

Dan's Desk

Computer Fundamentals #1

By Dan Douglas, President, Space Coast PCUG, FL

March 2018 issue, The Space Coast PC Journal

www.scpcug.org

[datadan \(at\) msn.com](mailto:datadan@msn.com)

Starting with this March issue, I'm going to start a recurring "Computer Fundamentals" series of articles tied into sessions at the Saturday Learning Center meetings. I'll attempt in this series to explain fundamentals of computers, programming and usage that will hopefully deepen your understanding of how it all works and why things are the way they are.

Computing is all about taking some input, doing something with it and producing some output. How this evolved into today's pervasive technology is amazing.

Herman Hollerith was a US Census worker leading up to the 1880 census. At that time all census data was counted by hand and he recognized a need for a tabulating machine to reduce the time it took to summarize the information. The input was the census forms, a summary of the data is what needed to be done with the input data and the output was the census reports. He invented a tabulating machine that used punch cards that were like those already in use by automated loom machines. The company that he formed, the Tabulating Machine Company, became a great success until the 1910 census when a Census Bureau technician improved on the Hollerith design and removed the monopoly that had been in place. The Tabulating Machine Company later became a company you may have heard of: International Business Machines Corporation (IBM).

If we jump forward a hundred years, what do we have for 1980 state of the art computing? Computers that take up a large room with special power and cooling requirements. Large cables connecting the main processing unit to storage devices that were typically disc drives, tape drives, or some other medium. Input was in the form of punched cards (still!), data stored on storage media or operator terminal screens. Output took the form of storage media as in updated files or printed report output, or as a screen display of information. Computer programs were no longer coded on punched cards, but rather as files (think .exe files) that were executed by operator commands or by automation tools. Networking was done by dedicated circuits where security was important from point A to point B. There is a mainframe Operating System (OS) in control of the processing unit. This is the large company environment of 'mainframe' computers still in use throughout the world today.

What came after that was essentially the miniaturization of that mainframe environment into a desktop sized machine. We have a similar OS with either Windows or Mac that runs today's PCs. The PC uses a Central Processing Unit (CPU) typically made by either Intel or AMD that performs the instructions that programs (those .exe files) tell it to process. The input of today takes the form of icons that you click or touch on a

display screen, or by automated tasks that run programs periodically. Storage is on your hard disc drive or USB memory stick or SD card. Output can be information displayed on your screen or a report that you print or files that you save on your hard drive.

Here are the core components that every 'computer' type of device have always had:

- a CPU or processing engine of some sort to interpret instructions and to do something - one or more input sources (a button to press, a screen to touch, a sensor, a file to read, etc.)
- one or more programs to take some information or data and do something with it
- one or more outputs (printer, files stored on some media, a screen display, etc.)

Next, we'll look at programming and how your OS controls everything.

