

Inferring the Future of the Electric Vehicle Industry from Tesla's New Business Model

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ABSTRACT

Since 2020, the automotive industry has faced a new transition from mechanical machines to electronic products, and its development model has undergone fundamental changes. The automotive industry has turned to software and application ecology to seize user needs and explore new profit models. Tesla has changed the original car-making concept that was biased towards manufacturing, and transformed the Electrical/Electronic Architecture and profit model to bring about a reassessment of the industry's valuation system. The catfish effect brought by Tesla has opened up the imagination of the industry's business model, the electric vehicle industry will begin to a new era. This study provides implications for enterprises in the electric vehicle industry to improve their business model.

Keywords: EV Industry, Revolution, Tesla, New Business Model.

1. INTRODUCTION

The new energy vehicle industry is at the inflection point from the 2.0 era to the 3.0 era. Quantitative change leverage qualitative change has occurred, qualitative change leverage demand is about to cash, and the industry has entered the golden age. In the 2.0 era, giants accelerate the transformation of new energy vehicles, and medium-and long-term model planning is landing. In the era of 3.0 era, the new energy platform of the global mainstream car enterprises has changed from concept to landing, and the quality of new models developed based on special platform has been improved.

With production and sales, the industry competition in the 3.0 era will significantly intensify, and the ability of car enterprises to grasp technology, cost and market will become the capital competing for the leader of new energy vehicles.

Since 2016, the growth rate of global new energy vehicle sales has accelerated, and the market penetration rate has accelerated accordingly. In terms of technical routes, pure electric has become a common choice in the global market, and the proportion of sales in 2019H1 increased to 76.0%. In terms of sub-regions, the sales performance of the core market in China is generally stable. The year-on-year growth rate of sales in January-August 2018 and 2019 reached 83.2% and 41.6%

respectively. The global sales in Europe and the United States accounted for 22.2% and 13.3% of the global sales in 2019H1, respectively. Electric vehicles are gradually recognized.

Consumers' stereotype of the short driving range, high price and difficult charging of new energy vehicles is changing, 1) Power battery technology iteration superposition cost reduction, B end total holding cost parity has been the lead to achieve, C end parity; 2) new energy platform popularization brewing qualitative change, electric vehicle performance advantage to fully show, leverage the C end demand; 3) global charging facilities construction steadily, new energy vehicles; 4) new energy vehicles are the best carrier of intelligent network technology, intelligent, information help energy conservation and emission reduction, integrated development to promote the sublimation of automobile technology, new energy vehicles gradually replace the traditional fuel vehicles as the main market.

In 2019, the electric car manufacturer spent \$1.33 billion on capital expenditures, also called "CAPEX," and produced nearly 510,000 vehicles — that's an increase of about 144,505 vehicles from the prior year.[1]

Tesla has changed the original car-making concept that was biased towards manufacturing, and transformed the Electrical/Electronic Architecture and profit model to

bring about a reassessment of the industry's valuation system.

At this stage, the auto industry is facing the biggest change in a century. The catfish effect brought by Tesla has opened up the imagination of the industry's business model, the electric vehicle industry will begin to a new era.

Through the analysis and research of Tesla's new business model combining information technology and intelligence, this research aims to explore the development trend of enterprise business models in the electric vehicle industry, and provide inspiration.

Table 1: Tesla's business revenue and earnings space forecast from 2020 to 2025

	2020E	2021E	2022E	2023E	2024E	2025E
Hardware Segment						
Total vehicle sales revenue (US \$100million)	233.70	455.30	559.40	685.80	808.00	943.80
Total profit (US \$ billion)	5.30	23.30	24.90	38.10	58.80	61.60
Software Segment						
Total software sales (USD)	9.89	26.30	48.27	78.18	120.83	175.21
Total software business profit (US \$100 million)	5.52	14.80	27.08	43.83	68.32	98.92
Service business						
Total Sales (USD)	1.30	2.43	4.39	7.29	11.32	16.74
Total service business profit (USD billion)	-0.40	-0.42	0.11	0.76	1.20	2.11

2. DISCUSSION

Our discussion on Tesla's business model is based on hardware, software and service business.

2.1 Hardware System: With "Quantity" as the Core, Performance Upgrades Superimpose Price Drop, and Radiate a Larger Market

Tesla's sales increased in Q2 of 2020 with 90,650 cars delivered to customers. The increase in the number of deliveries pushed the company's market capitalization to nearly \$208 billion and surpassed Toyota's \$202 market cap to become the world's most valuable automaker by market value.

Tesla became the market dominator of EV in US, which delivered 80,050 Model 3 and Model Y units in Q2 of 2020 with a total of 90.650 cars delivered in the quarter. Tesla recognized as one of the "New Big Three" along with Ford and GM. In 2019, Tesla Model S was the most sold electric vehicle in the US with 187,971 cars sold. In 2021, Tesla's new car deliveries increased by 87% year on year, exceeding the delivery record of 930,000 vehicles. The total delivery of new cars was about

936,200, up 87.4% year on year, far exceeding Tesla's previous annual commitment of 50% annual growth.

Tesla has thousands of suppliers around the world. Among them, Tesla has established strong relationships with several major suppliers. There are some important components, such as batteries and other critical system components, for which the company has established close sourcing relationships with its suppliers. Panasonic is one of Tesla's main suppliers, and it also has been a long-term supplier of Tesla's car batteries.

According to reports, Tesla keeps growing its investment in research and development each year. In 2015, the R&D expenses of Tesla stood at \$718 million and rose to \$1.46 billion in 2018. The company also provides regular software updates for its cars. Tesla's cars also offer excellent battery range, compared to its road rivals, electric cars and hybrids.

On a global scale, the automotive industry is increasingly competitive, and the market for electric vehicles has changed a lot. Technology is a major source of differentiation in the global automotive industry. Autonomous driving technology and electric vehicles are the hottest technology areas in the auto industry right now. Disruptive technology is overturning the digital

transformation of the automotive supply chain. The integration of technology applications and electric vehicles will become the future development trend.[2] Tesla is a leader in R&D in both areas. Tesla's huge investment in technology R&D and innovation, and the high cost of R&D, has helped Tesla to continuously improve its products and increase its influence in the global market.

It is reflected in the vehicle sales, the three power and chip vertical integration of research and development mode, localization to promote procurement Link

repricing, will guide the price of a clear downward path, radiation to a larger sales market. The profit space for Tesla's CAGR is 64% in the next five years.

For the sales segment, the United States expects auto sales revenue to exceed \$30 billion in 2025, with short earnings. Combining capacity planning and 3/Y-type price cuts in China, a profit of US\$2.6 billion can still be achieved in 2025 with lower gross margins. In Europe, Model3, the Model Y ASP is expected to be cut to \$4.2 and \$43,000, respectively, with sales exceeding 251 in 2025 \$ billion, \$1.8 billion.[3]

Table 2: Tesla vehicle sales revenue and profit space forecast

	2020E	2021E	2022E	2023E	2024E	2025E
US						
Auto Sales revenue (\$100 million)	132.1	194.4	226.9	258.5	292.9	327.9
Profits (\$ billion)	0.4	5.8	1.8	7.8	20.5	16.4
China						
Auto Sales revenue (\$100 million)	58.8	185.9	222.8	266.6	312.0	364.6
Profits (\$ billion)	3.1	13.0	15.4	20.7	24.1	27.6
Europe						
Auto Sales revenue (\$100 million)	42.8	74.9	109.8	160.7	203.0	251.3
Profits (\$100million)	1.8	4.5	7.7	9.6	14.2	17.6
Total						
Tesla Sales (10,000 unit)	50.0	97.1	129.4	168.5	211.3	258.7
Total vehicle sales revenue (\$100 million)	233.7	455.3	559.4	685.8	808.0	943.8
Total profit (\$100 million)	5.3	23.3	24.9	38.1	58.8	61.6

In summary, Tesla's automotive hardware sales revenue will grow from \$22.15 billion in 2020 to 2025.

At \$92.68 billion, earnings are expected to rise from \$460 million in 2020 to \$6.03 billion in 2025 Yuan, the CAGR was 64%.

2.2 Software: Diversified Realization, Building an Initial Software Profit Model

Tesla, a Silicon Valley-based company, has confirmed a feasible path for large-scale realization of software, divided into three modes: FSD payment, software application mall and subscription service. Obviously, the development of hardware has a ceiling effect, and the software and service system continue to give new added value to the models. Most automotive hardware biased to manufacturing will be affected to the limit, will eventually enter the industry steady state stage of interface and function standardization and maintain a

stable profit margin. But the software and service system provides a new profit model for vehicle industry due to the fast iteration cycle and low degree of standardization brought by industry characteristics.

Measure points: due to the FSD package consumption and hardware system completely separated, the split difficulty stems from two points, on the one hand is the determination of income rules, Tesla when consumers choose to buy FSD cash, usually half in the current income, the other half of the deferred revenue in the launch of new function, such as 2019Q3 new intelligent call function to confirm \$30 million deferred revenue. On the other hand, the loading rate is difficult to determine, which is mainly affected by the non-linearity of consumer demand for software, large differences between regions, and less relevant disclosure of Tesla.

FSD loading rate: Assuming that since the loading rate of FSD in the US market exceeds 20% and the

loading rate of FSD in the domestic market is 10%, the continued increase in its price is likely to indicate the good performance of FSD software in penetration rate. Stanley's 27% estimated value is evidenced; this time, in the 2020Q3 quarterly report, Tesla expects to receive \$1 billion in service business revenue in the next year, and more than half of its structure is expected to be contributed by FSD software). It is expected that with the advancement of the intelligent driving business, the FSD loading rate is expected to increase from 30% in 2020 to 55% in 2025 (including the monthly payment model). Tesla sales: Tesla's Model S, Model X, Model 3 and Model Y have been branded, and is expected to continue to launch Roadster 2 and Cybertruck expanded product lines in 2021. Sales are expected to rise from 5 million in 2020 to 2.59 million in 2025.

FSD unit price: The US FSD has risen to \$10,000 per vehicle. Later with the FSD function more complex and diversified, the price will continue to rise. With an annual price growth rate of 5%, it is expected to reach us \$12,800 per vehicle in 2025.

Monthly payment model: Attract potential users and add \$600 million in revenue in 2025.

It is expected that Tesla will launch a monthly payment model for FSD software in early 2021 to maximize the attraction of potential user groups to increase the purchase rate and achieve stable revenue generation. Based on "FSD annual income=MAU*monthly ARPU*12", "MAU=Tesla holdings*FSD loading rate", FSD is calculated from the three core dynamic variables of Tesla holdings, FSD loading rate and monthly ARPU Profitable space for monthly subscription payment model.

Household groups to increase the purchase rate, to achieve a stable income generation. Based on "FSD annual revenue =MAU * monthly ARPU * 12" and "MAU= Tesla ownership * FSD loading rate", the profit space of FSD monthly subscription payment model is calculated from the three core dynamic variables of Tesla ownership, FSD loading rate and monthly ARPU.

Monthly Active User: In terms of ownership, assuming an annual scrap rate of 4%, it is calculated in 2019 based on Tesla's sales data over the years. (The scrap rate is a KPI in manufacturing that measures the production quality and output. Scrap rates tell companies how effectively manufacturing processes are operating.)

Tesla has about 86 0,000 units at the end. Based on the 2020-2025 sales forecast, the ownership of Tesla is 9.22 million, at the end of 2025. Assuming that the annual sales growth rate of Tesla in 2026-2027 and 2028 is 20% and 10% respectively, the ownership of Tesla is expected to reach 28.11 million in 2030. In terms of FSD loading rate, it is defined as incremental FSD monthly loading rate. [4]The monthly payment mode can attract users with potential desire to experience FSD, and it is expected that

some users will switch to one-time loading. It is expected that the FSD loading rate will grow rapidly in 2020-2025 and enter a period of steady growth. Based on the assumed ownership and FSD load rate, the MAU is expected to increase from 22 0,000 in 2021 to 1.69 million in 2030.

Monthly ARPU: Assuming that the FSD monthly payment model starts in early 2021, the monthly ARPU value is US \$100. Based on the increasing complexity of FSD features and increasing one-time prices, with the ARPU annual growth of 1%, the ARPU will grow to \$105 and \$110 per month in 2025 and 2030.

Subscribe software: Car entertainment, earnings grow to \$1 billion in 2025. The application software of smart cockpit is mainly monthly subscription. Intelligent cockpit is an important differentiation element to open the gap between cars, covering the interactive ecosystem between people and cars, including the on-board infotainment system IVI, ADAS, HUD, AR, AI, holographic, atmosphere lights, intelligent seats and other aspects. Tesla updated the V10 version of the car and phone system in September 2019, introducing streaming software .2019Q4 Tesla launch the Internet of Vehicles Advanced Connection Service (Premium Connectivity) priced at \$9.9 0 a month, including streaming, kara OK, cinema mode and other features. It is expected that the on-board entertainment system more APP to attract third-party developers, jointly explore consumer demand. Earnings are expected to grow to \$1 billion in 2025.

2.3 Service Aspect, Insurance Business

With Real-time Follow-up, Direct Customer DTC Mode to Improve Stickiness, Photovoltaic and Energy Storage Energy Business through Charging.

Tesla has the advantage of personalized, low-price premiums over traditional insurance companies. Real-time follow-up, face the customer DTC mode to improve customer experience.[5]

Some estimates weigh the fact that Tesla could achieve above-average insurance margins because of the highly detailed driving data it collects from its customers.

Since Tesla have above-average safety profiles, the company has the advantage of using real-time data to offer insurance to its customers with dynamic prices, which will ultimately lower customer acquisition costs and increase margins. Some estimates show that Tesla could achieve insurance margins close to 40%. If Tesla sells 40% of its vehicles with insurance by 2025, the company's insurance revenues could easily approach \$23 billion per year.[1]

Profit calculation of Tesla's charging business: As an important part of broadening the use scenario of electric vehicles, charging pile has the characteristics of high investment cost and fuzzy operation mode, and the

correlation between profit model and use frequency (equivalent to ownership Quantity level) is large. Revenue is expected to grow from \$130 million in 2020 to \$15.0 million in 2025 as Tesla expects to simulate an increase in production and sales and its charging business will gradually shift to gross margins. Profit margins increase from -\$40 million to \$180 million from the start of 2020 to 2025.[6]

Robotaxi network is an unmanned sharing mode, which consists of vehicles with unmanned functions, equivalent to time-sharing rentals that do not require self-driving and online car-hailing without drivers. In the first

stage, Robotaxi is mainly promoted in Model 3 models. Robotaxi charges far lower than current taxi/ride-sharing services, and may reshape travel patterns. [7] Traditional ride-hailing services in the U.S. charge an average of \$2-3 per mile, newer ride-hailing services like Uber and Lyft cost \$1-2 per mile, and Robotaxi charges as low as under \$0.18 per mile, much lower than traditional U.S./ The cost of carpooling is much lower than the cost of domestic travel in China.

Musk expects each Robotaxi to bring in more than \$30,000 a year in profit and carry passengers for 11 years.

Table3: Tesla Branch business valuation in 2025

	2025 Valuation (USD 1 billion)			Valuation ratio under the neutral assumption
	conservative	neutral	Optimistic	
hardware business	616	924	1232	15%
Software business	2628	4380	6132	72%
Travel business	388	621	854	10%
insurance business	17	26	35	0%
Charging business	27	36	45	1%
Energy business	61	101	141	2%
total	3737	6089	8440	100%

Tesla Robotaxi network is a fleet of idle vehicles served by its own and Tesla owners. With its advantages in autonomous driving technology, Tesla can gain considerable market share in the first stage of ARS market development, and Tesla's share in ARS market may remain at around 20% after 2024. Revenue from the business is expected to grow rapidly from \$60 million in 2021 to \$7.77 billion in 2025, with a CAGR of 233%. Given the low marginal cost of Robotaxi, with 30% net interest, earnings will increase from \$20 million in 2021 to \$2.33 billion in 2025.[8]

Compared with traditional insurance companies, Tesla has the advantage of being personalized and low price. The DTC model follows up in real time, faces customers directly, and improves customer experience. Assuming insurance penetration increases from 0.5% in 2021 to 7% in 2025, premiums per policy increase at a 1.5% year-on-year growth rate from \$1,000 in 2020. Then Tesla's insurance income after claims will increase from \$0.3 billion in 2021 to \$174 million in 2025, and earnings in 2025 are expected to reach \$31.286 million.

3. CONCLUSION

This study provides implications for enterprises in the

electric vehicle industry to improve their business model.

The long-term development trend of electric vehicles is to integrate with information technology and intelligence, and Tesla's new business model is in line with this development trend.

Under the new business model, consumers' willingness to purchase new energy vehicles will continue to increase in the future, and new energy vehicles will replace traditional fuel vehicles as the main force in the mid-long term.

According to estimates, in 2025 Tesla's automotive hardware business, software business, travel business, insurance business, charging business and energy business revenue will be 94.38 billion US dollars, 17.52 billion US dollars, 7.77 billion US dollars, 170 million US dollars, 1.50billion US dollars, \$4.04 billion, accounting for 75%, 14%, 6%, 1% and 3% of total revenue, respectively.[9]

Valuation of Tesla by business, with a valuation of \$608.9 billion in 2025 under the neutral assumption. It is estimated that the hardware, software, travel, insurance, charging and energy business valuations in 2025 are expected to reach 92.4 billion US dollars, 438 billion US

dollars, 62.1 billion US dollars, 2.6 billion US dollars, 3.6 billion US dollars and 10.1 billion US dollars, of which the software business accounts for the valuation. The proportion will increase to 72%, becoming the most imaginative part of Tesla's business model in the future.

3.1 Key Risks to the Core Assumptions or Logic

First, the car software business model is not advancing as expected.

In the process of automobile electrification and intelligent development, the importance of software automobiles became prominent, Tesla has enhanced customer service and value creation through software upgrades and service. [10] However, there is great uncertainty in the promotion of the new model, and the lack of late-stage innovation, resulting in a software business model that does not meet expectations, affects industry valuation, which is one of the potential risks.

Second, economic fluctuations and pandemic factors have brought downside risks to the automotive industry

Innovation in the automotive industry is closely related to sales. The industry is affected by the economic environment and incidents such as the epidemic.

Third, as the industry rapidly transforms, the emerging leaders lack in know-how.

They are filling in through acquisitions, networks and partnerships. They recognize that waiting for this know-how to grow organically falls short and takes too long. [12]

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