The battle of the giants: Apple challenges Tesla

Henri Schildt, January 2021

When reading, consider the following questions:

- What is the role of digitalization in the industry disruptions?
- How does AI change the basis of competitiveness?
- What are the key factors that determine the outcome?

Business Week ran an article on December 22nd, revealing that Apple is planning to launch its self-driving car in 2024. Should this happen, we will witness a fight between the world's largest company (Apple, valued at around $2 trillion) and the world's fastest growing company in terms of market capitalization (Tesla, rocketing from $75B at the beginning of 2020 to over $600B by the end of the year).

Apple's challenge to Tesla provides an opportunity to reflect on two "disruptions" in the car industry: Tesla's successful efforts to overtake the established players by redefining the basis of competition and Apple's likely strategy to do the same to Tesla. Like disruptions in all industries these days, both of these changes are linked intrinsically to digitalization.

This case study first elaborates the strategy that made Tesla by far the most valuable car company in the world. I will then turn to Apple and its likely strategy to challenge Tesla. While the winner of the coming "car wars" is far from clear, it seems likely that Apple might be able to disrupt Tesla's business in the way Tesla disrupted the traditional car companies.

Tesla's break into the car industry

Tesla's rise to the top of the automotive industry was driven most obviously by performance and cost improvements in battery technology. But changing industry context also played a role. The increasing centrality of software inside products made prior competencies in mechanical engineering and precision manufacturing less relevant. Tesla's ability to reach a significant niche market without expensive television advertising and racing team sponsorships hinged on the growth of social media and the decline of the mass media.

Advances in battery technologies decreased the relevance of established companies' capabilities, creating the opening for Tesla to enter the industry. One might have easily overlooked the impact that electric engines have on the rules of the game. An average Toyota car has roughly 30 000 different parts, while a Tesla Model 3 has around 10 000. Obviously, some of those twenty thousand missing parts are pretty expensive to make. After all, an operating internal combustion engine goes through hundreds of controlled explosions every second. Legacy manufacturers are tied to extensive supplier networks in the U.S., Germany, and Japan that they needed to build cars around combustion engines. Tesla could move faster because it was not held back by such ecosystems.

Cars of every kind increasingly involve software, something that established car companies were never very good at creating. Software does not only take care of the user interface and interactions, but controls all aspects of the car's operations. The digital control enables the physical equipment to be adapted over time. Software can adapt the timing, power, and various other parameters to how engines, transmissions, brakes, and parts of a car function. In any complex system, such as a car, software can significantly improve performance through the mutual adaptation of various sub-systems. As the importance of top-class software developers has increased, Tesla has been a far more attractive employer than traditional car companies. More generally, manufacturing firms have long underpaid software engineering talent, for a number of reasons.

Elon Musk is a brand ambassador like few others, and Tesla has exploited the free marketing afforded by his celebrity. Traditional car companies poured a significant percentage of their revenues into advertising. In year 2015 alone, Volkswagen spent $6.6 billion on advertising, while Daimler spent $5 billion. Tesla claims it spends $0 on marketing, although these are "hidden" marketing expenses like its retail network. Even as Hollywood movies systematically featuring Audis with hardly a single Tesla on sight, the latter has become the more desired brand. Media has become more fragmented, making the classic sponsorship approach less attractive. At the same time, social media has allowed Elon and Tesla enthusiast to spread the brand message.

Sales channels have also changed. During the past ten years, car dealerships have turned from a key resource to a liability. While established car companies pay a significant cut from every car sold to dealers, Tesla allows its customers to do business through the internet and ignore the unpleasant haggling altogether. There is little uncertainty in buying a Tesla, because they only sell a handful of models and there are no radical changes in the product from year to year. In the social media world where consumers are used to iconic services, such as Facebook and Uber, and a few iconic products, such as the iPhone, traditional car companies' product strategy is outdated.

Tesla's approach to innovation

In pre-digital world, expensive innovation processes culminate in a go-to-market phase, an extravagant product launch that seeks to capture the investments into product development. Car companies used to launch a more or less incremental update to each of their cars every year. The first car I owned was a 2003 Audi A3. My friend drives a Tesla Model S, but I have no clue what year it was made and it does not matter. It is not anyhow the same car that he bought, because it has received many free software updates that make a meaningful difference for the user.

Professors Yoo, Henfridsson, and Lyytinen observed already in 2010 that the nature of innovation processes have been changing due to digitalization. Instead of developing and launching entirely whole products or product generations, companies now create value through constantly updates to their digital services. Instead of grandiose launches of new product generations, companies can now constantly update bits and pieces of their software. Facebook and Spotify launch new products very seldom, but instead focus their innovation efforts to constantly improving their services. They use the "release train" model, where teams can incorporate new features and improvements into regularly scheduled updates (the

release train) that is tested and introduced to existing customers every month or two. Frequent low-fuss updates mean that customers are regularly delighted by improved service and new features, while the product maintains its identity. These companies charge subscriptions fees to benefits from customer satisfaction without risky bets into new products generations. While Apple followed the traditional product generation strategy with iPhone, its approach with iPad is much closer to the single iconic product. One has to be a bit of an enthusiast to know which generation one's iPad is.

The competition among traditional car companies got them locked into a proliferation of car models. More flexible manufacturing processes allowed companies to broaden their product portfolios and to compete through differentiation. Mercedes-Benz, for example, now has an alphabet soup of models that few uninitiated consumers can make sense of. The old mass market advertising model rewarded spectacles, pushing product development to produce novelty for the sake of novelty. Tesla is too young a company for us to really tell if it will revert to this mode, but so far there have been fairly few models and much of the focus has been on steadily improving the Model S and Model 3, its two most important and iconic cars.

What will Apple do?

Apple will almost certainly approach electric cars with a different competitive strategy, capabilities, and ecosystem than Tesla. If it didn't, it would stay out of the industry. Any company would be reckless to challenge a successful giant like Tesla heads-on. The industry is undergoing further changes due to the commodification of battery supply chains, next generation battery technologies, increasing sophistication of supply chains, and—arguably most importantly—the self-driving technology.

The self-driving technology is a big game changer. Not only does it change the car as a product, but it changes the competitive dynamics of the industry. It is the crucial new technology that opens up an opportunity for Apple to enter and shake up the industry. When Tesla entered the industry, it offered only two advantages for the high-end customers: green credentials and acceleration. Tesla Roadster and Model S were fast and furious, characteristics consumers associated with expensive cars. Critical characteristics for self-driving cars are different. As a passenger, I have always preferred my driver not to accelerate too quickly. If you are not driving, you want your car decked with entertainment and productivity tools. This translates to large screens, voice control, and well-designed interiors (a white board, anyone? no?). A self-driving car is likely to have even fewer physical parts than a Model 3, making it easier to manufacture. A self-driving car has no need for a steering wheel or pedals anymore; users who occasionally want to control the car manually can do it through a touch-screen.

Product strategy will change in other ways too. Apple is likely to sell a very small number of different models, perhaps for four and eight persons, with a few different options on battery size, etc. Like all Apple products, cars will be on the expensive side. Yet, even more money will be made through add-ons and subscriptions. Self-driving technology will come as a subscription, and the company will sell numerous other add-ons. There will be music, TV, new digital themes for the interior, and third-party applications. Apple's offering might look so different from Tesla that consumers do not even conceive them to occupy the same

product category. In effect, Apple Car will disrupt Tesla just like Tesla Model 3 disrupted the incumbent car companies.

News about potential alliance between Apple and Hyundai confirm the predictions that Apple will rely on external partners much more heavily than Tesla, especially in the manufacturing process. When Apple entered the smartphone industry, Nokia was still making its own phones. Competitiveness was driven by operation efficiency, and outsourcing partners appeared simply to be too inefficient. In 2007 when iPhone was launched, the ecosystem was maturing, however. Partnership with Apple allowed Foxconn to make necessary investments to drive down production costs. The car industry has already a number of contract manufacturers that assemble cars for high-end brands, and many of the established players have excess manufacturing capacity. Due to digitalization factories can be adapted more quickly, and the learning curve (cost and quality improvements from production scale) are no longer as significant as they used to be. If the manufacturing ecosystem matures in time for Apple to forego investments into its own production lines, it may be able to ignore the single biggest barrier to entry in the industry.

Investments in battery production and the alliance with Panasonic have provided Tesla a significant advantage thus far. This domain is developing fast, however, and there may be opportunities for Apple to "leapfrog" Tesla by sourcing next-generation technology. The concept of leapfrogging comes from economic history and refers broadly to the ability of challengers to overtake incumbents that are too tied up with the previous generation of technology. For example, observers have argued that U.S. companies' leadership in web-based ecommerce made them slow to invest in mobile commerce, whereas lack of established web-based businesses helped China leapfrog U.S. to become the leader in mobile Internet. While Tesla's investments into massive "Gigafactories" gives it a huge advantage, Apple must be hoping that the next generation of battery architectures arrives and that Tesla cannot adapt its existing facilities.

Finally, perhaps the biggest asset Apple has in the fight for the "smart car" will be its ecosystem of app developers and content providers. Despite its Silicon Valley credentials, Tesla has never built a software platform with third party applications and services. In contrast, Apple owns the premium platform in the world. If cars will turn into entertainment systems, Tesla may have to ally with some of the existing platform players with a working voice assistant technology, Google, Amazon, Microsoft, or—highly unlikely even for Elon Musk—Tencent.

How will it play out?

There is a cliché that whether strategies really work always comes down to execution. This is not a very helpful aphorism; execution a catch-all category that deflects the blame away from visionaries and glorifies tenacity. Apple's execution has been world class, and there is no reason to expect they will make missteps. But do investments into autonomous cars make sense and should Tesla be worried?