Dustin Nguyen

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History of the Internet Text Content

**History Channel- The invention of the Internet**

The idea of connecting computers to improve the sharing of information was first envisioned by J.C.R. Licklider, a psychologist and professor at the Massachusetts Institute of Technology, during a time when computers where still seen as futuristic as autonomous robots and ray-guns. Computer communication was overshadowed in the United States by the space program but still continued forward at M.I.T. with Leonard Klinerock’s application of queueing theory to data transmission. This theory made data packets line up as they arrived at nodes of a communications network and wait to be sent out to the next node. He would also improve the speed of communication with the theories of demand access, which meant data packets were only sent where requested and distributed control, which dispersed authority so that no one device would be responsible for controlling the whole network.

These innovations made people realize that Licklider’s idea of connected computer communication network was possible. Further development was made by Paul Beran, who was hired by the U.S. government to create a communication network that was less vulnerable than the telephones of the time that used the method of circuit switching, which was easily disrupted by simply cutting the single circuit between caller and receiver. Beran came up with hot-potato routing which had small chopped up pieces of data, called packets, find their way through the communication network like mice in a maze by having the nodes of the network decide where to send the packets when they arrived at the node. The nodes would keep a copy of the packets and continue to send them until the packet had successfully made it to the next node. This is called packet-switching.

Then in 1969, born out of ARPA researcher Bob Taylor’s frustration, a $1,000,000(a bit over seven million today) was put toward creating a computer network to connect the expensive and sparse research machines so that they could communicate with each other and be accessed from a single terminal. With the help Dr. Lawrence Roberts, who developed the first network between two computers at M.I.T., they came up with a system of smaller identical computers, called Interface Message Processors(IMPs), that would connect to one another and act as interpreters for the larger research machines at institutes. This computer network would be called ARPAnet. Graduate students at SRI worked on the language and software that would be used to communicate between the research machines and the IMPs, while engineers at BBN worked out the kinks of packet-switching. By the end of 1969 four nodes at different universities in the western U.S. were connected, increasing to 18 nodes across the entire U.S. by 1971. After the establishment of this revolutionary network the first great application was developed, electronic mail.

Raymond Tomlinson, of his own initiative, took a mail program meant to operate between users on the same machine and merged it with the file-sharing capability of the ARPAnet to create a long-distance electronic messaging program and the iconic at symbol, @. More and more uses for the network would come about over the years as both the number of computers and networks increased, thanks to the collaborative and open nature of the internet. With this increase of connections and nodes in the connected world, so too did the need for a standardized protocol with which all computers and networks could communicate. This led to the creation and adoption of the TCP/IP protocol by Vint Cerf and Bob Kahn in 1983. Finally, with the inventions of the world wide web and user-friendly browser programs in 1993, computers users could follow and find information in a way much more similar to the way that people think. These innovations over many decades led us to the Internet that we know today, and further innovations in both hardware and software will continue to shape the way we communicate into the future.

**The True Story of the Internet: Browser Wars Part 1**

In 1993, the world wide web was sparsely populated by plain pages of text and was primarily used by academic researchers and scientists. Marc Andreessen foresaw a future where the internet was accessible and useable by all people, not just academics, and started to work towards that future with his fellow students at the University of Illinois. Together they created the first graphical web browser called Mosaic, that allowed pictures, videos, and audio to be interacted with in a point-and-click fashion. This openly available software spread quickly and caught the eye of Jim Clark, a bigshot in the Silicon Valley who saw the potential and had the capital to pursue this new web browser program as a business venture. Jim Clark contacted Marc Andreessen and together they recruited student from the University of Illinois to form Netscape Communications. They made a rival of Bill Gates, a giant if not the king of personal computing at the time, and his Microsoft Network, MSN. Microsoft had toppled many other companies in its rise to the top and aggressively sought to keep its place.

On October 13, 1994, building upon Mosaic, Netscape released their new web browser, Navigator, and its popularity was immediate. This disrupted Microsoft’s hold of the personal computing market by providing access to a neutral platform in the World Wide Web, which would circumvent the strict need of using the Microsoft Windows platform. This caused Bill Gates to immediately shift the priorities of the Microsoft to working on competing in the new frontier of the Internet, thus beginning the Browser Wars. Microsoft’s first move was to send an envoy straight into Netscape’s headquarters in 1995. While both sides provide conflicting views about the nature of the meeting, an offer was made by Microsoft to purchase all of Netscape’s technology for one million dollars. Microsoft’s version of the meeting is an amicable consultation about how Microsoft and Netscape could move forward cooperatively. Meanwhile, Netscape’s interpretation was a threatening corporate encounter, bordering extortion, and saw it as anti-competitive behavior from a computing giant with a vice-grip on the market. Netscape had famous anti-trust lawyer, Gary Reback, pursue an anti-trust suit against Microsoft.

Netscape’s popularity and faceoff with Microsoft garnered much attention from the business world and launched an Initial Public Offering(IPO) which promptly set off the Dot Com Boom with soaring capital gains. With many public jabs taken at Microsoft by Netscape’s higher ups, Microsoft fought back with the release of Internet Explorer and related products set to fight on every front with Netscape. Microsoft was fully committed and used every resource, from coders to shady salesmen to the extreme amounts of capital available to them, to compete against Netscape. Finally, Microsoft was able to find the edge by integrating their web browser, Internet Explorer 4.0, into their Windows operating system, which most computers used, completely free in 1997. After this Netscape had lost and faded quickly until being acquired by AOL.

Despite their victory over Netscape, Microsoft and Bill Gates now faced an anti-trust lawsuit started by Netscape’s famous anti-trust lawyer, Gary Reback. Bill Gates’ deposition was filmed as he was questioned about how Microsoft leveraged their position to force their influence on the fledgling company, Netscape. Bill Gates’ avoidant attitude did not inspire confidence and Microsoft was found guilty and ordered to break up causing massive losses in Microsoft’s stock value. An appeal would see Microsoft not be forced to break up but still found guilty and not long after Bill Gates would step down from his position as CEO to focus on the Gates Foundation instead.

**The True Story of the Internet: Internet Search Part 2**

Before web search engines, the way to search for information was to click through link after link, like tugging on knots of a never-ending rope. This would be the only method until two electrical students at Stanford University, Jerry Yang and David Filo, began working on a way to aggregate data to leverage in their fantasy basketball league. In its beginnings their data from various websites were compiled manually into categories and sub-categories onto their website. They gained much popularity online and chose a catchier name, Yahoo!. Thanks to their popularity they caught the eye of famous venture capitalist, Michael Moritz, from successful firm, Sequoia Capital. Without having a business model to make money from their website, Moritz pushed the idea of advertising, which had traditionally served as the main funder of other media formats such as print. Although concerned about alienating their user base on an Internet that had not yet been commercialized, Yang and Filo decided that advertising was the best way to monetize their popular website. They implemented banner ads on Yahoo! and despite their concerns, their user base continued to grow along with the revenue and interest from advertisers.

Yahoo’s first major competitor was Excite, who had a superior method of aggregating data. As opposed to Yahoo’s manual sorting and categorization of different websites, Excite used software to search the entire web for pages that matched terms in queries generated by users. Both Yahoo and Excite, along with other similar sites known as “portals”, expanded the content and services accessible from their site to make them the first place Internet users would go. The need to be competitive and have the edge over one another search engine companies generated new features and services all the time, rapidly evolving the way people used the Internet.

In this mad pursuit for features many search engine companies forgot to innovate their main attraction: their search feature. The ones to push the innovation of the search feature once more were the founders of Google, also a pair of Stanford students, Larry Page and Sergey Brin. Google’s search engine was built around the idea that the number of times a site was linked to by other sites could be used as an indicator for usefulness or relevancy. Using this they could combine the term matching of the search engines that had come before and combine it with this new way to sort search results for relevancy, bringing users the most linked to sites that matched their queries. Their instant popularity was overwhelming and caused Stanford, who initially hosted Google, to kick the search engine off-campus due to the insane amount of traffic put through Stanford’s network. Excite turned down the opportunity to purchase Google a million dollars, as did many other tech companies at the due to the industry-wide perception that not much money was to be made in search engines as all search engines were nearly indistinguishable. Google would later be funded by venture capitalists John Doerr and Michael Moritz, with both contributing a combined $24,000,000.

While they had difficulty, founders ,Larry Page and Sergey Brin, refused to simply to resort to generic banner ads that would reduce the user’s experience. The solution to Google’s monetization came from another company IdeaLab and Bill Gross’s idea to use search queries of users to generate marketing data, called keywords. Bill Gross started successful search engine Overture which would be based on keywords and have sponsored links. Google would try to negotiate a merging of services with Overture but would eventually walk away from the meetings empty handed. Instead Google introduced Adwords which was basically a copy of Overture’s monetization model, so Overture sued Google and they came to significant settlement out of court. With the question of monetization out of the way, Google’s ascent to the top as a billion-dollar company was assured. Google continues to this day to use its massive gains and data index to expand features and put pressure on its competitors like Yahoo! and Microsoft.

**The True Story of the Internet: Dot Com Boom Part 3**

Both businessmen like Jeff Bezos and software coders like Pierre Omidyar were looking for ways to commercialize the web and create highly accessible markets that would generate great volumes of trade. Although both saw this commercial potential in the web, Omidyar and Bezos took differing approaches. Omidyar, creator of ebay, saw the web as a way to create a fair market where sellers of all sizes could compete to sell goods. Omidyar created a marketplace where anything could be listed, and he would profit from seller’s fees on each transaction. Meanwhile Jeff Bezos started Amazon and focused on creating a marketplace no bookstore could compete with by offering more titles than a bookstore could possibly contain to an international market. These marketplaces quickly began generating unfathomable amounts of traffic and popularity amongst Internet users and not long after Wall Street.

The rapid advancement of computers and increases in connectivity are due to two principles, Moore’s law and Metcalfe’s law. Moore’s law says that the number of transistors that can be crammed into a finite space doubles every roughly 18 months. This is driven by the fact that with more powerful computers from this doubling are immediately put to use to make even more powerful computers. Metcalfe’s law is similar but applies to the connectivity of a network. Metcalfe’s law shows that the addition of a single node increases the amount of connections available in a network by an ever-increasing amount with larger and larger networks. With these two laws working in tandem, the barrier to entry to join the internet was decreasing and the usefulness of the internet was increasing.

With the exponential growth of popularity in the internet and computing, Wall Street and investment firms dumped money into the promising technology boom, kicking off with Netscape’s historical IPO in 1995. Year after year there were new exciting technologies for investors to believe in from search engines like Yahoo or marketplaces like ebay. Notably Jeff Bezos leveraged all this attention by sacrificing profits to lower prices and attract new customers, with his idea being that rapid short-term growth would lead to much more significant profit margins down the line. This ideal was simplified to “Get Big Fast”. Thanks to public key cryptography, Amazon was able to begin use customers’ credit card information for transactions by providing a secure, and easy means of transaction.

Along with the wide and rapid spread of computing and popularity of the Internet, came the increased access of the average person to be able to buy and sell stocks. This access led allowed the financially eager to fervently trade from home, creating day traders who would meticulously watch the news and search online for any information to capitalize on. This only added to the ludicrous amount of capital pouring into the dot com market. With this treasure trove of capital for the taking many dot com companies, often of dubious quality, rose and fell trying to get a taste. Alongside the dot com boom, an increased need for infrastructure, in the form of fiber optic cables, was needed to support the exponential increases in internet traffic. This increased need also led to overinvestment into companies that would lay fiber optic cables.

The bubble began to collapse in 2000, after the chairman of the Federal Reserve of the United States, Alan Greenspan, chose to increase interest rates and cool down the fervent market. Finally, the bubble completely collapsed on April 14, 2000 with many companies going out of business and even larger tech companies taking significant hits. After the collapse, the public’s ire turned towards Wall Street with financial analysts like Henry Blodget being charged for civil securities fraud and was eventually banned from securities trading. Even public figures like Martha Stewart getting caught up in the mix. While an incredible event, this trend of financial bubbles surrounding new and exciting technologies is not new at all and will likely happen again in the future.

**The True Story of the Internet: People Part 4**

Web 2.0 is all about user-created content and distributing that content on an equal platform for everyone to use. Youtube, co-founded by Chad Hurley, is platform for people to share videos. Digg is a social news site, created by Kevin Rose and Jay Adelson, that lets users decide what new stories make it to the front page. These are both sites founded on the principles of Web 2.0. Likely better known than either of these sites is Facebook, founded by Mark Zuckerberg, which connects users that create profiles to represent themselves on this social network.

The mp3 file format is a compressed audio file that allowed for music to be played and shared on computers in a size that was easier to share while not diminishing the sound quality too much. This innovation allowed music to become much more accessible to average person and allowed them to only take the songs that they wanted as opposed to buying a record full of songs that they may have only enjoyed one of. With this increased access to music through mp3’s and the music industry’s stance against officially the distribution of music online, music piracy gained rapid popularity on the internet. Peer to peer file sharing sites like Napster and limewire became extremely popular as young people across the U.S. sought out free music. Inadvertently Napster became one of the first Web 2.0 sites with users sharing and learning about other user’s interests. Napster’s popularity brought to the forefront the problem of media piracy that could threaten the whole entertainment industry that had largely ignored the internet as a means of distribution. All this negative attention brought on lawsuits from the Recording Industry Association of America (RIAA) and popular artists like Metallica. These lawsuits resulted in Napster’s shut down.

With the increase of these populist Web 2.0 sites, social media services began to rise, with websites like myspace, twitter, and digg gaining large userbases. Sites like myspace were sold for millions of dollars and when one site would lose popularity another was sure to take its place with explosive force. Hence, Facebook, still today one of the internet’s most popular social media sites.