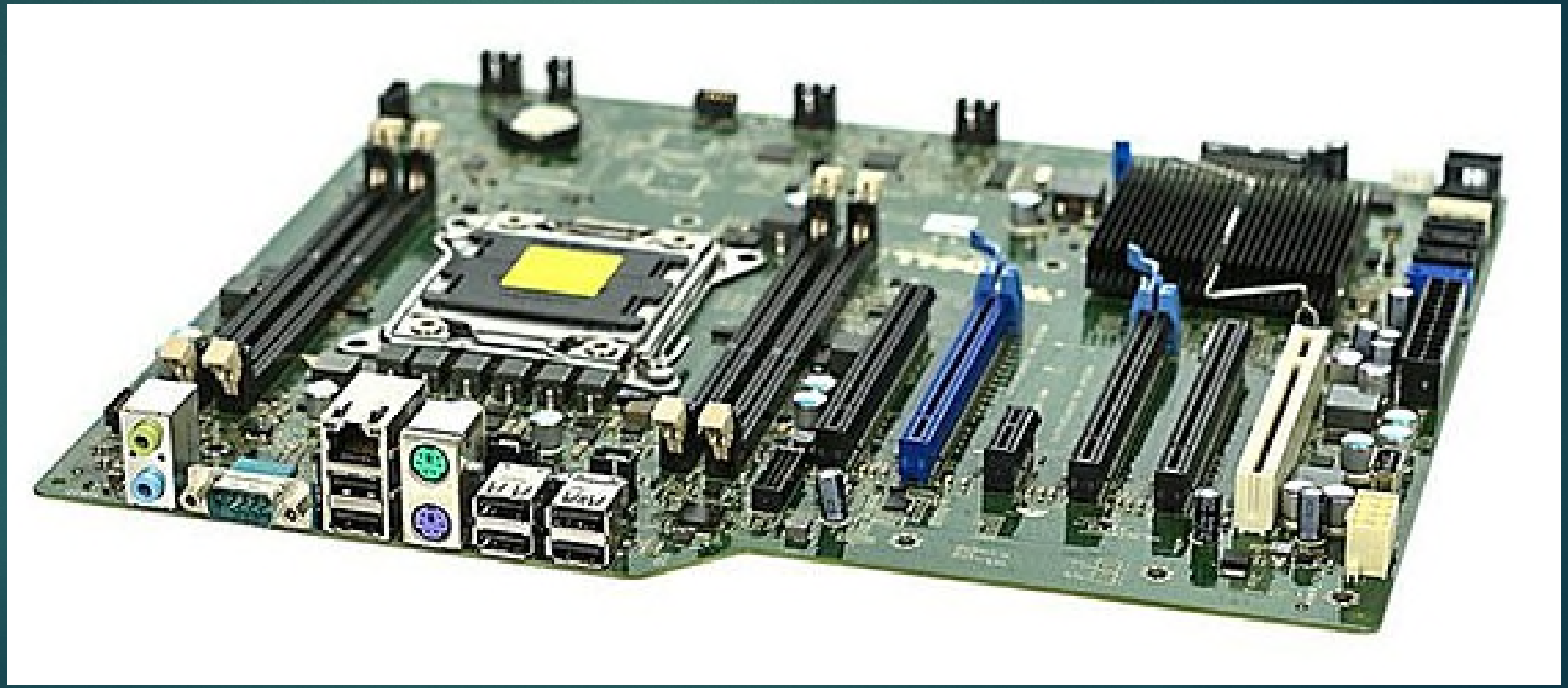
Is a computer a car?

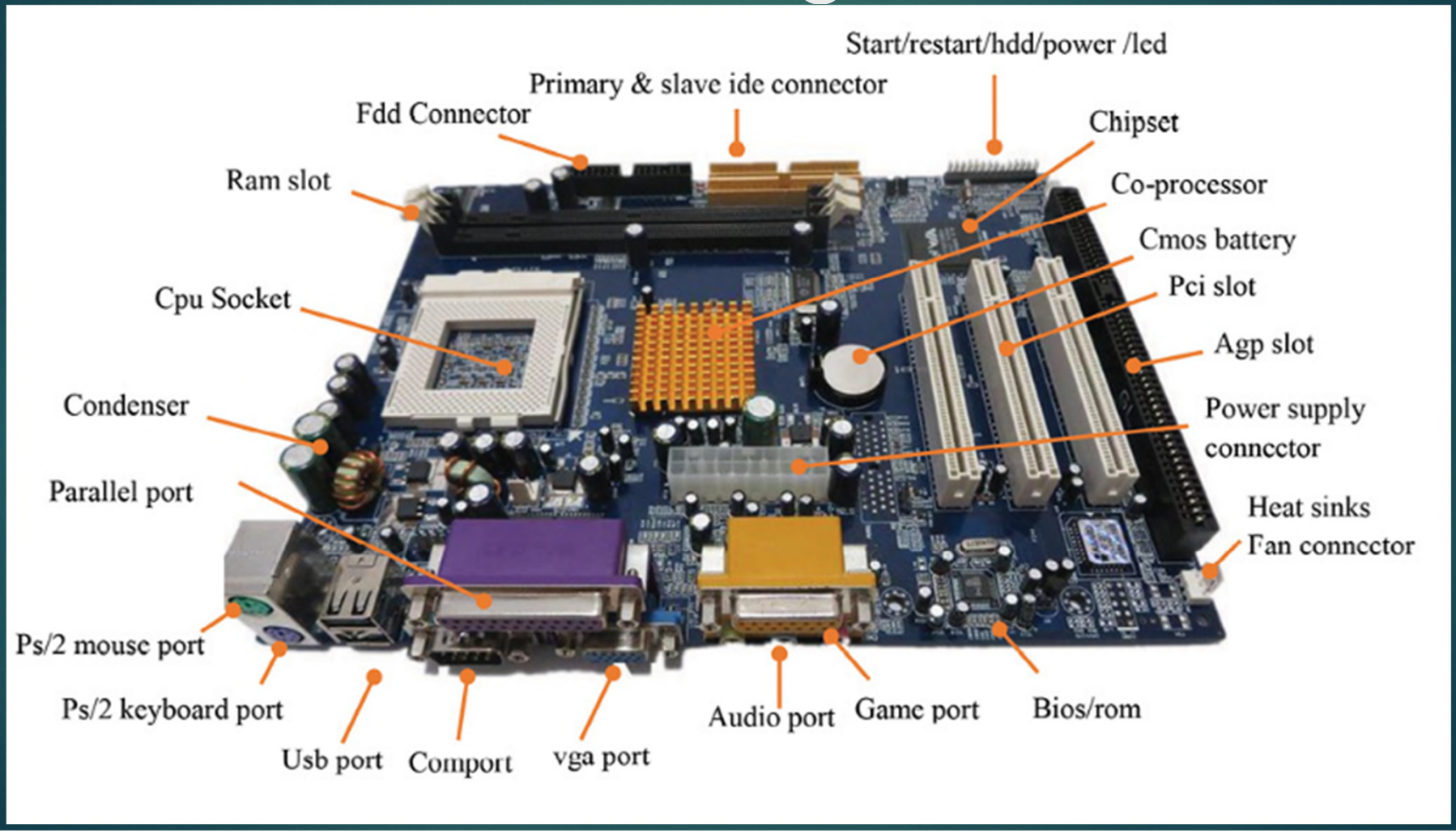
OR IS A CAR A COMPUTER?

Let's look at a computer's Components

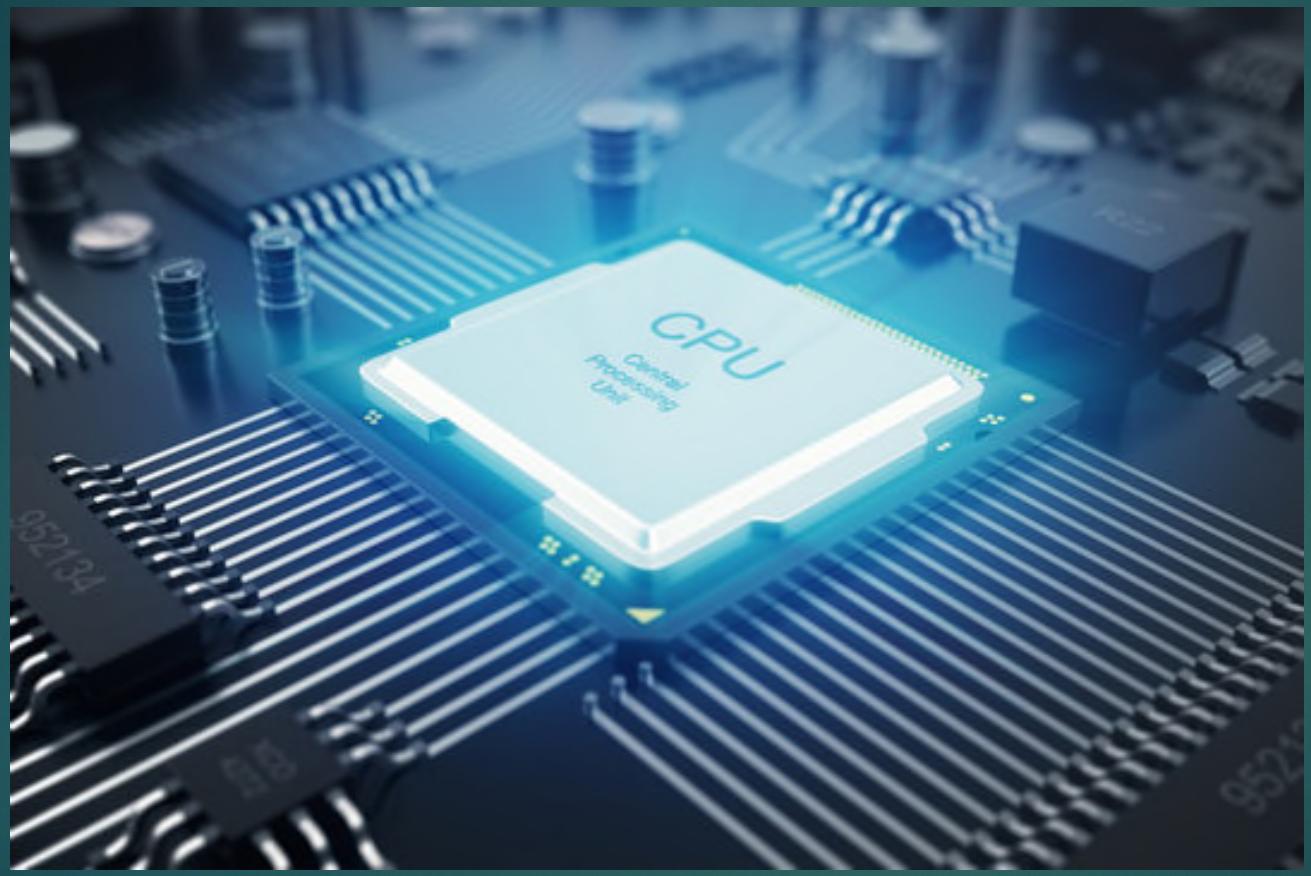
- 1. Motherboard



Motherboard = Chassis & Wiring Loom Of A Car

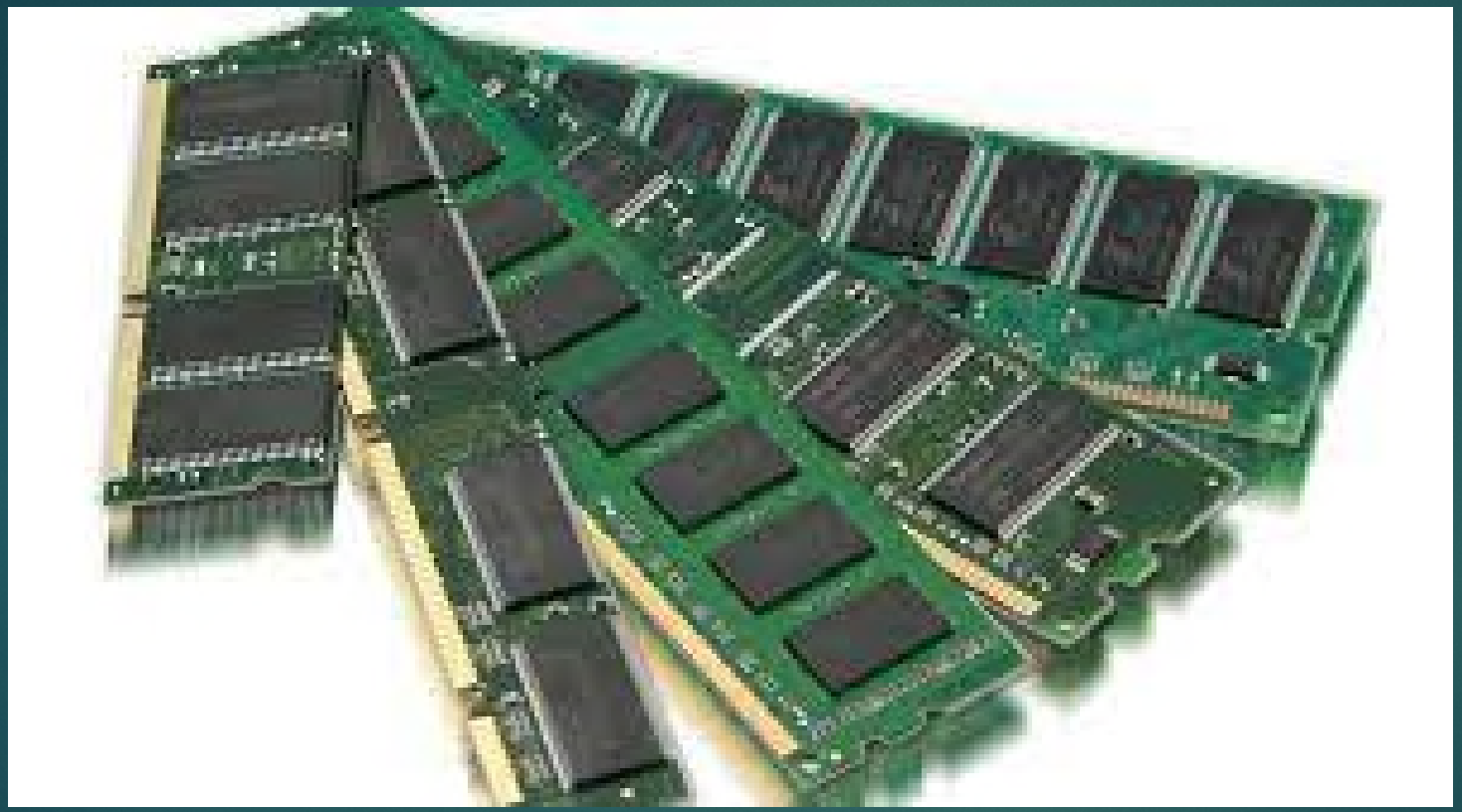


CPU = Engine



Central Processing Unit

RAM = Brain



Random Access Memory

ROM = Your Box Of Music Cd's

Read Only Memory

BIOS = Start Button

Basic Input Output System

CMOS = default settings (Hard wired memory)

CMOS is the memory on a motherboard

- that stores the BIOS settings.
- A small battery, called a CMOS battery,
  - keeps it powered.

Complementary metal-oxide-semiconductor

Power Supply = Battery + Alternator

PORTS = Fuel, Water, Oil inlets, Exhaust outlet

- USB
- LAN
- AUDIO
- POWER
- MOUSE/KEYBOARD
- HEADPHONE
- MICROPHONE
- HDMI/VGA/ D SUB
- SPDIF

INPUT/OUTPUT Ports

Computer Case = chassis + bodywork

Software = Highway code!

- Analogue to digital input converter
- Human /computer Interface
- Digital to analogue output

So can a computer be likened to a car?

- You tell me!
- But at least now you know what the building blocks are!

Is a Car a Computer Now?

- Pre-Collision Braking (PCB)
- Automatic Emergency Steering
- Pre-Collision Throttle Management
- Lane Departure Warning (LDW)
- Lane Departure Prevention
- Advanced Adaptive Cruise Control
- Lead Vehicle Start Alert
- Rear pedestrian alert
- Passing vehicle alert

Is a Car a Computer Now?

- Google maps with traffic update
- Android auto
- Online streaming music
- Voice assistant
- Handsfree phonecalls
- Smart phone unlock/engine start
- Facial recognition instead of keys

Bill Gates reportedly compared the computer industry with the auto industry

'If GM had kept up with technology

- *like the computer industry has,*
- *we would all be driving $25 cars*
- *that got 1,000 miles to the gallon.'*

CEO of GM replied

If GM had developed technology like Microsoft, we would all be driving cars with the following characteristics:

- 1. For no reason whatsoever, your car would crash..... twice a day.
- 2. Every time they repainted the lines in the road,
  - you would have to buy a new car.

CEO of GM replied

- 3. Occasionally your car would die on the motorway for no reason.
  - You would have to pull to the side of the road,
  - close all of the windows, shut off the car, restart it,
  - and reopen the windows before you could continue.
- For some reason you would simply accept this..

CEO of GM replied

- 4. Occasionally, executing a maneuver such as a left turn would cause your car to shut down and refuse to restart,
  - in which case you would have to reinstall the engine.
- 5. Macintosh would make a car that was powered by the sun,
  - was reliable, five times as fast and twice as easy to drive –
  - but would run on only 5% of the roads.
- 6. The oil, water temperature, and alternator warning lights would all be replaced
  - by a single '**This Car Has Performed An Illegal Operation**' warning light.

CEO of GM replied

- 7. The airbag system would ask, **'Are you sure?'** before deploying.
- 8. Occasionally, for no reason whatsoever,
  - your car would **lock you out and refuse to let you** in
  - until you simultaneously lifted the door handle,
  - turned the key and grabbed hold of the radio antenna.
- 9. Every time a new car was introduced car buyers would have to **learn how to drive all over again**
  - because none of the controls would operate in the same manner as the old car.

CEO of GM replied

- 10. You'd have to press the 'Start' button to turn the engine off
- 11. When all else fails, you could call 'customer service' in some foreign country
  - and be instructed in some foreign language
  - how to fix your car yourself!!!!

EV Manufacturers in Thailand

- BYD (Build your Dreams)
- SAIC (MG)
- Neto
- Changan
- GWM
- GAC Aion

So What's Next?

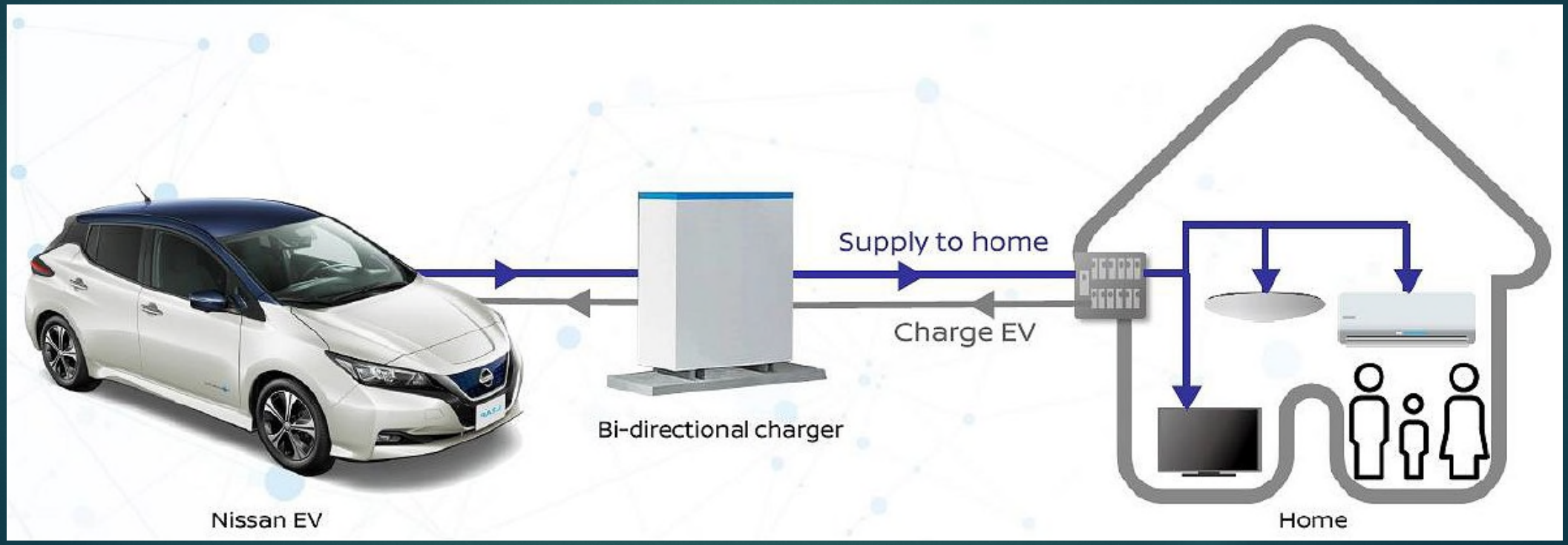
Software, Battery & Smartphone Manufacturers making cars

- Tesla
- Hua Wei
- BYD
- Xiaomi
- Apple
- Meta

Car Manufacturers selling software?

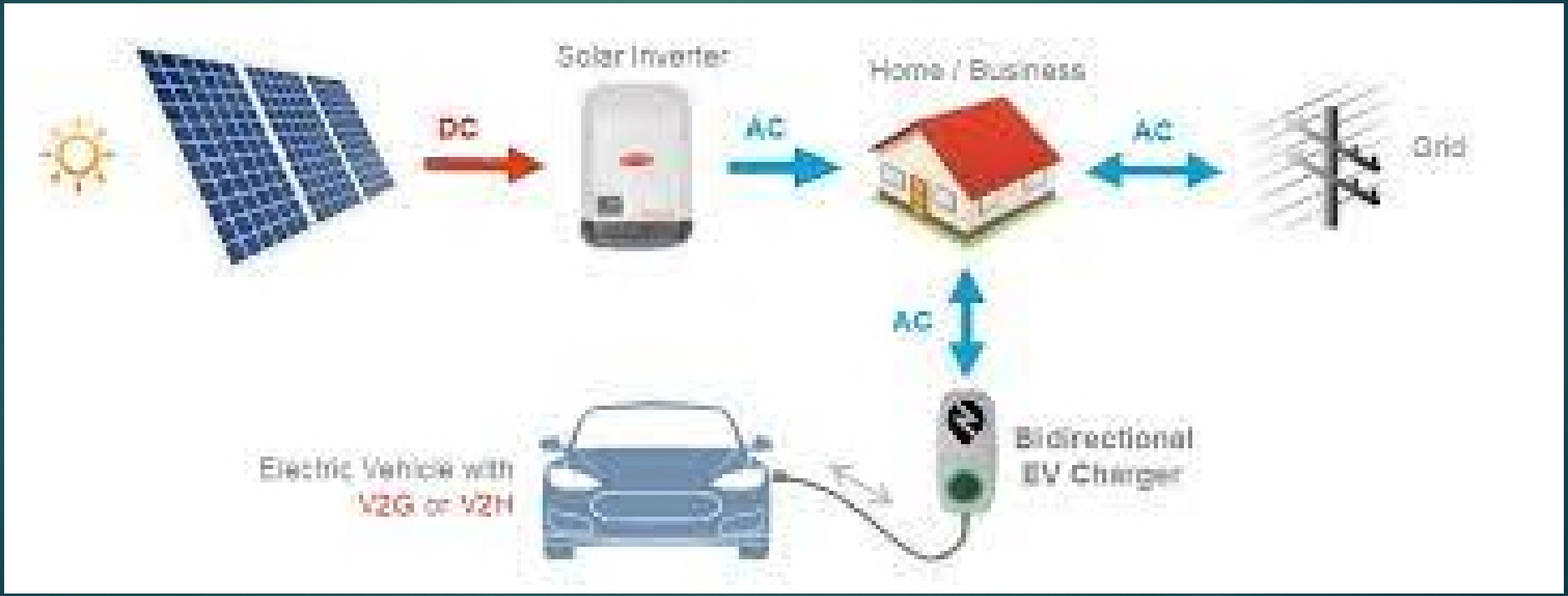
Using Your Car as a Power Supply!

- Using an electric vehicle (EV) to supply electricity to a house,
  - a process known as vehicle-to-home (V2H)



V2G

Vehicle-to-grid (V2G), involves utilizing the energy stored in the EV's battery to power household appliances or feed electricity back into the grid



And don’t forget

- The introduction of AI
- Autonomous driving vehicles
- What else?

Electrification

- Governments around the world are setting ambitious targets to **reduce emissions**, (EU 2030 no more ICE)
- and many automakers are **investing** heavily in **electric and hybrid technologies**.
- As battery technology advances and charging infrastructure improves,
- EV **adoption is expected to increase**.

Autonomous Vehicles:

The development and deployment of autonomous vehicles are expected to continue.

- While fully self-driving cars are still in the testing phase,
  - advanced driver-assistance systems (**ADAS**)
  - and s**emi-autonomous** features are becoming more common.
- The industry is exploring **new business models**,
  - mobility services, and
  - transportation ecosystems around autonomous technology.

Connectivity and IoT Integration

Vehicles are becoming more connected,

- integrating with the Internet of Things (IoT).
- This includes features such as
  - advanced infotainment systems,
  - over-the-air updates,
  - vehicle-to-vehicle communication, and
  - enhanced safety features.
- Connected cars are expected to play a role in
  - smart city initiatives and
  - traffic management.

Shared Mobility and Mobility as a Service (MaaS):

- The rise of ride-sharing services,
  - car-sharing platforms,
  - concept of **Mobility as a Service** (MaaS)
    - changing how people use and perceive transportation.
- The industry is likely to see more emphasis on shared mobility solutions,
  - with traditional ownership models evolving.

Environmental Sustainability:

- Environmental concerns and regulatory pressures
  - are driving a focus on sustainability.
- Includes not only the electrification of vehicles
  - but also efforts to reduce the environmental impact of manufacturing processes
  - and the entire automotive supply chain.

Advanced Materials and Manufacturing

- Advances in materials,
  - manufacturing processes,
  - and design are expected to contribute to
  - **lighter and more fuel-efficient vehicles.**
- This includes the use of composites,
  - Lightweight metals, and
  - innovative manufacturing techniques.

Digitalization and Customer Experience:

- Digital technologies are transforming the customer experience,
  - from online car shopping
  - to virtual showrooms and
  - personalized in-car experiences.
- Artificial intelligence,
  - augmented reality,
  - and other digital tools are
  - likely to become integral to the automotive retail experience.

Regulatory Changes

- Governments worldwide are implementing stricter emissions standards
  - and regulations to address **climate change.**
- This is influencing the types of vehicles manufacturers produce,
  - with an increasing **focus on electric and hybrid models.**

Cybersecurity Challenges

- As vehicles become more connected,
  - the industry will need to address **cybersecurity challenges**
  - to protect against potential cyber threats
  - ensure the safety of autonomous and connected vehicles.

Global Supply Chain Dynamics

- The automotive industry is highly globalized,
  - geopolitical factors,
  - trade policies,
  - and supply chain disruptions
    - **can impact production and distribution**.
- Companies may need to adapt to changing global dynamics
  - and diversify supply chain strategies.