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Module 1

COP 4640 - Operating Systems Environments & Administration

# THE EVOLUTION OF COMPUTERS:

# THE MEN AND WOMEN BEHIND IT ALL

* **Charles Babbage:** Babbage developed a passion for the idea of a calculating machine around 1820 while working as a mathematician. Babbage then went forward with this passion, inventing the Difference Engine for compiling mathematical tables. Though he did complete it in 1832, he had a bigger and better idea. This idea was the Analytical Engine, a machine that could perform any kind of calculation. Sadly, he never really was able to finish a working model of this device, even with his son continuing the work after his death. Fortunately, a Swedish printer named George Scheutz constructed a machine based on the designs of the Difference Engine. His machine printed mathematical, astronomical and actuarial tables. Babbage’s work, despite all the failures incurred following his passion, earned him the title of “the father of computing”. [1].
  + *Fun Fact:* The science museum in London used the design for Babbage’s Difference Engine No. 2 and built the model. When it was finished, it consisted of 4000 parts and weighed over 3 metric tons [1]!
* **Ada Lovelace:** Ada Lovelace befriended Charles Babbage. She became Babbage’s protégé and showed her the Difference Engine before it was finished. Lovelace, talented in mathematics, took an interest in Babbage’s ideas. She contributed to Babbage’s work by adding her own thoughts into the articles she translated for him. In the articles, she would describe how codes could be used to handle symbols, repeat steps (aka, looping) and numbers. This is what made her known as “The first computer programmer” [2].
  + *Fun Fact:* Lovelace tried using mathematical schemes to make money gambling, sadly this failed and put her in financial ruin [2].
* **Grace Hopper:** Grace Murray Hopper had most of her education in mathematics and physics. Following bombings on Pearl Harbor, she enlisted in the Naval Reserve which led up to her beginning in computation technology that would revolutionize science forever. She became involved in the Bureau of Ships Computation Project at Harvard University. In this project, she worked on a calculator called the MARK I. The computer was capable of useful calculations like computing rocket trajectories which were vital to the war effort. Her most impressive feat throughout her impressive involvement in computing is aiding in the development of COBOL. This encouraged a wider adoption thanks to the user-friendly interface the language provided. She opened the doors to this field to those without a background in engineering [3].
  + *Fun Fact:* Apparently, Grace was nick-named “Amazing Grace” by her colleagues [3]. (With good reason)
* **Alan Turing:** Alan Turing was pioneer of computer science and known as a hero for his breaking of the German Enigma code during world war II. He also known as one of the first behind the entire concept of artificial intelligence. He argued that if a computer could mimic the exact functions of a sentient being, then the computer indeed was sentient. The Turing test is used frequently in AI discussion today as a result of Turing’s legacy [4].

* + *Fun Fact:* Turing was theorizing on relativity and quantum mechanics before he even started school [4].
* **John von Neumann:** During World War II, Neumann worked with the development of nuclear weapons and energy. After the war, a report Neumann created led to EDVAC. The Electronic Discrete Variable Automatic Computer. Neumann’s idea was that computers could be used as devices to solve specific problems through applied mathematics [5].

* + *Fun Fact:* Neumann’s ideas may have led to the development of the hydrogen bomb [5].
* **Bill Gates:** Bill Gates started Microsoft with his old friend Paul Allen. They left Harvard during their junior year and decided to develop software for personal computers. Microsoft became a tech-giant thanks to the MS-DOS operating system. Eventually Gates took notice of Apple’s graphical user interface. Gates knew well that a GUI would appeal heavily to the common folk and knew that this was the future of computing: PCs in everyone’s hands. This seemed like a joke at first to many. However, with the launch of Windows in 1985 and Microsoft Office in 1989, the face of computing forever altered the dynamic in the home, business world, education and more. Gates and Allen technologically and astronomically advanced society [6].
  + *Fun Fact:* Microsoft was originally “Micro-soft”. Micro was taken from Microcomputers and Soft was taken from Software [6].
* **Gary Kildall:** Gary Kildall wrote assemblers, interpreters and compilers. He created CP/M, an operating system that dominated the market of microocmputers for some time. Digital Research, Kildall and his wife’s company, celebrated the 40th anniversary by releasing the source code. Kildall’s work ethic and view of computers as learning tools rather than profit generators is the embodiment of today’s open source community. According to the article, he is often overlooked in comparison to Bill Gates. The open source community still owes its’ conception to this man [7].
  + *Fun Fact:* Kildall is typically nick-named “The man who could’ve been Bill Gates”.
* **Dennis Ritchie:** Dennis Ritchie helped expand and develop programming languages starting with his colleague Kenneth Thompson. Thompson had adapted BCPL (Basic Combine Programming Language) into the B programming language. Ritchie had expanded on B and eventually created the famous C programming language that is still widely used today. Ritchie and Thompson rewrote the Unix operating system in C, making it much more portable. C served as the first step towards other major high-level programming languages such as Java, C++, JavaScript, etc. Programming became even more accessible, easier to learn than ever before [8].
  + *Fun Fact:* Ritchie, like many other computing professionals at the time, had degree involving intense mathematics rather than actual Computer Science [8].
* **Steve Wozniak:** Being one of Steve Job’s key colleagues, Steve Wozniak helped Jobs realize his visions with his knowledge of electronics. He created the Apple I and Apple II personal computers. Although most people think of Jobs rather Wozniak when they talk about Apple, it is important to give recognition to Steve’s technological mastermind that helped him revolutionize the world with Apple [9].
  + *Fun Fact:* Wozniak himself wrote a negative review on the 2013 movie, *Jobs*, for the supposed false portrayal of Jobs and his interactions with others [9].
* **Tim Berner-Lee:** Having invented HTML, URLs (At the time known as URIs) and HTTP and ultimately the World Wide Web, Tim is oftenaccredited to almost single-handedly inventing the modernized internet we all know and love today. Never have humans had the ability to transfer information across the globe at such a level [10].
  + *Fun Fact:*  Berner-Lee advocates an internet bill of rights and is avidly against state control and suppression on the web [10].
* **Linus Torvalds:** The Linux operating system owes its’ existence to Linus Torvalds. Gary Kildall may have been an open source enthusiast himself, but Linus is usually seen as the embodiment of open source development with the invention of Linux. Linux was so popular, that some took it a step further a made their own licensed distributions of Linux. An example of this is Red Hat, which even offered stock options as a token of gratitude. Torvalds showed the world just how powerful the open source community can be with mere passion over the chase of profit initially [11].
  + *Fun Fact:* Linus holds 35 patents [11]!

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