

Linus Torvalds

When picking a Software Engineer (SE) to write this biography on I wanted to pick a SE who has made the lives of fellow SEs easier, who has created open source projects and who has been involved in successful projects that are still in use to this day.

I therefore found it hard to look past Linus Torvalds as he matched all of the above criteria, and for good measure, he also ticked the box of having an asteroid named after him (9793 Torvalds).

About

Linus Torvalds was born in Helsinki on 28 December 1969. He began writing BASIC programs at the young age of 10, sparking his love for computers and programming. As military service was compulsory at the time in Finland, Linus took a break in his studies and became a second Lieutenant in the Finnish army.

Shortly after resuming his studies at the University of Helsinki he wanted to buy a UNIX system, due to the shortcomings of MS-DOS and MINIX (an educational stripped-down version of Unix). Since he did not have enough money to buy a UNIX system, which was a common problem of the time, he decided to build his own clone of UNIX, from scratch (Prakash, 2020) and named it Linux. Linux became his main project at University, the title of his thesis being “Linux: A Portable Operating System”. After creating Linux, he did not rest on his laurels and later went on to create the very popular version control system Git.

Linux

Linux started out as his main University Project, his goal being to create a new free open source operating system kernel. Linux was originally written specifically for the hardware he was using at the time and was independent of an operating system but has since grown immensely “with more than 23.3 million lines of source code, not counting comments” (Die Neuerungen von Linux 4.15, 2020).

Some of Linux’s biggest advantages are that it is open source and free. This makes it easily available to anyone, and it is possible to customize the operating system, people can contribute, modify, distribute and enhance the code to better fit their needs.

Linux is also stable, flexible and lightweight.

Open Source Advocacy

Linus believes that “open source is the right way to do software” and the two global products, Linux and Git, that he has had a major role in creating is testament to this. Both are open source, and both are free. Hence, both are accessible to all.

A key reason that Linux is still relevant and widely used today is the fact that Linus made the early decision that it would be a free and open source product. It has built up a very large community of developer and contributors who have helped in grow much quicker than would have been possible if he had not made it an open source product from the outset.

It is also important to note that Linux may not have been created if it were not for the open source contributions of Richard Stallman, whose products Linus used to create Linux. In all Linus used Stallman's text editor (Emacs), compiler (GCC), debugger (GNU Debugger), and a build Automator (GNU make). Most sources use the name Linux to refer to the general-purpose operating system thus formed, while Stallman and the FSF call it GNU/Linux.

A fascinating thing to note is that Linus hardly codes anymore, even though he is working fulltime on the Linux kernel. Nowadays most of the code in the Linux kernel is from contributors around the world and Linus, together with the help of kernel maintainers, approves these contributions and ensures smooth releases. (Prakash, 2020). This has resulted in the Linux Kernel growing much faster than would have been possible if it were not an open source product, as of course Linus and a team alone could not match the contributions of many SEs from all over the world.

Buy, not build where possible

As Frederick Brooks outlined in his research paper "No Silver Bullet" it is better to exploit the mass market if a product already exists that fits your needs rather than reinventing the wheel so to say (Brooks, 1986).

In the words of Linus, use the "best tool for the job", even if that includes proprietary software. As has become common practice in the world of software engineering when there is an existing piece of software on the market that fits the job description procure it where possible instead of building it. The reasons for this being it will often work out cheaper and you get the software/tool immediately.

Listen to & gather feedback

Another important lesson to learn from Linux is to listen to your customers.

In the early stages of creating Linux Linus sent out an email to friends asking what features they would like in Linux. While this is a very basic step nowadays, it was sometimes overlooked by developers who built to their needs only and sometimes adapted the product to others needs at later stages.

Originally, he used the proprietary BitKeeper software for version control in the Linux kernel, but upon receiving criticism for his advocacy of the proprietary software he decided to write the free open source Git software for version control. Which, as it turns out worked out very well. (Linus Torvalds, 2020)

The Revolutionary Git Version Control

Git version control has made the lives of countless software engineers all over the world much easier. Linus created Git in 2005. It was a huge advancement in version control.

“The biggest and most important difference between Git and everything that became before it” is that it is distributed (How Git Changed The History of Software Version Control | Hacker Noon, 2020). This means that SEs were now able to commit, log and do anything else locally instead of depending on a centralized server. This has resulted in teams being able to work remotely much more effectively.

SEs workflows became far more flexible as Git can work with multiple repositories and synchronize changes between them. Working in branches became much easier and merging was much more efficient.

This amounted to increased productivity for SE teams and individual SEs all over the world.

Closing

Linus Torvalds has created two of the most widely used Software products in the world, Linux and Git, which are both free open source products that have increased the productivity of SEs across the world, and although both are more than 15 years old now are still widely used to this day. This shows just how good these products are.

He is an advocate of a number of key SE ideals, such as open source development and the buy not build principle.

His contributions to the world have been recognized across the world. In a poll, the Time magazine name Linus as the 17th most important person of the century, which goes without saying is a very impressive feat.

Sources & References

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