

Linus Torvalds is best known for his work on the Linux kernel, which is widely used across a variety of devices using Linux distributions and phones running on the Android operating system. He is also known for developing the distributed version control system Git.

His contributions to software engineering are evident as Android makes up approximately 70% of the worlds phone operating systems, Linux being used in hardware such as routers and much more. The effect of his work extends even further due to Linux being open source, allowing others to change the code base to change the system in line with their own vision and their needs, as well as Git being the most popular version control system used in the world.

In 2012, Torvalds has been awarded with the Millennium Technology Prize by the Technology Academy Finland for his creation of an open-source OS which led to the widely used Linux kernel, in 2014 he has been awarded the IEEE Computer Society Computer Pioneer Award and in 2018, the IEEE Masaru Ibuka Consumer Electronics Award.

## Early Life and University

Torvalds was born in Helsinki, Finland on 28<sup>th</sup> December 1969. His parents Anna and Nils Torvalds were journalists and his grandfather Leo Törnqvist was a statistician.

At the age of 10, Torvalds has been introduced to computers and began programming on his grandfather's Commodore VIC-20 by starting off with BASIC. Torvalds interest was greatly focused on operating systems very early as once he purchased the Sinclair QL he has dabbled in modifying various aspects of the system, but mainly focusing on the operating system.

Torvalds had great interest in logical thinking, mathematics and physics since a young age and in school, Torvalds excelled at subjects such as mathematics and physics, though he himself claimed that he wasn't 'particularly exceptional'. He was not a 'people's person' and often preferred to keep to himself and focus on his interests instead.

Torvalds began university education in 1988 however his first year of study was interrupted by the mandatory Finnish Military service where he gained the rank

of Second Lieutenant. He finally graduated in 1996 with a master's degree in computer science. His master's thesis was titled Linux: A Portable Operating System, which would become the thing that has brought Torvalds fame in the computer science and software engineering world.

## **Linux**

Linux started off as a personal project in 1991 after Torvalds purchased an Intel 80389-based clone of the IBM PC, after which he received his MINIX copy, allowing him to start working on Linux. After approximately half a year of work, he made the project publicly available, allowing others to comment on his work. A friend introduced Torvalds to the concept of open source at the University of Helsinki, by introducing him to a open-source licenses, after which he thought for a while before finally deciding on going open-source as his main initial fear was the commercial interests and others taking advantage of his work.

Torvalds had a revelation after seeing people give feedback and ideas to improve his code and finally providing their code, as Linux was Torvalds first project which was shown to the public. The first version of Linux was released to the public in 1994, on March 14<sup>th</sup>.

Torvalds was the only person deciding on what changes are done to the Linux kernel and soon the work became overwhelming as hundreds and thousands of people became interested in contributing to the project. Torvalds at the time was using a proprietary version control software called BitKeeper for which he was criticized for, and this led him to begin working on his own version control system called Git, in order to help with the development of Linux.

Nowadays, only about 2% of the Linux kernel code is actually written by Torvalds due to the incredible amount of people who have contributed to the project since it began, through the power of open-source.

## **Git**

Git came about out of necessity to manage Torvalds' main project, Linux, in 2005. Its design was made to mimic a file system, where each Git directory on a machine is a whole repository containing a complete history with version tracking capabilities allowing to revert back to old code if something ever went wrong.

Git rose in popularity and is now the most commonly used version-control system in the world, implemented by services such as GitHub or BitBucket. Its creation has had a profound impact on collaborative software development and has greatly changed the way people in the tech industry work.

## **Conclusion**

Linus Torvalds has had incredible impact on the world through his contributions in the software engineering field, affecting to some degree almost every person in the modernized world due to the prevalent use of the Linux kernel, as well as changing software engineering through the creation of Git. Although his journey wasn't easy due to how he interacted with other people, leading to many conflicts along the way, his impact will have a long-lasting effect on the world in the future.