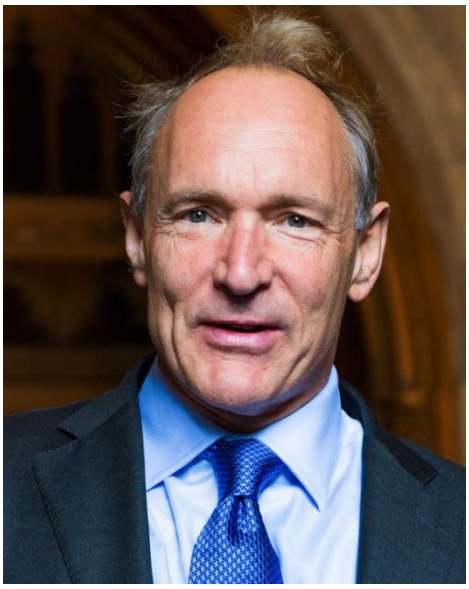
Tim Berners-Lee's contribution to modern-day software engineering.



Sir Timothy Berners-Lee is an English computer scientist, best known as the inventor of the World Wide Web. This led to rapid growth and discovery in the field of software engineering as it made programming more accessible to the world, dramitaically increasing the number people who have and use a computer on a daily basis. The World Wide Web and it's protocols are now the backbone of nearly every tool and source of information used by software developers today. In reponse to this monumental invention, in 2016, Berners-Lee was awarded the Turing Award, which is recognised as "the highest disctintion in computer scice".

Early life

Berners-Lee was born in London, United Kingdom on June 8th, 1955. Doing his A levels at Emanuel School, he then went on to Queen's college, Oxford University, where he received a first class degree in physics.

From 1980 he was emplyed at CERN in Geneva, Switzerland, where a large portion of his work consisted of sharing information between researchers at other geographical locations. To help with this, Berners-Lee suggested the system ENQUIRE[1], a predecessor to the World Wide Web. ENQUIRE allowed for the storage of snippets of information which could be linked together using 'hypertext' (1).

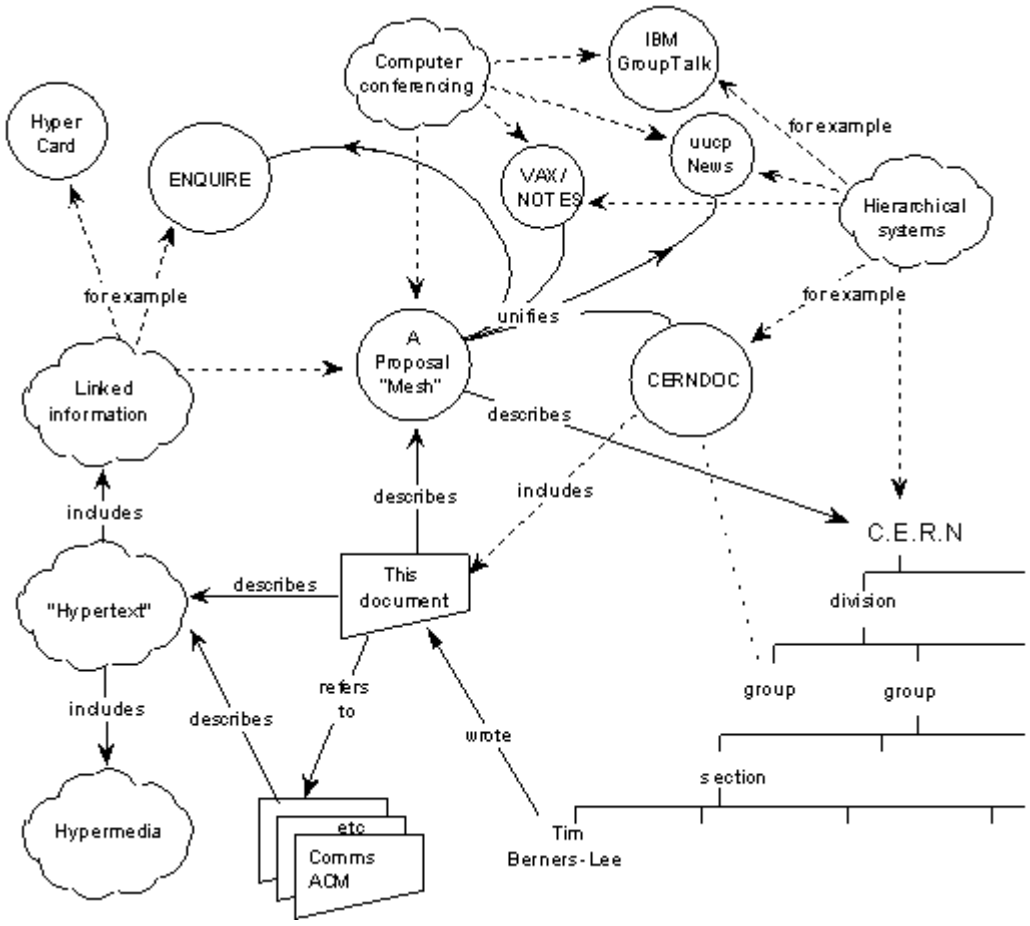
Invention of the World Wide Web

The internet had already existed for some time and in 1982, the Internet Protocol Suite (TCP/IP) was standardized, which permitted worldwide proliferation of interconnected networks.

In March 1989, Berners-Lee wrote a proposal "Information Management: A Proposal", concered with the management of general informaiton about experiments at Cern[2]. His

[1] Information Management: A Proposal, Tim Berners-Lee, 1989
[2] Information Management: A Proposal, Tim Berners-Lee, 1989

proposal argued for the use of Hypertext to link data together, like ENQUIRE. However this time the page containing the hypertext would allow for the storage of both text, images and graphics. Combining this idea with the already existing internet would allow users to share and access information from all across the world.



A diagram of Berners-Lee's proposal.

In 1990, he and Robert Cailliau has produced the first verion of the World Wide Web, the first web breowser and the first website/web server (info.cern.ch) [3]. This system allowed users to easily view hypertext web pages from anywhere on the internet. This system consisted of three main elements:

- A standardised system for recognising the locations of web pages (URL or Uniform Resource Locator).
- Hypertext markup Language or HTML is how webpages are published.
- Hypertext transfer protocol (HTTP) which allowes servers to show webpages upon request.

[3] The first website can be found here : http://info.cern.ch/hypertext/WWW/TheProject.html

This system quickly took off, with nearly 3000 websites by 1994 and to over a billion today.

Later work

In 1994, Berners-Lee founded the W3C (World Wide Web consortium) tasked with imporiving the quality and standard of the World Wide Web and is currently the Director of organisation. Berners-Lee often speaks up on the topic of privacy and data ownership, founding the Solid project in 2014, aimed at making a more decentralised version of the World Wide Web, where the user is in control of their data.

In recognition of his work, Berners-Lee was awarded the ACM A.M Turing Award in 2016 “For inventing the World Wide Web, the first web browser, and the fundamental protocols and algorithms allowing the Web to scale[4]”.

Effects on the world on Software Engineering

The growth of the World Wide Web has had a huge impact on the field of sotware engineering and on the software industry. Software architectures and web platforms differ from traditional client and server and desktop applications, requiring a new generation of tools and programming languages. Developers make extensive use of open source programs, made accessible to anyone on the web. Development teams can easily use Internet-based tools for collaboration, access to which is hosted on the World Wide Web. The ability to release new products and updates easily on the web has supported the idea of rapid prototyping and deployment, one of the key pillars of AGILE development.[5]

[4] https://amturing.acm.org/award_winners/berners-lee_8087960.cfm
[5] https://link.springer.com/article/10.1007/s13174-011-0019-x