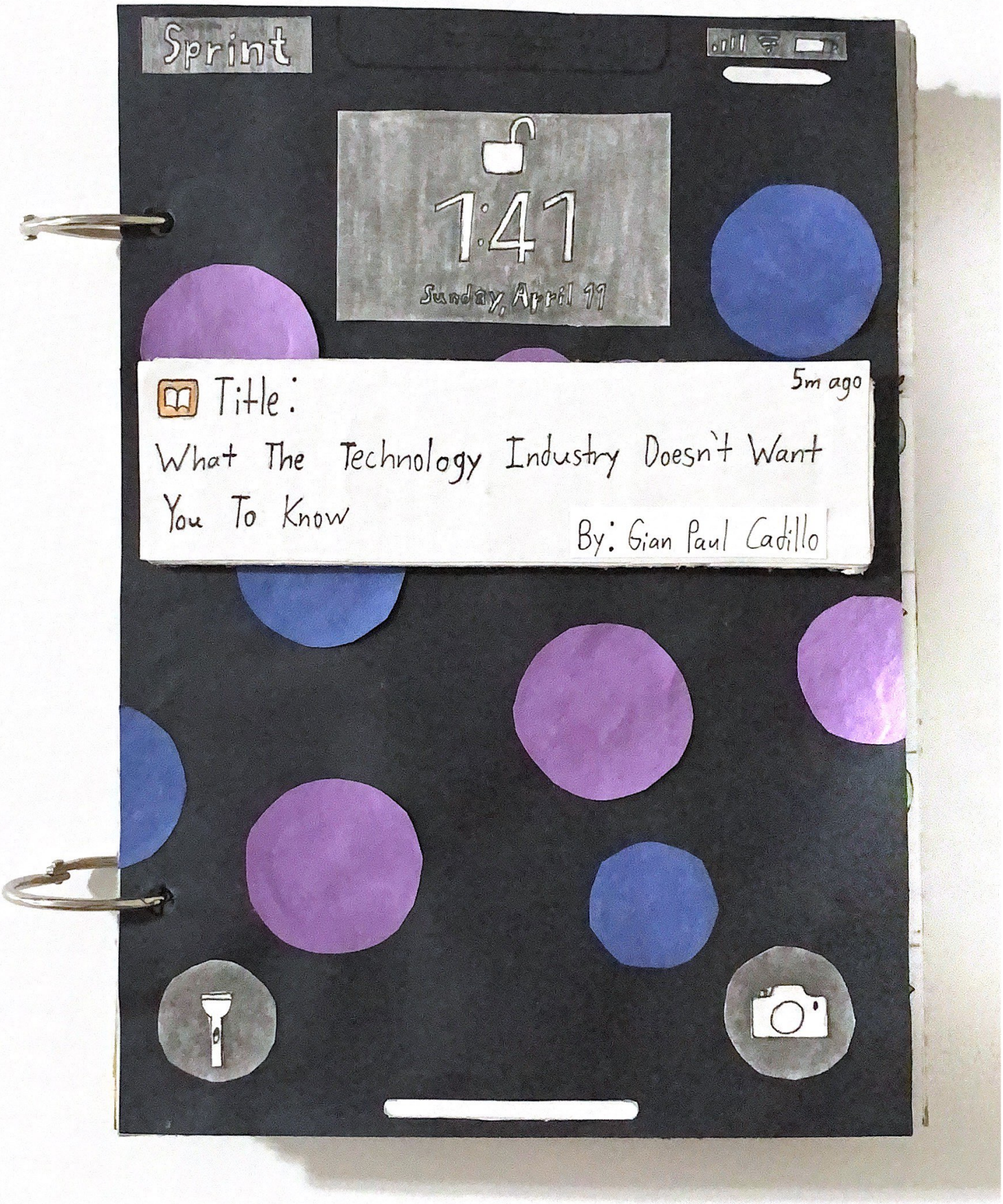
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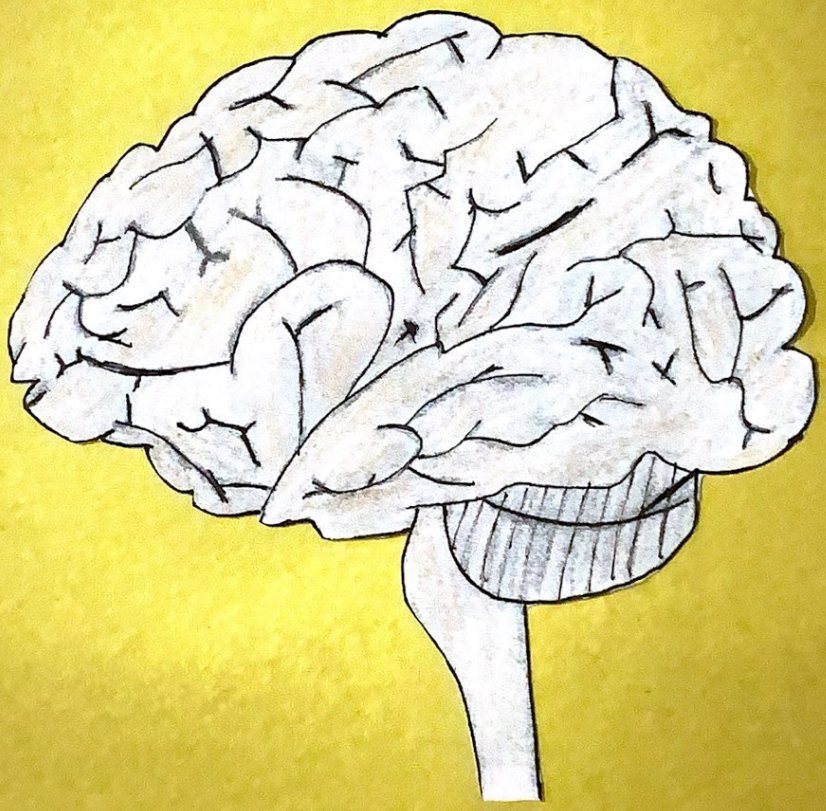
What The Technology Industry Doesn't Want You To Know
By: Gian Paul Cadillo



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# Table Of Contents

Search

Page

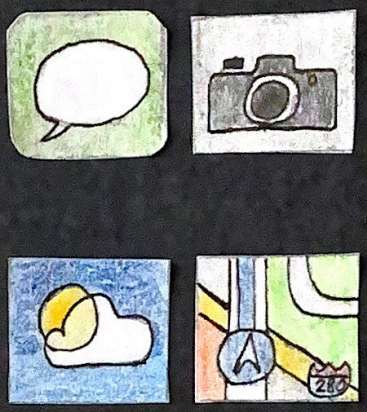

## Section 1: Who is the technology industry?

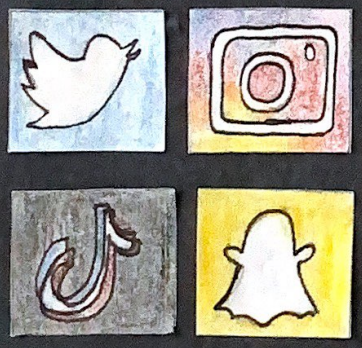
### Apple

Apple Inc., it's the company that has become a globally-known name in the past decade. It is also the first publicly traded U.S company to reach the value of $2 trillion dollars. So how did Apple Inc., the company which 900 millions users owe their phone to, start out?

### Starting In The Garage

You may know that Steve Jobs, who passed away on October 5th, 2011, played a large role in the birth and success of this company. However, many may forget the name of Steve Wozniak, Job's partner in creating Apple. Wozniak is an electronics engineer, programmer, philanthropist, and technology entrepreneur. In April of 1976, Wozniak and Jobs founded Apple; they were both college dropouts. At the time, Wozniak was a self-taught engineer and built phone boxes with Jobs that allowed long-distance phone calls for free. They sold hundreds of these boxes together, all of which were made in Job's garage. Then came the Apple I, a computer with no keyboard or power supply, a bigger step into a vision which Wozniak and Jobs had for the future of the company. Selling their van and 2 of their calculators, the two built the computer with the money they had. The Apple I was a success. After this came the Apple II computer, which was also built in the garage of Jobs' with the help of high school tech enthusiasts.[1] The future trillion dollar company had been born in a small garage in Los Altos, California.

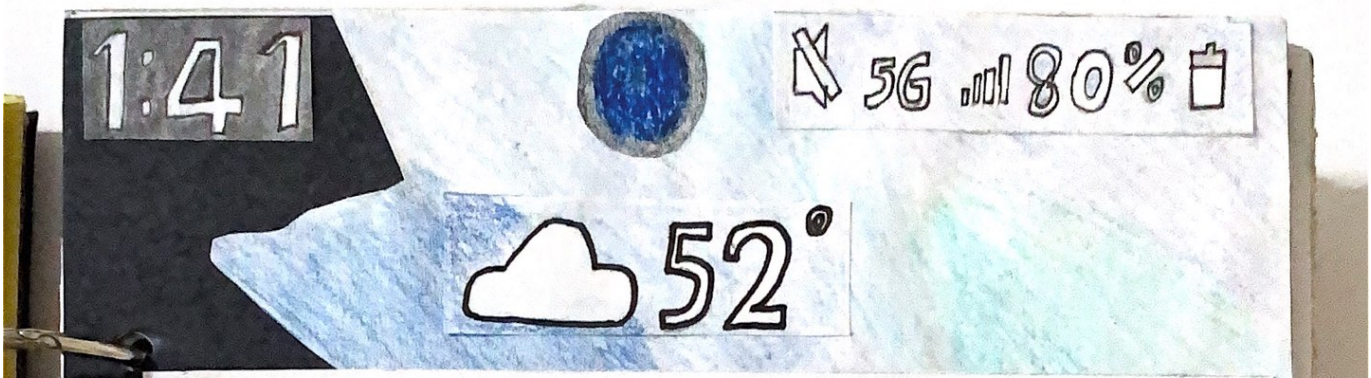




### What About Today?

Introducing the iPhone to the world 14 years ago, Apple has changed the world of technology and paved the way for new developments. With the slogan "Think Different," the company has made it clear that it aims to be a leading company in the future of technology while also creating a story around its customers. With customer/employee feedback being a core of the company, and being a core belief which Jobs attained, Apple has a population of users to help it move forward.[2]

Recent Major Releases: Apple's latest phone release was on October 23rd, 2020: iPhone 12 line up (iPhone 12 Mini, iPhone 12, iPhone 12 Pro, and iPhone 12 Pro Max).

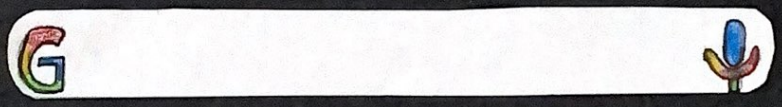



## Samsung

Having been the competitor to Apple in recent years, Samsung has seen its fair share of successes and contributions to the technological world, many in areas which Apple hasn't. Worth around $300 million today, the originated Korean company is another big name in the developing future.

## Born in South Korea

The South Korean company was founded by Lee Byung-Chull on March 1st, 1938 as a Grocery trading store. When it built the largest woolen mill in Korea, the company slowly grew into textiles. This expansion was specifically seen after the Korean War. It was only in 1969 that Samsung began working in the technology industry. The company manufactured black and white televisions in the late 60s and in the 70s began to export home electronic products overseas. Electronics branches were created and in 1978 even an aerospace division was put together. In order to serve businesses' growing need for some form of systems development, the company created Samsung Data Systems. Along with this, research and development institutes were created to help aid the creation of new technologies and advancements like nanotechnology and telecommunications.[3]



## Samsung in the 21st Century

Compared to Apple, Samsung was a company formed with a different intention than what it actually became. It is also a technology company that has a wider range in what it aims to accomplish. Creating smart televisions, OLED screens which many iPhones use, fridges, and its well known smartphones, Samsung has revolutionized the technology world. With its leading motto "Inspire the World, Create the Future," Samsung has not disappointed tech enthusiasts and has not hesitated in creating a better tomorrow in the world's eyes.

Recent major releases: On January 29th, 2021, Samsung introduced its next line of smartphones: Galaxy S21, Galaxy S21+, and the Galaxy S21 Ultra.

The Demographics of The Industry

Diversity in the workplace has been an issue at the core of business for several decades, and it isn't one which the large technology companies haven't excelled in. With this diversity has come the discrimination and lack of inclusion for minority employees. To highlight this, Pew Research conducted a study in early 2018 to find accurate responses from those in the workplace. What was found was that more than 60% of Black people in STEM fields said they had experienced discrimination at work, as had 50% of women, 44% of Asian STEM workers and 42% of Latino people.[7] In an industry mainly dominated by white males, it is easy for women, members of the LGBTQ community, and all minority populations to be excluded or not feel included due to the specific culture that exists in the tech industry.

Not only is it difficult within the workplace, but many applicants of underrepresented populations have found it difficult to enter the field. An anonymous Hulu employee that discussed the issue on LA Times stated "Hulu employee: "A single mom that didn't go to college is seen as uneducated whereas a white college dropout is seen as a 'genius,' as if he's too good for college."[7] This employee recognizes the fact that many young talents in the pipeline, or just ordinary people with just as much talent as previous generations, aren't given the chance because they differ in the stereotypical white tech savvy male. In other words, they are trying to communicate that there could easily be another "Steve Jobs" or "Steve Wozniak" out in the world, but the industry won't give them a chance if they aren't similar to the "blueprint." There are still roads to pave and drive across if a difference in this aspect of technology wants to be made.

## Real Experiences From Within The Companies

All quotes are taken from a panel discussion, "The Black Experience in Business and Technology," held by WAYE. This panel consisted of black leaders, founders, and representatives of companies like Google and Amazon, speaking on their experience as part of the minority population in the field.

Jason Crain: First working at Google and Shazam, Crain was a founder and COO of Particip, which was a computer vision startup bought by Amazon in 2016. Crain then worked in Amazon where he built products and processes for the company's mobile app.

"Black employees have said the issue in this is the culture in the company once they become hired. Big tech companies blame the pipeline talent rather than the culture." - Crain

Previously hearing these issues at Amazon, Google, and Shazam, Crain and along with all panelists agreed that blame is thrown to the lack of talent in the technology pipeline. Being part of this pipeline and experiencing it firsthand, Crain denies that lack of black talent does not exist in technology centered college graduates.

"If you can't go out to the bar and have a drink then you aren't going to last." - Crain

Crain discussed how in much of the technology industry, and business world in general, it is common for coworkers to grab a drink after work at a bar nearby. The environment is mainly white males, as is in the workplace, and Crain often felt out of place in this set culture. However, he was forced to participate in these events if he wanted to expand his network and establish himself in his workplace.

Yvonne Bajela: Bajela is a Founding Member and Principal at Impact X Capital, a UK based venture capital founded to invest in companies led by entrepreneurs that are minorities.

"Venture Capitals (VCs) tend to invest in owners of companies that look like them. Most of them won't even put their email on their website which makes equal access difficult. Black founders (including those of technology companies) have difficulties trying to find a VC for their startups." - Bajela

One of the reasons Bajela created Impact X Capital is because most Venture Capital's make it difficult for black start up businesses to find funding. Today, VC's will make efforts from taking their email off their website to only accepting founders networked through white colleagues, in order to help only startup white businesses. On the other hand, Impact X Capital conducts thorough and fair examinations/feedback to every application received for aid in funding, although there is a stronger emphasis to aid black businesses.

## Section 2: The Dark Side Of The Industry

Behind the mask

Many companies have their products assembled in China, it is a common practice for businesses around the globe. In October 2011, Mike Daisey, an American monologist, paid a visit to Apple's factories in Shenzhen, China where he expected the working conditions to be terrible; however, when Daisey got there he was surprised by what he saw.

Daisey reflected on his visit by saying the following: "What was shocking to me was the level of dehumanization built into the systems that have been put into place by American corporations in collusion with suppliers…" [5]

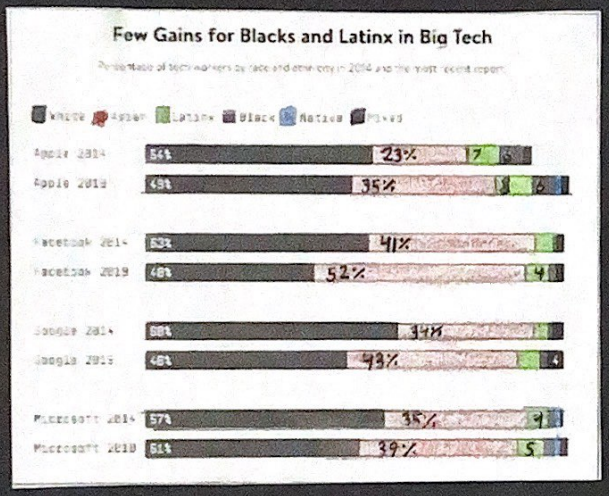
Foxconn, the manufacturer Apple uses to supply iPhones to this day, had allegations directed toward them because of over exhausting work days, lack of working relationships, and employee practice abuse. (Amazon is another company that uses Foxconn for its technology manufacturing). To assess the truth behind this, Apple conducted an inspection in 2006 where it was found that Foxconn was in compliance in most key areas of the work they were doing. However, when further investigating the facility Daisey was able to find 13 and 14 year-old workers in only the first two hours there.[6] He also discovered and was there when a number of suicides took place at Foxconn:

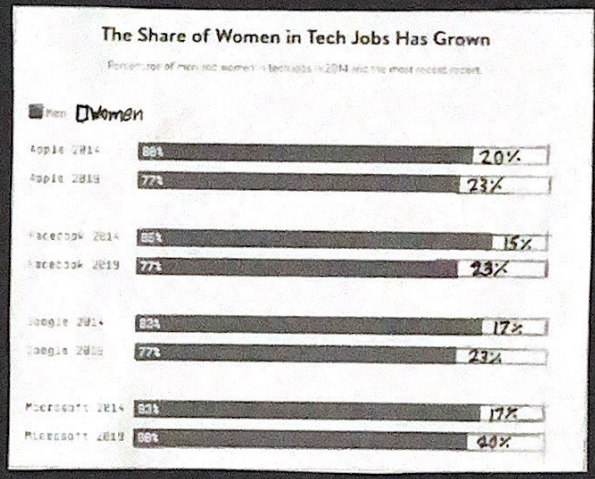
"... where week after week, workers would go up onto the roofs of these buildings and throw themselves off the buildings." [6]

Having over 15 hour shifts in a factory line led to 18 suicides in 2010, with many more attempts being made that same year as well. Apple never publicly commented on this, and continues to use Foxconn today.[6]

## Demographic Data

It isn't surprising that in a STEM field like the world of technology is, diversity is one of the leading issues. Looking at data from just two years ago it can be noted that Facebook in 2019 only had a 23% female employment rate, just up from 15% in 2014.[4] A large portion of this issue leads back to advertising campaigns aiming computers at just boys and the idea of a member in the tech world being a white "nerdy" male. Increases in diversity and female workers have been seen, yet the betterments aren't enough in the span of years shown. The graph below show this:




The tables above show slight to none increases in Black/Latinx workers in the technology industry, and around 3-8% increases in the amount of women employees in these organizations.[4] Over the span of 5 years, such a small range of increase doesn't paint the best picture for women in the technology industry. More leadership roles occupied by women need to be opened and become prominent parts of all types of business, not just in technology.

| Female Employees* | 2017 | 2018 | 2019 |
|---|---|---|---|
| Overall (%) | 45.2 | 43.2 | 40.2 |
| Tech Female Engineers (%) | 17.7 | 17.8 | 17.5 |
| Sales/Marketing Female Marketers (%) | 29.7 | 30.8 | 31.2 |
| Leadership Female Executives (%) | 6.8 | 6.3 | 6.5 |

This table is an addition of the past two, showing a tenth of percentage increases in the number of women workers at Samsung over three years.[4]

## Facial Recognition Flaws

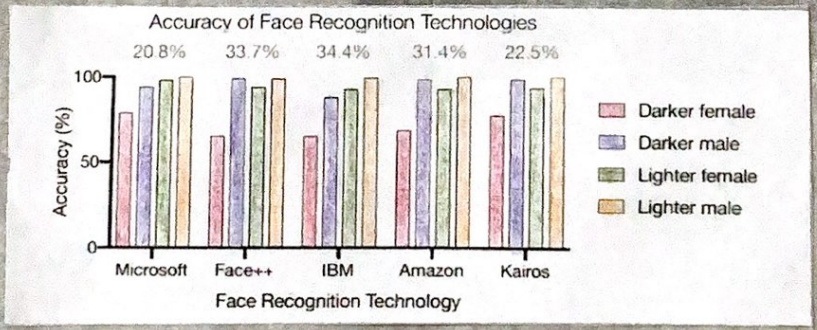
As technology companies march forward innovating and changing the world we know every day, there comes some issues when applying the tech to every user. This issue stems from the lack of diversity in the industry.

One of the fastest improving pieces of technology out in the world is facial recognition. It is used from the unlock feature on your phone to being used in forensic evidence. Nevertheless, in its creation has come a flaw, it only works best with the white population. This problem can be traced back to the demographic of workers in the "room" when working or advancing this technology.

Desmond Dickerson, a futurist at Cognizant's Center for the Future of Work (CFoW), strongly believes this to be one of the root causes, as he stated:

"Facial recognition has a 99% success rate for white males, and less than 55% success rate for black women. The reason for this is because the white males are the ones in the room where this technology is designed. This has led to black people being falsely accused or arrested; there are severe consequences." - Dickerson

A student from Harvard created the graph below in 2020. What the graph shows is the range of error which is unacceptable in the situations which facial recognition is used, like law enforcement.[8]




Having over 20% error ranges has led to false arrests and prosecution, mainly being of minorities. Collected information has gone to prove this, as an assessment of Rekognition's face-matching capability by the American Civil Liberties Union (ACLU) showed that 28 members of Congress, all people of color, were incorrectly matched with mugshot images. A mismatch with the technology can leave people to be falsely accused and face years of prison for no reason. IBM and Microsoft, both companies that produce this technology, have commented that they will modify testing cohorts and begin to collect more data from specific demographics.[9]

## Bias In Algorithms

Flaws have also been found in algorithms in social media; there has been specific bias towards white creators or white users on various platforms. Desmond Dickerson gave his own thoughts on the situation, saying that "Black creators on social media don't always have the algorithm work their way. They can struggle to reach audiences. This has huge impacts on these creators and on social media marketing." In a job where influencers need to use social media to reach their fullest potential, having their main source of networking restricted limits their success. Algorithms can learn to flag and filter content posted by minority populations and even against women users, as seen through discrimination in resume-screening algorithms. Companies like Facebook and Twitter are yet to publicize information about their bias algorithms. Most data will remain private for the time being.[9]

However, Facebook has taken note of this issue and has developed two equity teams, one for Instagram and one for Facebook itself. What this team will do is analyze how harassment policies are enforced, and study the racial bias present in the algorithm. The data found will then be brought back to Facebook's Responsible AI Team where it will be studied and used to revise the algorithm.[9]

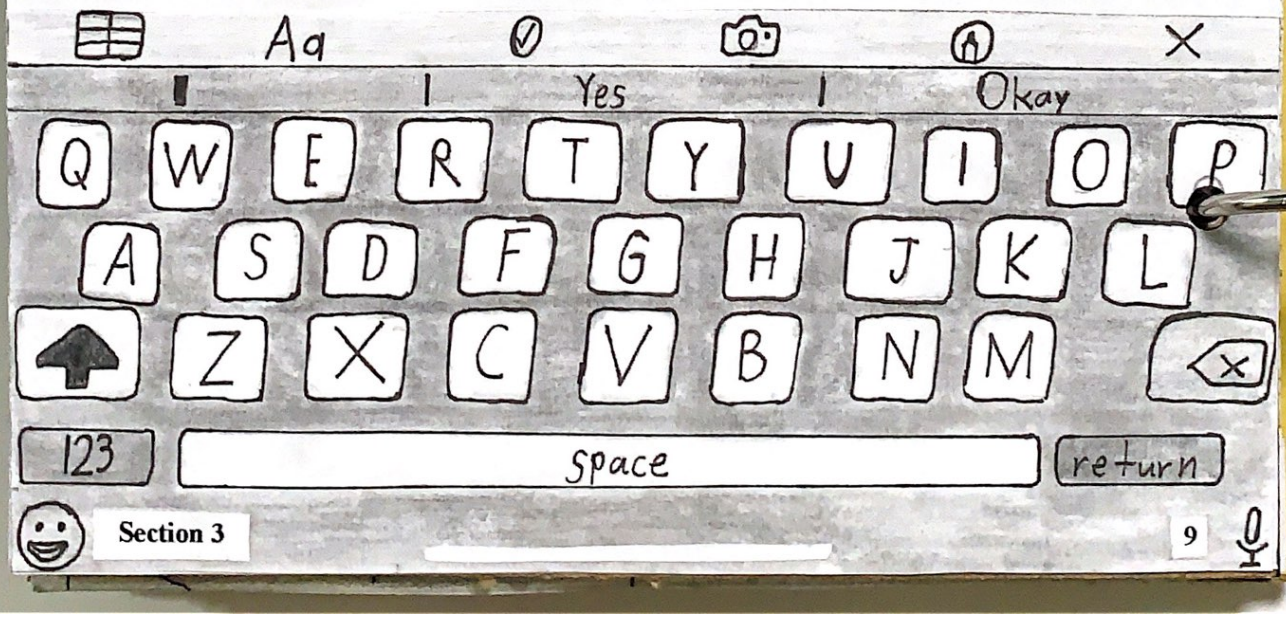
Other solutions not focused on as much involve diversifying teams already existing in these companies. For example, less than 4% of the roles at Facebook are held by Black employees and about 6% are held by Hispanic employees.[9] The people in the room need to be from a wider range of backgrounds in order for there to always be equitable products.

## Section 3: Impacts on Cognitive Skills

### Cognitive Skills - What Are They?

We use cognitive, brain-based, skills everyday of our lives in the most basic to the least basic tasks. Without these skills, humans simply would not be able to function. Each of these abilities could be broken into groups: Perception, attention, memory, motor skills, language, visual and spatial processing, and executive functions.[10] One way in which you put your perception skill to test without noticing, is picking up the phone when it rings or turning your head to someone when they call your name. If you are physically lifting something you are using your motor skills. These examples are just one of the few that go to show how we carry out actions/thoughts subconsciously, which correlate to cognitive abilities.

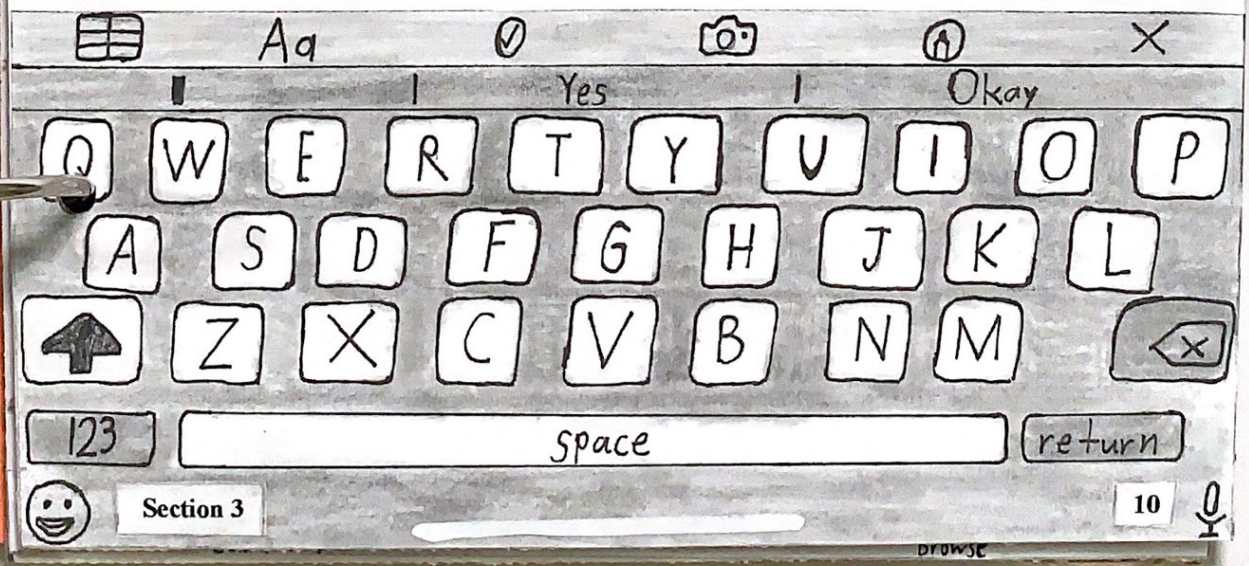
Cognitive skills are subject to change and develop overtime, partially because of personal experiences and because of the more universal events every person goes through as they grow up. However with the rapid development of technology in the 21st century, cognitive abilities have been impacted in ways which a few decades ago humans would have not imagined. Attention span has deteriorated at faster rates due to users being entrapped in their phones and the brain stimulating the body to turn to the sound or vibration of a notification. As our attentional capacity has been modified for the worse, so has our intellectual maturity.[12] With no control, large companies like Apple, Samsung, Google, etc. will continue to make changes in our minds which shouldn't have occurred in the beginning.



## What Else Is Impacted?

Other parts of our lives have also been impacted by new technologies. One notable example is our sleep. Many people have a tendency to sleep with their phone right next to their bed or even next to them. This creates an urge for users to reach for their phone before, during, and after sleep. Studies have shown that staring at bright screens before sleeping affects one's abilities to get rest, explaining why many users show to lose hours of sleep besides being captivated by social media. This loss of sleep goes to affect mood, which has shown to have strong correlation with depressive symptoms in relation to cell phone use. Depressive symptoms have been found to be connected simultaneously to cognitive disorders.[11] Therefore, loss of sleep has proven to be a factor leading to worsening cognitive abilities and even possible cognitive disorders.

In addition, anxiety is a large factor that has been inflicted because of our smartphone use. In a study where individuals were separated from their phone, it was found that the group who scored higher on the anxiety test was the one which had their phones put away. This goes to say that many users have built a connection with their phone, resulting in separation anxiety when it gets taken away. To add on, in a test to see how a person performed on a word-search puzzle while not having their phone with them, it was found that the person performed significantly poorly. As a whole, anxiety has been found to negatively affect cognitive functions, meaning that the close bond users build with their phone is detrimental to the skills they subconsciously use every day.[11]



## Sustain Attention - What Is It and How Is It Affected?

Sustained attention is the ability a person has to focus on a task and continuously perform on that task over an extended period. In other words it's how long you can concentrate on what you are doing. This cognitive ability is one which has seen extreme deterioration over the years in the 21st century. Users have often found their attention to drift towards their phone even if it didn't ring, this is called endogenous interruptions. On the other hand, when users drive their attention to their phone because of an environmental factor, then that is called endogenous interruption.[11] Whether at school, at work, or while driving, these kinds of interruptions are constantly occurring and negatively affecting the time it takes for people to finish or find solutions to what they were previously working on.

Another way in which sustained attention is impacting users is that it is learning to manipulate and capture audiences for a long period of time. It was found that the birth of new media software technologies specialized in manipulating users' attention away from their surroundings.[12] In the creation of these new media softwares, the youth were specifically at the center of the software development's vision. The reason for this is that it is easy to distract and turn younger audiences into passive audiences. Over the course of recent times, our sustained attention has seen impacts which can be seen by just your reaction to your phone's notifications.[12]

The human brain has been reconstructed in various ways because of our continuous phone usage, and now society is slowly seeing the effects of the brain being stimulated to reach or look at one's phone if it rings or vibrates. Sustained attention is just one of the few cognitive functions being impacted; however, some cognitive functions are seeing positive rather than negative effects.[12]

## CPS Skills - What Are They And How Are They Affected?

In contrast to the deterioration in sustained attention, collaborative problem solving skills (an executive function cognitive skill) have seen improvements, especially from the educational perspective. With the progression of new media and software tools, classrooms have become one of the most improved areas in the country with technology. In a research study it was observed that when students were given the opportunity to collaborate together through technological software, (such as Skype or a messaging application like iMessage), they were able to solve group problems at rapid rates. Two other groups of students that were allowed to communicate through only messaging were able to finish the task in under 20 minutes; each student was given part of the problem. In addition to this, a group of students was allowed to use Skype as their communication tool was also able to finish the task at hand.[13] Overall, with few barriers imposed by technological limitations, the group of teenage students was able to question, challenge, and agree on the aspects of the problem they were presented with. This goes to show the improvement of communication in a group setting with today's technology such as Zoom, Skype, iMessage, etc. The specific areas of improvement seen in the students studied were in their motivation, dialogue, self regulation, metacognitive processes, and other working environment skills.

As a whole, collaboration is a skill which is developed in cooperative spaces. For many it involves getting out of their comfort zone, but now with advancing technology it is possible to gain collaboration problem solving skills through a screen. With access and a task at hand, any person can learn how to improve their collaborative problem solving skills right from their home.

## Section 4: Final Takeaway

As an 18 year-old, I have been entrapped by today's social media just as most of the younger generation has been. I spend hours on social media and entertainment just on my phone: around 5 hours on Tik Tok, 2 hours on YouTube, and 2 hours on Instagram and Snapchat. I also keep my laptop on all day on weekdays for school work and use my iPad for math work and entertainment. Combined, I use all my devices for at least 25 hours a week which is a number I have tried to decrease over the years. Yet I believe that as much as a person may try to decrease their screen time to practically none to a few hours, it is difficult to do so since society has embraced and structured itself around technology. During the CoronaVirus pandemic, students have spent hours every day on zoom meetings, doing school/homework, and virtually interacting with friends and family. It has become apparent that technology has progressed enough that most of what we once did physically, can be done virtually. What this leads me to say is that just as I have tried and much of the world has, it is more difficult than ever to reduce the amount of time we spend involved in technology because of our current situation, and the advancements seen in technology. Nevertheless, these advancements are the exact reason why we should aim to take control over our device/program usage, rather than let it control us. If it is too difficult to lower the general number of hours we spend on our devices, then we should aim to use our devices as efficiently and positively in the time we do use it. If we don't take the wheel, then we'll eventually lose total control over the cognitive skills we once mastered and used each day.

In the end, technology will always have two faces, a beneficial one and one that is detrimental to every user that lays eyes upon it. It is up to the user to decide whether they will use it for the better and if the technology will improve them as a person. I hope that this book made you aware of the positives and negatives in the actions and innovations of companies around the world. I also hope you, the reader, are able to reflect on your own usage so that any adjustments needed are made. Your cognitive skills, physical health, and mental health always come first, so take the steering wheel on your technology usage.

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