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The Business of Electric Vehicles: A Platform Perspective

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ABSTRACT

Platform business tactics are highly visible and dominant in business today. Prominent firms in industries such as information services, retail, and travel, have embraced platform thinking. Still, many others are engaged in a platform game without realizing it, often to negative consequences. This monograph develops this theme with an illustrative focus on the battery electric vehicle segment of the automobile industry. It traces the development of the industry, identifies key decisions by various participants, and analyzes these decisions from a platform strategy lens.

We emphasize that platform characteristics and network effects are at the core of the electric vehicle industry. A battery electric vehicle is not just a vehicle whose fuel happens to be supplied by the battery. Rather, the vehicle purchase decision is heavily influenced by the availability of a widespread supercharging network as a complementary good. Hence, it is vital for the vehicle maker to ensure that customers have access to both sides of the market—an exciting vehicle and robust supercharging network. An electric vehicle differs from gasoline-powered vehicles in this regard because

the refueling network for gasoline vehicles is already robust, widespread, and interoperable across brands, thereby becoming inconsequential to customer adoption decision and firms' strategy.

For electric vehicles, the two-sided platform nature of the industry underlines the need for a well-coordinated strategy on both sides of the market. Our analysis reveals that industry participants (vehicle producers, providers of charging locations, government and policy makers)—with the notable exception of an industry newcomer, Tesla, which has astutely employed platform thinking in its core decisions—have executed a flawed strategy that fails to recognize and leverage the platform aspect of the industry.

1

Introduction: Are You Playing a Platform Game?

The most successful companies of the last decade have all been platform businesses. Platform businesses create value in unprecedented ways. In April 2020, the five largest stocks in the S&P 500 accounted for 20% of its total market cap, exceeding the 18% concentration level reached during the dot-com bubble. Those stocks are Microsoft, Apple, Amazon, Alphabet (Google), and Facebook. All of them are platform businesses and, with other often cited examples such as Alibaba, AirBnB, Uber and the like, they spearhead what has come to be known as the *platform economy*.

Looking beyond the headlines, however, chances are quite good that firms are developing platform products even when they don't recognize them as such. This is because platform thinking extends far beyond the digital platforms and tech giants that everybody is now able to spot. One example is the electric car industry; the various entry approaches of traditional automakers and newer disruptors, such as Tesla, provide the backdrop for our analysis throughout this monograph.

In particular, platform firms increasingly depend upon external actors to provide the necessary complements to create a complete system that delivers value to end users. Another feature of platforms in

the way that we discuss them is that the value to a platform's user is dependent upon the number of other users who also affiliate with the system. This leads to a simplified test to help spot a platform: a product or service value is a combination of an independent product/service value and network value. This means that the utility to a user can be expressed as a function of the standalone value that a user derives from the product or service plus the value that the user gains because other users also join the system. That is, user i 's utility for brand j with quality level q_j is of the form $V_{ij} = V_i(q_j) + f(N_j)$ where N_j is the network or number of users of brand j . The implication of this network effect is that, unlike traditional goods, a user's utility is not a constant, and increases as more buyers adopt the good. This creates opportunity for the firm to continue expanding the market as previously low-value users develop higher utility as N_j grows, as well as to increase its product monetization e.g., through recurring fees or add-on features. But this network effect also creates some distinctive challenges which call for distinctive business strategies which we discuss in Sections 4 and 5.

Recognizing that a firm is in the platform game is important, as platform markets are fundamentally different from traditional markets, and these differences must lead to distinctive business tactics and strategies. A rule of thumb goes as follows: Platforms exist if a firm is working on a platform product where the value of their product is a function of standalone value and network value consisting of value from same-side (Katz and Shapiro, 1985) and cross-side network effects (Parker and Van Alstyne, 2005; Rochet and Tirole, 2003). Consider, for example, Microsoft's spreadsheet program, Excel. Excel offers the single user a broad spectrum of functions and features, and delivers great value to users even when they act alone. This value increases even further because users can easily share spreadsheets and collaborate with one another. This collaboration makes it highly unlikely that users who must collaborate would adopt *different* spreadsheet programs because they would forgo the network component of the value proposition.

Over the last years, a solid theory of multi-sided platforms has been developed and has diffused into management practice, often by using the famous digital platforms mentioned above to explain the mechanisms.

By now, many managers won't have trouble spotting and understanding the mechanisms at play when a new digital platform emerges. However, the phenomenon extends far beyond digital platforms and chances are good that you are in the midst of developing a platform product, but don't recognize it.

We use the case of electric cars and charging networks to highlight the differences in business strategies between product and platform thinking, and to give a detailed analysis of these to explore the reasons why firms make different choices depending upon the lens they use. Indeed, as we shall demonstrate below, electric cars follow the same platform architectural logic as the widely known examples of digital platforms. The platform logic, in essence, is the idea that there are two sides in the market, one side is the network of car owners and the other is the network of charging stations. The platform is the entity that coordinates both sides, ensures they grow in suitable balance, and it may own proprietary technologies relevant to one or both sides.

There are three key issues for managers of platform products in the electric car industry. First, managers need to actively work both sides and doing so opens additional strategic options. *For example, Tesla actively manages both sides and has the option to switch sides, while traditional car makers who have been passive and have waited for others to solve the problem have given up many strategic options.* Second, openness is a critical decision variable. *Only when you manage both sides (such as Tesla does) can you afford to have a closed system, otherwise you need to actively pursue an ecosystem strategy.* Third, revenue models are not straight forward and can sometimes be counterintuitive. *For example, it is almost impossible to develop viable independent business models only for the electric vehicle charger market.* The ability to cross-subsidize depends upon participating in more than one part of a multi-sided platform. Firms that operate only on one side of a multi-sided platform are constrained in the business models that they can deploy.

As a case in point, our analysis supports the view that Tesla's—to many unexplainable—success and lead in the EV segment is predominantly on account of pursuing a platform strategy. In fact, Tesla has achieved and maintained this leadership despite substantial weakness

on the product front. Journalists and industry analysts alike have often pointed out or even belittled the product performance of the Tesla vehicles: Tesla ranks last on JD Power quality survey with 250 problems per 100 vehicles, for a long time didn't seem to get basic production right and lived through the infamous production hell, turned to outside body shops to repair scratches and paint defects before cars were delivered to customers. However, from a platform's good perspective, that is the vehicle and its complementary charging infrastructure, Tesla has the best product and the best options to monetize either side of this multi-sided platform.

This monograph elaborates on these perspectives by highlighting the platform strategy elements that are relevant in this industry, and then analyzing the crucial factors that have led to the competitive outcomes we observe today.

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