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Dialogue, Debate, and Discussion

Comments on Murmann and Vogt 'A Capabilities Framework for Dynamic Competition Assessing the Relative Chances of Incumbents, Start-ups, and Diversifying Entrants'

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ABSTRACT Murmann and Vogt's (2022) analysis of the automobile industry using a capabilities framework that integrates both dynamic and ordinary capabilities supports an informative table which sets out the major relevant capabilities that incumbents, start-ups, and diversifying entrants would need to develop or access via contract or other arrangement (see Murmann and Vogt, 2022, Table 3). Jiang and Lu (2022) have further discussed new industry paradigms which they suggest will greatly challenge – and perhaps overwhelm – automotive industry incumbents. We believe that their insights can be taken a step further by focusing on two areas: first, the greatly increased availability of outsourced manufacturing driven by the shift to electric vehicle ('EV') powertrains; and second, the ongoing transformation of the driver and passenger experience that is driven by software–user experience software integrated with networked consumer service ecosystems.

KEYWORDS automotive industry, competition, diversifying entrants, EV powertrains

ACCEPTED BY Deputy Editor Can Huang

INTRODUCTION

Murmann and Vogt's (2022) analysis of the automobile industry using a capabilities framework that integrates both dynamic and ordinary capabilities supports an informative table which sets out the major relevant capabilities that incumbents, start-ups, and diversifying entrants would need to develop or access via contract (see Murmann & Vogt, 2022, Table 3). Jiang and Lu (2022) have further discussed new industry paradigms which they suggest will greatly challenge – and perhaps overwhelm – automotive industry incumbents.

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We believe that their insights can be taken a step further by focusing on two areas: first, the greatly increased availability of outsourced manufacturing driven by the shift to electric vehicle ('EV') powertrains; and second, the ongoing transformation of the driver and passenger experience that is driven by software–user experience software integrated with networked consumer service ecosystems.

These factors suggest that start-ups and diversifying entrants are in a stronger position than Murmann and Vogt (2022) propose, but for reasons different than those suggested by Jiang and Lu (2022). Our observations flow from a recognition of the panoply of individual and organizational skills now needed, given technological evolution in recent years.

Dynamic capabilities are about figuring out, and then implementing, new sets of competence/ordinary capabilities needed to compete. Technological change (from within the enterprise/industry or from outside the industry) often renders existing skills less relevant or irrelevant; and incumbent management must endeavor to transform their organizations. Needless to say, there is no guarantee of success … and that is particularly true if there is no effort to renew/transform. Before looking forward to the next decade in the automobile industry, it may be helpful to look backward – to the transformation of the mobile phone industry during the 2010s.

LESSONS FROM MOBILE PHONES

In 2009, global mobile phone manufacturers competed and prospered. The top three vendors made up almost 70% of the market, led by Nokia and Samsung with over 50% share between them (Statista, 2015). New entry was not easy. It required global scale, complex radio design skills, and all of the associated intellectual property. The market was growing rapidly – Gartner estimated 2009 mobile phone sales at 133 million units, a 22% increase from the same period the previous year (ZDNet, 2003).

Apple released its iPhone in 2007, but it had achieved only a 2% share, and as Steve Ballmer, CEO of Microsoft, observed, 'You can get a Motorola Q for $99. […] There's no chance that the iPhone is going to get any significant market share. No chance' (Madry, 2019). Vendors were aware of the growing importance of data but viewed their data platform as a component on top of their phone; the phone was optimized for its primary purpose – making phone calls – with the occasional need to look something up.

By 2014, the market had indeed grown – to almost two billion units (Statista, 2021). But in that same period, Apple and Android had inverted the model: the phone was now an app on top of a mobile computer, just one element of many within a unified user experience. Manufacturing shares had fragmented as commodity chipsets and outsourced manufacturing coupled to Android OS had allowed multiple entrants to sell over a billion of those units (Richter, 2018); Apple sales were closing in on 200 million units (Statista, 2018). Nokia was essentially gone – purchased by Microsoft in an attempt to save its Windows Phone and eventually written down by over $8 billion (Krigsman, 2018).

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Smartphones were a systemic innovation that created new ecosystems. The competition that mattered had come not from Nokia, Motorola, etc., but from outside the industry and most notably Apple which had software was well as hardware capabilities. Focused on competing each other, established hardware vendors seemed powerless to respond. Revenue and profits flowed to new ecosystems, first iOS, and then Android.

The automobile market in 2021 is not the same as the mobile phone market in 2009. For a start, the automobile market is not rapidly growing. Furthermore, smartphones are a different class of device from 2009's mobile phone – at the end of the day, cars will still be cars. And the more enthusiastic projections for the growth of autonomous 'robotaxis' – at one point projected to reach almost $3 trillion in revenues by 2030 (McGee, 2019) – are sinking with the growing understanding that there is no known technical path to their economically viable realization.

However, powerful parallels exist between mobile phones in 2009 and automobiles today. First, as Murmann and Vogt (2022) observe – and just as occurred with smartphones – EV platforms are far more subject to commoditization than traditional internal combustion engine ('ICE') vehicles. The vehicle platform is evolving from a strategic (not easy to replicate) asset to an element that can be replicated or outsourced. Second, as that happens, barriers to entry are falling – Tesla has been joined by many new entrants: Byton, NIO, Piech, Faraday, Lucid, Canoo, and Rivian (Ewing, 2020). Established distribution channels are under attack – Deloitte has characterized the existing models as 'outdated', 'poor for consumers', and 'poor for OEMs' (Deloitte, 2019). These are significant threats to incumbent majors from start-ups.

Software Competencies/Skills Matter as They Anchor Consumer Experiences

As with smartphones, the real challenge is software, and in particular the software platform that increasingly will anchor the vehicle user and owner experience. Such software should be divided into two separate classes.

First, user experience ('UE') software will rapidly dominate and differentiate the driver and passenger experience. Initial proof-of-concept systems from Mercedes (the MBUX Hyperscreen) (Mercedes-Benz, n.d.) and Apple (next-generation CarPlay) (Dunn, 2022) are the first steps in moving the experience focus from hardware to software. That change demands a fundamental shift in necessary ordinary and dynamic capabilities, of the same magnitude as the shift from keyboard-based to full-screen mobile phones. Incumbent original equipment manufacturers ('OEMs') are not well positioned here.

Second, networked systems software platforms will be used to manage and integrate connected capabilities of the vehicle – everything from entertainment and navigation through to advanced active guidance systems – that will allow drivers to be 'hands-off' and 'mind-off' in certain circumstances. Increasingly, that software platform will anchor brand values.

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Again, incumbent OEMs are not well positioned to provide the necessary services. Such capabilities lie outside the auto industry. Distributed service providers ('DSPs') – such as those owned and operated by Apple and Google in the Western world and by Alibaba and Baidu in China – are likely powerful players in a new automobile/transportation services industry. Those companies deliver an integrated set of services – media, mapping and guidance, communications, etc. – using massive cloud-based platforms. Crucially, those services are the same regardless of the device used to access them – phones, tablets, PCs, and, importantly, commercial and passenger vehicles.

The automobile industry has long embraced the power of software in its components – electronic systems are now estimated to make up almost 50% of total car cost. But UE and DSP software systems are different – they are not components, but rather unified platforms that treat everything else as infrastructure. They invert the traditional automotive electronic model. UE and DSP providers want to define and control the user and owner experience – vehicle hardware is simply infrastructure.

The market dynamics of DSPs are thus reasonably clear – large economies of scale and ecosystem effects, supported by massive R&D budgets may lead to regional duopolies i.e., two ecosystems, but multiple automobile brands, as in the smartphone business. Thus, just as Android commoditized the mobile phone brands on which it runs, so will DSPs cause vehicle brand differentiation and product attributes to migrate to a few (perhaps two) software platforms and related ecosystems. Established automobile OEMs – although world-class for their existing market dynamics – mistakenly view software from a narrow component perspective. Their organizational structures are not configured to respond to the seamless services ecosystems that are emerging around personal and commercial transportation.

CONCLUSION

In our view, the insights in Murmann and Vogt (2022) – summarized in their Table 3 – can thus be segmented and expanded. First, one must ask which of the capabilities set out there can now be outsourced to EV manufacturing suppliers – for example, companies that can do for Apple in cars what Foxconn has long done for them in smartphones. Second, Murmann and Vogt's (2022) 'Software Development' should be redefined and segmented to focus on separate user experience and DSP ecosystems that will increasingly define the user experience and brand identity.

EV manufacture and support should be viewed as three separate businesses, each requiring different ordinary and dynamic capabilities:

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Business	*Major elements*	*Notes*
EV Drive Platform	Powertrain, floorplan, suspension, steering and climate	Global scale and regulatory compliance Large-scale component assembly Supply chain integration
Vehicle	Car body, interior and UE software	Regional scale Full-stack UE software
DSP	Navigation, entertainment, communications and commerce[1]	Multimodal services Cross-device integration: car, home and mobile

Disruption in this view comes from three major trends. First, EVs allow much looser integration between Drive Platform and Vehicle than was possible in ICE vehicles – allowing the emergence of separate, focused businesses. Second, the shift to UE software as a primary driver of brand and differentiation disadvantages current OEMs. Third, the networked nature of navigation, entertainment, communications, and e-commerce will lead to ongoing dominance by regional duopolies, now extended into the passenger vehicle.

With the above perspective, we can analyze which OEM incumbents are most at risk – and which new entrants should most be feared. In Murmann and Vogt's (2022) assessment of how many new capabilities incumbents, start-ups and diversifying entrants will need to compete in the EVs of the future, they implicitly treat each capability as approximately equal in importance. A capabilities framework for dynamic competition needs to recognize (more than Murmann and Vogt do) that strategically relevant capabilities differ greatly in importance and change over time.

In our view, entrants from the DSP space such as Apple, Google, Tencent, and Alibaba will use their dominance in network service capabilities to take economic value (i.e., profits) away from incumbent auto firms. Paths for that evolution will differ markedly, however, depending on those firms' ordinary and dynamic capabilities. As Murmann and Vogt (2022) observe (with respect to Google), and Jiang and Lu (2022) observe (with respect to Tencent and Alibaba), some DSP entrants into vehicles are faltering or already have been abandoned; those firms' disadvantages in EV Drive Platforms are even more clear. They will, however, claim significant margin and revenues over vehicle lifetimes by providing DSP services to Vehicle OEMs. New entrants into Vehicle manufacture will exploit outsourced Drive Platforms – greatly reducing the cost and complexity of regulatory and safety compliance – and integrate with third-party DSP providers for those necessary services. And Apple has a major opportunity to exploit its capabilities in both UE and DSP software, and the ability to outsource Drive Platform manufacture to vendors such as Foxconn, allowing it to enter profitably into Vehicle sales.

In summary then, we depart from Murmann and Vogt, and from Jiang and Lu, not in form but in emphasis – in the belief that disruption in passenger vehicle manufacture will overwhelmingly be driven, and success overwhelmingly determined, by dynamic and ordinary capabilities in software. In mobile phones in

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the 2010s, hardware capabilities, global scale, and established brand – the elements set out in Murmann and Vogt's (2022) Table 3 – proved of marginal importance once dominant software platforms emerged. The next decade of competition in vehicle manufacture looks set to follow a similar path.

NOTE

[1] Here, we differ from Jiang and Lu (2022) with respect to the importance of autonomy in any areas outside long-distance trucking. Useful autonomy remains an undefined and unsolved problem in any areas outside disciplined, monitored, and regulated roadways. Autonomy will not be a significant factor in the foreseeable future and, rather, has the potential to be a substantial and unrewarded drain on resources.

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