Reflection on Device Teardowns: MacBook Pro (M4) and iPad Pro 13"

For this assignment, I explored two iFixit teardowns: the **M4 MacBook Pro** and the **iPad Pro 13" (2024)**.

MacBook Pro (M4):
The MacBook Pro featured a clear internal structure with major parts like the **battery pack**, **keyboard assembly**, **trackpad**, and **speakers** relatively easy to identify. However, since Apple Silicon integrates the **CPU cores, GPU cores, and memory chips** into a single system-on-a-chip (SoC), it was not possible to label each component separately as one could with a PC laptop also as in the image it is under the cooling pipe we didn't get a full view of that M4 chip. The **SSD chips** were also soldered directly to the motherboard with the M4 chip which was not visible, limiting upgradability. What stood out most was how Apple balances replaceable elements (ports, trackpad, speakers) with ones that cannot be replaced.

iPad Pro 13":
The iPad teardown revealed an even more compact design. The **battery**, **motherboard**, and **display assembly** were the most prominent parts, but nearly everything else was tightly integrated. Components like the **CPU** and **RAM** were also part of the small motherboard between the batteries. The device contained clear **input/output systems** such as the touchscreen and speakers, but its **repairability score** remained low due to how strongly the screen and battery are glued in place. One interesting detail I learned was that, despite its difficulty to repair, the iPad Pro included a modular USB-C port that made at least one replacement process simpler.

Comparison:
The inside of both devices looked denser and more integrated than I expected. The MacBook still had some replaceable components, while the iPad was far more compact, reflecting its need to be extremely thin. It was easier to find parts in the laptop because there was more space and separation between them, while the iPad's parts were layered tightly. I was also struck by how both devices rely heavily on Apple's SoC design, where CPU, GPU, and memory cannot be separated. This design improves performance and efficiency but makes traditional repair and upgrading nearly impossible.