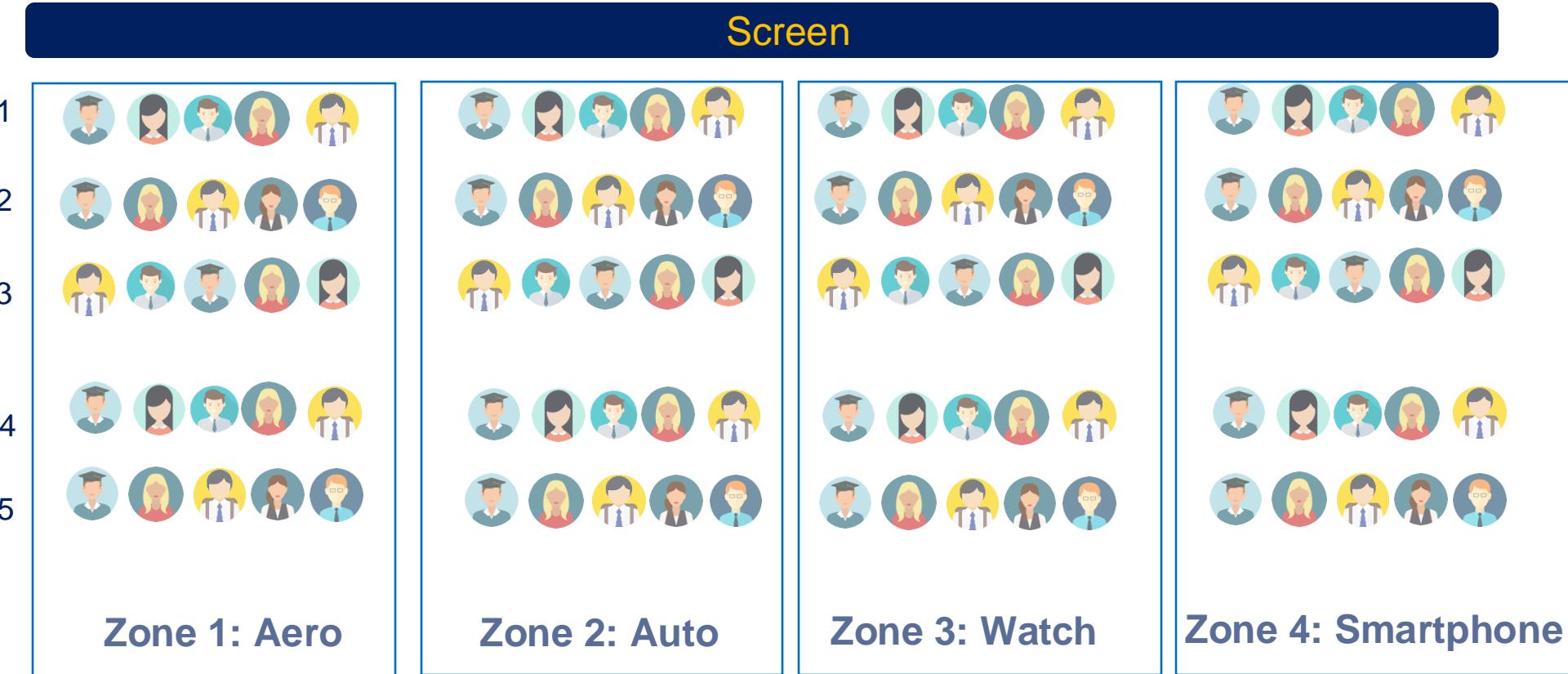


Class Layout – Please Sit with Your Group



The last row of the class are reserved and must remain empty!

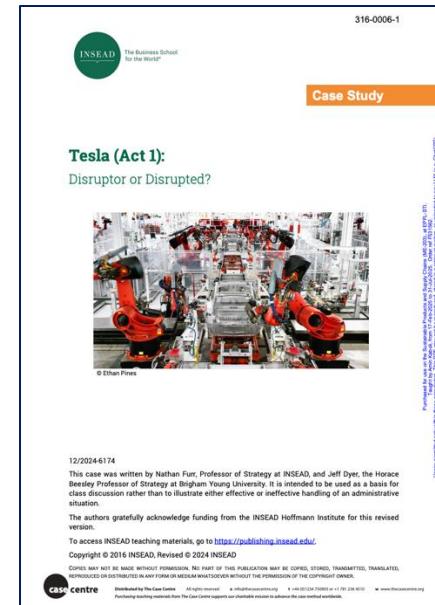


Sustainable Products & Supply Chains (ME-203)

Case Study: Tesla

Amin Kaboli

Week 4 – March 13th, 2025

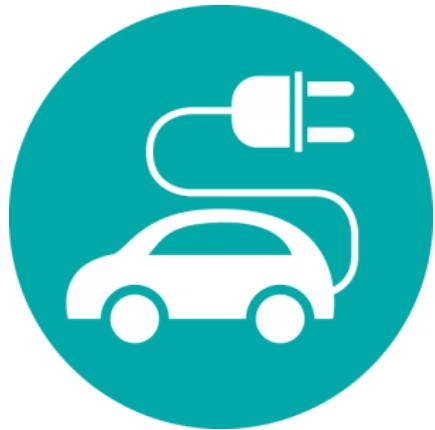


Mobility



Image Source: World Bank Blog

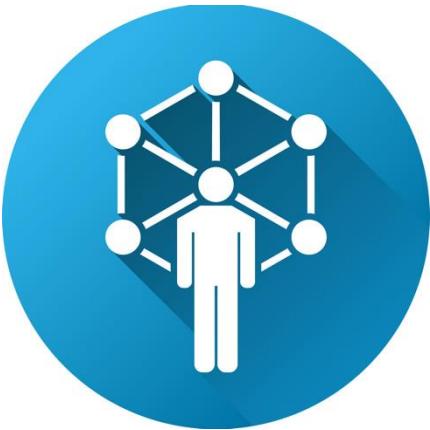
Disruptions in Mobility



Changing the fuel: Electrification

Challenges:

- Battery costs
- Charging times
- Distance per charge
- Charging infrastructure



Changing ownership: Sharing

Challenges:

- Digital barriers
- Cultural barriers
- Safety



Changing the driver: Automation

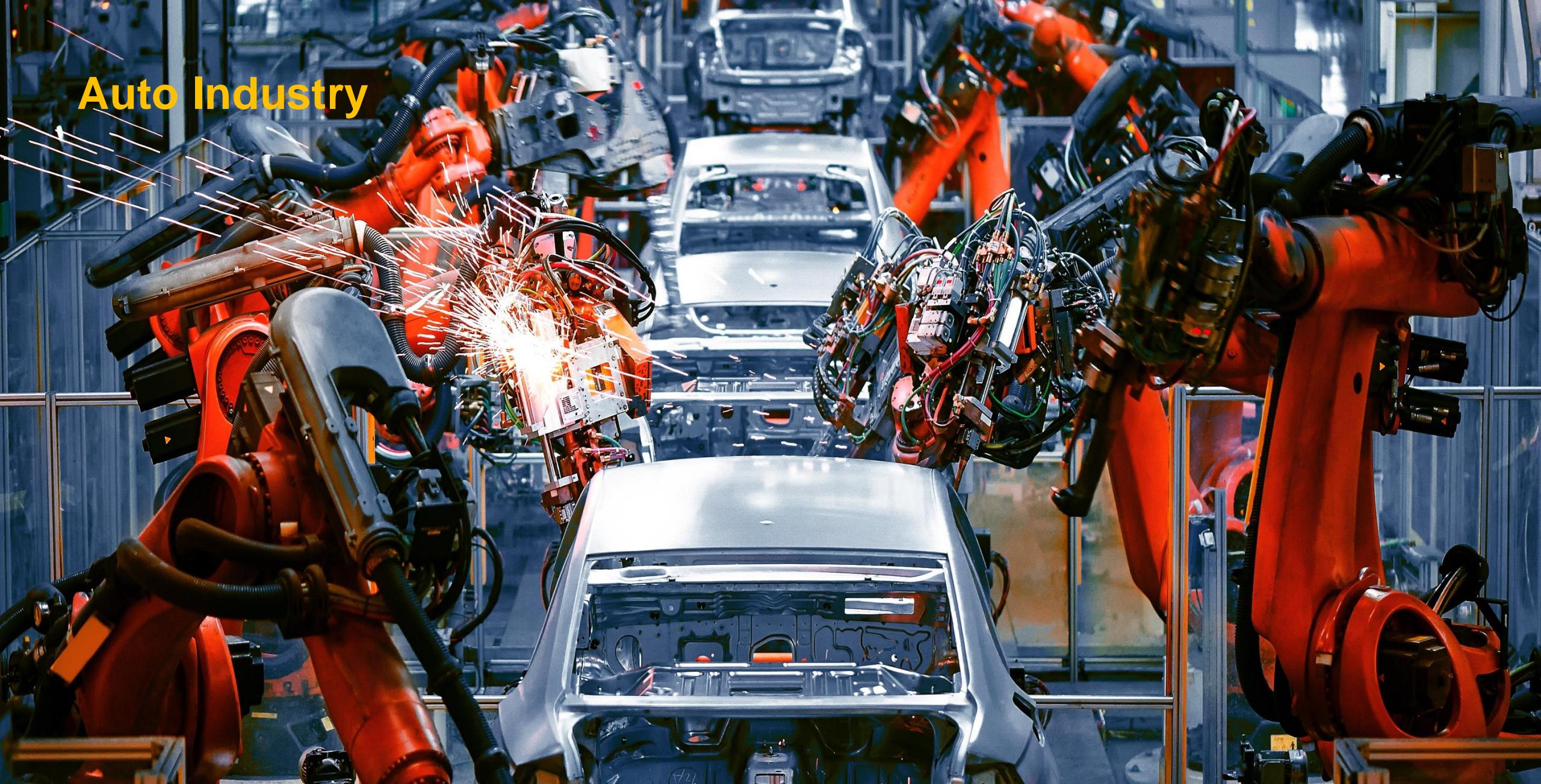
Challenges:

- Technology development
- Quality data collection
- Legal approval
- Geographic restrictions

Industries Facing Disruption



Auto Industry



Tesla Motors – Disrupting the Auto Industry?



The Learning Outcomes

By the end of this case study, the student must be able to:



Analyze Tesla's products and supply chains



Evaluate Tesla's role in auto industry transformation



Assess Tesla's impact on sustainability

Case Questions

Case Question



30 Min

Q1: Why would Tesla enter such an unattractive industry? What are the risks to Tesla in entering such a difficult industry?

Q2: What are the elements comprising Tesla's business model? How did Tesla's business model change over time?

Q3: How is Tesla different from its rivals? How does Tesla deviate from the business model of a traditional auto maker?

Q4: What is the "system" that impacts Tesla and its ability to succeed?

Q5: Is Tesla foolish to pioneer a new architecture and do it all in house or Tesla should outsource? Why? What are the risks?

Q6: What are pros/cons of Tesla open patents? why are there no tours of the Gigafactory?

Q7: Tesla is making its own components should it have diversified into Tesla Wall? Is this a distraction or a plus?

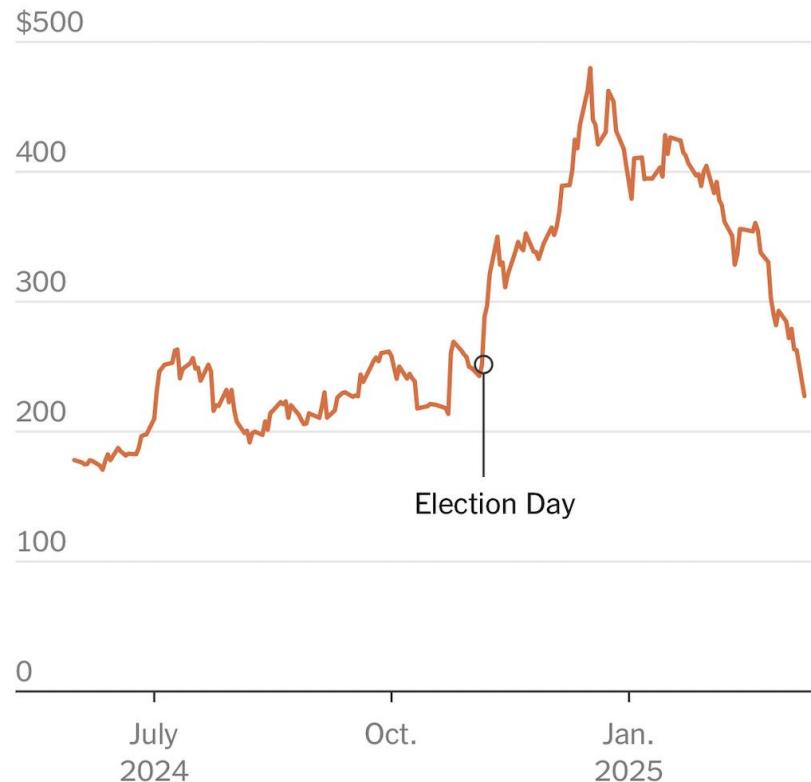
Q8: What factors are most important for predicting Tesla's future success?

Question 1:

**Why would Tesla enter such an unattractive industry?
What are the risks to Tesla in entering such a difficult industry?**

Tesla's Share Price & Market Capitalization

Tesla's share price



Source: FactSet • By The New York Times

Tesla's rally runs out of gas

Market capitalisation, \$bn



Source: LSEG

Market Capitalization – Auto Manufacturers (March 2025)

Largest automakers by market capitalization

Companies: 63 total market cap: \$2.379 T  

Rank	Name	Market Cap	Price	Today	Price (30 days)	Country
1	Tesla TSLA	\$800.83 B	\$248.98	▲ 7.98%		USA
2	Toyota TM	\$246.30 B	\$185.79	▲ 0.68%		Japan
3	Xiaomi XIAOF	\$167.94 B	\$6.70	▼ 3.60%		China
4	BYD 002594.SZ	\$137.56 B	\$48.49	▲ 0.18%		China
5	Ferrari RACE	\$80.39 B	\$450.42	▲ 2.08%		Italy
6	Mercedes-Benz MBG.DE	\$63.58 B	\$66.03	▼ 0.43%		Germany
7	Volkswagen VOW3.DE	\$61.28 B	\$120.01	▲ 0.92%		Germany
8	BMW BMW.DE	\$56.96 B	\$91.99	▼ 0.05%		Germany
9	Porsche P911.DE	\$55.83 B	\$60.23	▼ 2.99%		Germany
10	General Motors GM	\$47.56 B	\$47.80	▼ 0.99%		USA

yahoo/finance

Elon Musk insists Tesla isn't a car company as sales falter

Source: <https://companiemarketcap.com/automakers/largest-automakers-by-market-cap/>

Top publicly traded automakers by revenue

Companies: 63 total revenue (TTM): \$2.828 T  

Rank	Name	Revenue	Price	Today	Price (30 days)	Country
1	Volkswagen VOW3.DE	\$354.86 B	\$120.01	▲ 0.92%		Germany
2	Toyota TM	\$305.78 B	\$185.55	▲ 0.55%		Japan
3	General Motors GM	\$187.44 B	\$47.80	▼ 0.99%		USA
4	Ford F	\$184.99 B	\$9.59	▼ 1.03%		USA
5	BMW BMW.DE	\$162.84 B	\$91.99	▼ 0.05%		Germany
6	Mercedes-Benz MBG.DE	\$161.20 B	\$66.03	▼ 0.43%		Germany
7	Honda HMC	\$142.45 B	\$29.05	▲ 0.38%		Japan
8	Hyundai HYMTF	\$127.81 B	\$47.00	▲ 3.87%		S. Korea
9	Stellantis STLA	\$101.32 B	\$12.31	▼ 1.36%		Netherlands
10	Tesla TSLA	\$97.69 B	\$246.88	▲ 7.07%		USA

Top automakers by operating margin

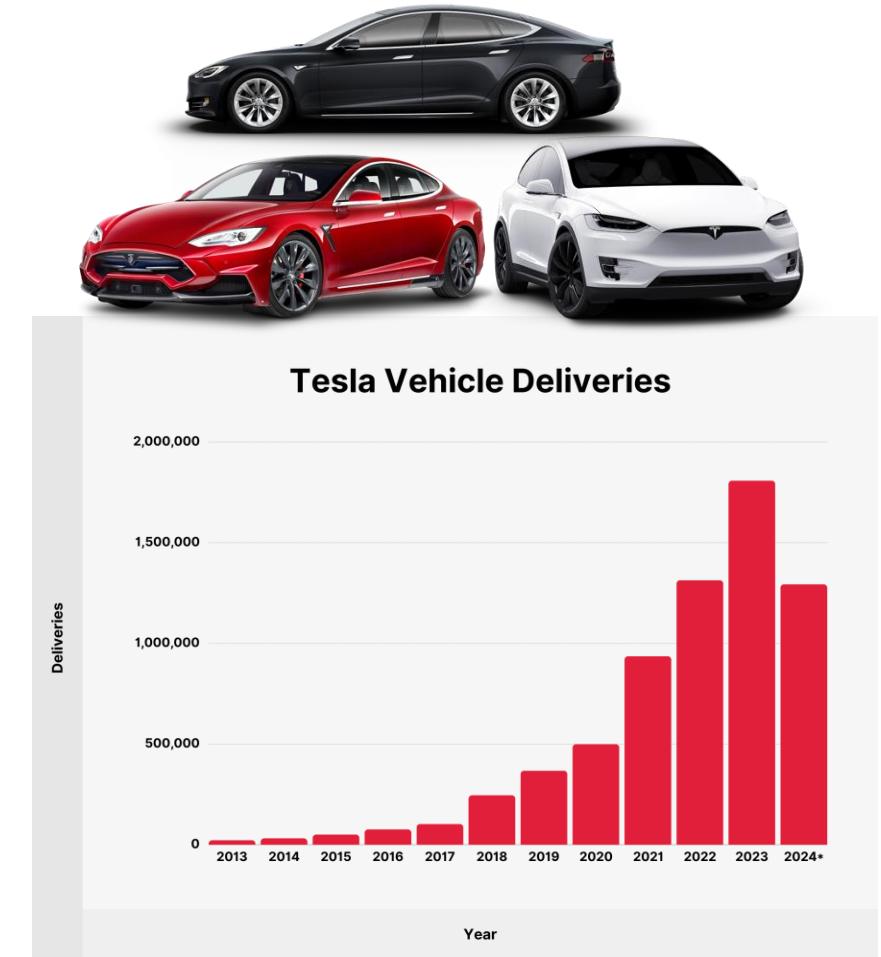
Companies: 63 average operating margin (TTM): 10.21%  

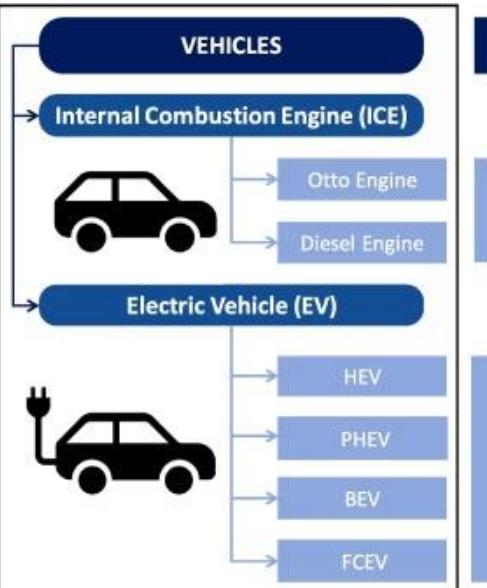
Rank	Name	Operating Margin	Price	Today	Price (30 days)	Country
1	Ferrari RACE	28.29%	\$448.30	▲ 1.60%		Italy
2	Kia 000270.KS	15.81%	\$68.24	▲ 0.71%		S. Korea
3	Porsche P911.DE	15.64%	\$60.23	▼ 2.99%		Germany
4	Toyota TM	15.44%	\$185.55	▲ 0.55%		Japan
5	Maruti Suzuki India MARUTLNS	13.86%	\$133.55	▼ 0.06%		India
6	Hotai Motor 2201.TW	13.60%	\$18.10	▼ 0.67%		Taiwan
7	Hyundai HYMTF	13.29%	\$47.00	▲ 3.87%		S. Korea
8	Subaru 7270.T	12.68%	\$18.67	▼ 4.65%		Japan
9	Mahindra & Mahindra M&M.NS	11.76%	\$30.44	▲ 0.29%		India
10	Yulon Motor Company 2201.TW	11.59%	\$1.39	▲ 0.66%		Taiwan
11	Mercedes-Benz MBG.DE	10.86%	\$66.03	▼ 0.43%		Germany
12	Force Motors FORCENOT.NS	10.65%	\$82.22	▼ 1.40%		India
13	Tesla TSLA	9.56%	\$246.60	▲ 6.95%		USA

Auto Manufacturers (Sales 2024)

Rank	Manufacturer	Sales (Mio units)
1	Toyota Group	10.39
2	Volkswagen Group	8.48
3	Hyundai-Kia	6.82
4	Renault Nissan Alliance	6.24
5	General Motors	5.96
6	Stellantis	5.32
7	Honda Motor	3.88
8	Ford Group	3.87
9	BYD	3.82
10	Suzuki	3.09

Source: <https://focus2move.com/world-car-group-ranking/>

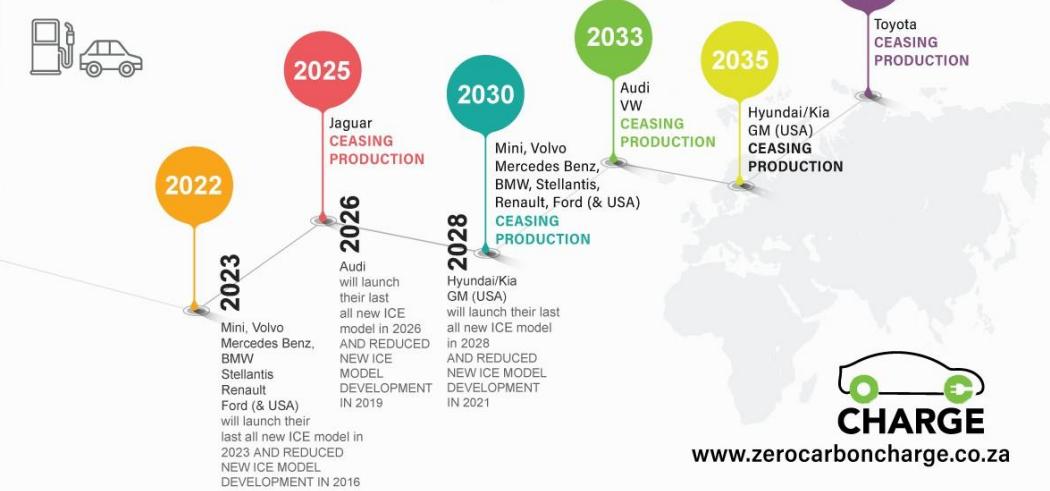




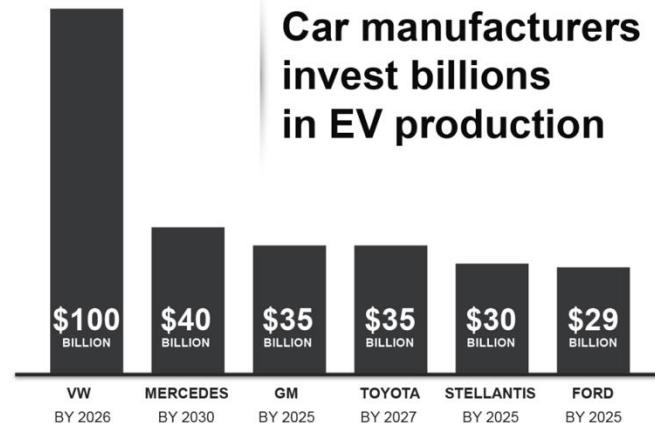
Source of Energy	Powertrain Device	Emission
Fossil Fuel (Gasoline)	Engine	Yes
Fossil Fuel (Diesel Oil)	Engine	Yes
Fossil Fuel	Engine	Yes
Battery	Motor	Yes
Fossil Fuel	Engine	Yes
Battery*	Motor	Yes
Battery*	Motor	No
H ₂ Fuel	Fuel Cell	No

*Completed with Plug In

Manufacturers ceasing production of ICE vehicles in Europe



Car manufacturers invest billions in EV production



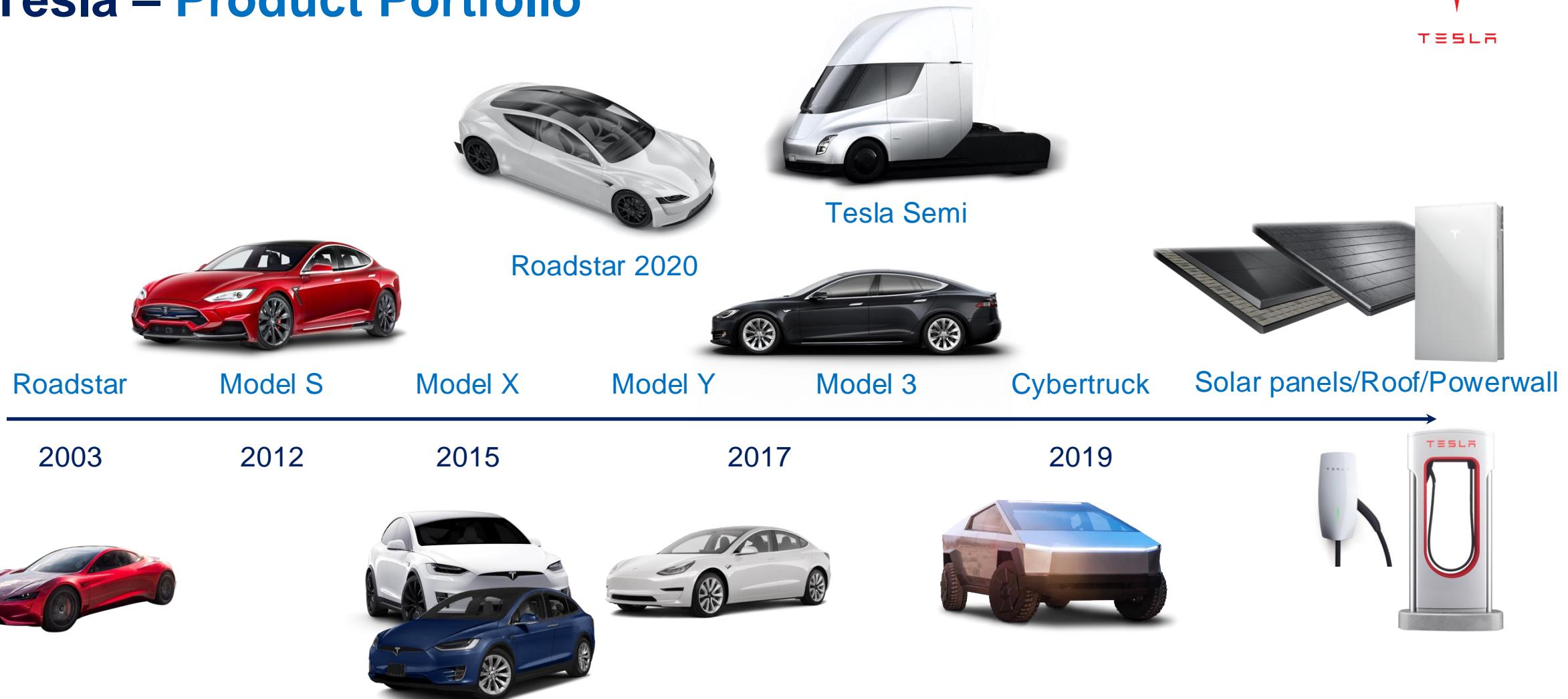
SOURCE: Ford: Financial Mail 11 – 16 Nov – Corporate profile Ford South Africa, Pg2

www.zerocarboncharge.co.za

Question 2:

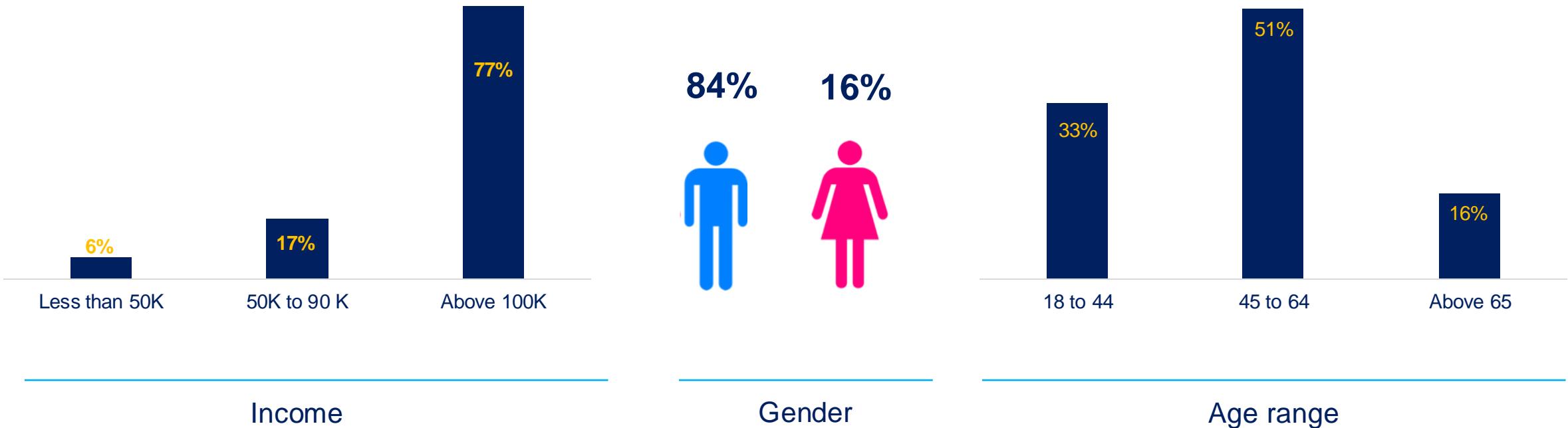
**What are the elements comprising Tesla's business model?
How did Tesla's business model change over time to accommodate its development from niche to a mass-market player?**

Tesla – Product Portfolio



Source: Tesla's website

Tesla's Customers

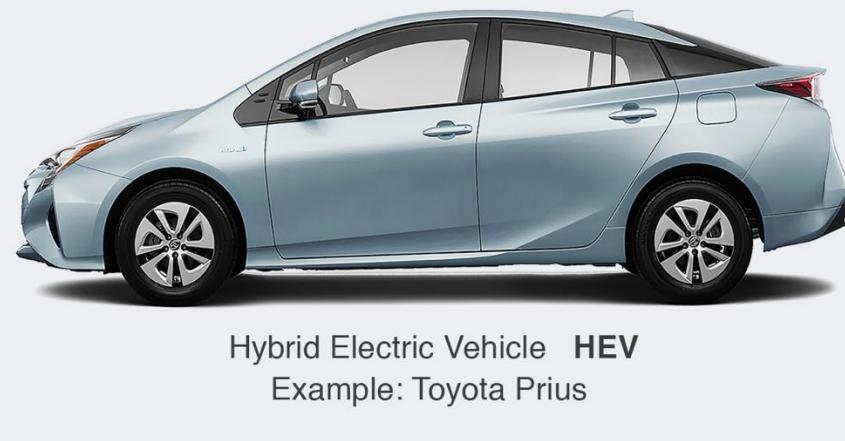


Source: <https://www.investopedia.com/articles/personal-finance/021715/what-drives-consumer-demand-tesla.asp>

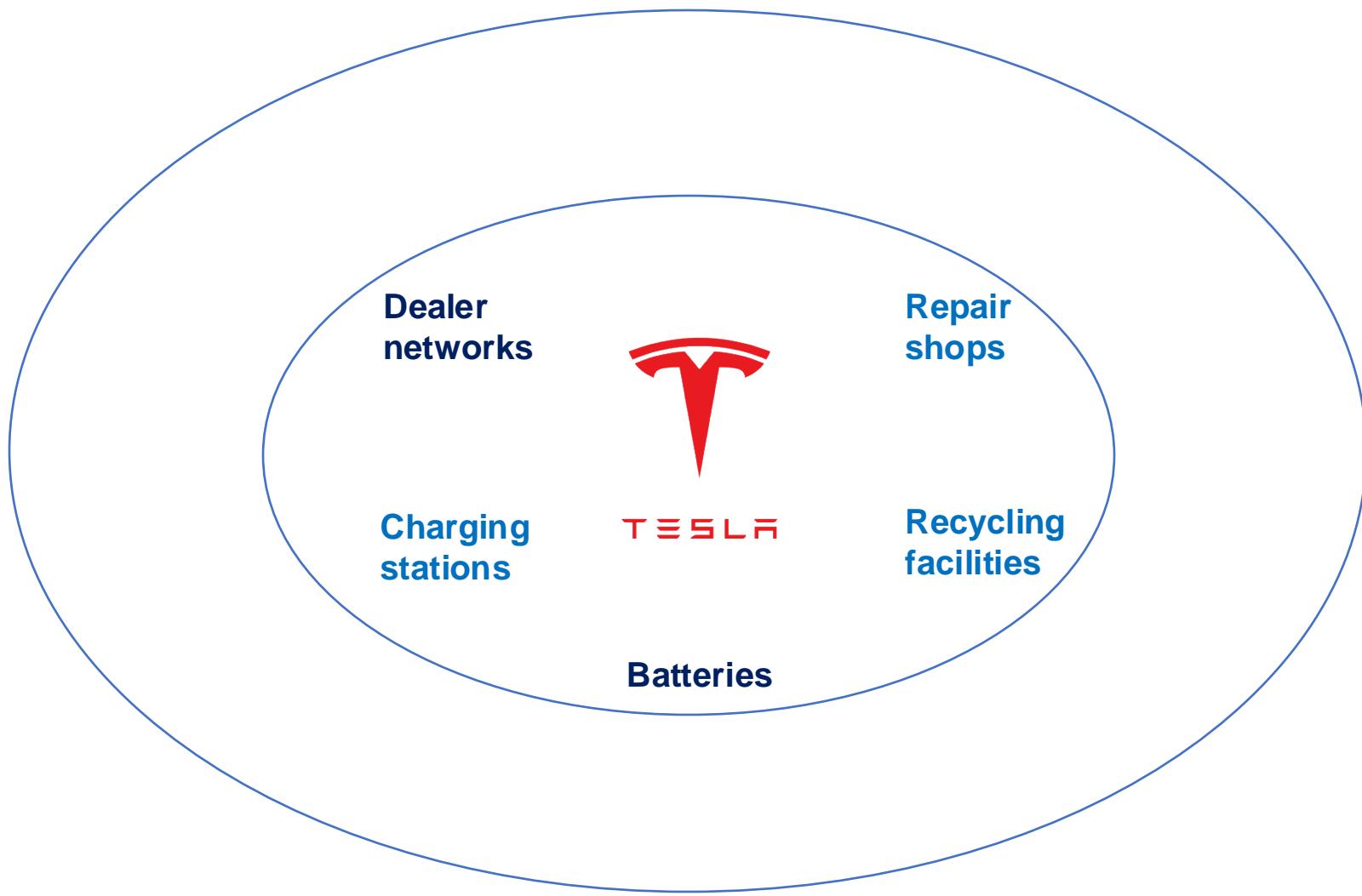
Question 3:

How is Tesla different from its rivals?
How does Tesla deviate from the business model of a traditional auto maker?
Why does Tesla do it differently?

BEV, PHEV, EREV, HEV



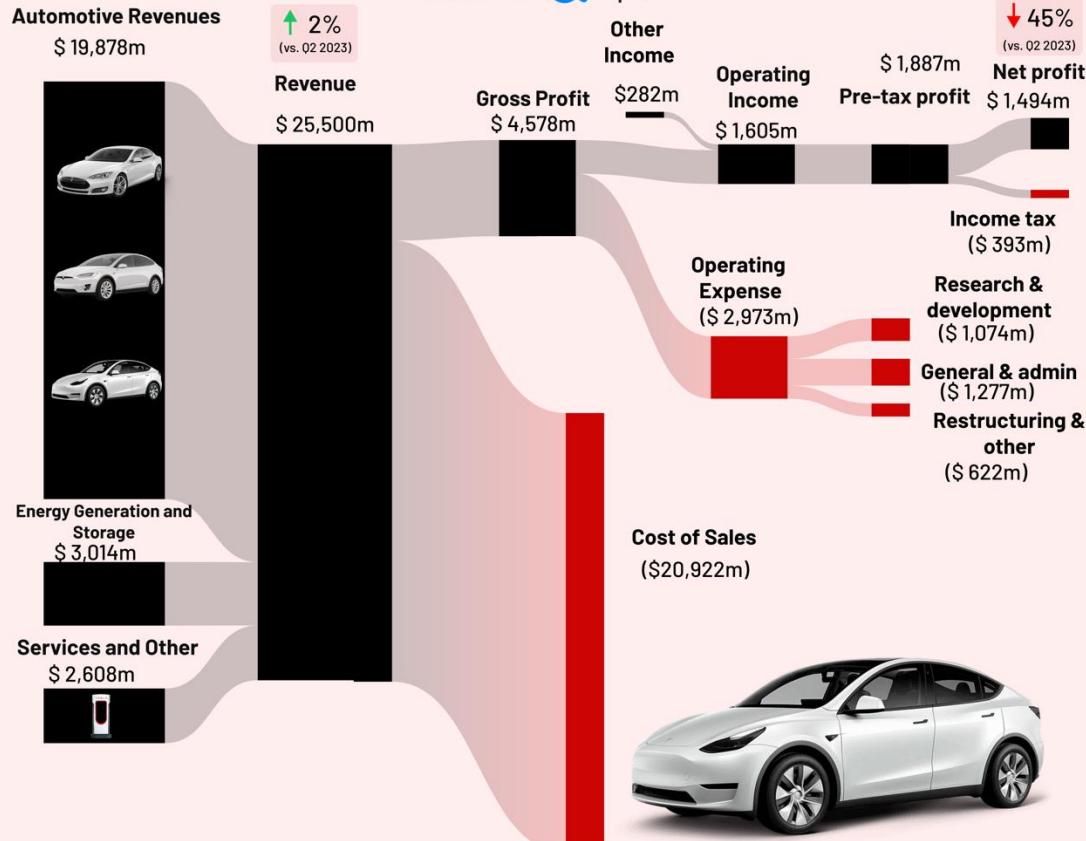
Tesla – Ecosystem ... How is Tesla different from its rivals?





Tesla Q2 2024 Financial Performance

Created by genuine impact

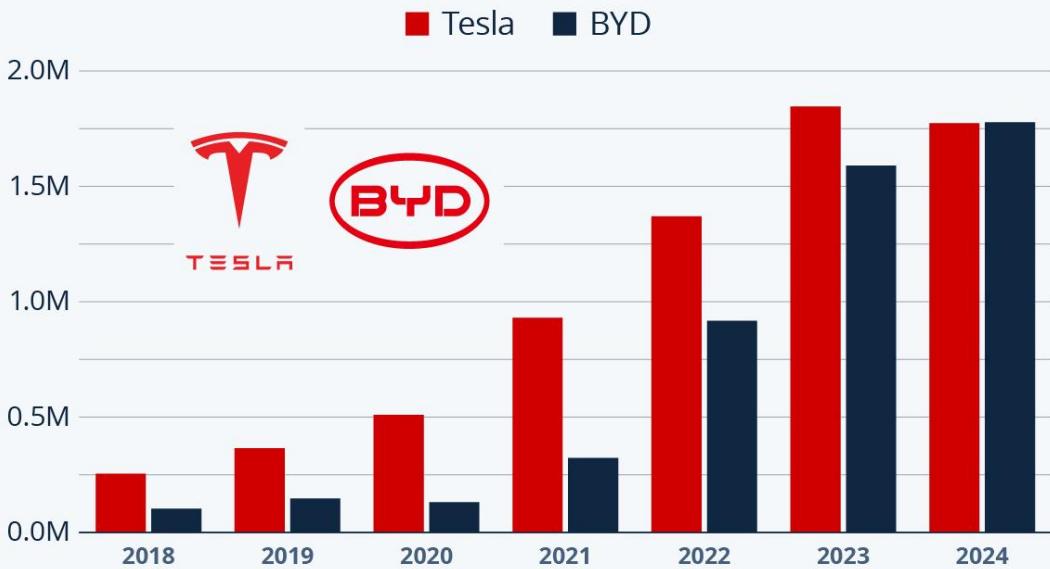


Source: Tesla

More charts: genuineimpact.substack.com

BYD Pulls Ahead of Tesla to Become Largest EV Maker

Annual battery electric passenger vehicle production of Tesla and BYD*



* BYD figures for 2018 and 2019 are sales, as the companies didn't report production volume back then.
Sources: Tesla, BYD

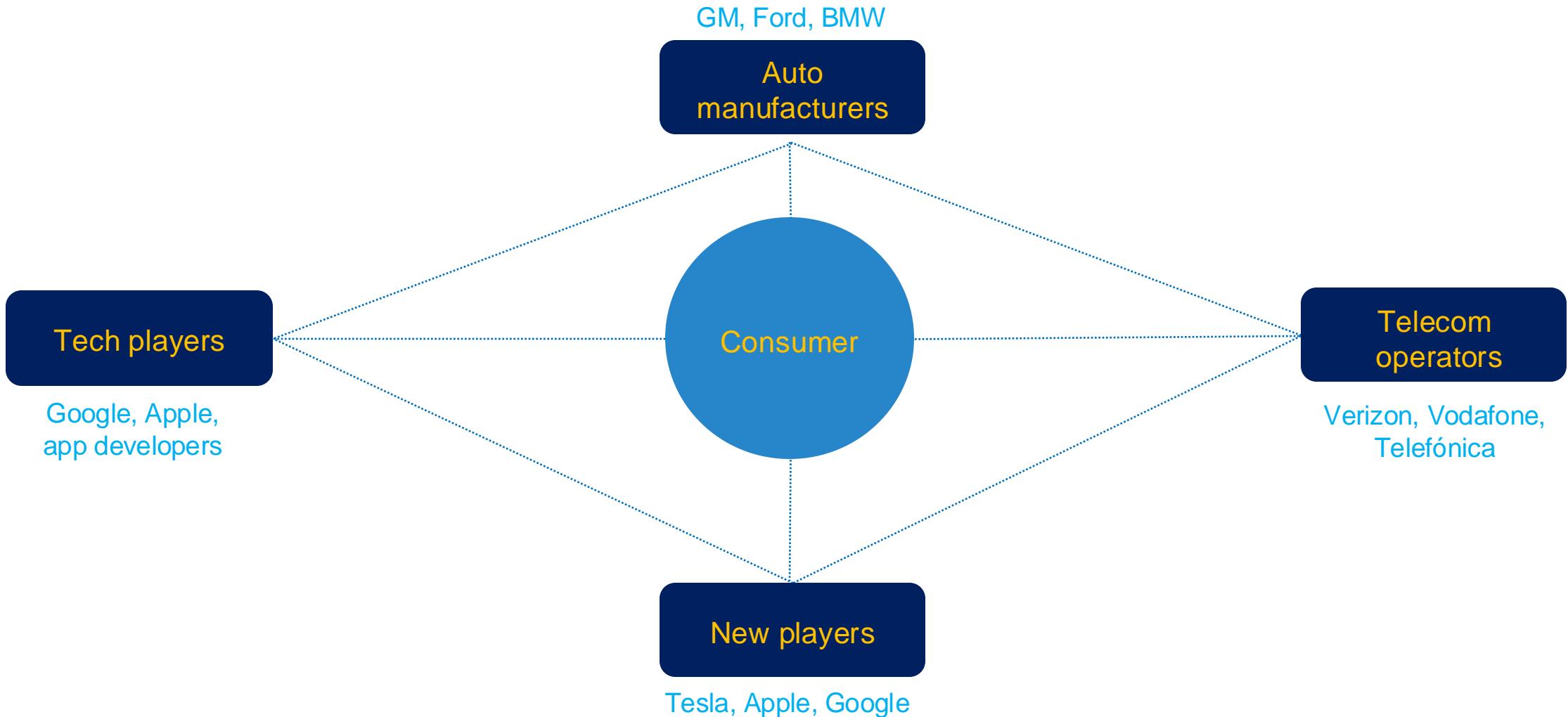


statista

Question 4:

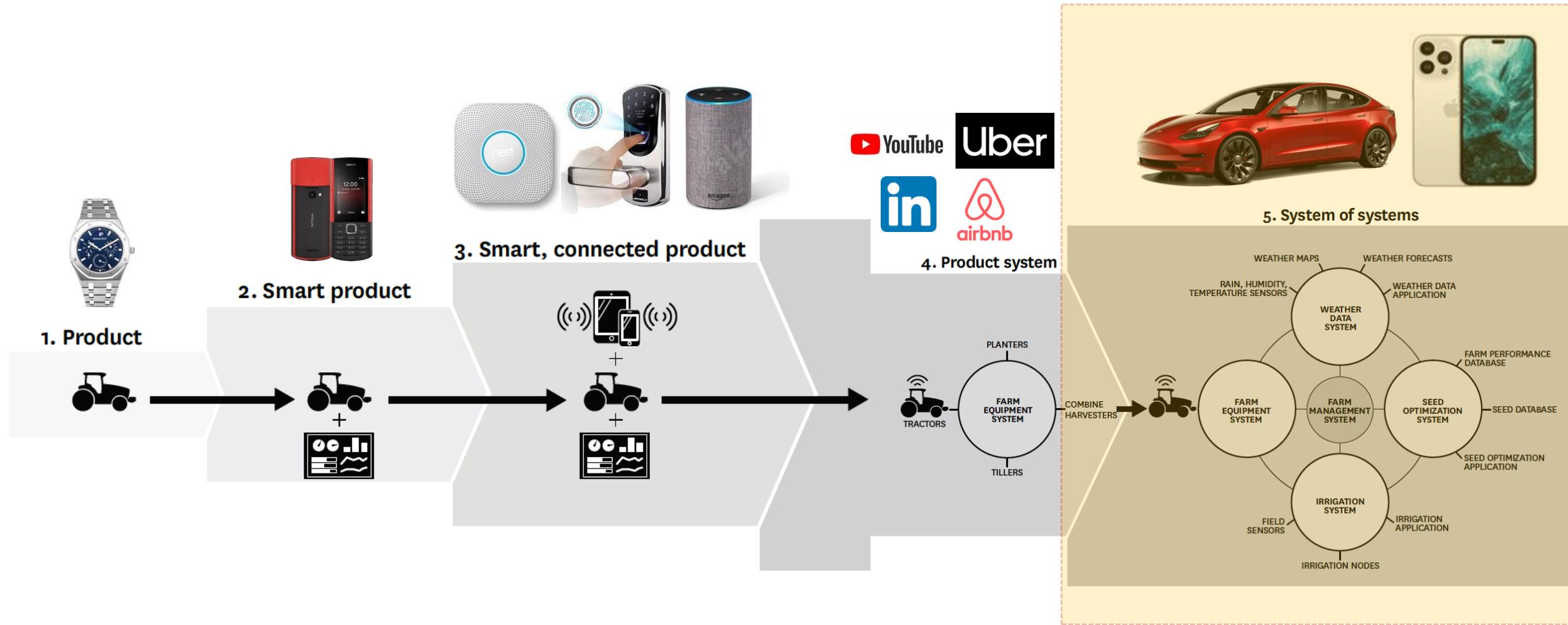
What is the “system” that impacts Tesla and its ability to succeed?

New Ecosystem of Auto Industry



Source: Sunil Gupta, Driving Digital Strategy, Harvard Business Review Press, 2017

From Product to System of Systems



Source: How Smart, Connected Products Are Transforming Companies, Harvard Business Review, 2014

Question 5:

Is Tesla foolish to pioneer a new architecture and do it all in house or Tesla should outsource? Why? What are the risks?

Question 6:

Why Tesla opened up its patents? What are the pros and cons? If it's willing to open the patents, why are there no tours of the Gigafactory?

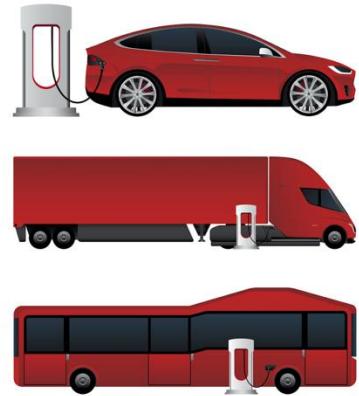
Question 7:

Tesla is making its own components, charging stations, dealerships and repair centers. Should it have diversified into Tesla Wall? Is this a distraction from the core, or it is a plus?

Tesla – Master Plan Part Deux



Creating stunning solar roofs with seamlessly integrated battery storage



Expand Tesla lines to fill other vehicle segments: pickup trucks, semi truck, buses, etc.



Develop a self-driving capability that is 10X safer than manual via massive fleet learning.



Enable autonomous Tesla cars to be part of a shared fleet, making money for Tesla owners while they aren't using their cars

Question 8:

What factors are most important for predicting Tesla's future success?

Assignment 3 – Best Carbon Footprint Materials

Read the questions in your booklet carefully and ask your coaches if you have any questions.