**What Is a Motherboard?**

A motherboard is a circuit board with various components that work in unison to make a computer function. We’ve established that a motherboard is the headquarters of a large corporation. But surely, the headquarters is not the only vital aspect to making a company successful. Just like there are different branches of a company, a motherboard has different parts within it that work together to transmit data to each other.

**Form Factor**

The form factor is basically how a motherboard is formed, or how it physically looks regarding its specifications (namely size, shape, and layout). Different models have different kinds of ports, dimensions, and mounting holes. Popular form factors include:

* ATX: The prom queen of form factors, the ATX is a popular choice and features large dimensions (most being 12 x 9.6 inches)
* microATX: A smaller version of the standard ATX with fewer parameters
* Mini-ATX: Smaller than the micro version, these are designed for mobile CPUs
* Mini-ITX: Smaller than an ATX board (6.7 x 6.7 inches), the mini-ITX form factors are quiet and don’t use a lot of power

Other discontinued form factors include BTX, LPX, and NLX.

**Chipset**

The chipset allows data to flow between various components, namely the CPU, peripherals, ATA drives, graphics, and memory. It can be divided into these two categories:

* Northbridge: Located on the “north” side of a chipset, it “bridges” together the following components: CPU, RAM, and PCIe
* Southbridge: Located on the “south” side of a chipset, it “bridges” together the following components: BIOS, USB, SATA, and PCI

Think of a chipset like the CEO of a large company, with the Northbridge and Southbridge acting as the CFO and COO.

In business these three C’s (or the C-Suite) work together within the headquarters of a company to delegate tasks to their subordinates. In the case of motherboards, the C-Suite is comprised of the big bosses that make sure information is flowing between the subordinates (like the BIOS, CPU, RAM, etc.).

**CPU Socket**

This is basically a little habitat for the CPU to rest in. A CPU is a small square with a bunch of pins and connectors underneath it that help to interpret and transmit data carried out by the northbridge part of a chipset. In general, the more capable the CPU (in terms of number of cores, amount of cache, etc.), the more pins will be found in the socket.

Think of the CPU like the overachieving office assistant to a CFO/COO. The office assistant resides in its own cubicle (or in this case, the CPU socket) to execute various kinds of tasks.

It’s like a CFO/COO telling an office assistant to schedule meetings, make phone calls, and go on coffee runs. The office assistant, or CPU, carries out these kinds of tasks (but in a more mathematical kind of way, as the CPU reads input and output instructions).

Having a high-quality CPU (and office assistant for the matter) is important to the overall speed and efficiency of a computer.

**Slots**

Think of slots like different branches /departments of a company. Most companies have departments for things like marketing, human resources, accounting, research, etc. Slots are like these kinds of departments for a motherboard, with branches like:

* Memory / DIMM Slots: Used for holding memory / RAM
* PCI: Connects expansion cards like video, network, and sound cards
* PCIe: A modern version of PCI but with a different interface that can work with almost any kind of expansion card
* USB: Used for USB connectors like flash drives, although not very common
* SATA: Used for optical /hard disk / solid-state drives

**Data Bus** All of the components mentioned above would not work in unison without the necessary data buses that connect everything together. Think of data buses as a form of communication.

So in a large company, if the CFO/COO wants to tell an office assistant what to do, how would they go about it? Email? Phone? An in-person conversation? It doesn’t matter as long as there is some form of communication going on.

It’s the same idea with a motherboard. All of the components transmit data to one another through data buses.

**Putting Them Together: How It All Works**

When you turn your computer on, power is sent from the power supply on to the motherboard.

Data is transferred via data buses and goes through the northbridge and southbridge part of the chipset.

The northbridge part bridges data to the CPU, RAM, and PCIe. The RAM begins to send inputs to the CPU, which “interprets” these actions as an output. Data to the PCIe is then transferred to an expansion card, depending on which type you have.

The southbridge part bridges data to the BIOS, USB, SATA, and PCI. Signals to the BIOS allow your computer to boot up, while data to the SATA “awakens” your optical, hard disk, and solid-state drives. Data from the SATA is used to power up your video, network, and sound cards.

In short, a motherboard serves as the headquarters of a computer which transmits data via data buses. These data buses go through the northbridge and southbridge parts of a chipset, which then venture off into other components like the CPU, RAM, PCI, PCIe, etc.

Everything works together like a successful corporation, albeit in a more binary sort of way.

ДОПОЛНИТЕЛЬНО СМОТРИТЕ ССЫЛКУ:

https://www.techspot.com/article/1965-anatomy-motherboard/

Let us begin with the main role of a motherboard. In essence, it serves two purposes:

* Provide electrical power to the individual components
* Provide a route to allow the components to communicate with each other

Nearly every motherboard used in a standard desktop PC today will have sockets for the central processing unit (CPU), memory modules (nearly always a type of DRAM), add-in expansion cards (such a graphics card), storage, input / outputs, and a means to communicate with other computers and systems.

Standard motherboards initially differ in terms of their size. The differences generally lie in the number of sockets available to be powered and connected; a bigger motherboard permits more sockets.

But what exactly is a motherboard?

A motherboard is simply a big electronic printed circuit board, with lots of connectors to plug things into and hundreds, if not thousands, of feet of electrical traces that run between the various sockets. Theoretically, the board isn't needed: you could connect everything together by using a huge mass of wires. The performance would be terrible, though, as the signals would interfere with one another, and there would be notable power losses by using this method, too.