively young, and its consumers are full of digital natives. Personal transportation's ability to get from *A* to *B* becomes the commodity, not the experience it once was. The experience is defined by what's going on in the vehicle. Here, Chinese brands have run with the

SDV idea first developed and productionized by Tesla. Like Tesla, they have none of the legacy vehicle architectures or systems and processes to maintain what the old guard juggles with.

The new car brands on the rise in mainland China are more about the digital experience — aka how good the software is — than they are about the ride. The fastest followers to Tesla are stacking up among the new Chinese competitors. The likes of Nio and BYD are closer to getting fully functioned SDVs to market than many of the leading original equipment manufacturers in the West.

Already, concerns are mounting in the triad markets — US, West Europe and Japan — that, with China's rising stars looking to use exports as a relief valve to alleviate increasing domestic excess capacity, there is a risk to the triad markets' natural order due to the surge in imports of low-cost EVs. The digital experience should be added to the EV concerns.

The SDV is often painted as a panacea for the industry's ills, not least of which is its consistent failure to earn a return on capital that finds favor on Wall Street. The SDV is the latest framework for, what the industry hopes, is transformational. In this, and in no particular chronological order, it joins backward and forward vertical integration; globalization (build where you sell); kaizen; just-in-time; high volume platforms; Industry 4.0; electrification, autonomous drive and many others.

While the SDV stands to benefit the industry, potential issues with SDVs are not just aligned with brand equity. SDV returns are a long-term game — revenue advantages will accrue in vehicle operation post-factory gate and thereafter, it is a question of fleet size. But, before we even get to the revenue piece, there will be considerable costs involved. As has been the case with EVs and autonomy, it will mean OEMs raiding their reserves and the capital markets as a sunk development cost for SDVs. And, as already mentioned, software sits outside a typical OEM's realm of experience. Auto companies are used to measuring tangibles. Software is nebulous and its effectiveness is impossible to measure with the auto sector's normal total value management and Six Sigma toolkits.

The need to plug technology and portfolio gaps, reduce cost burdens and add scale, all add up to the sector being ripe for strategic alliances and consolidation (again). The automotive industry's history is littered with brands that have ceased to exist because of overreliance on badge engineering. Among the Detroit Three alone, think Mercury, Oldsmobile and Plymouth. In the future, we could have a new failure point to add to the list in the shape of software engineering.

CONTACTS

The Americas
+1 877 863 1306

Europe, Middle East & Africa
+44 20 7176 1234

Asia-Pacific
+852 2533 3565

www.spglobal.com/mobility