The Disruptive Innovation Of The Internet & Computing

Reflective Report

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Graphic Communications

Abstract

This is a reflective report is exploring the disruptive innovation of the Internet and computing. Exploring the reaction these two defining technologies have had on the world in the last century, and what potential advances may be created because of them in the future.

Chapter 1 is a timeline of the past and development of the internet and how it got to how we understand it today. The second chapter is The Importance Of Graphical User Interfaces, a revolution in computing which first allowed users to interact with graphical icons. Chapter 3 is exploring the design & development of the internet. Chapter 4 is talking about Steve Jobs one of the pioneers of User Interface & User Experience. Chapter 5 is explaining what the Internet of Things is and how it is developing for the future. Chapter 6 is imagining the possible future of the internet, and how it may evolve based on current information. Chapter 7 summarises all ideas and thoughts within this report.

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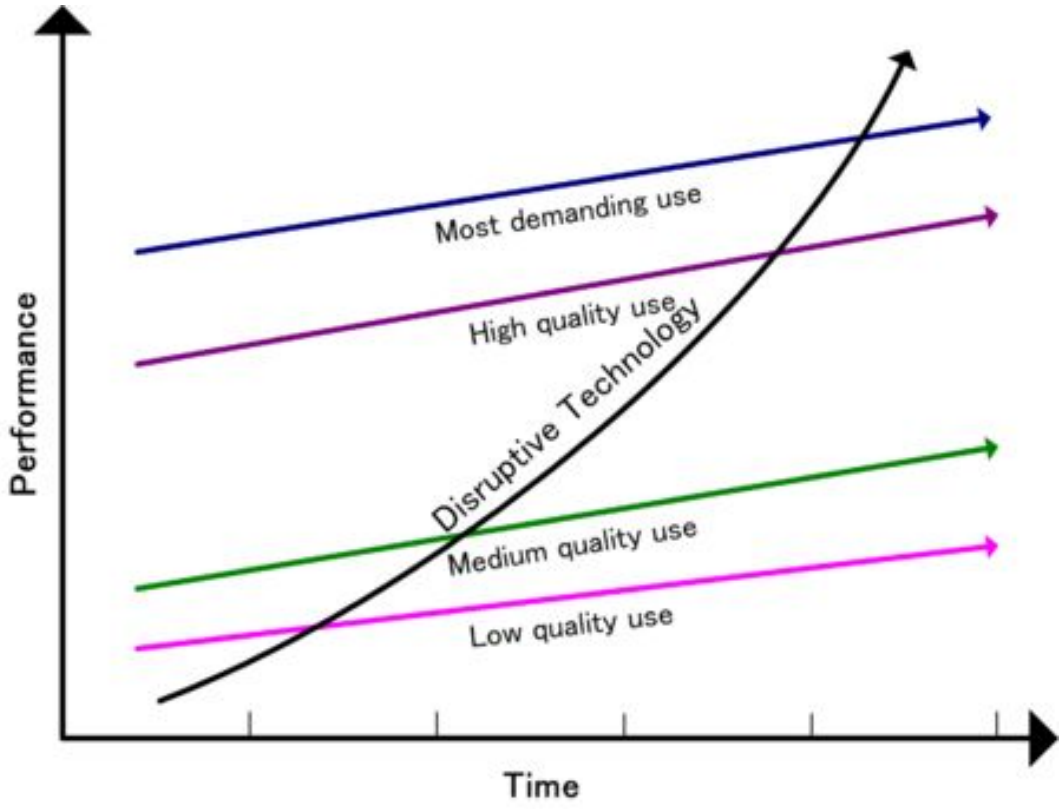
Introduction

Radio, Television, Post and Phones were essential communication infrastructures for life, but as the digital age surged it appeared to absorb all of these functions and make the original forms of communication obsolete. The Internet, originated from the academic elite in which you would find a rich tradition of sharing knowledge, and evolved into a massive community to which anyone can contribute ideas about its use and how to improve it.

A disruptive innovation is a new idea that creates a new market and value network and eventually disrupts an existing market and value network, displacing established market leading firms, products and alliances. This report is explains how the internet is the most significant invention of the modern age, revolutionising the way we live our lives.



The Internet is the defining technology of our time, a historic revolution in communication for the human race, that changed the face of the world forever. Will history books remember the Internet on par with the wheel, fire and language? The Internet allows the world to connect and contains information relating to every aspect of our lives. It is, amongst other things, an online marketplace, casino, library, musical database, a place to express opinion, a catalogue of sex, a tool of communication and a much darker place where debauchery and perversity is unregulated.

The Internet is the communications infrastructure of the 21st century and this section will explore where it came from. 3.2 Billion people use the Internet worldwide and its origins date back to the 1950's. No invention has ever grown as fast, technically speaking it spread faster then any disease known to man and has touched almost half the planet within mere decades. It is a communication tool of instant access responsible for 1/2 of the growth on the planet since the nineties.

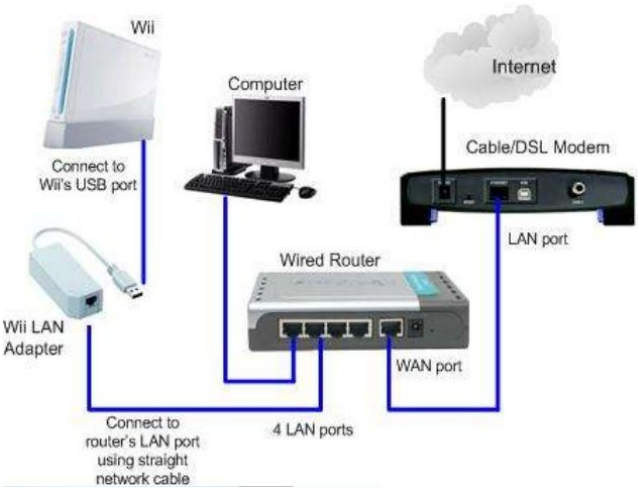
Chapter 1: The Age Of The Internet

1950 - In the 50's the Internet just was a figment of science fiction writers imagination. Computers were portrayed as Sci-Fi props, like ray guns, spaceships and robots. In fact the idea of a worldwide communications network of computers was far more imaginative than anything Hollywood had ever come up with. The first computers were monstrously large and expensive devices that were never intended to communicate. All computers were the size of a room and you would be lucky to have one in a city or on a university campus.

1957 - In October 1957 the Soviet Union launched Sputnik, to catch up and hopefully surpass this space technology, President Eisenhower created the bureau of the defence department called ARPA (Advanced Research Projects Agency). ARPA was in charge of the space program wich included computer Science. Along with Nasa this distracted America, who's main focus was getting a man on the moon.

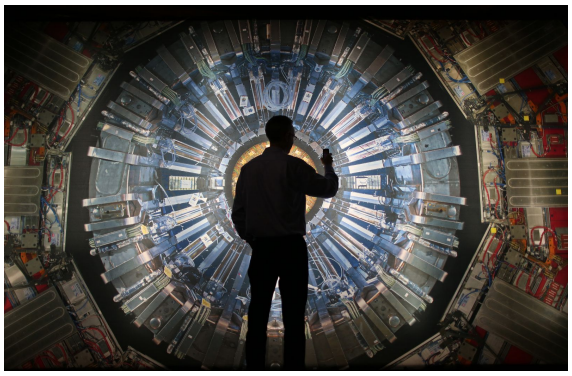
1960 - In the early 1960's surfing was the search for the perfect wave, mail was only delivered by the post office, online meant waiting behind someone in a queue, and a server was a waitress. Old computers had been big machines that you punched cards and submitted the cards in a deck and the next day you would get your answers. By 1969 you could sit at a terminal and you could type in your questions and the answer would come back instantly.

1966 - In 1966 you needed a separate Terminal to log into each time-share computer at research facilities across the country. No two computers could talk to each other. The Internet did not have the hype or the excitement of going to the moon. $1,000,000 was all they had to turn their theories into reality. None of the major communication companies like; AT+T or IBM was interested in investing, as they did not feel it would reach the mainstream.



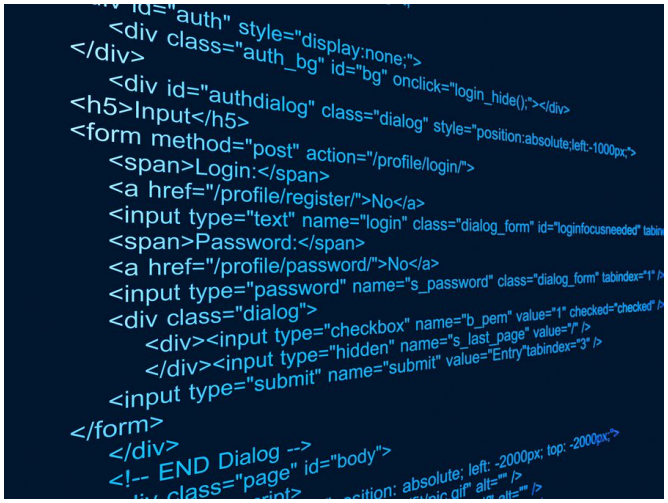
1983 - LAN was born, local area networks which, link computers in offices. WANS, wide area networks link networks across buildings. Breakthroughs in electronic technology which brought mainframe computer power down to the size of a desktop pc, the silicon chip, the high speed modem, the mouse are significant in shaping the internet as the first IMP.

1989 - AOL launches its Instant Messenger chat service and begins welcoming users with the iconic greeting "You've got mail!"

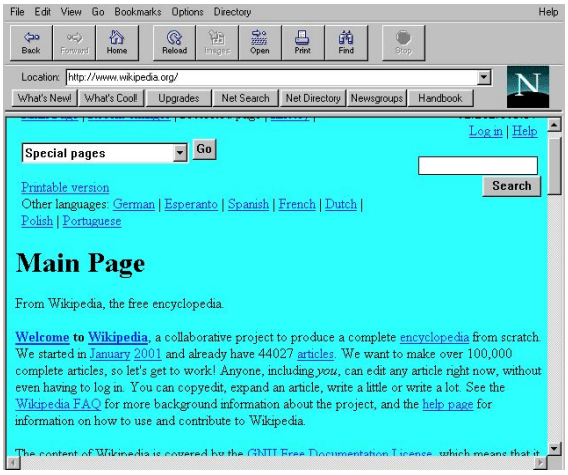


1991 - The first website quoted to be made was a 1991 Cern (European Organization for Nuclear Research Organisation) website, a file uploaded and published to an as yet quite early form of the internet. CERN created the World Wide Web "www". The World Wide Web made it easy for users to access data but, it was not particularly user friendly.

1992 - At this point there was only 50 web pages on the Internet. If the World Wide Web made the Internet more accessible, another development made it to instantaneously accepted by the masses. June 9th 1992 congress passed a bill taking the Internet out of the hands of the government and into the public. The dream of easily sharing information among computers was challenged by the complexity of finding it, it was like having a library at your disposal but being able to gather what was being written on a desired topic without tedious and often discouraging hunts. Under 80's technology it was difficult to decipher information on a computer without being a computer wizard. (Gandy, 2012)



1993 - HTML is first used as a standard markup language for creating web pages and web applications. Along with Cascading Style Sheets (CSS), and JavaScript, it forms a triad of cornerstone technologies for the World Wide Web. Web browsers receive HTML documents from a webserver or from local storage and render them into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.



1994 - A 22-year-old student named Marc Andreessen working for Mosaic made Netscape, a browser which made it easier for people to get access to content. This turned the Internet into a graphic rich world, the signature of today's Internet. Netscape was able to display text, scroll bars, images and page jumps, this made the essence of the internet a whole lot user friendly. This was not the first or the last browser but it was a breakthrough application, which brought the fire of the Internet to the everyday user. After this browser hit the web grew by 341,000%. (Gillies, 2000) By the late 90’s the Internet had grown in simplicity of use, complexity of performance and multiplicity of information, and is one of the defining characteristics of today's computers.

1994 - Jeff Bezos founded Amazon in Seattle. Created the largest Internet based retailer in the world. Started as an online bookstore, later diversifying to selling pretty much anything you would like purchase.

1994 - Microsoft releases Windows 95 and the first version of Internet Explorer. 18 million American homes are now online, but only 3% of online users have ever signed on to the World Wide Web.

1996 - PHD students of Larry Page & Sergey Brin began Google as a research project while attending Stanford University. They developed a technology called; Pagerank which enabling them to create a search engine which estimated website's importance based on its incoming links.

1999 - Napster was founded as a pioneering peer-to-peer (P2P) file sharing Internet service that emphasized sharing MP3s. The company ran into legal difficulties over copyright infringement & ceased operations by 2001.

2003 - Saw the release of Myspace where you could add friends, join groups of people with similar interests & share music. Myspace was much more customisable than Facebook is today, this did make the site slightly more annoying as when visited someone's page automatically music would play. Between 2005-2009, Myspace was the most popular social media site on the internet.

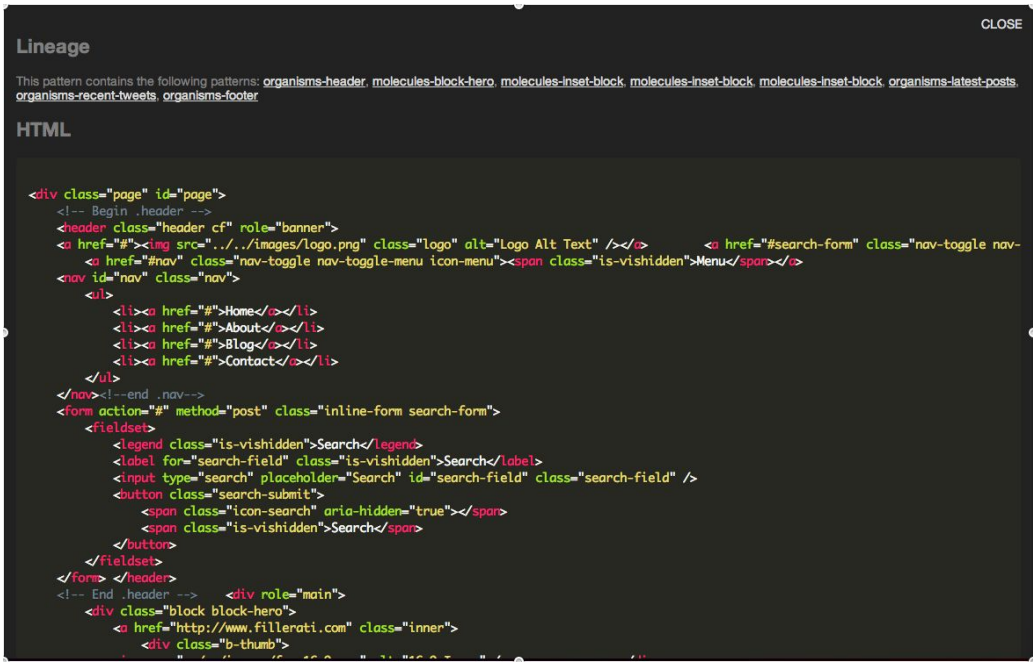
2004 - Launched only a year after Myspace, Facebook went from being a college only site to a public network by 2006 and three years later Zuckerberg overtook Myspace as the most popular social media site which it still remains to be today.

2005 - YouTube is founded on Valentine's Day. The first video, an explanation of what's cool about elephants, is uploaded by co-founder Jawed Karim on April 23. Google acquires the company a year later.

2006 - Apple releases its first iPhone, priced at $499 for 4GB and $599 for 8G. In the last quarter of 2014, there were 74.5 million iPhones sold, a record, compared to 51.0 million in the last quarter of 2013. Tim Cook revealed at the Apple Watch conference on March 9, 2015, that Apple had sold a total of 700 million iPhones to date.

2008 - Google Chrome is a freeware web browser developed by Google. It was first released for Microsoft Windows, and was later ported to Linux, macOS, iOS and Android. Google Chrome revolutionized software as a service

as web apps. Programs that can be executed inside the browser removing the need to have the program itself on your own computer.



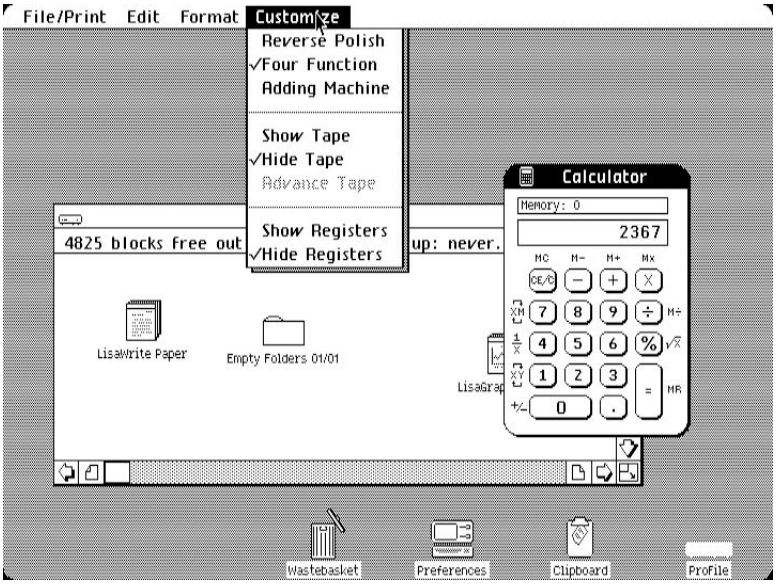
2011 - HTML5 is released, providing graphic and multimedia capabilities without the need of client side plug-ins. HTML5 also enriched the semantic content of documents.

2016 - 61% of Americans now own a smartphone of some kind. 51% of U.S. adults bank online. Apple says app store downloads top 70 billion, with 20 billion in 2012 alone. Twitter is now on the stock market. Shares soar 73% above their price on the first day of trading. The largest social media site, Facebook, has 1.76 Billion Users.

Chapter 2: The Importance Of The GUIs

A graphical user interface (GUI), is a type of user interface that allows users to interact with electronic devices through graphical icons and visuals, instead of text on a screen. GUIs were introduced in reaction to the perceived steep learning curve of command-line interfaces (CLIs), which require commands to be typed on a computer keyboard.

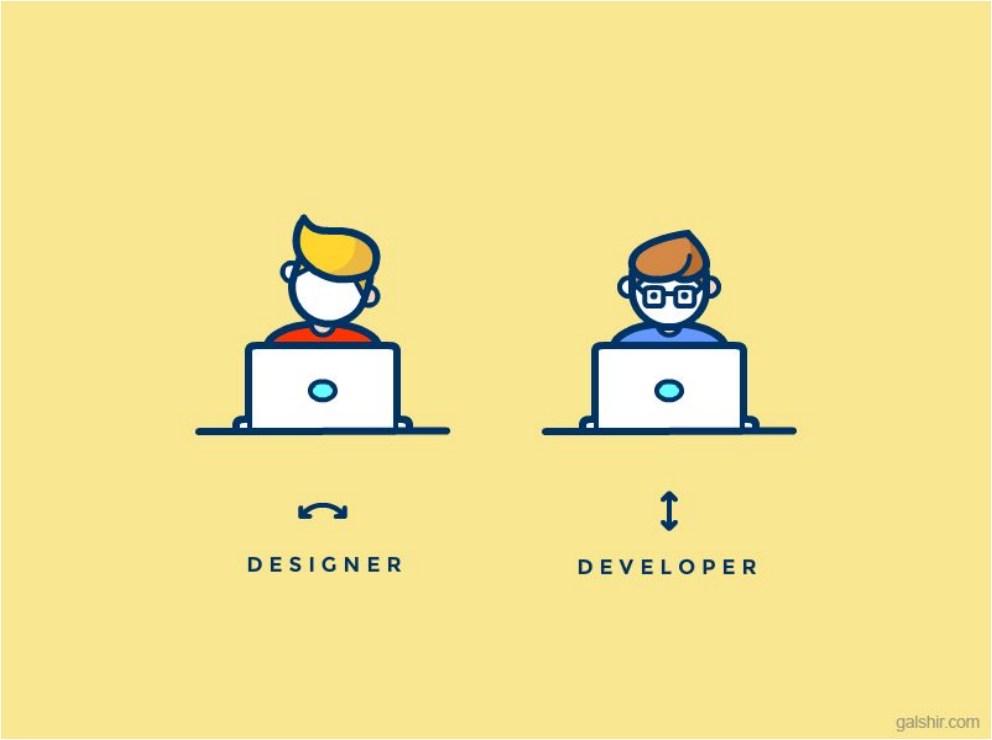
The Apple Lisa was a desktop computer developed by Apple, released on January 19, 1983 and it was one of their first personal computers to offer a graphical user interface (GUI), in a machine aimed at individual business users.



This new approach to computing arguably gave Apple the edge over their competition and shaped the way in which we interact with computers.

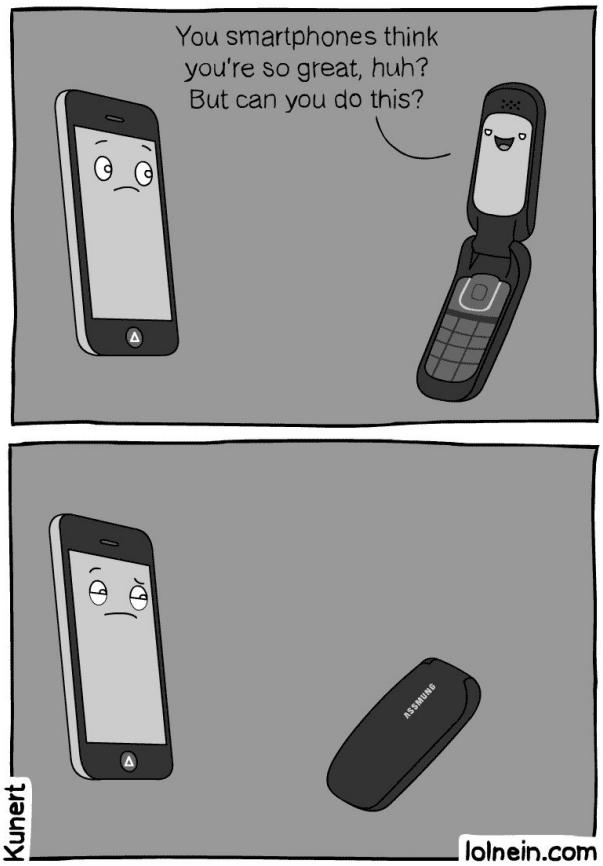
Chapter 3: Developing & Design

Design-Technology partnerships are the collaboration of designers and technologists, the respect for both roles resonates throughout the web development industry. This partnership agrees to solve clear problems by working together to find solutions to benefit the users experience. (Uckelmann, 2011) For decade's graphic designers, web developers and programmers have been the architects of the web, 50 billion pages and still counting. Genuinely things work quite smoothly, however with websites there are sometimes reliability issues with different type of services, for example a page may take a while to load, or a sudden loss of connection. These problems are frustrating but they are part of our Internet experience. These are not expectations we have from the physical world though, if you flip a light switch, you know that the light will come on instantly. (Rowland, 2015)



For the last 10 years we have watched devices evolve at an overwhelming rate to the point where we have found it hard to keep up with the latest trends. We are finally coming to a point where we are understanding what is important as a user experience as most phones are practically the same, just when this happened Google Glass, Apple Watch & Samsung Gear Vr are giving designers completely different interfaces to develop.

The typical British person changes devices 21 times an hour in an evening, 90% of people who own multiple devices to accomplish the same tasks. (Greengard, 2015) Ambiguity is dangerous, as unfamiliarity throughout media will leave the user confused and overwhelmed. Looking at the design of most smart phones and tablets, if the branding was covered the undistinguished design make it near impossible to identify each device. Designers need to design for people and not for screens; interaction design is not inherently about screens.



The best parts of our lives are happening when we are not behind the screen; the screen is preventing us from being face to face with reality. Augmented reality could be the revolution in technology we need, layering graphics on top of our physical reality, digitizing human interaction with the real world. Developers and designers are incorporating augmented reality into every aspect of our lives, they are hacking our brains. In the Matrix the characters had the ability to download skills into their brains, how to fly a helicopter, using A.R. this science fiction can happen sooner rather than later. There are 3 rules of A.R: Emerge from the

real world, do not distract from reality & deliver superior user experience. (Lex, 2014)

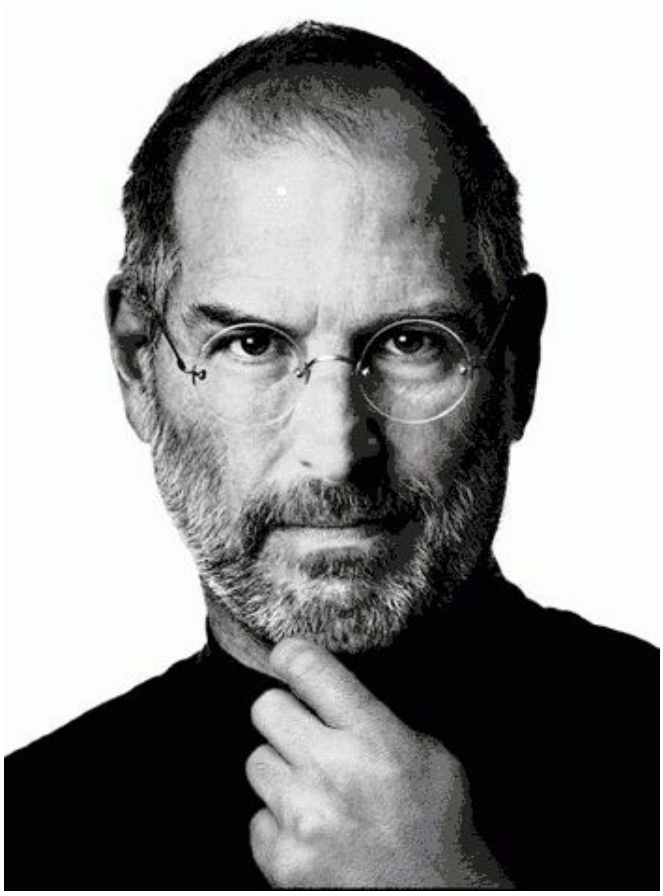
Science fiction has displayed its vision of augmented reality for decades, this style has inspired present design in software like Google Glass. When Google Glass was announced it doubled the awareness of augmented reality. Google Glass allows the world to become a Minority Report landscape with adverts and moving graphics popping out of everything, practically the developers at Google Glass's wet dream.

Pokemon Go released 2016 is interesting because how fast it became a success; On the day of release in Japan, more than 10 million people downloaded the game, including 1.3 million in the first three hours. By July 26, the intelligence system estimated the game to have been downloaded 75 million times worldwide. Through in-game purchases, the game generated more than US$75 million in revenue by July 26. From iOS users alone, the game generated approximately US$1.6 million in daily revenue. The average daily usage of the app on Android devices in July 2016 exceeded Snapchat, Tinder, Twitter, Instagram, and Facebook. Fascinated by these downloads, several app developers are focusing on developing similar augmented reality apps using available AR SDKs. The present in web design is augmented reality.

Chapter 4: Steve Jobs

“Design is a really loaded word, I don’t know what it means, so we don't really talk about design a lot at Apple we just talk about how things work. It's not how they look, it's how they work.” Steve Jobs. (Isaacson, 2011)

Jobs believed computing should be intuitive and precognitive. He wanted computers to know what the users were thinking of doing before they even know they want to do it. People bought Apple and not the competitors because it had bravado, it is social currency, Apple raised the bar. The computer, the phone the walkman whatever it is should be an extension of the user, to captivate their ideals.



Jobs knew he had to risk everything. Picasso, Dylan and Newton risked failure, and he knew that to be great, he too had to risk it all. When he knew IBM were doing things in similar ways, he wanted to gamble on his own vision, instead of making similar product, to make the small things, unforgettable. (Isaacson, 2011)

In the early days of Apple he famously asked his programmers working on Apple 3 how many font faces are available for his computer. A programmer felt it was not a pressing issue and arguing that having pretty fonts is not important. Jobs fired him on the spot as he did not share the enthusiasm and ethos of the company.

Jobs was kicked off Lisa, the leading project at Apple, and was then sent to the Macintosh team which was then just a minor project. He wanted to make the Mac simple and work like an appliance. Jobs used his new role as revenge and made Macintosh the biggest selling Apple product of all time.

Apple was the only company willing to give IBM a run for their money, so they created the 1984 George Orwell inspired advert. This advert has been noted as one of the most famous ads of all time as it sold a lifestyle and implied a rebellious option to the status quo. (Isaacson, 2011)

The advances in Apple's Avant-Garde style of computing lead Microsoft to steal Apple's ideas, this enraged Jobs so he attempted to sue Bill Gates.

In many ways Apple, Steve Jobs cemented the importance of User Experience and inspired design within computing.

Chapter 5: The Internet Of Things

Internet of things (I.O.T.): A proposed development of the Internet in which, everyday objects have network connectivity, allowing them to send and receive data. (Stevenson, 2010) It is predicted because of I.O.T. tens of billions of smart connected devices will change the market place in the next few years. The ability to control household objects via the internet; control heating settings, locks, electronic appliances, cooking equipment.

In this new era of connected things, companies are finding ways of using this technology and the immense amount of data connected things generate. (Greengard, 2015) This new era is being known as the Internet 2.0, design is evolving where product design is tremendously important, many companies are not prepared to compete in this way. Companies that fail to recognise the importance of design within the Internet, run the risk of falling behind their competitors. (Rowland, 2015)

In the next few years, a predicted 1.5 Trillion dollars of value for the I.O.T. will drive it to the top of discussions in technology. Programmers are understanding the importance of the user more and more, finding their problems with technology and adding value to digital products through design. The user is the most important aspect in the development of the internet. Metaphorically speaking a chef will cook food so the person eating has a unique taste experience, inspiring their taste buds this justifies the value of the dish, and displays the chefs experience and skills.

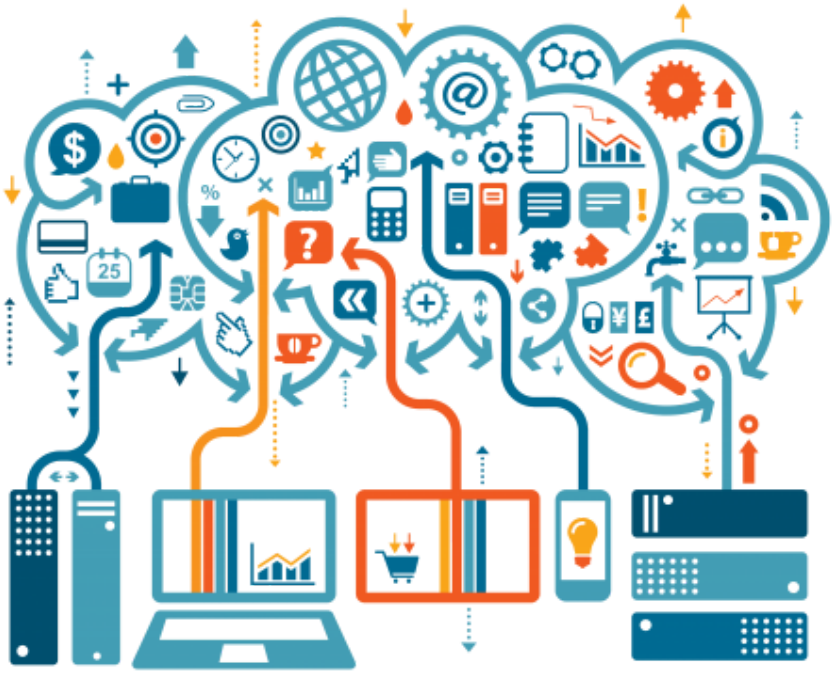
Traditionally, the fundamental value of the Internet was about access, maintenance and performance, it was the enterprise, which held all the value, the user enjoyed the performance but was not as interactive. To collect data the user needs to be involved and to be engaged with digital devices.

Chapter 6: The Future Of The Internet

Futurist: a person who studies the future and makes predictions about it based on current trends. (Stevenson, 2010) The world will most definitely be a vastly different place in 5 years. The countries not completely connected like: Brazil, Russia, India, China, are the fastest developing countries on the planet. When they do, 5 billion people will be connected to the Internet via mobile devices in comparison to the 3.2 billion we currently have today.

In 5 years people predict phones will get larger in contrast to the vision of the early 2000's when phones were noticeably getting smaller. 40% of Americans aged between; 15-25 update a post on Facebook Daily. 90% Of people with smartphones sleep with their phone in there bed, or within 30cm. Big Data; extremely large data sets that may be analysed computationally to reveal patterns, trends, and associations, especially relating to human behaviour and interactions. (Meeker, 1996) Big Data is the new oil of the Internet according to the European commission for consumers.

Every year since 2007 the amount of personal data users share has doubled. A Facebook profile makes it easy for anyone to make a map of whom you are and can predict what you are going to do. The FBI is doing just that, they say it is counter terrorism, but most people believe it is a means of control.(Meeker, 1996)



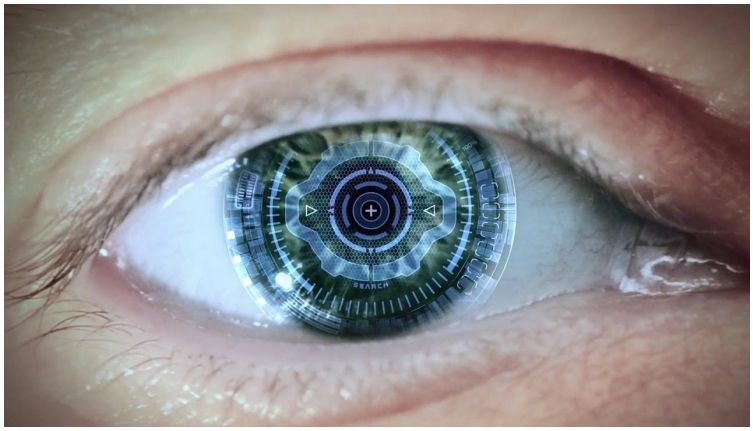
There are different types of data: 'volunteered', that which we upload ourselves, and 'observed', data collected by watching our movements online. For example, if you are searching for a Les Paul guitar online, Google knows you are either thinking of buying one, or that you already have one. Google knows your darkest secrets, whether you are checking symptoms of a disease or fetish porn, nobody may know this, but Google does. We are in an ocean of data, we have to understand the internet is re-imaging everything: Money, Television, Music, Production, Publishing, Education. Big Data is a huge wave in this ocean. (Leonard, 2016)

It is making us re-invent stuff. Amazing for entrepreneurs but terrible if you are a big company, every time you turn around somebody is going to take a shot, take your ideas and make them better. The problem; we can always find a way to do something different, the younger generation find it easier to talk on Facebook then to each other at a restaurant. I have seen it, teenagers sitting across the table from each other in Nandos, throughout a whole meal not say a word to each other as their faces are engrossed into their pocket sized black mirrors, then have the audacity to take a Snapchat of their food while holding a fake smile because the relationship they have in reality conflicts their online persona.

The size of Big Data is mind boggling, it is a huge resource which is becoming much more powerful than oil. Unlike oil, it doesn't kill us when we use it. You can create wars over data, in fact there are data wars going on as you read this. It has became a global resource, in 5 years governments will not care who is getting oil from who, but instead what data can they use. Are data companies going to be like oil companies? (Leonard, 2016) With no huge catastrophes destroying natural habitats &

with gigantic profits at very little cost. The International Energy Agency says that the world's capacity to generate electricity from renewable sources has now overtaken coal. Data driven companies like: Facebook, Google, Youtube, Amazon, Ebay, will they get away with murder while using our data with record profits? Big money will be made with Big Data & this creates big temptation. Facebook is very tempted to give everyone that will pay enough, access to us through their website. The data economy is estimated to be worth a trillion dollars by 2018. (Meeker, 1996)

It is the Internet's duty to do better with data then humans did with oil. We need to create an eco-system, which pays the value – the externalities as known in the oil business. Airlines ; despite the carbon tax, do not pay the true cost of the damage they are doing when they fly. If you take out more then you put in, the eco system eventually fails. We should create an ecosystem around data which replenishes itself. (Leonard, 2016) All the action in the future will not be in Germany, Japan, United States or the United Kingdom but in the developing countries. The rules will have to be rewritten in countries like India, Russia, Brazil and China. We need to think globally in everything we do. We are not going to have physical money in 10 years, everything digital thing we do is going to be saved in the cloud. In the future we will be able to pull information about people from the cloud.



What happened digitally is now happening physically too. 3d printers can print shoes, cups, scale replicas of the Eiffel Tower and pretty soon they will be able to print human organs. What happened to the music industry will happen to Nike. Bootleg copies of shoes will be available on Pirate Bay for free, instead of paying the extortionate prices that Nike demands. Brands are all about the intangible, why buy BMW, Mercedes or Porsche? Not because they are faster, but for some reason this brand speaks for you. Likeanomics as people call it. (Leonard, 2016)

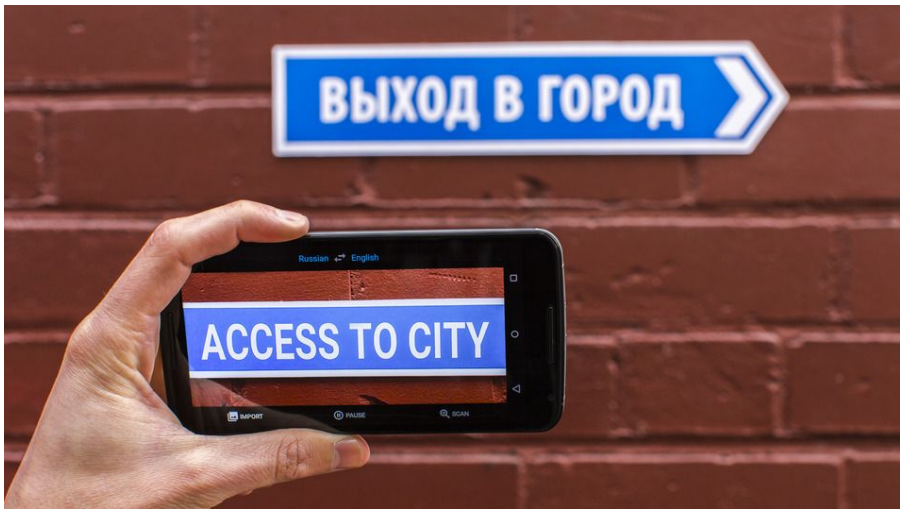
There is an art in sentiments, using data to find sentiments. Tweetstock allows you to get sentiment on stocks so you can predict what’s going to happen in the stock market using Twitter. This is not so farfetched; we are very close to this. Brands want to be loved, politicians want to be liked, an interesting dichotomy. (Bhargava, 2012) Touching data is really what is changing us, using smartphones we can touch data, like in Minority

Report. Mobile phones, to CRV, to Google Glass, to Iris, to implants. If you are having an argument with somebody about the answer to a question, you can now Google the answer and resolve the problem.

Imagine instead of an Alzheimer's implant you had a Wikipedia implant, this could be our reality. Singularity is an era in which our intelligence will become increasingly non-biological and trillions of times more powerful than it is today, the dawning of a new civilization that will enable us to transcend our biological limitations and amplify our creativity. (Stevenson, 2010) We use Google for free, because Google is using our data. Soon Youtube might let us watch copyrighted movies for free, because Youtube is using our data. Augmented reality is no longer a fictitious idea from Sci-Fi, soon the internet will be in your contact lenses. Your interface will be able to identify people through facial recognition software and present it through augmented reality. The internet will be inside us within 5 years.(Leonard, 2016)

Language barriers are a thing of the past: Samsung, Google & Apple all have software which can be translated in real time. There is a Yin & Yang relationship between humans and data. Control has moved from the nodes of the network. The rise of the global village, join the network or die. Use the network business model or fail in business. Google has allowed the removal of data since 2012 and has had a continuously growing number of requests to have data removed. Facebook knows what we are saying, Google knows what we are thinking. If you are thinking of going to Amsterdam, you

probably will have asked Google, but you have not even told your friends on Facebook. Google is already inside your head. Is the future perpetual Wikileaks of every company. There are benefits to transparency. Tracking data footprints is necessary, without it there would be no advertising. (Keen, 2012)



All of the advertising budget is being moved into the internet. If the agencies did not track us the whole thing would be dead. Advertising is 70% of the entire content industry. The number one business model on the internet is: It is free, but they steal your information. It is a fair model, if the user is in control, but data leaks are becoming increasingly prominent. Everything on Facebook and Twitter is public information. (Leonard, 2016)

A huge difference seen in the last 20 years is people are now paying to be private, where in the past we paid to be public. Data is the new oil, business should re-imagine their structure based on big data. (Keen, 2012) The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn. (Toffler, 2010) Data needs to be an eco system and not an economy. The humanisation of technology matters more than the technology itself. The shift will be towards a distributed economy and that will be the business model of the future. Future eco-systems will be implemented in all digital realms. (Leonard, 2016)

Conclusion

The Internet and computers have dramatically changed the way people all over the world interact and communicate. As communication and information travel faster and faster, the world seems to get smaller and smaller. As a result, this changes how the world communicates, especially with today's obsession with social media networks.

Good quality design is an integral part of sustainable development of any technology and never has that been more important than today.

Thanks to social media networks, we are now able to interact with thousands of people all over the worl. Without social media, that would be impossible. Social media networks allow us the opportunity to share opinions with a far wider audience.

Smartphones, laptops, IPods and IPads are not just gadgets, they're already part of our lives, and as they become more interconnected, we become more interconnected. The internet has grown from its humble roots into a blank canvas with infinite potential, and its only just in its infancy.

Technology should be considered as human evolution, messaging is not too different from telepathy. Digital storage of photography is an extension of our memories. The ability to find out any information you desire by the click of the button is a creation of a global brain. The inevitability of being able to 3D print organs suggests immortality is a possibility. The internet is making it impossible for us to get lost as we can navigate with digital maps. Language barriers have been closed. We can learn to play the guitar, how to fix plumbing, how to cook, how to paint and thousands of other skills thanks to the internet. The endless possibilities of technology and the speed with which it is progressing make it nearly impossible to imagine what future technologies have in store for us. Impossible is perhaps the wrong word, because if technology has taught us one thing, it is that if we can imagine it, it is possible.

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