

Ellen Whelan

17324116

11 October 2019

LARRY PAGE: THE WORK AND IMPACT OF A SOFTWARE ENGINEER

Larry Page is by no means an unknown figure in the field of software engineering. Credited with the creation of the worlds most widely used search engine, along with his partner Sergey Brin, Page's work on Google has undoubtedly impacted software engineering more than most could only dream of.

EARLY LIFE

Page was born in Lansing, Michigan in early 1973 to Carl Victor and Gloria Page. His career in software engineering was perhaps inevitable, with both his parents being in the same field. Carl Victor Page earned a PhD in computer science from the University of Michigan, where he worked mainly in the areas of artificial intelligence. Larry Page was certainly not the first of his family to make an impact in computer science area with his father being described as a "pioneer in computer science and artificial intelligence"^[1]. Page's mother Gloria was also a computer programming lecturer at another Michigan University, Michigan State University.

Page recalls his childhood home was "usually a mess with computers, science and technology magazines and Popular Science magazines all over the place"^[2]. With both parents in the field, it was not surprising that Page first began using early personal computers at the age of just 6, even being the first child in his elementary school to turn in an assignment from a word processor^[3]. Page has spoken in many interviews and Google letters about his interest in all things technology and business all throughout his childhood, so it comes as no surprise that Page

eventually attended the University of Michigan as an undergraduate, where he obtained a bachelor degree in Computer Engineering.

EDUCATION

As an undergraduate student in the University of Michigan, Page continued to excel in business and technology ventures with many projects, including an inkjet printer made of lego blocks, a business plan for a company that would use software to build a music synthesizer, and a proposal for a driverless monorail system to replace the school's bus system.

After completing his undergrad degree, Page enrolled in the Computer Science PhD program at Stanford University. Looking for a dissertation theme Page considered Telepresence, self driving cars and the structure of the world wide web as a huge graph. Ultimately Page chose the third option, having received advice from his supervisor to do so. Also enrolled in Stanford at the time was Sergey Brin, who joined Page's research project, which had been nicknamed 'Backrub'. The project focused on the problem of finding out which web pages linked to a given page, considering the number and nature of such backlinks as valuable information for that page. Page, along with co-author Brin, published a research paper entitled "The Anatomy of a Large-Scale Hypertextual Web Search Engine" during this time, which has since become one of the most read academic papers of all time. ^[4]

DEVELOPMENT OF PAGERANK

Brin and Page began work on an algorithm that would take the backlink data gathered by their web crawler, and convert it into a measure of importance for a given web page. The algorithm was named PageRank after one of its creators, and was based on the idea that data on the web could be ranked by 'link popularity', i.e. that a page ranks higher as it has more links to

it. PageRank assigns a numerical weight to each element of a hyperlinked set of documents, e.g. the world wide web, and uses that weight to measure it's relative importance within the set.

Page and Brin, along with the help of fellow Stanford students, developed the algorithm and then realised that the algorithm could be used to build a new search engine, one that would surpass all others at the time. By 1996, Page and Brin had built the initial search engine and it was being widely used by students at Stanford University. By 1998, Page and Brin had published their first paper about the project which included details of the algorithm and the initial prototype of the first Google search engine.

GOOGLE INC.

Following the publication of the paper, Page and Brin founded Google Inc., and Page was appointed CEO while Sergey Brin was appointed president. From 1998 to now Google, grew into arguably the world's largest corporation. Google is not simply a search engine these days, with many more services. Google, or more specifically its parent company Alphabet, has also acquired many smaller tech companies such as YouTube, Apigee and hundreds more. However, the PageRank algorithm is still used, along with many other algorithms, in the Google search engine.

IMPACT OF LARRY PAGE

In order to understand the impact of Larry Page as a software engineer, one must simply look at Google. A company so successful and widespread, its very name has become a verb. With the development of that key algorithm, Page changed the course of software engineering forever. The success of Google's search engine allowed the company to grow and change, but the company, and Page, has always had one goal in mind: to change the way people access and

use information. This determination is evident in their groundbreaking technological innovations. The company pioneered some of the world's most widely used tools such as gmail, drive, and docs and developed the most widely used smartphone software, android. The company is always on the forefront of new ideas, investing in research and development into the latest technologies, and this is all started with Page's algorithm and idea. While credit must be given to Sergey Brin, Page's partner, I and many others believe the credit for the creation of Google, the most influential corporation of the 21st century, lies mostly with Page.

“While Google is often thought of as the invention of two young computer whizzes-Sergey and Larry, Larry and sergey- the truth is that Google is a creation of Larry Page, helped along by Sergey Brin”.^[5]

Aside from the impact in the software realm, the social impact of Page and Google is undeniable. As I previously mentioned, Google is now a verb recognised by the Oxford English Dictionary as of 2006. The use of Google's search engine and it's other tools is so widespread, at least in the developed world, it's hard to find anyone who hasn't used at least one of their tools. In fact as of 2018 gmail, Google's email service, had 1.2 billion active monthly users.

Google's social impact can also be seen in the San Francisco/Bay area, where the company receives much of the blame for the areas homelessness crisis and gentrification epidemic. With its headquarters in the area employing thousands of high paid employees, and attracting other tech companies with similar salary plans, it has caused a tidal wave of gentrification in the city of San Francisco and the surrounding areas. Of course this crisis, is not solely down to Google but as one of the valleys biggest players, Google have been forced to take

responsibility for their impact, and under Page have announced plans to build 15,000 homes in the area to try to counteract the problem.

Page is currently acting as CEO of Alphabet Inc., Google's parent company, where he heads up hundreds of new projects, and continues to have his impact of software and indeed society.

CONCLUSION

Page started off as a software engineering student with an interest in looking at the world wide web in a different way. Page's idea grew into an algorithm, a simple search engine and ultimately a multinational corporation spanning the globe, which Page continues to head up. Plainly Page's impact as a software engineer and indeed as an exceptionally talented businessman, can be clearly seen in the success of his company and brain child- and nobody could call Google Inc. unsuccessful.

References

- [1] Will Smale (April 30, 2004). "Profile: The Google founders". *BBC News*.
- [2] Larry Page (2013). "2013 Founders' Letter". *Google Investor Relations*. Google.
- [3] Scott, Virginia A. (October 30, 2008) [First published in 2008]. *Google*
- [4] "Larry Page Biography and Interview". *achievement.org*. American Academy of Achievement. Archived from the original on October 25, 2018.
- [5] Nicholas Carlson (April 24, 2014). "The Untold Story Of Larry Page's Incredible Comeback". *Business Insider*