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BUSINESS STRATEGY

**Cleaning Up Oil And Gas:
The Future Of ESG**

ALUMNI INSIGHTS

Mike Hejmej

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We ensure that every single article that we share with you will provide thoughts on leadership and offer you valuable perspectives that you can apply to your everyday life.



A handwritten signature in black ink that reads "Andrew Dai".

Andrew Dai
Editor-in-Chief

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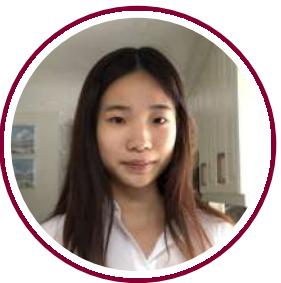
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Business Strategy: Cleaning Up Oil and Gas: The Future of ESG

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Introduction

Oil and natural gas (O&G) fuel our daily lives, powering 57% of global energy consumption. These fuels that we take for granted allow us to turn on our lights, drive our cars, and heat our homes. In 2019, natural gas was used by over two-thirds of Canadians in 7.2 million homes, businesses, and industries across the country. Our heavy reliance on these resources has led to the need for new and enhanced methods of energy production that have proven worse for our environment.

Conventional O&G extraction is obtained from deposits of oil and natural gas. After decades of extraction, most of these deposits have been discovered, contributing to the development of unconventional methods for drilling. The most well-known method is hydraulic fracturing, also known as fracking. This is done by drilling vertically into the earth, then drilling horizontally to allow oil and gas to flow to the surface and be collected and processed. While this increases the amount of oil available for extraction, fracking causes harm to the surrounding environment, impacting the people living in the region around the drill site. Up to 16% of hydraulically fractured oil is spilled annually, contaminating groundwater,

streams, and water supply. 3.7% of natural gas produced in the US is leaked annually, releasing roughly 1.2 trillion cubic feet of methane every year, and polluting the air with smog and particulate soot. The resulting water, air, and health damages within single regions can cost millions of dollars annually. Not only does the extraction process have negative environmental impacts, but the burning of these fuels to produce energy contributes to 55% of total global carbon dioxide emissions.

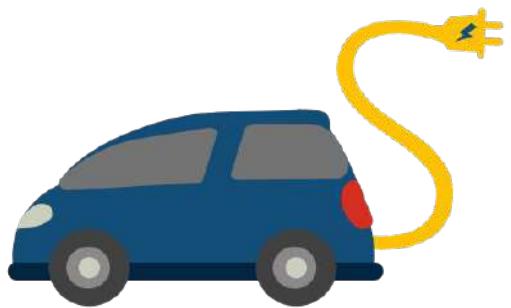
It is these environmental impacts that have branded O&G as “dirty”, leaving this industry behind as investors shift to Environmental, Social, and Governance (ESG) investing. ESG are the three areas of interest for “socially responsible investors”. A driving force behind ESG awareness is the millennial generation that is making up more of the total pool of investors—90% of millennial investors are interested in pursuing investments that reflect the values they hold. Emphasis on ESG is growing, with one third of global assets under management expected to be ESG-related by 2025, meaning the pressure is on for companies to deliver on ESG metrics. As consumers and regulators put more pressure on traditionally “dirty” companies to become “greener”, the O&G

industry must adapt its practices in order to become the future of ESG.

Capturing a Share of the Renewables Market

The O&G industry can capitalize on the growing electric vehicle (EV) market by positioning itself as a leader in clean electricity generation and using its existing real estate infrastructure to expand electric charging networks. With global EV market share expected to triple to 30% by 2030, there will be an increasing need for renewable electricity. While EVs produce 30-70% less lifetime emissions in most countries, those with the least emissions are in countries where most electricity comes from renewable and nuclear sources. O&G companies must therefore focus more of their resources on expanding their renewable electricity capacity.

The rapid integration of EVs will put a strain on global electricity resources, presenting an opportunity for O&G companies. EVs will require 640 TWh (enough to power 58 million single family homes in the US) by 2030, which O&G companies can supply through increased investment into renewable energy projects. In the past 5 years, the O&G industry has



invested \$60 billion into renewables, accounting for merely 6% of their total expenses. Despite the small percentage, some large O&G companies such as BP are setting ambitious targets of 50 GW by 2030, which would place it ahead of green energy leader Ørsted. With a current capacity of 2.5 GW, BP is estimated to spend \$60 billion to reach its target. Much of the industry has been slow to adapt, but can increase its investments in renewable energy in order to play a key role in the expanding EV market.

In addition to supplying the renewable electricity demand for EVs, O&G companies should also invest in electric charging stations, which can be directly integrated into their existing real estate. With the growth trajectory of EVs, charging will become a bottleneck for integration. Large players in the O&G industry are already investing in EV charging companies to make these more accessible. As shown in Figure 1, Shell acquired multiple charging companies to increase its global charging presence to 134,000+ stations, and BP's

acquisition of Freewire Technologies will lead to the roll-out of 50 kW chargers at select BP fueling stations. The race is on to capture a share in this growing market, with O&G companies competing against EV giants like Tesla and its Supercharger stations. With its existing real estate and ability to supply clean electricity, the O&G industry is in a unique position to capture a share in the transition toward EVs. Beyond the EV market, hydrogen is a promising investment for O&G companies. This fuel can be used to replace traditional natural gas, producing zero emissions when

A concern is that hydrogen weakens and damages pipes, which is addressed by replacing metal pipes with plastic. It is estimated that 90% of the current piping system will be replaced by plastic by 2030, making hydrogen an attractive alternative to natural gas [Guardian]. As with most innovations, green hydrogen is significantly more expensive, costing 9 times as much as natural gas. This price barrier will shrink as renewable electricity prices continue to decrease, with experts expecting green hydrogen to cost less than natural gas by 2050 [Barrons].

O&G Company	Acquired Company	Impact
Shell	New Motion (EU), Sonnen (Germany), Ubricity (UK), Greenlots (US)	Added 134,000+ charging stations Goal: 500,000 by 2025.
BP	Freewire Technologies (US) Chargemaster (UK)	Added 6,5000+ charging stations Goal: 70,000 by 2030
Total	G2Mobility (France), Source London (UK), Charging Solutions (Germany)	Added 13,600+ charging points Goal: 150,000 charging points in EU by 2025

Figure 1: Charging Companies Acquired by O&G Companies

burned. Hydrogen is produced using electricity, meaning this fuel can be completely renewable if produced using clean electricity (known as green hydrogen). More importantly, it fits perfectly into the gas industry's existing infrastructure as it can be transported to homes through pipeline networks.

Forming Partnerships to Achieve Dynamic Capabilities

With innovations comes new expertise demanded. In addition to the rising production delivery targets, O&G companies take on projects with increasing complexity—this is where collaboration

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comes into play. In recent decades, partnerships in the O&G industry have sparked new innovation and the mutual benefit it brings extends beyond business to business. It might be worth taking a step back to look at the collaborations strategically. Specifically, the point at which companies start to bring in outside talent to maximize outcome. The idea of dynamic capabilities is often alluded to in the technology sector but applying it here can shed light on the long-term tactics. Dynamic capabilities include integrating and recombining core operations and components at a system level.

Providing a foundation on the basis of partnership, dynamic capabilities play a role in different levels of operation. On the base level, projects are embedded in particular regions with their own supply, commercial, regulatory, and community dynamics, but must draw on common expertise, and experience. The middle includes integration at the level of the supply chain both for technology and quality, and finally at the

full ecosystem level including setting standards and integrating the co-creators. Companies need to be strategic in forming their partnership to take on particular challenges through innovative avenues. It is crucial that the firm takes into consideration its existing assets and capabilities to, in turn, inform its strategy.

Taking past projects as an example, BP's Thunder Horse South Expansion project is a prominent example of one that is extreme in its technological complexity, but fairly forthright in the institutional challenges the collaboration faced. The project took place in the deepwater Gulf of Mexico, which was within an established regulatory framework in a resourceful region with solid operatorship. This is when BP brought in Technip, now TechnipFMC, who had successfully made its name known through projects like Statoil Trestakk Oil Field Development in Norway, Sulphate Reduction Plant in UAE and Liza DeepWater Project in Guyana. Integrating its expertise in project management,



Thunder Horse South Expansion
BP X Technip

engineering and construction, Technip quickly brought huge success to the partnership. Specifically, the offshore installation was performed by Technip's flagship vessel, the Deep Blue, one of the world's largest ultra-deepwater pipelay and subsea construction vessels. Thanks to the advanced technology and methodologies that Technip brought, BP was able to "bring the project onstream 11 months early and about 15%, or \$150 million, under budget."

On the other hand, when challenging projects fail to obtain talent from both dimensions, the results are consequential. Kashagan exemplifies a project which possesses high levels of technical and institutional complexity given the toxic nature of the reservoir and intricate geographic location. Moreover, the immaturity of the local regulatory framework together with mismanagement and the controversy around operatorship elevated the difficulty of the oil megaprojects. In this project, companies rushed into the oil extraction process which resulted in gas leakages and hydrogen sulfide mismanagement. On top of technological inadequacy, institutional guidelines were loose and ended the project with devastating results. Wildlife was severely affected and damages were long-term. By preliminary estimates,

[T]he total cost of recovery operations stands at \$4 billion. Combined with the money already spent, this makes Kashagan the most expensive project in the history of the oil industry.

The two aforementioned cases illustrate the importance of strategic partnership and tactical talent integration in the technological and institutional dimensions. While we do not have a crystal ball on the challenges future O&G companies will face, we provide a framework of integrative dynamic capabilities that have thrived in the scope of organizations that bear strategic lenses.

Reducing Emissions Throughout the Supply Chain

Beyond renewable technologies and partnerships, O&G companies can become more ESG-friendly by reducing emissions throughout their supply chain. According to McKinsey & Company, using the most cost-effective interventions, companies can reduce one tonne of carbon dioxide equivalent for \$50. Right now, companies in Canada will have to pay \$50 per tonne of

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carbon dioxide equivalent in Canada in 2022. This cost that companies incur will increase by \$15 per tonne each year until it costs \$170 to produce a tonne of carbon dioxide equivalent in 2030. If the companies are able to reduce each tonne of carbon dioxide equivalent by spending \$50, they will become more profitable in the long run, as it will cost less to reduce the emissions than to produce them.

In the supply chain, 47% of emissions come from fugitive emissions, which is the controlled release of greenhouse gases (GHG) into the atmosphere during the production of oil and gas. By using vapour recovery units, which recover hydrocarbons to be used or reused as fuel onsite, companies would reduce emissions while also benefiting from the recovered hydrocarbons which could be used in future operations.

Recently, a new product has been introduced to the natural gas industry, known as “Green” Liquid Natural Gas (LNG). This refers to LNG in which the companies reduce or offset GHG emissions throughout their supply chains from upstream production, to liquefaction, transportation, and downstream use. Companies are reducing emissions in a number of ways including using biogas as

feedstock—which is the raw material used to fuel the process to extract natural gas, reducing pipeline emissions, using renewable energy to power liquefaction facilities, and using carbon capture systems. Some companies are also participating in reforestation and investing in renewable energy to compensate for their GHG emissions.

There are many opportunities for O&G companies to reduce emissions throughout their supply chain. Doing this would not only improve the ESG factors of the company, but could also improve the profitability of the company, especially in the long run due to the high cost of producing emissions.

Clear Incentives for Becoming ESG Friendly

In order to quantify the benefits of reducing GHG emissions for corporations and shareholders, we examined five renewable energy ETFs and five O&G ETFs. We found that the top ten holdings in the renewable energy ETFs with a market capitalization of over \$10 billion have a median Next Twelve Months (NTM) price to earnings (P/E) ratio of 28.1x, while the top ten holdings in the O&G ETFs with a market capitalization of over \$10 billion

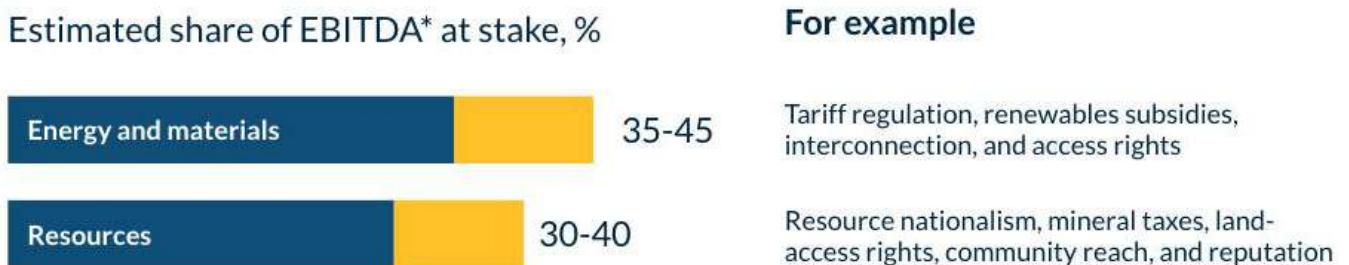
have a median NTM P/E ratio of 12.3x. We also found that the EV/EBITDA ratio in the renewable energy ETFs have a median of 22.1x, while the O&G companies have a median EV/EBITDA ratio of 12.1x. The lower P/E and EV/EBITDA ratios for O&G companies suggest that investors are more pessimistic about the future of O&G companies than renewable energy companies due their environmental impact. However, O&G companies have a plethora of opportunities to reduce their emissions. Once O&G companies start shifting to become more ESG-friendly, investor outlook on the future of these companies will improve.

We also found that O&G companies have a lower return on assets and equity. Renewable energy companies have a median five year return on assets of 3.11%, and return on equity of 10.57%, while O&G companies have a median five year return on assets of 1.48%, and median return on equity of 3.17%. If O&G companies diversify into renewable energy, they would have a better return on their invested capital and equity, which would help companies generate more income. Since many O&G companies are cash heavy, they could diversify into renewables without diluting shares in the company, or raising funds through debt financing.

The O&G industry also stands to benefit from increased government support for ESG-friendly companies. Green energy subsidies currently account for around 30% of total energy sector subsidies (\$187 billion). The amount is projected to increase to 65% of total energy subsidies by 2030 and a further 71% by 2050 [source]. This results from substantial commitments to environmental sustainability by governing bodies, with Biden's newly proposed budget increasing spending on fossil fuel alternatives by 27% [source] and the EU planning to phase out all environmentally harmful subsidies by 2027 [source]. Pivoting towards ESG-friendly practices will allow O&G companies to benefit from the changing allocation of energy subsidies. Not only will O&G companies benefit from government support in the form of subsidies, but they will also decrease the risk of adverse government action—a significant risk for companies as shown in Figure 2.

The benefits of an ESG focus extend to the intangible realm, including positive brand perception as well as talent acquisition and retention. A strong brand is built on trust and transparency between a company and its stakeholders, which is exactly what ESG reporting offers. By aligning itself with certain values,

In many industries, a large share of corporate profits are at stake from external engagement.



*Earnings before interest, tax, depreciation, and amortization.

<https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/five-ways-that-esg-creates-value#>

Figure 2: Share of corporate profits at stake from regulation

a company is able to manage and strengthen stakeholder perception. This directly impacts the company's talent pool, affecting talent acquisition and retention, employee motivation, and overall productivity. LinkedIn research found that 46% of professionals place strong emphasis on working for a company that has positive social impact, and a further 71% would be willing to take a pay cut to work for a company whose mission they believe in [LinkedIn]. Improving ESG practices would allow O&G to attract and retain top talent, which is an integral component of building successful partnerships. Both the financial and intangible benefits of ESG are the key to generating sustainable long-term growth benefiting O&G companies and their investors.

To Conclude

Oil and natural gas play a significant role in the world today, powering most of our day-to-day activities. Our reliance on these "dirty" fuels has caused irreparable damage to our environment, prompting the rise of ESG awareness that is placing pressure on the industry to adapt. O&G companies have a chance to capitalize on this trend by investing in renewable electricity to supply the EV boom and integrating hydrogen as a fuel in their gas operations. Beyond investing in renewable energies, the O&G industry can further offset and reduce emissions throughout their supply chain to rebrand themselves as ESG-friendly. Another way to rebrand is by expanding partnerships to advance sustainability

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development. As demonstrated in many instances in the O&G industry, partnerships can serve as a catalyst to drive this growth and innovation forward. Analyzing the success of historical partnerships, the integration of dynamic capabilities is at the core of manifesting optimal results. By taking these steps to become more ESG-friendly, companies will diversify their revenue streams, increase their return on assets and equity, and improve their stock multiples to increase the cash available for investment into the business. In the long-term, O&G companies will build positive brand perception and improve their talent pool. The incentives of becoming ESG-friendly are clear; by adapting its investments, practices, and partnerships, the O&G industry can continue to power our world while moving to the forefront of ESG.



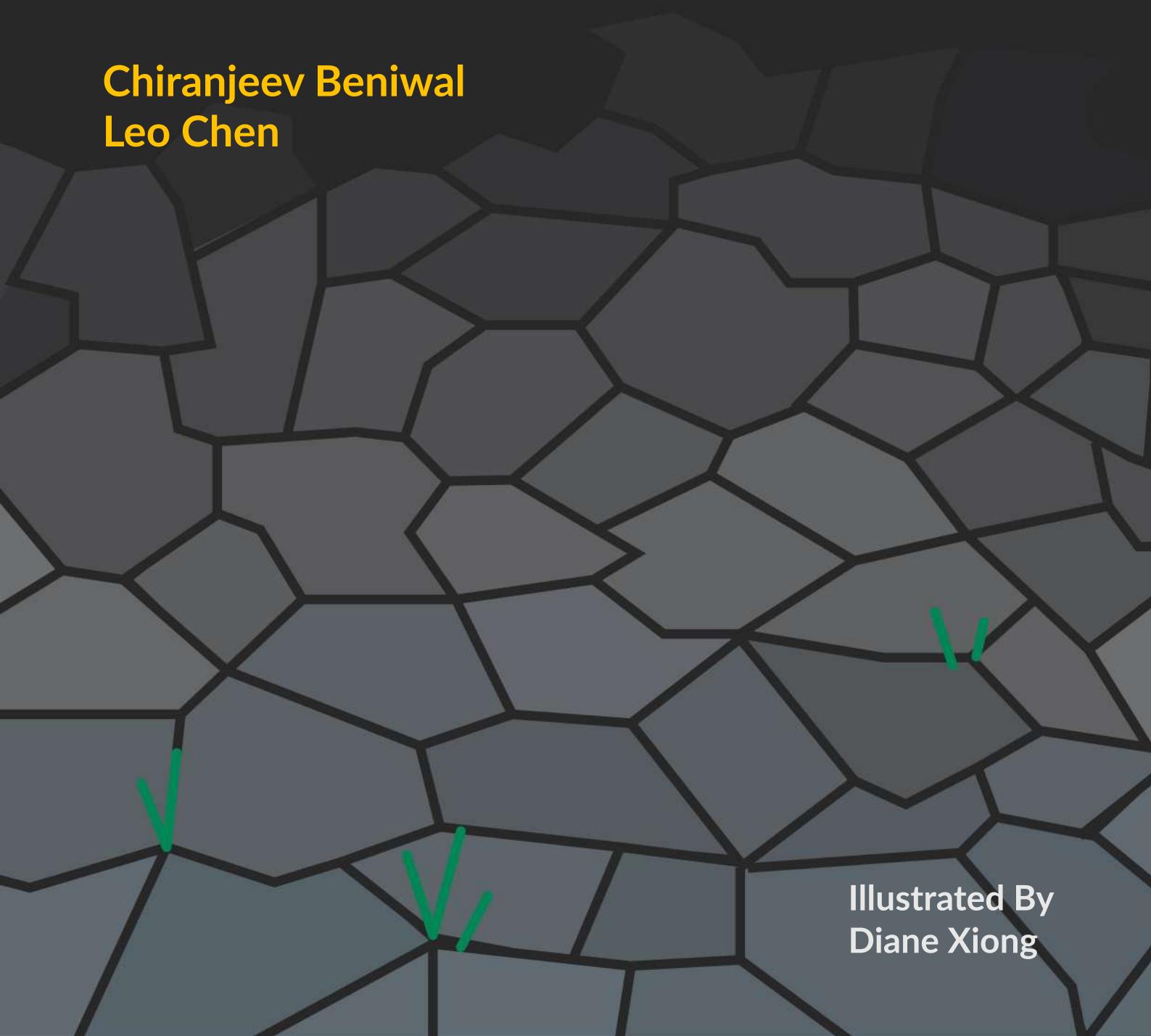
Business Strategy:

Catastrophe Bonds:

Preparing India for

Disaster

Chiranjeev Beniwal
Leo Chen



Illustrated By
Diane Xiong

Introduction

For years, scientists have been raising alarms about climate change, and the general population has come to understand the need to reduce emissions in order to stop climate change. However, there has been little discourse regarding the possibility that we will likely fail to stop it in time, and that contingency plans are needed to prepare for the inevitable destruction.

While the world's leaders gather every few years to discuss climate change and then come forth with a vague statement saying that they pledge to reduce emissions in the next few decades, the tipping point is already nearing. Carbon dioxide concentrations in the atmosphere are at the highest they have been in 4 million years. Within 30 years, the Sonoran Desert in California lost 37% of its vegetation. An iceberg twenty times larger than Manhattan broke off from the Brunt Ice Shelf in February 2021, and a study published in Nature has suggested that between 50% and 70% of Antarctica's ice shelves are at risk of collapsing. A meta-analysis of hundreds of studies showed that approximately 70% of more than 400 studied extreme weather events were made more severe or likely by

human-caused climate change, with 92% of the studies on heat waves finding that human causes had made them more probable to occur and of greater severity. Whether it be the increased intensity of hurricanes in the Caribbean, or human-attributed flooding risk in Bangladesh, it is clear that the effects of climate change are already being felt quite severely, with the death toll mounting.

One type of extreme weather event which doesn't seem to get as much attention in popular discourse is drought. This type of disaster is one of the most catastrophic types of extreme weather events, which can cause both widespread starvation and death. When crops fail and water reserves dry up, a ripple effect can bring a society to its knees, and is arguably more dangerous than hurricanes or flooding. For example, 4 droughts between the years 2000 and 2010 ravaged Northern Africa, wiping out nearly 85% of total herd stock in many regions. Even highly developed countries such as the USA lose between \$6 billion and \$8 billion a year from drought, primarily in the country's southwest. Mapping out drought risk involves a mathematical calculation, which consists of multiplying hazard (probability of drought occurrence) by exposure (population and crops at risk) by vulnerability (how prepared

a region is against drought). Not so surprisingly, India ends up being at most risk of drought out of all of the world's major countries, primarily due to exposure factors such as high population density and lots of land under cultivation. This risk has already manifested itself in the country: India has been hit by drought at least once every 3 years for the past 50 years, and just the past 10 years have seen 350 million Indians affected by drought with \$149 billion in cumulative economic damage.

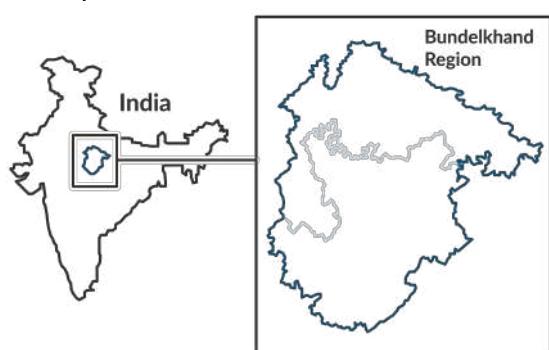
With a population highly involved in agriculture and inhabiting a tropical latitude, rising temperatures and drought have already been wreaking havoc across India. Climate change will increase the frequency and severity of drought and cause disasters such as crop failure and water shortages, with the onus falling upon the Indian government and insurance industry when the next megadrought ravages the country.

To hedge themselves against the risk of systemic failure as droughts get more severe moving forth, Indian institutions must look beyond traditional methods of risk management, and instead tap the global capital markets to protect themselves in the form of catastrophe bonds.

The Drought Situation in India

The issue of drought is very touchy for many Indians. Despite making up only 13% of India's GDP, the agricultural sector employs 60% of the population. However, the farming industry has been affected by farmer suicides, with a farmer committing suicide every hour on average. In the state of Punjab, farmer suicides have increased a staggering tenfold in only five years, with crop failures being a major reason. If a major drought destroys crops, 90% of farmers have been estimated to not have enough capital to start all over again, putting them in a very precarious position.

The entire country as a whole is very vulnerable to drought. The worst drought in 150 years hit India from 2015-2018, resulting in moisture deficits of 50% - 90% in many areas.



Entire villages in regions such as Bundelkhand were abandoned, with climate refugees piling into cities like Delhi, and drinking water across the country was

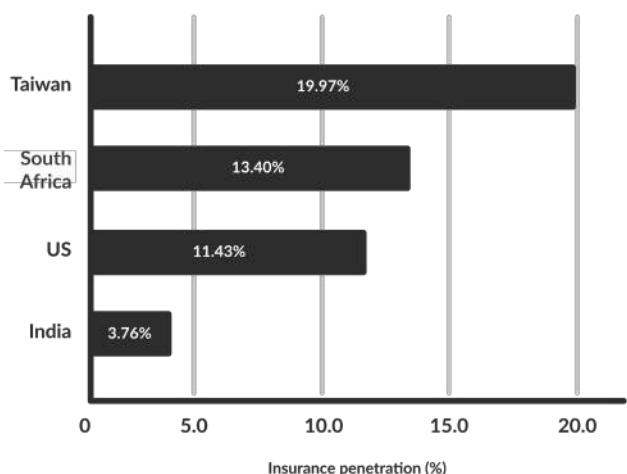
threatened by aquifers drying up. The massive city of Chennai nearly ran out of water, causing widespread panic, and power plants were shutting down due to low water reservoirs. The drought problem in India will only continue to get worse, as global temperatures continue to rise, and weather patterns change. The monsoon season has traditionally brought plenty of rainfall in Southern India, where agriculture is still largely rainfed, unlike the more irrigated north. With monsoon patterns now changing, the Indian south faces the devastating possibility of no longer receiving the rains needed to grow their crops, which would put India's food security in a very dangerous position.

The Crop Insurance Scheme

Crop insurance has existed in India for decades; however, it was overhauled in 2016 to make it more standardized. The principle behind crop insurance is simple: the insurer promises to pay up to a certain amount of money to compensate farmers for any damage to their crops from drought, and in return, farmers pay the insurance company a premium, which is usually set at a certain percentage of the assured amount. Currently, the premium rate paid by farmers ranges from 1.5% to 5%. However, the government subsidizes

80% of the total premium paid to insurance companies, meaning that the real premium Indian insurers receive is 7.5% to 25%. Insurance penetration in India, as of 2019, was only 3.76%, while the global average during the same time period was 7.23%, with the American figure being 11.43%.

Insurance penetration in 2019 for selected countries



With the insurance market being relatively small compared to population, there is less competition in the market, meaning premiums remain relatively high when compared to risk. To understand premium pricing, it is important to understand the idea of expected value. Take the example of a consumer who wants to insure themselves against their house being burned down over the next 10 years, for a total value of \$1,000,000. Assuming the risk of the house burning down is 1% every year, the expected loss that the insurance company faces from a purely mathematical

standpoint is 1% of \$1,000,000, which comes out at \$10,000 a year. Although the insurance company would payout in a binary fashion (either pays out nothing, or pays out \$1,000,000 in a single year), distributing expected payout continuously informs the company that to break even from a probability standpoint, it needs to charge a yearly premium of \$10,000 a year. Of course, as a profit-making enterprise, the insurance company will actually price the premium higher, but as competition in the industry increases, these companies will ostensibly decrease premiums to approach the expected loss value. While the actual insurance industry functions in a far more complex manner, this simplified model shows what is wrong with the Indian insurance industry - there simply isn't enough capital. Currently, public sector insurers, such as the Agricultural Insurance Company of India which commands a 30% market share, have been making losses overall, since they pay out more in claims than they receive in premiums. Meanwhile, private sector insurers like Bajaj Allianz and ICICI Lombard have been making hefty profits, in part due to high premiums.

Increased Systemic Risk

Despite insurance companies promising to pay out claims to farmers in case of crop

failures, there is no full assurance that the system will work as intended in the case of a string of particularly severe droughts. First, expenditures in the case of drought disasters will go beyond simply crops. If water reservoirs dry up and hydro dams slow down power generation as they did a few years ago, the government will be on the hook to spend money to keep everything working as intended. If the aquifers dry up as they also did on multiple occasions, the government will have to spend lots of money to ensure emergency water supplies reach the cities, and that there is a secure supply of water to hundreds of millions of people. Additionally, the crop insurance scheme doesn't actually cover all farmers, with around 50% to 60% still uninsured. Already handling a large budget deficit of around 320 billion dollars, the government would be very cash strapped in the case of a severe drought, and this could be disastrous for the population of the country.

Similarly, insurance companies are not infallible in the case of a massive disaster either. When insurers receive premiums every year, they invest them in a series of yield investments, such as bonds and stocks. In fact, most insurers in Western countries like Canada only make a profit

thanks to their investments - intense competition has eroded premiums to the point that these insurers pay out more in claims than they earn in premiums every year. If claims are extraordinarily high in a given year, insurers will have to liquidate mass holdings of securities to pay off claims. However, in a scenario where the situation is this bad, the markets will likely have already tanked, with government paper and public securities trading at significant discounts, meaning that insurers might not be able to pay the farmers. As previously mentioned, 90% of farmers don't have the capital to rebuild their farms, meaning the country would be on literal life support from imports of food, as local food production would grind to a halt.

A scenario like this is not unthinkable. Leading up to 2008, investments in mortgage-backed bonds, which offered strong yields and theoretically had low risk of default, were booming. However, many institutions essentially bought insurance on these bonds in case of default, through instruments called credit default swaps. Many insurers, such as AIG, were earning premiums from these swap contracts, never expecting that a huge crash was imminent. However, when the market went belly-up and the insurers were left holding the bag, mass liquidations of assets began,

tanking the markets in a self-destructive feedback loop and causing solvency issues with major banks and insurance companies. At the end, the US government had to use taxpayer money to bail out these institutions.

In the case of a drought disaster, the Indian government would hardly have the money to bail out the insurance companies, which could lead to a major economic collapse deadlier than the Great Financial Crisis of 2008.

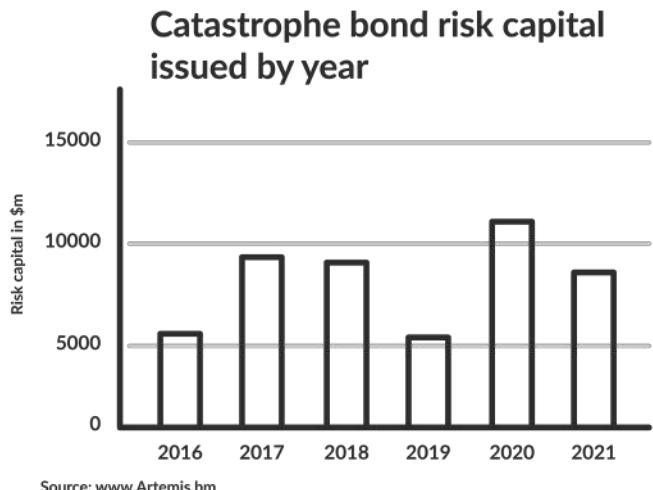
It becomes clear that to reduce systemic risk, some of this risk must essentially be transferred to international players who wouldn't face the same meltdown as local institutions like insurers and the Indian government.

Securitization

Securitization is one of the most important innovations in the history of the financial markets. Essentially, certain assets are turned into securities that can be easily traded, like stocks or bonds. Take the example of a house - by creating a company with several shares issued, and then buying the house with this corporation, it essentially becomes possible to buy shares in houses. Another example

is the aforementioned mortgage backed security. Banks would lend a certain amount to homebuyers in return for promised monthly payments. To reduce their own risk, banks would then issue bonds to investors that were backed by these same monthly payments; in essence, the bank would get their money back plus some profit, and the buyers of the bond would be given the mortgage payments.

Securitization plays a large role in the insurance market as well - one such innovation is the catastrophe bond. Essentially, insurance companies realized that they had taken on too much risk when it came to insuring against natural disasters after Hurricane Andrew in 1999, where dozens of Florida insurers went bankrupt. To reduce this risk, they offered investors the catastrophe bond, where buyers of the bond essentially deposit some money in a Special Purpose Vehicle (SPV), and they are paid interest on this principal by the insurance company in the form of premiums earned from customers. If the insurer has to pay out a large amount of claims due to a certain natural disaster, they draw upon this principle to do so. Essentially, the buyers of these catastrophe bonds are indirectly insuring individuals and companies, thus decreasing the liability of insurers.



Reducing Risk through Catastrophe Bonds

Indian institutions can help hedge themselves against systemic failure through the issuance of catastrophe bonds. By tapping the global capital markets, which are far larger than the global insurance industry, both insurers and the government can have access to more competitively priced insurance for themselves, which ensures that in the case of a particularly devastating drought, they will be able to access the capital put up as collateral by these investors. In turn, premium rates for farmers will also become more affordable due to the hedging of risk. Around 88% of total catastrophe bonds have yields of under 10%, which simply underscores how much more affordable they are than current crop insurance premiums of 7.5% to 25% in India.

Catastrophe bonds & ILS risk outstanding by coupon pricing

Legend (coupon pricing)

- 2.01% - 4.00%
- 4.01% - 6.00%
- 6.01% - 8.00%
- 8.01% - 10.00%
- 10.01% - 12.00%
- 12.01%+
- 0.00% - 2.00%



Source: www.Artemis.bm

In addition to being affordable for the insured, purchasers of these bonds enjoy coupons higher than calculated expected losses, with these spreads being an average of 3.34%.

In addition to more competitive pricing, the use of catastrophe bonds also reduces the risk of failure to pay to almost zero. Unlike insurance companies, which only promise to pay out claims, a catastrophe bond means that money is already put into a secure SPV. As such, while insurance companies may go bankrupt and not have enough money to pay claimants, the buyers of catastrophe bonds have already put the insured amount into SPVs, so claimants have near-certainty that they will get their money back.

Conclusion

With climate change already a reality across the world, it is absolutely crucial that

nations begin to develop contingency plans for how to deal with this risk. While the regular citizens of India, such as farmers, have been assured that insurance companies and the government will step in to help during disasters of epic proportions, there is the potential that these institutions that promise to pay out to regular citizens may themselves face solvency issues. In a very internal economic system like India, systemic risk is amplified, as every institution is dependent on each other, which could lead to a domino effect rippling throughout the country. A megadrought large enough to nearly sink the Indian insurance industry would certainly ravage the country's financial markets, which would mean insurers would likely be insolvent and unable to pay out unless the government steps in. By transferring some risk to well-diversified international investors, such as hedge funds, via catastrophe bonds, India can take advantage of the deep global capital markets to reduce systemic risk at attractive costs. While there have been calls for years for Indian institutions to begin using catastrophe bonds, the sluggish pace of adoption of innovative financial strategies by India means that great risk remains on a systemic level.

Technology:

Walmart: A Pivotal Shift to Digital

Sanovar Bajwa
Matthew Leung
Joyce Ren



Illustrated By
Devena Mohabir

Introduction

Technological innovation has been a substantial catalyst for change over the last decade and has disrupted every major industry group by revolutionizing how individuals interact with businesses, one another and the world around them. Providing convenience, influence and personalization to consumers, technological advancements have disrupted the retail landscape and forced retail giants like Walmart to adapt. Undoubtedly, the most prominent trend within consumer retail has been the growth of e-commerce and the sharing economy, which has been at the heart of Amazon's business model. Driven by its ability to create exceptional customer experiences, leverage its impenetrable moat within logistics and shipping operations, and diversify its revenue streams, Amazon has experienced strong growth and has found itself increasingly competing with Walmart, which is currently the largest retailer in the world. Both retail giants hold strong market positioning within the consumer retail market with differing business models, but recent developments suggest competition amongst one another is intensifying. Given Amazon's current trajectory, it is set to overtake Walmart as the king of retail within the next decade, unless Walmart

makes a concerted effort to defend its market position through changes to its corporate strategy.



To defend its title as the king of retail, Walmart must further develop its omni-channel grocery model and drive growth within the healthcare industry. Walmart's key competitive advantage over Amazon is its vast brick and mortar footprint of 10,526 store locations and operations within 24 countries. Furthermore, 90% of Americans live within 10 miles of a Walmart store, which provides additional customer interaction opportunities for the retailer. Combined with the capabilities of its Walmart+ membership, the retail giant needs to further develop a medium between its digital and physical offerings and employ a stronger omni-channel

approach to grocery and healthcare. In addition, there are accessibility issues within the healthcare industry in the United States, as over 35 million Americans are without health insurance and 17% of Americans have expressed financial barriers. With the company's "everyday low price" strategy, it can cater to this market to expand its presence within healthcare.

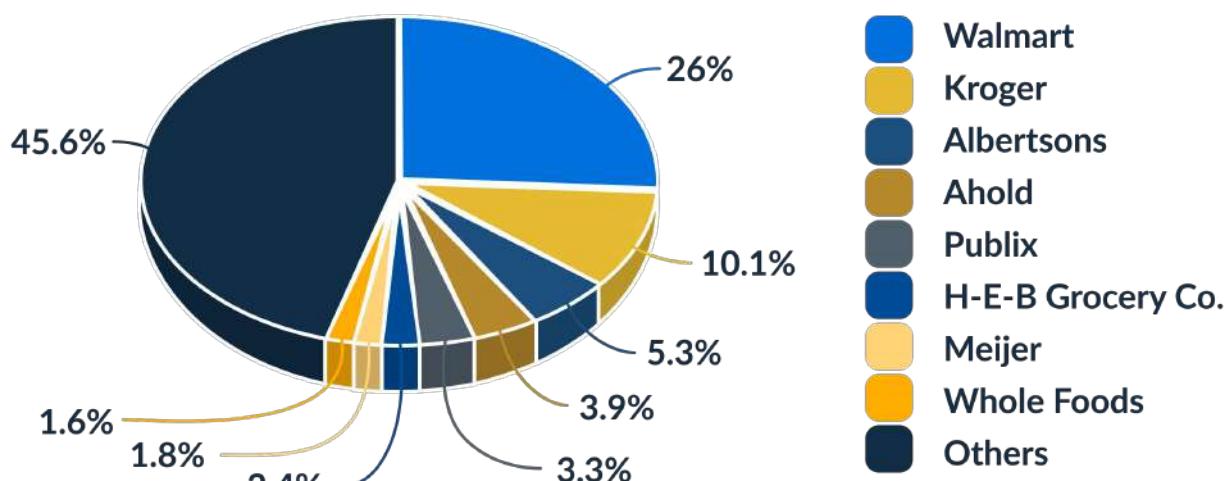
Omni-channel Retail & Walmart+

E-commerce sales are the fastest growing segment within Walmart's business, registering an average annual growth rate of over 40% in the past 5 years. The COVID-19 pandemic was a major catalyst for the growth of Walmart's e-commerce segment in 2020, as lockdown measures increased digital sales, expanded Walmart's online marketplace, and led to the release of Walmart+. The Walmart+ membership was launched to rival Amazon Prime through providing members with unlimited deliveries on orders above \$35, fuel discounts at Walmart and Murphy stations, and access to a mobile scan-and-go feature for in-store shopping. Modifying Walmart+ and optimizing its omni-channel approach can nurture Walmart's growth within two key disciplines: expanding its online grocery segment and furthering its penetration within the US healthcare market.

Industry Leading Supply Chain Efficiency

Walmart currently provides unlimited free deliveries on orders above \$35 and same-day grocery delivery through Walmart+. It has also been able to better streamline the process by allowing consumers to order their grocery items and other products in one checkout. In addition, Walmart provides a more affordable grocery experience with a 2-hour delivery option that does not include an order minimum. From a supply chain perspective, Walmart is an industry leader with its in-bound logistics and saturation expansion strategy, which makes it possible to drive from a distribution centre to each of its associated 150 to 200 stores within 24 hours. As a result, Walmart's distribution and logistics infrastructure has allowed the company to continue to operate using a "Loss Leader" pricing strategy for 85% of its total merchandise, which involves selling select retail products below cost in order to entice customers to buy a higher volume of products overall. In addition, Walmart has saved on transportation costs by 2-3%, maintained relatively stable operating margins between 4 and 5% and experienced a competitive advantage over Amazon with higher margins, economies of scale and more flexible e-commerce and

Grocery Market Share of Leading Food Retailers in the United States



Source: www.Statista.com

delivery operations.

Walmart's Grocery Operations

Amazon has increased its efforts to rival Walmart's 26% market share within the United States grocery market through its acquisition of Whole Foods, launch of Amazon Go and expansion of its online grocery segment. It is imperative for Walmart to defend its market position within this sector, as grocery accounts for 56% of Walmart's revenue and is the company's primary revenue segment. Although there has been a trend of decreasing margins within the grocery industry, grocery is the largest segment within food sales, which are the third

highest type of annual expenditure for US consumers, and the essential nature of grocery as a consumer staple contributes to low revenue volatility.

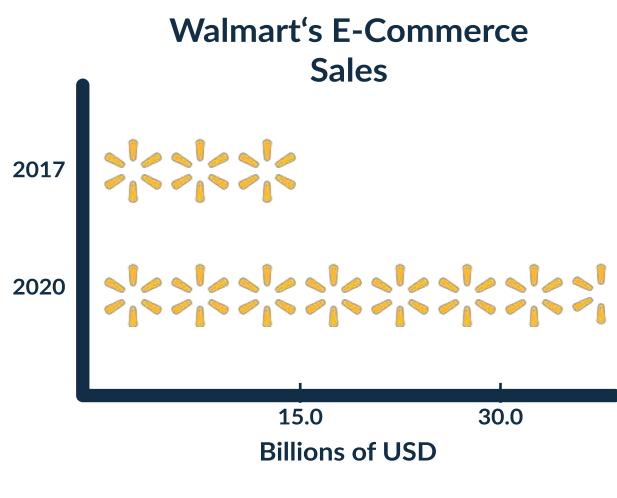
The future of grocery relies on retailers like Walmart supplementing their strong in-person experience with digital offerings, maximizing value to consumers, and effectively integrating technology to further support a hybrid retail model. In addition, shifting consumer preferences towards healthy, organic foods and a focus on value and convenience are critical to success within the grocery industry. Although Walmart is positioned well for in-person grocery as a result of its vast product offerings, curb-side pickup options,

BUSINESS STRATEGY

and exceptional value, they will need to create better experiences for consumers in order to continue its success. Its pricing strategy as an “everyday low price” retailer has been effective, but additional value can be created for consumers through in-person shopping experiences like educational workshops on healthy eating and sample tastings. Similar to Amazon’s cashier-less checkouts at its Amazon Go stores, Walmart must also integrate innovative technologies for in-person shopping in order to create a more seamless experience for consumers and increase operational efficiency.

The digital segment with online grocery will have the most impact on the future of the industry. With the online grocery market projected to grow by 17% to surpass \$38 billion by 2023, there is a sizable opportunity for Walmart to establish itself as the preeminent leader within the space. The COVID-19 pandemic accelerated the adoption of online grocery shopping among consumers, as a result of social-distancing and lockdowns. Although many grocers were not prepared for the increased order volume and surging demand for online grocery services, Walmart was able to provide a seamless experience for consumers and deliver in as little as 2 hours because of its close proximity to

consumers, while also effectively managing operating margins. With 75% of online grocery shoppers still shopping with their first-ever online grocery provider, companies best equipped to handle high order volume and build reliability are likely to be the most popular services post-pandemic. In addition, online grocery adoption is projected to reach 55% of US consumers by 2024, which makes the next few years critical to Walmart’s success within this segment.



Walmart is well-positioned to capitalize on the growth of online grocery through its distribution and logistics network, vast brick-and-mortar footprint, and Walmart+ segment. Walmart’s same-day delivery will also be attractive to digital native Generation Z consumers. In order to further expand Walmart+ and Walmart’s

online grocery operations, the company should further cater its offerings to Generation Z consumers, as they will make up the largest component of the company's consumer base in the future. Walmart's digital offerings will need to provide increased personalization, which the company can integrate through incorporating data analytics and artificial intelligence into a "suggested products" list within its online grocery platform. In addition, order tracking, delivery-slot notifications, online and in-store order price parity, and expanded assortment can all further improve Walmart's e-commerce operations, both in online grocery and general retail.

Meal Kit Partnership

A unique strategy Walmart can take to further expand its online grocery business is to partner with a prominent meal kit company. Meal kits have become increasingly popular in the last 5 years, as they've created a medium for customers to enjoy the experience of cooking, while making the delivery of ingredients convenient. Meal kits run on a subscription model and provide customers with the instructions and ingredients required to cook meals of their choosing. Meal kits are also aimed at being value-based in terms

of pricing, as they only deliver the ingredient quantities consumers need to cook the dishes they order. The COVID-19 pandemic has accelerated the growth of the meal kit industry, with market leaders like Blue Apron reporting an increase in first-time customers and subscription reactivations in the second quarter of 2020, with revenue growing by over 75%. The industry is projected to grow to nearly \$20 billion by 2027 at a rate of 13%. Incorporating meal kits into the Walmart+ subscription offering would be a strategic opportunity mutually beneficial for Walmart and the prominent meal kit company they partner with. First, the partnership would help Walmart grow its subscription revenue from Walmart+ by acquiring additional subscribers and incrementally increasing the price of the service. Meal kits will also appeal to GenZers, and help improve Walmart's brand recognition, while the retailer's economies of scale can accelerate the growth of its meal kit partner by further decreasing prices and making them more competitive. Walmart's close proximity to 90% of the American population opens doors for meal kits to reach a larger consumer base and Walmart's strong in-person grocery operation and supply chain efficiency allows for higher margin revenue within the meal kit subscription model.



Walmart's Healthcare Segment

Furthermore, Walmart must use Walmart+ to diversify its product and service offerings by further penetrating the healthcare sector to compete with Amazon Care, which is a telehealth service Amazon provides through employee-sponsored health plans. In addition to being the largest grocer in the United States, the company is also one of the largest pharmacy chains in the nation behind only CVS Health and Walgreens. Walmart's Health & Wellness segment currently contributes to 10% of Walmart's overall revenue, through providing pharmacy, optical and hearing services, as well as over-the-counter drugs to consumers. However, Walmart has begun to rebrand its healthcare arm into Walmart Health, which will further expand the company's Health & Wellness offerings through providing primary care services, dental exams, x-rays, laboratory tests, and mental health counseling. The company launched its first

of a kind, doctor-run clinic, called a health supercentre in Georgia in September 2019 and now has a total of 15 locations across the United States. Walmart, similar to its competitors, is trying to gain market share within the United States healthcare industry, which is valued at \$1.3 trillion and is an essential service that provides recurring revenue.

With rising healthcare costs, the number of uninsured Americans is increasing, which provides an opportunity for Walmart to target more than 35 million Americans without health insurance through its "everyday low price strategy". Within the consumer healthcare industry in the United States, there are currently several issues with the primary care market; pricing is not transparent, there is a lack of customer service and there is a lack of accessibility in many rural areas within the United States, where there isn't access to primary care doctors. As a result, there is a significant opportunity for Walmart to capitalize on these inefficiencies. Walmart's key advantages over competitors are its "everyday low price strategy", convenience and highly skilled healthcare staff. Walmart's prices are significantly lower than competing brands, with a primary care office visit costing \$40 and an adult teeth cleaning costing \$25, regardless of

insurance status in the United States. Walmart is also very accessible to the vast majority of Americans, as 90% of the US population lives within 10 miles of a Walmart store. In addition, expanding its healthcare services makes Walmart a one-stop shop for many essential products, which also increases convenience for consumers. Walmart's reputation as a retailer that specializes in high quantities and low prices may harm its brand with regard to healthcare services, as they consist of several intricacies and require a more personalized touch. However, its highly skilled healthcare staff consisting of primary care physicians, dentists, audiologists, optometrists, and mental health counselors ensures the retailer will still be able to provide high quality services. Furthermore, Walmart health clinics are doctor-led, which is not a value proposition competitors are able to offer.

Telehealth & Telemedicine

However, the retailer faces major hurdles to successfully scale Walmart Health, including a lack of personalized services with Walmart's mass-scale operations, high labour costs, as a result of high healthcare salaries, and a lack of reputability and trust due to Walmart's reputation as a discount retailer. Although 75% of the US

population had a primary care physician in 2015, there is a decreasing trend of Americans moving away from primary care physicians. In addition, the future of healthcare is being driven by the emergence of telehealth, which must be at the core of Walmart's healthcare strategy going forward. Telehealth allows individuals and physicians to conduct appointments online and arrange healthcare services through the use of digital applications. With 61% of patient appointments being conducted online right now, and 19% expected to be conducted online post-COVID, there is a large opportunity for Walmart to penetrate the growing market. Furthermore, there is incredible expected growth in telehealth, as highlighted by a forecasted CAGR of 28% with the industry projected to reach a value of \$300 billion by 2028.

Telehealth and telemedicine will allow Walmart to develop a unique omni-channel healthcare model and supplement its in-store offerings with a digital presence. Furthermore, telehealth is the optimal solution to increase the personalization of Walmart's healthcare offerings, as it allows the company to gather additional patient data, which can be used to cater future healthcare products and services to individuals. In addition, data collection will

also improve disease detection and monitor patient health through the digital platform, which will improve the quality of Walmart's healthcare offerings with regard to preventative treatment, which is the focus of healthcare going forward. The digital nature of telehealth also contributes higher margin revenue to Walmart's business, as there are lower overhead costs and limited capital expenditure, which offsets the higher operating costs of in-person healthcare services. Further, Walmart can build reputability and trust with consumers by highlighting a physician's background and pairing the digital platform with in-person treatment. By incorporating healthcare into Walmart+, the retailer can also increase its subscription numbers through acquiring telehealth platform users.

Walmart's unique value proposition within telehealth and telemedicine lies in the retailer's omni-channel model, vast brick-and-mortar footprint and supply chain efficiency. Currently, the two biggest concerns among consumers that inhibit industry growth are the lack of personal contact with doctors and the absence of immediate treatment if necessary. However, Walmart is best-positioned to address these concerns, as they are able to pair the digital telehealth platform with

in-person treatment to further personalize services. Also, since 90% of Americans live within 10 miles of a Walmart, the retailer is able to provide a higher level of accessibility to immediate treatment. In addition, Walmart can provide high margin drug delivery unrivaled by competitors. Through Walmart's acquisition of MeMD in May 2021, they have acquired a platform that provides on-demand, online care for common illnesses, injuries and behavioral health issues to 5 million consumers and businesses across the United States. Walmart's next steps will be to further develop the platform by applying data analytics capabilities and integrating the platform with telemedicine delivery and in-person healthcare services.



Conclusion

Although Walmart may not be able to build an e-commerce operation at the same scale as Amazon, it doesn't necessarily need to. Amazon has been on the attack with its

efforts to gain market share within grocery, through the launch of its Amazon Go stores and the acquisition of Whole Foods, and healthcare, through the development of Amazon Care, because of the attractiveness of these two industries. However, as long as Walmart has a brick-and-mortar presence that is supplemented by digital growth, Amazon will not be able to compete with Walmart's robust hybrid retail model that provides additional touchpoints, unrivaled convenience and a unique, seamless experience for consumers. Although the grocery and healthcare industries are set to experience disruption, they aren't going anywhere, as their products and services will continue to be essential to consumers. By utilizing digital offerings like meal kit partnerships within grocery and telehealth platforms within healthcare, Walmart will be able to complement its in-person operations to foster the growth of an impenetrable omni-channel business model and retain its title as the king of retail.

Business Strategy: The War on Big Tech

Lakshya Balchandani
Anjing Li



Illustrated By
Diane Xiong

Introduction

Over the last few years, there has been a growing shift in the power dynamics between governmental bodies and the companies that operate within the consumer economy. It is a shift that has found Big Tech companies — primarily Apple, Amazon, Google, and Facebook — under attack from policymakers for violating laws that aim to govern fair competition in the free market. Antitrust is the umbrella under which these laws fall, and it is a proprietary legislation that is designed to protect consumers from malicious business practices and behaviour. It has irrevocably become the driving force responsible for recent movements against tech giants and other similar corporations.

More specifically, Antitrust pursues a free market by addressing matters of monopolization — the process by which a company attempts to hold majority control over a market, which results in influence beyond a fair standard. Antitrust legislation attempts to define what it means to have “majority control” or “a fair standard” by stipulating that a monopoly is fair as long as it is not anti-competitive in its nature — a definition muddled in smoke and mirrors.

At a surface level, it may seem like the

conflict is fairly one-sided. However, while the idea that “righteous antitrust legislation fights to control power-hungry Big Tech corporations” is a comfortable narrative to establish, it is largely inaccurate. The public and major trades might proclaim antitrust laws as heroic because of a deep institutional worry around the concept of “Big Brother”, but the real story finds itself to be both more complex and worrying. The philosophy behind Big Brother represents the inherent fear of an organization exercising complete control over the lives of others. As Big Tech continues to become rapidly ingrained in the consumer culture, these fears begin to influence a largely negative view towards their involvement in our lives.

As antitrust legislation grows more aggressive in an era where inorganic growth via M&A (mergers and acquisitions) has become prolific, the missing perspective realizes the flawed nature of its hero. Unfortunately, antitrust legislation in its current form is less a protective mechanism fighting against the monopoly power of Big Tech, but rather an economically misguided, politically motivated and legally conspicuous institution focused too much on tearing things down and too little on building them back up.

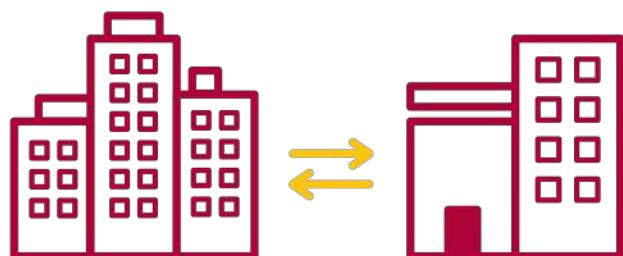
A Reductionist Approach to Economics

The most pressing problem with current antitrust laws is how it unfairly targets monopoly power. The platform behind Antitrust is based largely on a reductionist viewpoint implying monopolies are a force of economic disruption.

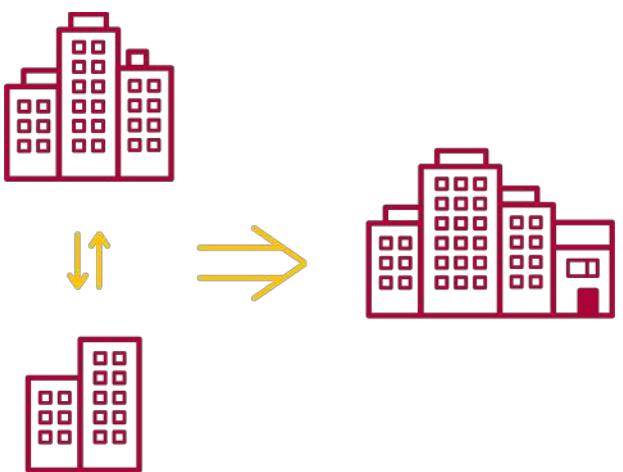
At the very core of monopoly power stands one of its most significant instruments of success — M&A. Both of these processes are responsible for changing the ownership of a company. A merger will combine two companies to form a new one, whereas an acquisition would have one company absorb the other. Oftentimes, when monopoly power becomes a topic of discussion, M&A is commonplace because companies grow through the purchase of ownership. When a company goes through M&A, market share is transferred over. Thus, Antitrust needs to carefully evaluate major transactions that may obstruct competition.

Furthermore, it is important to realize that there are several main types of M&A activity — horizontal vs. vertical consolidation, and potential competition are the most common. Horizontal consolidation indicates a merger between two competing firms, whereas potential competition is a merger with one

competitor buying another company that is planning to enter the market as future competition. Both of these forms of mergers are harmful to the economy because they can hinder healthy competition in the market, and thus exert unfair control over prices for consumers.



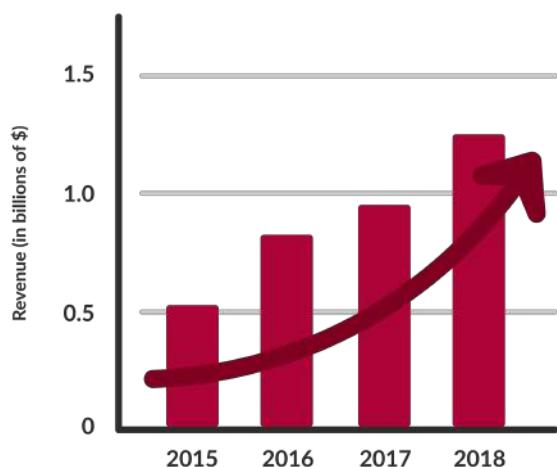
On the other hand, vertical consolidation is a merger between two companies that are in different stages of the production cycle, and it is a powerful economic process that can improve cost savings and business synergies as well as prices for consumers. This effectively combats the detrimental risks of M&A activity by antitrust standards.



Beyond the oversimplification of M&A activity, there is a misunderstanding that

these large companies are hindering competition. Dropbox, which is a successful cloud backup and file sharing company, is a good example of how this is not true. Even though Apple, Google, and Microsoft provide cloud storage of their own, Dropbox still doubled revenue to \$1.2B from 2015-2018.

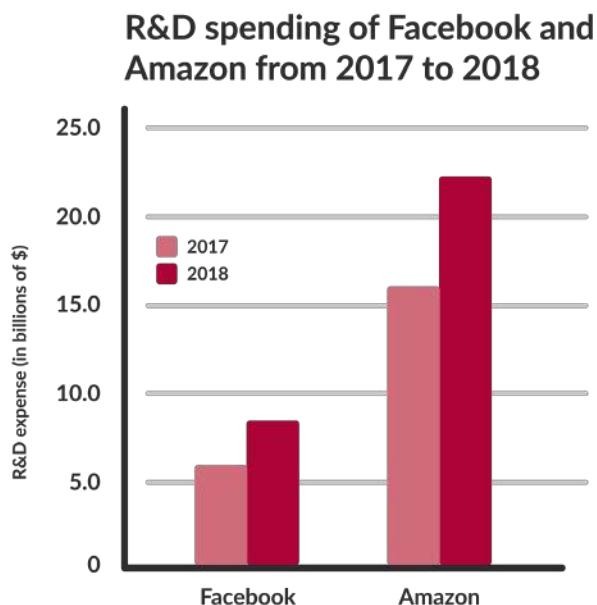
Dropbox revenue from 2015 to 2018



Essentially, by providing a different experience, Dropbox was able to get a slice of the market even though there was apparent saturation. Not to mention that with hard-to-define markets that are constantly shifting, M&A essentially allows companies to participate in a variety of sectors by diversifying their product/service categories. Disney is a good example of an entertainment conglomerate that does this. The company provides services ranging from theme parks, streaming, to even dining. With companies now merging their business model into one that combines other markets,

competition in these markets is becoming more fierce and not less. The best example of this can be seen in the proliferation of streaming services in the industry (ex. HBO Max, NBC Peacock, Apple TV+) after the launch of Disney+ into a market previously dominated by only Netflix. Soon after the entry of new companies into the industry, Netflix's pricing power was hit significantly and their subscriber growth during their fourth quarter earnings report in 2020 fell short of expectations by 180,000. It is important to note that this would make it the third quarter consecutively that Netflix has underperformed after a steady rise for decades. This goes to show that not all M&A activity is detrimental to competition after all.

In addition, the basic understanding that these companies are simply monopolists is just untrue because they constantly cultivate innovation and competition. Is it all possible that allowing monopoly power to grow and evolve in this modern landscape does more good than harm? It seems so, because Big Tech is responsible for exorbitant amounts of R&D in the consumer economy. In fact, Amazon went from \$16.1B to \$22.6B from 2017-2018, whereas Facebook went from \$5.9B to \$7.8B. In fact, Michael Mandel of the Progressive Policy Institute even determined that Big Tech seemed to



outperform the rest of the private sector when it came to competition. Although, monopoly power appears to trigger more monopoly power, and in an economy where markets are not stringent and difficult to define, it is clear that there will never be one true monopoly. There will always be competition. Companies will have a fear of being replaced by another, so competition will be continuously fostered.

A Hidden Political Agenda

Another one of the biggest issues with Antitrust in its current capacity is that it is being utilized by policymakers not simply for consumer benefit but for the sake of pushing a particular political agenda. Policy makers are heavily intertwined with the current legal battle between Antitrust and Big Tech. This ultimately stems from the aggressive

sentiment amongst politicians towards large technology companies. For example, in the US, both the Republican and Democratic Party have their own issues with these companies, and it becomes clear upon further exploration how deeply it ties into the current legal landscape. Political motivation can be justified, but this bias should still be examined.

In the same vein, Republicans also simply dislike that private technology companies hold strong political influence; these companies can control what information can reach a particular audience. The worry from their end stems from how many of these services are allegedly places where users can spread anti-Republican sentiment. Donald Trump has long lobbied that many of these social media companies, Facebook and Twitter specifically, are working to "undermine him". In fact, his anti-Big Tech sentiment eventually got him banned from both Facebook and Twitter earlier this year and then from the Capitol for inciting violence and spreading misinformation. In more than one way, Donald Trump and the Republican Party demonstrate a conflict of interest in this matter which has less to do with wanting to correct antitrust abuses led by Elizabeth Warren, and more about controlling anti-Republican sentiment on these platforms.

This particular disconnect highlights that technologists and policymakers inhabit two different worlds. Usually, aggressive sentiments like the ones exhibited by both entities are typically not well-informed. Bias is created because neither side truly understands each other. The Republicans believe there is anti-Republican sentiment, whereas the Democrats believe regulation is necessary to control a service that has significant influence over speech. The problem arises not when there is a discussion on these matters but rather when the ongoing legal battles do nothing to explore these political biases and address their validity.



Sometimes, intentions are everything and in this particular situation, change the context and validity of Antitrust's attack on Big Tech. Can someone blame an entire group of companies for something they cannot even prove? This is what makes

their attempts to drown them in litigation in what can only be a war of attrition that much more confusing. A battle being fought to wear down the opposition through continuous losses so much so that the entire empire collapses.

A Legally Ambiguous Nightmare

Finally, another issue with Antitrust is that it no longer reflects the current market. In the case of Big Tech, antitrust legislation is too outdated to handle the complicated nature of what it means to be a monopoly in this dynamic technological market.

The issue becomes transparent with the legal implications regarding regulating Big Tech. At this moment, the DOJ (Department of Justice) and FTC (Federal Trade Commission) are focused on using the aforementioned antitrust laws to break up Big Tech. Their exploration of the statutes, particularly the Clayton Act — one of the first statutes set in place — prohibits any merger that can “substantially [] lessen competition, or [] tend to create a monopoly”. It could also possibly be used to unwind certain mergers that are viewed to be concerning such as the acquisition by Alphabet of Waze and Nest in 2013 and 2014, and the Facebook-Instagram merger in 2012.



However, the Clayton Act had a particular provision that complicated the situation. Essentially, to unwind a merger, the Clayton Act has to prove that it "meaningfully decreased competition in a particularly defined marketplace". However, this prompts a myriad of legal questions around market definition in an increasingly complicated and shifting technological industry. How does one legally stipulate what is considered to be "decreased competition in a market" when there is difficulty in defining what the market should look like?

The numerous legal questions surrounding Big Tech originate from how the current laws barely scratch the surface for defining markets and monopolies in this climate. For example, when dealing with a monopolization case, it needs to be proved without a reasonable doubt that the company in violation possesses "market power". This is defined as the ability of the company to raise prices to competitive levels, which is the legal stipulation set in place by the Clayton Act.

However, many tech companies do not even charge their customers for their services and so, what then? Moreover, market power is also defined by proof "that the defendant-firm is insinuated from new rivals by barriers of entry". However, it has been argued by several European authorities that this idea is also flawed since certain technological markets have structural features — economies of scope, network effects, and structural features — that make this barrier uniquely difficult. The legislation does not consider this when dealing out judgement. Modern monopolies are far more complex than the legal statutes give them credit for, and so how can someone wield a set of laws that themselves are — for lack of a better word — ignorant?

It does not even begin to address the recent movement made by politicians to change Antitrust laws. While one might hope that these changes would address the aforementioned questions, they seem to be making it even more legally conspicuous. At the moment, Amy Klobuchar, a US Senator, is introducing a bill that would bar mergers that "create an appreciable risk of materially lessening competition" by shifting the burden of persuasion to the defendant in question. Burden of persuasion is defined as the "obligation of a

party to introduce evidence that persuades the factfinder, to a requisite degree of belief, that a particular proposition of fact is true.” In other words, it seems to completely abolish the long standing philosophy of “innocent until proven guilty” and instead approaches a sentiment where it falls on the company to prove whether or not they injured competition. This means that each company goes into a case already guilty, and it could lead to several companies being charged for behaviour that is not anti-competitive. Similar to how someone innocent might be charged for a crime they did not commit. That is not a comparison that should be made for a regulatory statute that is responsible for governing the consumer economy.

A Path Forward

The entire conflict between Big Tech and Antitrust brings up a myriad of questions about the government’s increasing involvement in the free market and whether companies should prepare themselves for a rude awakening. It seems more and more likely that the industry itself should prepare for a change, since aggressive sentiments are growing across the world to reign in Big Tech.

However, this change is a reflection of

what is wrong with the system in place. Antitrust legislation in its current capacity has proven to be economically misguided, politically biased, and legally ambiguous. So why is a clearly flawed piece of paper deciding the fate of the entire consumer economy, and what can be done about it? With a situation like this, it can be easy to default to either breaking up Big Tech or abolishing Antitrust, but the problem is that both of these entities are part of a symbiotic and mutually beneficial relationship. One without the other would do far more damage than keeping them in their current state, since removing Big Tech or Antitrust may eventually lead to a complete market collapse. As such, the answer does not simply lie in either of these options and rather in the collaboration of both Antitrust and Big Tech. Both should move away from the current war of attrition that is doing nothing but bleeding the entities dry. The best way for them to do this is to work on improving the issues with Antitrust that we identified — improving the economic, political, and legal constructs of the legislation.

From an economic standpoint, there must be a realignment in the way economic growth via monopolies is understood. Specifically, the consumer welfare principle

should be emphasized as the primary goal of Antitrust. The CW principle “urges that antitrust policy should encourage markets to produce output as high as is consistent with sustainable competition, and prices that are accordingly as low”. This would make markets more competitive but not necessarily result in smaller firms.

From a legal standpoint, there would need to be a mechanism to combat the uncertainty behind defining markets and monopolies. It should start by keeping the burden of proof on the prosecution and then be implemented via injunctions — which is a legal order that requires a company or entity to stop a certain action. Instead of focusing on providing generalized definitions about what is considered competitive or not, it may be smarter to take each potentially dangerous act on a case-by-case basis and prosecute it using a case-by-case tool like a legal injunction. A positive example of its promising effect was during the Google search engine case. During the conflict, complaints were filed against Google for limiting competition by paying billions of dollars to make their search engine the primary search tool on iPhone and Android devices. An injunction was filed that forbade Google from paying other companies to make their search engine the

primary system. From a political standpoint, there needs to be a way for lawmakers and technologists — who essentially exist in two separate worlds — to start understanding each other better. This can be addressed by setting interoperability requirements that would force platforms to share data collected from users with competitors if the user agrees to it. This would allow for analytics between companies to be shared and prevent either side from spreading misinformation. By making this information widely available, you prevent the risk of political bias becoming as influential a factor in this conflict as it has been thus far.

At the end of the day, these solutions are a guide for what a world might look like if people were less focused on tearing each system down and one focused on helping each other instead. It is easy for the public to create a narrative that characterizes one side as the villain and the other as the hero, but nothing is that simple. The truth behind the war between Antitrust and Big Tech is that it is unnecessary. With a focus on analyzing the systems that run the world and the ones people put on a pedestal, individuals can begin to create a system of co-existence that may offer a brighter future to these entities and allow them to help consumers.

Technology:

Connecting Creativity and the Blockchain

How NFTs And Social Tokens Can Restructure The Future Of Creative Industries

Katrina Hermanns
Sandra Huang



Illustrated By
Diane Xiong

Introduction

In March 2021, the world saw the mainstream popularization of Non Fungible Tokens (NFTs) with NFTs of memes, music, and YouTube videos selling for millions of dollars. At the same time the idea of social tokens came to light and BitClout launched the first open-source blockchain to support social tokens. Since then, sales of NFTs and social tokens have cooled to more reasonable levels, but one might wonder whether they were a fad driven by the flywheel of social media, or if they provide enough substantial value to permanently alter how certain industries function.

Looking closer at the creative economy — which consists of musicians, fine artists, photographers, designers, and social media influencers — opportunities for innovation are evident, as the industry has operated in the same way since the term was coined in the 1980s (Gross, 2018). In the creative economy, creators generate works of art (which can be broadly defined as songs, videos, images, etc.) that provide emotional value to their community of supporters. Creators often need to sign with an agency that provides monetary funding and industry resources to support the production and distribution of their work. These agencies take a substantial cut of the

artist's copyright — on average about 50% (McDonald, 2021) — in exchange for the capital and intangible resources they provide. On the other side of the story, fans only encounter a limited number of opportunities to support their favourite artists. Fans can purchase event tickets, merchandise, and prints, however these must align with the fan's personal schedule, geographical location, and budget. Looking at both sides of the story reveals that there are gaps in the creative economy that are ripe for innovation. Creators are looking for ways to retain the rights to their work while still having the resources needed to distribute it, while fans are looking to support their favourite creators in ways that are more consistent, repeatable, and accessible.

The craze for NFTs and social tokens witnessed in March of 2021 clearly demonstrated how both technologies can disrupt the status quo in the creative economy, and solve the needs of both creators and their communities of supporters. NFTs are digital tokens that can be thought of as certificates of ownership for digital or physical assets. Each time the NFT is sold, the transaction is recorded on the Ethereum blockchain. The Non-Fungible aspect of these tokens means that they represent unique units of value

that cannot be exchanged for another token of equal value — unlike how a ten-dollar bill could be exchanged for two five dollar bills.



NFTs also feature the ability to be “smart” in the sense that they can encapsulate and facilitate terms and conditions that are attached to the sale of the token. Social tokens on the other hand are a type of cryptocurrency based around the value of a brand, community, or influence (White, 2021). Social tokens are considered fungible, as they can be exchanged for other coins that represent the same unit of value.

Re-Introducing Scarcity into Creative Markets

If we reflect on how we currently support our favourite creators, the need for NFTs and social tokens becomes apparent. Think about your favourite musical artists. You are typically drawn to music that provides emotional value — for example, specific music can help you focus during a workout.

The music fulfills the job to be done of invoking a particular emotional response, and creates an atmosphere that you crave. Companies such as BMW and Apple have been able to capitalize on the idea of emotional value to sell their products for a higher monetary value. This is done by using marketing strategies that leave you feeling as though you need the product to feel stylish and appear “technology forward” (Zorfas, 2012). However, in comparison, creators don’t have the ability to capture monetary compensation that is equivalent to the emotional value they provide due to the structure of the creative economy. You likely consume music through a streaming platform, which compensates artists with fractions of a cent for every stream.



Figure 1

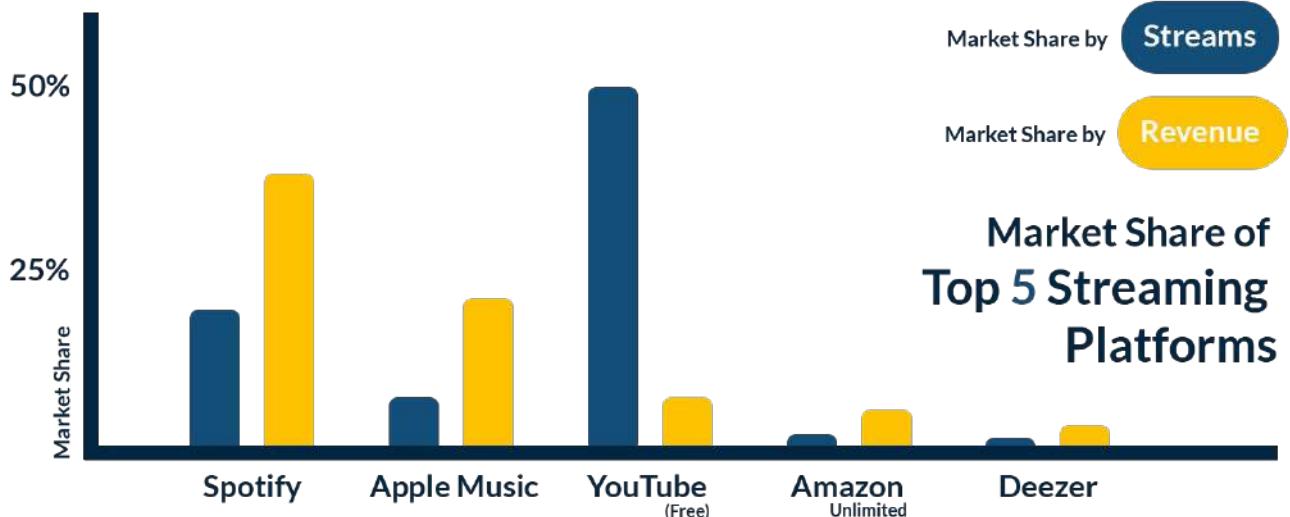


Figure 2

The highest paying platform is Facebook at \$0.05 per stream, closely followed by Peloton at \$0.03 per stream (Trichordist, 2020). However, Facebook and Peloton are not the most popular platforms, which means their higher compensation rates aren't helpful to artists. The top 5 streaming platforms, shown in Figure 2, account for 83% of all streaming traffic and all but one pay less than \$0.01 per stream. This market concentration forces artists to release their work on these platforms in order to gain exposure, but at the cost of monetary compensation.

Let's return to your favourite musical artist. You can support them in a limited manner through streaming their music, but what if you want to do more? You may tell your friends and family to help promote them, but this exposure also supports them in a

limited way. If they happen to be on tour near you, you might purchase tickets and merchandise — if it aligns with your finances and schedule. Live events and merchandise are a main source of income for many artists, but they are limited by the items that fans are willing to purchase, the number of fans that can fit in a venue, and the inability to tour all year round. The structure of the industry is the same for photographers, YouTubers, and many other creatives who share their work on free or low-cost platforms in order to build a community of fans who will support them through monetized events, sponsorship deals, and merchandise (a16z, 2021). The ultimate goal for creators would be to find a way to match their compensation with the value their work provides. This is where NFTs can step in and help restructure the creative economy.

The current structure of the creative economy fundamentally creates a scarcity problem for creators. By making their work readily available on free platforms, their day to day work is no longer scarce and consumers are unwilling and unable to pay for work that is freely available. Instead, creators rely on a limited number of live event tickets and merchandise to generate scarcity and provide them with income. NFTs challenge this traditional structure by introducing scarcity back into the daily creative process, allowing creators to monetize their work, while still sharing it with fans in order to grow their community of supporters.



Over the course of the pandemic, EDM artist 3LAU (pronounced “Blau”) sold NFT rights to a collection of unreleased songs, fractional song rights, and unique video graphics for over \$15 million. This was done without hosting a single live event, while also maintaining majority rights, and

retaining the full monetization rights to his music. In comparison, 3LAU noted in an interview with the Morning Brew that he earns around \$21,000 a month from the streaming of his entire released collection of music. 3LAU isn’t the only artist capitalizing on the opportunity that NFTs present, and although the craze that was seen in March 2021 has died down, artists believe that NFTs are the solution to equalizing the emotional value their work produces and the monetary value they receive in return.

A Shift in the Meaning of Physical Ownership

NFTs not only provide a way to monetize digital assets, but can also revolutionize the ownership of physical items such as art and clothing. The security and authentication that NFTs provide can also solve the issue of rampant counterfeit in physical art. The chief of the Fine Arts Expert Institute, Yann Walther, contends that 50% of works of art circulating on the market are counterfeit or misattributed due to the weak, manual authentication process. NFTs could protect the authenticity of the art by linking the physical artwork to the blockchain, which stores information in an immutable and transparent manner.

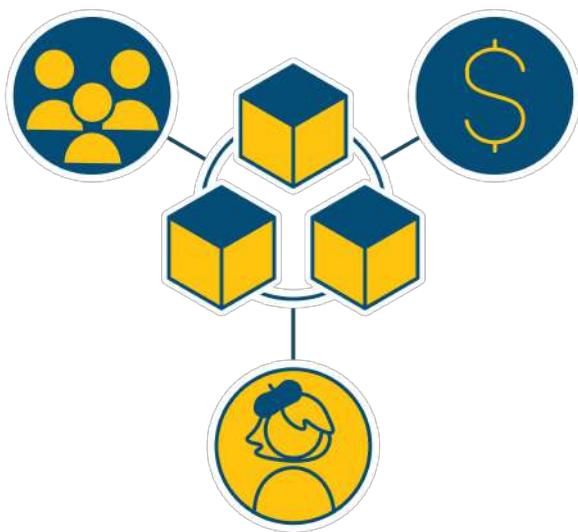
Each time the artwork changes hands, the transaction would be recorded on the blockchain. One physical asset being linked to NFTs is sneakers. In 2019, Nike successfully patented the tokenization of ownership for exclusive shoes (Andon, 2019). The purchase of these shoes will unlock digital tokens that will be linked to an owner using a 10-digit shoe identification code. The shoes and tokens will be collectively known as "CryptoKicks". Since these NFTs are tied to the production of real shoes, this will ensure digital scarcity as well. Nike plans to integrate a procreation feature into CryptoKicks that will provide additional monetization opportunities for owners. This concept, similar to the breeding of NFT cats called "CryptoKitties", will allow shoe-owners to intermingle one digital shoe with another to create a "shoe-offspring", which can then be manufactured as a tangible pair of shoes. NFT sneakers can also provide a unique monetization opportunity for artists. For example, digital sneaker brand RTFKT (pronounced "artifact") partnered with Fewocious to sell \$3.08 million worth of digital shoes adorned in the artist's colorful drawings.



A Path Away from the Middle-Man

The traditional path to monetization for creators within the current creative economy structure involves signing with an agency, label, or management team. This agreement provides artists with two essential resources: a well-defined and highly connected network to aid in advertising and distributing their work, and capital to fund the early days of their career (Grant, 2021). Depending on the industry, these agreements can be highly predatory towards emerging artists who are desperate to make it big. The fine arts and design industries provide what is considered a typical partnership agreement, where partnering with an art dealer, auction house, or corporate entity requires paying pre-defined fees and commissions. However, the music industry takes a more aggressive approach, where artists sign significant portions of their rights over to labels for the opportunity to participate in the industry. Record deals typically have three elements, the "rights" (the copyright to the master recordings), the royalty rate, and the advances paid to the artist (Bradley, 2020). A high profile example of these predatory deals is Kanye West, who signed what is considered a standard contract, giving the rights to his first 6 albums to Rock-A-Fella records in

exchange for \$2 million in advances and royalties between 14% and 18% (Bradley, 2020)(Grant, 2021). These albums would go on to reach platinum status, and be worth much more than the \$2 million advance and royalties that Kanye received. This is only one of the highest profile cases that has been publicly disputed, and only demonstrates a subset of the challenges faced by up and coming creators.



NFTs and social tokens present new opportunities for creators to monetize their work while retaining their rights. Both technologies offer creators the two essential resources of distribution and capital, while foregoing the need for a third party management team or partnership. The need for a well-defined and connected network curated by a management entity is no longer required, as the internet and blockchain act as the intermediary between the artists and their supporters.

Additionally, through NFTs and social tokens, creators can access funds without selling the rights to the entirety of the work, as well as gain the opportunity to monetize on future sales through smart contracts.

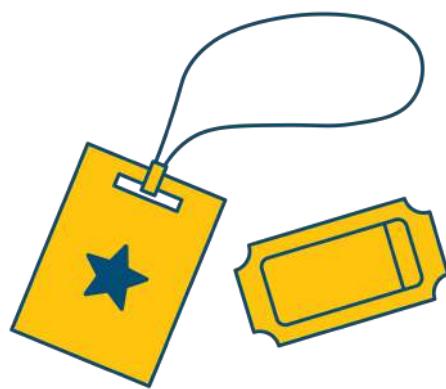
Another area of the creative economy that NFTs and social tokens are poised to disrupt is the traditional form of advertising. Currently, artists rely on word-of-mouth referrals and media opportunities such as interviews, advertisements on streaming platforms, or being featured in ranking events (such as competitions or the Billboard Hot 100) to bring attention to their work. By allowing supporters to directly invest in their brand through NFTs and social tokens, creators could see a shift towards predominantly word-of-mouth advertising. This hypothesis is based on the theory of the Endowment Effect, a phenomenon in which people tend to place more value on something they own (Ethereum, 2021). According to the Endowment Effect, when a person invests in a creator — for example through NFTs or social tokens — they will believe more strongly in the artist than they did before, and are more likely to participate in peer-to-peer advertising. This creates an outward spiraling effect as more supporters invest in the artist, allowing them to fund

more work more quickly with the influx of capital, and in turn increase the value of their brand by growing their collection of work and reaching a wider audience.

Expanding Relationships through Investment Opportunities

Beyond providing solutions to existing challenges in the creator economy, NFTs and social tokens could also add a new dimension to the relationship between creators and supporters. The first element that can be added to the creator-supporter relationship is the opportunity for supporters to gain monetary value from the relationship. Until now, supporters have traded monetary value for the emotional value that artists provide, whether it is paying for concert tickets, consuming ads on a streaming service, or purchasing books illustrated by their favourite comic artists. With the rise of NFTs and social tokens, supporters will be able to instantaneously invest in their favourite creator through an accessible means, with the potential to profit from the investment.

This relationship does exist in industries such as fine arts, illustration, and photography, where high-end pieces can appreciate in value over time. However, the investment opportunities are often limited to those with specific financial and networking means. NFTs and social tokens expand this opportunity to any industry and supporters of all financial means.



NFTs and social tokens also present the opportunity for creators to expand the means by which they connect with their audience. An NFT can be multipurpose such that it can act as a back-stage pass, or be viewed as a collectible to prove you were at an event years down the road. Creators aren't bound to simply selling the rights to their work through NFTs, or tracking the value of their brand through social tokens, rather they have the freedom to be creative in how they deploy these technologies to best capture their audience. The top creators on BitClout have already started capitalizing on the



opportunity to provide unique incentives to their supporters. @jakeudell held a banquet feast for his top coin holders, while @craig hosts private calls with his top 25 shareholders (Kamel, 2021). In the future, these opportunities could expand to the equivalent of collecting memorabilia, except the blockchain would track the exact history of the memorabilia, denoting the user who unlocked the memorabilia and how many times it passed hands.

The Next Steps for NFTs and Social Tokens

In theory, NFTs and social tokens seem to solve a number of problems that exist in the creator economy. However, there is one question that needs to be answered before a shift to NFTs and social tokens can occur. How do you make these technologies accessible to the general public?



Right now, the process of purchasing NFTs and social tokens relies heavily on having knowledge and confidence in operating on the blockchain. Even BitClout, which claims to be accessible to anyone who is looking to invest in mainstream social media influencers, has only recently allowed the direct purchase of coins using USD through Wyre (Goldberg, 2021). Artists who are heavily invested in the future of blockchain in the creator economy, like 3LAU, have started working on platforms to seamlessly facilitate the purchase of NFTs and social tokens. An early example of this is an application built by 3LAU's team that leveraged QR code technology to facilitate transactions, and was available at one of his pre-pandemic events (Grant, 2021). Early adopters like 3LAU have already started working on solving the problem of mainstream accessibility, and as the popularity of NFTs and social tokens rises, knowledge, financial resources, and human capital will become more readily available to solve these problems. Signs of this innovation began to emerge in July of this year when NFT startup Bitski held a hybrid gallery to display their digital-wallet-as-a-service technology and "Shopify-like experience". Bitski aims to give creators the tools they need to mint and sell NFTs through their own storefront. Based on the current outlook of how NFTs and social

tokens could change the creator economy, the ultimate goal would be to allow supporters to click on a link and invest in their favourite influencer or musician right from the content they are viewing on TikTok, YouTube, Spotify, or any brand website.

Conclusion

Many may argue that the NFT craze that took place in March of 2021 was a temporary fad that has since expired. However, through exploring how NFTs and social tokens could play a role in the creator economy, it has become evident that these technologies are more than just a fad. Rather, NFTs and social tokens present the opportunity for better monetization of artwork by increasing scarcity and equalizing monetary compensation paid with the emotional value provided through creating investment opportunities for supporters. Additionally, they could provide a solution to the long-standing predatory behavior of record labels and management groups that prey on artists looking for a way into the industry. NFTs and social tokens could provide artists with the two fundamental resources they need — a distribution network and capital — while allowing them to forego the loss of rights and

compensation. Finally, NFTs and social tokens open up a new dimension to the creator-supporter relationship, by allowing supporters to directly fund their favourite artists and participate in new experiences. Although the creative economy does face the challenge of making complex blockchain technology accessible to the masses, this is a challenge that is already being tackled by some of the most progressive artists in the industry, and with time and trial-and-error, a solution should emerge in the near future.

Business Strategy: Ethical Hacking

Smriti Sharma
Grace Fan



Illustrated By
Sienna Zhao

Introduction

With the proliferation of new technical bugs, computer viruses and ransomware, the demand for comprehensive security plans to protect businesses and individuals has never been greater. Though testing tools such as security scans are helpful in protecting organizations from cybersecurity threats, they are often inadequate and thus hiring hackers to instead test corporations' platforms proves to be beneficial. The role of hackers has also evolved drastically, with hackers now being viewed as technological tools. With cybercrimes being very lucrative, it is critical to understand how cybercriminals are incentivized to commit crimes given the legal complications that could follow.



white-hat hackers. Black hat hackers gain unauthorized access to systems to either steal data or do other illegal acts while on the other hand, whereas white-hat hackers (or ethical hackers) use their hacking skills to find security loopholes so that they can be patched up before they can be exploited for malicious purposes. Currently, ethical hacking is an integral element of a comprehensive security plan because it provides a method to test a computer system or a network to address and identify vulnerabilities.



Ethical Hacking

Ethical hackers try to hack into the systems, breach the security and exploit company weaknesses to show possible vulnerabilities in a legal setting. There are two main kinds of hackers; black-hat and

Significance

Due to an increasing number of businesses leveraging ethical hacking tools, it is being used in conjunction with several tools and strategic plans. These include but are not limited to security assessments, penetration testing and risk analysis in several business processes to maximize cybersecurity. Companies are also exploring the possibility of red teaming, where companies implement rigorously



challenging plans, policies, systems by adopting an adversarial approach. According to a Norton cybersecurity analysis from 2017, 978 million people were victims of cybercrime in the same year, resulting in \$172 billion in losses worldwide. Ethical hackers protect data breaches, prevent security breaches, defend national security and gain customer trust by ensuring the safety of their data.

Economics of Hacking

The economic model of hacking reveals the different incentives for cybercriminals to influence business decisions, exploit bureaucratic pitfalls and alarm citizens and businesses against the unawareness of cybersecurity. Businesses can assess if and how much hackers "supply" hacking by evaluating the return on hacking over other opportunities. This can be illustrated and understood through the economic model of hacker behaviour. The law of supply and demand is a theory that explains the relationship between sellers and buyers, in

this case, being hackers and businesses, respectively. The theory describes the relationship between a product's price and people's willingness to buy or sell it. For the hacking market analysis, the model in Figure 1 will be used.

Economic Supply and Demand Graph for the Hacking Market

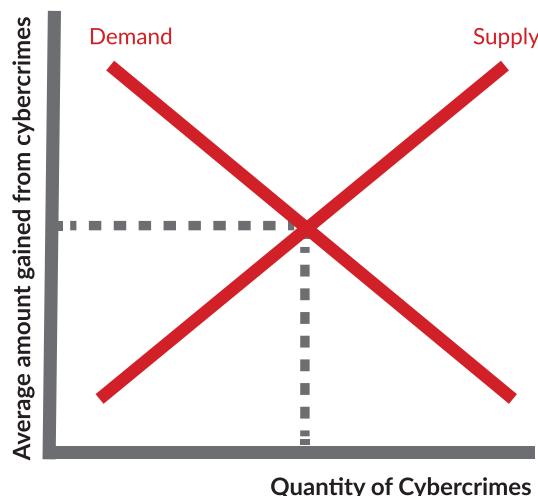


Figure 1

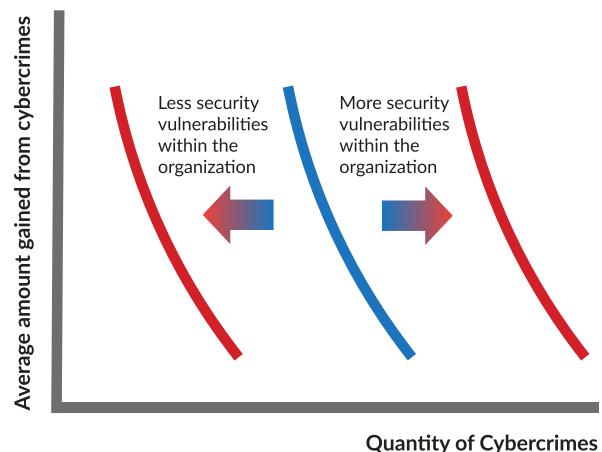
Opportunity cost is the cost of the next best alternative, which, in this case, would be the businesses' indirect demand for hackers. Since prevention is costly, businesses typically tolerate some degree of hacking risks, and so this sensitivity can be perceived as an implicit "demand" for hacking. With the x-axis representing the number of cybercrimes (using an arbitrary quantity unit) and the y-axis representing the average amount gained from cybercrimes (again using an arbitrary price unit), the equilibrium occurs when the supply and demand curves intersect to

represent the ideal hacking conditions because cyber crimes are inevitable. Pragmatically speaking, vulnerabilities, attacks, breaches, and malware are all part of the natural and expected order of things in information technology hacking and because cybercrimes cannot be completely eradicated, the onus is on businesses and organizations to employ both offensive and defensive tactics to protect their data.

According to how firms execute their defensive strategies in security plans, factors such as law enforcement and financial advantages to hackers shift the supply right, legal alternatives shift the supply left, and private defensive measures impact the demand curve, similar to how they do in a regular supply and demand model. When the demand shifts right, it means that there are several security vulnerabilities within the organization that incentivize cybercriminals. Thus, businesses expose their systems to cyber threats through several vulnerabilities in their systems. On the other hand, there are several factors that shift the demand curve, including a defence model used by companies to avoid cyber threats. Their models must follow the COBIT (Control Objectives for Information and Related Technology) principles in some form, which state that the businesses should be

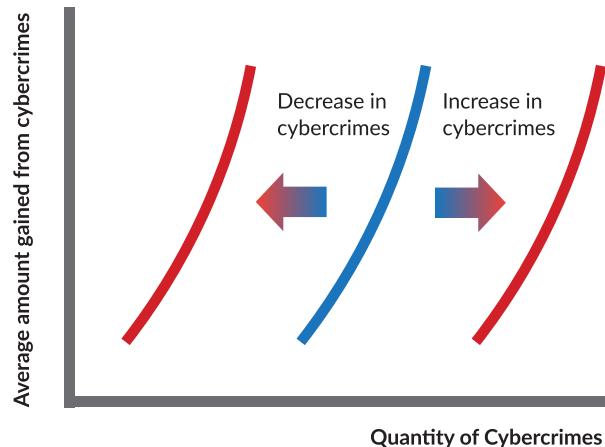
meeting stakeholders' needs, covering the enterprise end to end, applying a single integrated framework, enabling a holistic approach and separating governance from management. Depending on how businesses implement their security systems, it could create inefficiencies such as spillovers, misaligned incentives, and information asymmetry. This results in an increase or a decrease in cybercrimes than the equilibrium quantity.

Economic Demand Graph for the Hacking Market



If the supply shifts right, it means that the quantity of cybercrimes increases but there is less black money and intellectual information gained from illegal hacking as there are relatively more hackers, so the amount gained is spread amongst a larger group. As the law cannot be adequately enforced in cyberspace and the dark web, where all hacker interaction occurs, hackers could strategically escape from punishment. Cybercrime is a relatively new

Economic Supply Graph for the Hacking Market



phenomenon that is becoming increasingly complex, thus responses from legislators and law enforcement agencies are still being established at all levels of the government. In the US, there are 50+ federal statutes that address different aspects of cyber-security and cybercrime, but there is no single comprehensive U.S. legislation that encompasses all aspects of cyber-related crime to account for an entire chain of events that occur in massive hacking activities such as ransom attacks where the attacker illegally gains access to company files to then demand a ransom from the victim to restore access to the data upon payment. Some examples include the ransom attack on JBS by the Russia-linked cyber-criminal gang REvil, breaches of the computer systems of the Australian National University in 2018 and the 2015 malware attack on the Bureau of Meteorology which never got caught.

Importance in Business

Additionally, hackers can perform an Advanced Persistent Threat which is a prolonged and targeted cyberattack where the intruder gains access to a network and remains undetected for an extended period of time for illegal purposes without the victim's knowledge. These attacks are increasingly becoming common, thus going around law enforcement for prolonged periods. Furthermore, mass cyberattacks exhibit high economies of scale meaning that even with little cyberattacks, a lot of damage can be done to a company's properties.

This is evident especially when the COVID-19 pandemic hit and businesses were forced to migrate online rapidly and some or most aspects of the migrations were not secure, resulting in high damages shifting the supply curve rightward. Since the outbreak, over two-thirds of member countries that responded to the worldwide cybercrime survey said they've seen a significant number of COVID-19 themes for phishing and online fraud. The most prevalent are online scams and phishing where threat actors deployed COVID-19 themed phishing emails, often impersonating government and health authorities, to entice victims into providing



their personal data and downloading malicious content. Furthermore, there has been a significant increase in cybercriminals registering domain names containing keywords, such as "coronavirus" or "COVID" to underpin a wide variety of malicious activities. From February to March 2020, there was a 569% growth in malicious registrations, and a 788% growth in high-risk registrations was detected. As well, many hackers have call centers where they conduct phone scams claiming they are professionals and ask for access to hacking into their systems.

If, however, the supply shifts left, the quantity of cybercrimes decreases. This can happen when the hackers are given other alternatives. Certain factors that shift supply left include legal alternatives such as increasing the attractiveness of IT ethical hacking jobs that shift the supply curve more than marginal jobs or non - IT jobs,

which tends to decrease the equilibrium quantity of cybercrimes. With a lot of white-hacker (ethical hacking) jobs as opposed to black-hat hackers (with illegal intentions), modern hackers are categorized not only according to their expertise but also according to the values they adhere to. Although hiring ethical hackers has several associated risks such as the chance of corrupting the files or data of an organization, massive security breaches and cybercrimes, if hired correctly, they can prove to be very useful. Ethical hackers will help fight against cybercrimes by giving their business new perspectives through several testing methods such as penetration testing to identify potential vulnerabilities to defend customer data and information present in business exchanges and follow strict policies such as the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and Payment Card Industry Data Security Standard (PCI DSS).

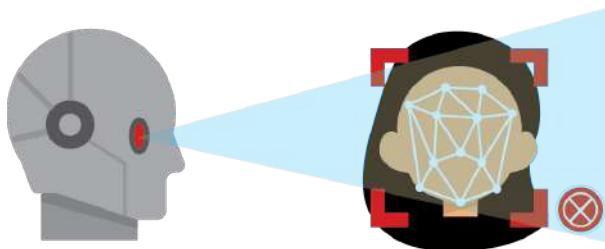
Even with a few automation tools and vulnerability analysis available, there is a high chance that reports will be misinterpreted, may miss key components that should be tested, and new undetected threats could emerge after the scans are done, such as those in Advanced Persistent Threats as mentioned earlier. As well, these tools lack the ability to reduce the overall threat, as they do not check all attack vectors such as physical/social engineering and may miss what a reconnaissance exercise would show. Thus, businesses need to invest in ethical hackers as they provide the best defensive strategy with an offensive approach, handle sophisticated attacks as it is difficult to detect the notorious activities of a hacker in the absence of an intelligent intrusion detection system and reduce losses. Previously, an ethical hacker informed Homebrew, a popular, free and open-source software package management system regarding its flaws. He accessed their Github repository in under 30 minutes to prove that if he were a malicious actor, he could easily make a small unnoticed change to the code to place an application on any machine that installed it to maliciously victimize the users. Furthermore, a security researcher revealed a vulnerability in a WordPress plugin that leaked the Twitter account

information of users. Elliot, the ethical hacker, informed Twitter of this vulnerability on December 1, 2018, prompting Twitter to make the accounts safe again from the security lapse.

Government Involvement

Moreover, hacking is very prevalent among the general public and in politics as well. Several whistleblowers violated privacy policies to save citizens from their own government, and their actions influenced how organizations understand privacy. For instance, the British Columbia Civil Liberties Association recently used illegal methods to prove and sue the Canadian government for illegal domestic surveillance. The group said Canada's intelligence agency, known as Communications Security Establishment Canada (CSEC), is collecting personal information on its citizens. In addition, in Edward Snowden's case, wherein he fraudulently hacked US government networks to establish the government was monitoring its citizens, there was widespread public awareness and opposition to government mass surveillance, leading to judges declaring parts of these programmes illegal. Before December 2014, the legal authority that regulates the secret services in the United

Kingdom considered portions of the sharing of intercepted communications between the United States and the United Kingdom to be unlawful. Furthermore, in May 2015, a court of appeals in the United States found that the mass collecting of US phone records was illegal.



Furthermore, a new examination of documents detailing the US National Security Agency's SKYNET programme shows that SKYNET carries out mass surveillance of Pakistan's mobile phone network and then uses a machine-learning algorithm to score each of its 55 million users to rate their likelihood of being a terrorist. Most of the 2,500 to 4,000 people killed by drone strikes since 2004 have been classified as "extremists" by the US government but as the victims' names are being identified by sources such as Bureau's researchers in Pakistan and other organizations, including Amnesty International, Reprieve and the Centre for Civilians in Conflict, most of them may have been innocent. As well, in 2017, a website run by the Jharkhand Directorate of Social Security leaked the personal

details of over 1 million Aadhaar subscribers, and cybersecurity agencies and the Supreme Court have expressed concerns over its security, especially in view of the government's plans to link it to every aspect of citizens' lives. In India, Aadhaar is a 12 digit individual identification number issued by the Unique Identification Authority of India on behalf of the Government of India and thus holds a significant value in storing private data. The number serves as a proof of identity and address, anywhere in India.

While insurers are attempting to manage their risks by requiring clients to adhere to cyber policies (such as HIPAA and PCI DSS) in order for their claims to be approved, they can only do so if businesses believe their services are feasible. With the insurance rates increasing, smaller firms with low budgets may feel that the coverage is not worth the cost if insurers increase rates too much, making them more vulnerable to cybercrime. As a result, government officials seeking to improve organizations' cyber postures may need to either mandate certain best practices – rather than relying on the promise of insurance coverage to incentivize voluntary compliance – or intervene to help insurers by helping them in providing affordable coverage more financially attractive.

Conclusion

As a result of these security breaches, technology corporations and software developers are including privacy into their products, and businesses are standing up to governments. World's largest tech companies including Apple, Facebook, Google, Microsoft, Twitter and Yahoo, have launched a campaign calling for an end to the bulk collection of personal data. For instance, Microsoft rolled out Microsoft AccountGuard & Defending Democracy Program that aimed at protecting "organizations that underpin democracy" from hacking and disinformation campaigns. Furthermore, Google launched Project Strobe & Advanced Protection Program was created for high-risk users including "journalists, activists, business leaders, and political campaign teams to ensure their systems are secure and can defend any potential threats.



Apple, as well, announced a partnership in 2018 with Cisco, Aon, and Allianz to enhance and work in conjunction with their networking, ransomware, and security capabilities to avoid any malicious attacks that could expose tons of public data.

The hacking economic model reveals the various objectives for cybercriminals to influence businesses' decisions, exploit administrative flaws, and alert citizens and businesses about cybersecurity illiteracy. Companies require ethical hackers even with certain testing tools, and recent political events highlight the need for privacy and provide an incentive for businesses to hire ethical hackers. While the application of economic theory does a good job explaining why hackers respond the way they do, it neglects certain assumptions and driving forces, such as psychological motives and economies of scale in offences that are less common in traditional (offline) criminal behaviours but tend to underscore hacking in cyberspace.

Waterloo Business Review aims to use the Alumni Insights initiative to gauge experiences and takeaways from past students and curate them into unique articles, ultimately supporting our mission to

Educate, Engage, & Empower.

Alumni Insights

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A School of Accounting and Finance Student-Run Initiative

Alumni Insights

A Seat With Ambiguity

An Interview With Alumnus; Mike Hejmej



Illustrated By:
Zia Baig & Diane Xiong

INTERVIEW: Mike Hejmej, Pierogi House

Waterloo Business Review had the privilege of sitting down with alumnus Mike Hejmej over the summer to speak to him about his experiences, as well as his time at the University of Waterloo (UW) and Wilfrid Laurier University (WLU). Mike graduated from the joint Mathematics and Business Administration (Math/BBA) program in spring 2017 and is currently the Chief Executive Officer at his restaurant chain, Pierogi House, based in Kitchener. He previously worked as a Consultant at Bain and Company in their Toronto office upon graduating from the University of Waterloo and Wilfrid Laurier University.

Early on, Mike was unsure as to what he wanted to pursue for post-secondary education but sought a program that would give him a strong technical background that would also teach him about the real-world applications from his learnings. This led him to the joint Math/BBA program as Math was a challenging foundational discipline with endless real-world applications, while the business component allowed Mike the flexibility to apply and understand those applications through various means. Through his co-ops, Mike was able to narrow down, little by little, his professional focus and passion. Mike would go on to

complete valuable finance internships but soon realized he wanted to continue exploring different roles until he found his ultimate passion.

Through extracurricular involvement and case competitions, Mike found his passion for business and problem-solving which later fueled his interest in management consulting. He sought a career where day-to-day tasks and projects were rigorous, yet also ambiguous - calling on skills that he had developed through experiences during undergrad. Having achieved success in undergraduate case competitions, Mike thrived under rigorous case-based environments. Soon after, one of Mike's mentors would introduce him to the world of consulting, explaining that consulting would be a place where he would get to solve opaque problems with no two days being the same. Mike recounted his initial reaction to management consulting as: "that sounds way too good to be true" and was thankful it ended up being the perfect fit for him. Upon graduation, Mike started full-time at Bain & Company where he worked for four years with Private Equity clients & Fortune 500 companies from across the world.

ALUMNI INSIGHTS

Along the way, and by virtue of working with executives on projects which require high-level strategic thinking, Mike would have a lot of takeaways. Working at Bain, Mike went through a lot of learning - attributable to the processes that had long been established at the firm.



As a newcomer at the firm, Mike recalled a manager sitting him down early in his journey to pinpoint areas where he needed improvement. Having his manager credit him for the tools and skills he had, Mike was motivated and determined to succeed by actively embracing learning through failure. Mike recalled projects where he and his teams would work tirelessly on cases, only to learn towards the end that the approach or finish wasn't quite right. These learnings and constant trials with errors reinforced Mike's comfort level when faced with uncertainty. Mike credits his learning at Bain as a key driver in his success and growth as a professional during his four years and said, "Failing at a task yourself first is the best way to learn, you'll never learn without trying to learn by yourself".

During his time at Bain, Mike also had the

chance to work on a lot of commercial due diligence projects within the firm's Private Equity Team. At Bain, the work on such projects consisted of working on later stages of deal processes to help clients (often Private Equity firms) validate their investment theses by performing deep dives into a given firm, industries, markets or even deals. These projects often would be driven by one or several underlying questions that when answered, provided key information in order to make informed investment decisions, or otherwise help to realize opportunities for value creation. For Mike and his clients, there was a lot of learning and growth. Mike reflected and said, "If I look at the beginning and endpoint of each [case], it's a completely different Mike." Similarly, by evaluating factors across competitive moats, strengths and weaknesses, integration, and synergies - clients and investors would be able to make appropriate and informed decisions when deploying capital. Highlighting one of his projects, Mike had the chance to work with one of the world's largest tech companies and was given a lot of control because of his past experience and results. The client sought support regarding a global transformation, and Mike was tasked to manage the governance behind the Americas division, helping the company drive the transformation across the region.

"Having the vertical myself, the biggest learning for me was how crazy a company is behind the scenes at the highest level."

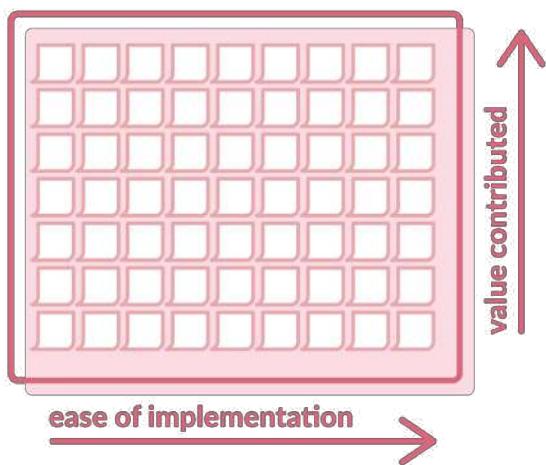
Having worked on large-scale projects during his time at Bain and seeing the magic behind the scenes of leading ventures, Mike continued to apply his expertise to the next chapter of his career - Pierogi House. From the get-go, this was great as it allowed him to connect two of his deepest passions - business and food. Working through the project, Mike was fascinated by the business model and sharply identified key areas to drive and increase value - coming up with an early investment thesis he would soon, step by step, test and validate. He believed for there to be a ton of "low-hanging fruit" that can strengthen the business, large room for growth with its competitive edge, and a great franchise model. Fast-forwarding a few years and then finding himself, and much of the world still in the onslaught of the COVID-19 pandemic, Mike knew he needed a change and Pierogi House was a business he was growing more and more curious about. Eventually, the opportunity to gain majority ownership of Pierogi House would present itself in July 2021 and Mike, with a team of supportive investors, would become an owner of the business. One of those investors includes

his father. For Mike, the opportunity to gain ownership of a strong and well-positioned business while working with his family was everything he could have wanted, and a new direction for his career he is very passionate about and equally excited for.

Now as the CEO of Pierogi House, Mike finds himself applying the skills he obtained at Bain, like the 80/20 rule, at the restaurants. He highlighted that there are so many ventures the business could be taking on at this time which is why they had to plan and prioritize accordingly. As an example, Mike recounted the first week at Pierogi House, where a big board was used to visualize, and eventually apply the 80/20 rule to help prioritize upcoming initiatives. Eventually, the board would be filled with 80 to 100 sticky notes, each written with an initiative which would be organized into a matrix. On the y-axis, the team measured the ease with which these initiatives could be achieved, while the x-axis illustrated how much value they would bring. As weeks went by, the matrix grew larger with more and more ideas and initiatives being added. "Our entire mentality in the team has been 80/20 in the last two months". After constructing the matrix, Mike and the team started with its upper right corner which contained the initiatives that were the easiest to implement and brought the

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highest value. Afterward, the team continued to tackle the initiatives requiring medium effort but offered high value. Quadrant by quadrant, the team is now beginning to shift focus to the ones that are very difficult to achieve but could push the business forward.



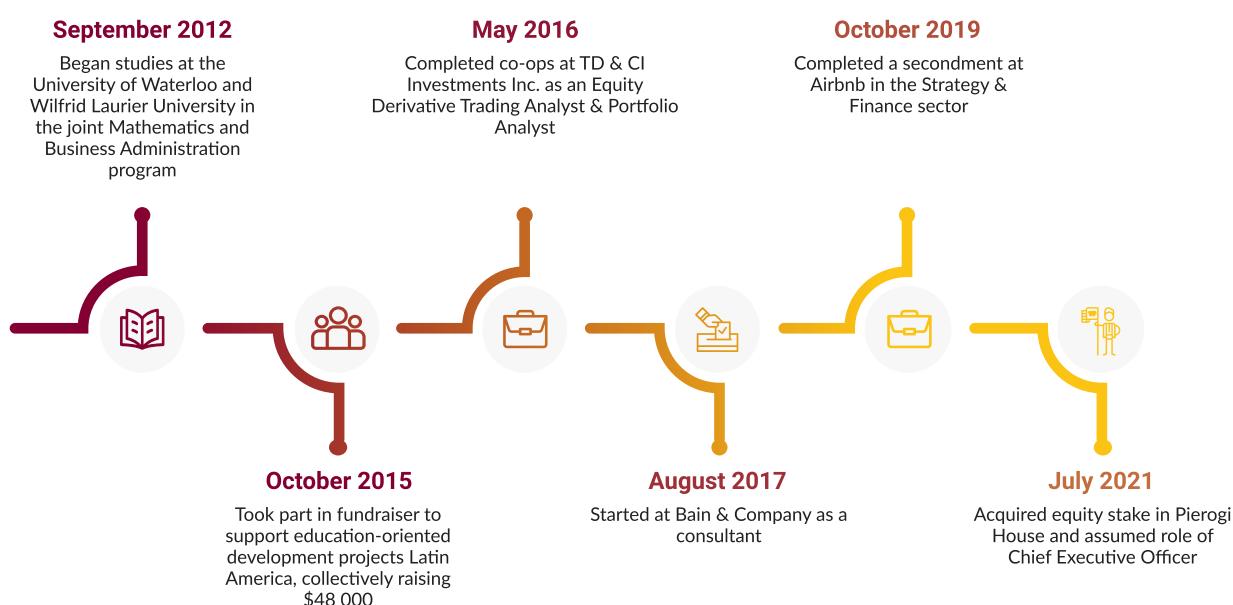
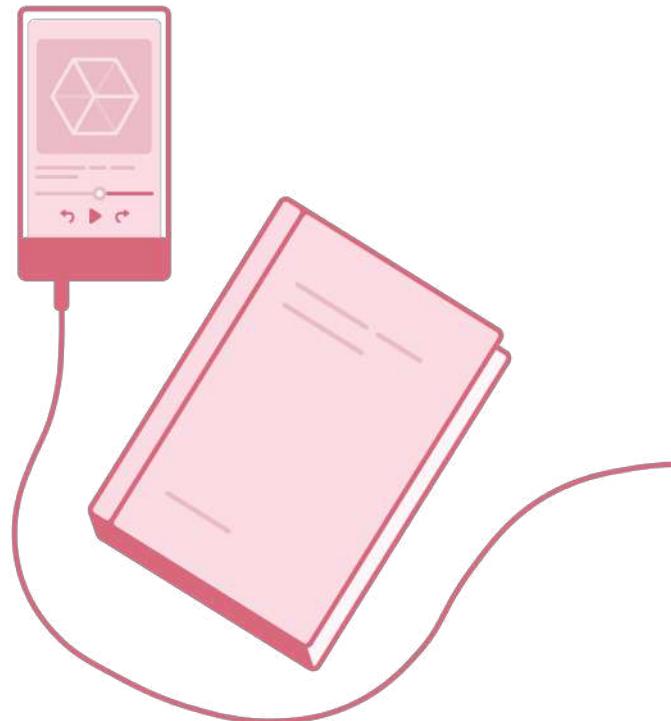
"Every day, priorities change - something gets added, something gets taken away." Mike finds that this strategy has helped accelerate the growth of his company and has helped bring focus to what brings the most value and works directly towards the vision. "We've seen such a big impact in the business and it's just incredible".

Achieving milestones one after another, Mike and his team continue to expand Pierogi House with their unrivalled recipes. They are especially excited about their recent Brisket Pierogi launch with Lancaster Smokehouse, based in Kitchener. On top of the new addition to the menu,

the team is also looking forward to three new locations this year, responding to the high demand from their customers. Local partnerships have been one of the success drivers for the business and Mike believes for it to be an important piece of the puzzle in Pierogi House's future endeavors. One of Mike's macroeconomic ideologies plays a role in his outlook on the business. He suggests the concept of aggregation and disaggregation entails the process of the world shifting from a concentrated economy into disaggregated, or relatively scattered business forms, every few decades. That is, before technology, there were restaurants that allowed customers to source their purchases from their own community. Then, retail giants came along and aggregated restaurants and retailers to conveniently become customers' go-to's for purchases in one stop. "Now, thanks to technology, we are going back into a disaggregated economy because we can see reviews. It has become easier than ever to determine the quality of a good by inspecting others' reviews on them through the internet and community."

Looking back at his time in undergrad, and so far through his career, Mike felt grateful that he was able to discover his passion for business and find mentors from whom he was able to receive advice, and guidance.

Beyond academics, Mike encourages students to embrace external learning. "Books and podcasts - they changed many of my perspectives on life." Podcasts like Robinhood Snacks Daily, How I Built This, Business Breakdowns..." are just some of Mike's recommendations for students who are looking to gain in-depth knowledge in the entrepreneurial world. Mike also puts great emphasis on learning from people, taking the time to find the right balance for you and a lifestyle that is sustainable will serve students well in the long run - it is never too early to start.



Alumni Insights

Looking In The Past To Building The Future

An Interview With Alumnus; Stephanie Han



Illustrated By:
Zia Baig & Diane Xiong

INTERVIEW: Stephanie Han, Amazon One

Waterloo Business Review had the privilege of sitting down with alumnus Stephanie Han over the summer to speak to her about her experiences, as well as her time at the School of Accounting and Finance (SAF). Stephanie graduated from the Accounting and Financial Management (AFM) and Master of Accounting (MAcc) programs in Spring 2011. She would go on to graduate from the Master of Business Administration (MBA) program at the Wharton School of Business in Spring 2018. She is currently a Senior Product Manager at Amazon One in Seattle and previously completed roles within audit, alternative funds, and product management.

Early on, when beginning her post-secondary education at the University of Waterloo, Stephanie had a strong interest in accounting. This led her to the AFM program as it had a strong technical background which combined with co-op, would prepare students well for the world of accounting. Stephanie would go on to complete co-op placements at Mercedes in their accounting and audit department. After graduating from the MAcc program in 2011 and completing the Uniform Evaluation (UFE), she started her full-time career at PwC in their Bermuda office,

where she had the opportunity to work as an Assurance Associate in the Financial Institutions group. Within a year, she was promoted to Senior Associate and stayed with the firm for 3 more years before ultimately leaving to join SS&C Corp as an Alternative Fund Manager.

At SS&C Corp, she was able to leverage her experiences from PwC by better understanding the nature in which her clients operate. Through applying both technical and interpersonal skills, she found great success in her role and was able to serve the mandates of clients well - by helping to reduce investment and operational risk year - round. After getting the chance to experience private accounting for 2 years, Stephanie realized she wanted to take a step back from accounting and pursue an MBA to explore different career paths.

When deciding which business school she wanted to attend, Stephanie considered multiple factors with regard to career aspirations, as well as the network she would have the opportunity to build. Despite the large opportunity cost associated with an MBA, she knew her heart was no longer with accounting after experiencing two aspects of the field and

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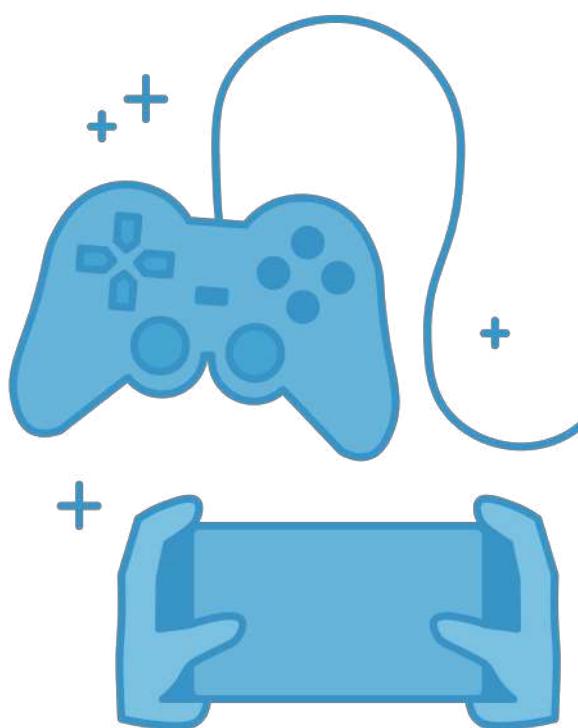
wanted to change paths. She knew going in that her main goal was to learn more about the world around her and meet people from different walks of life in order to broaden her overall perspectives, learnings and understanding.



With all this considered, Stephanie decided to attend the Wharton School of Business at the University of Pennsylvania with the goal to find a fresh start.

With a variety of career options made possible and enticing for her to explore, from investment banking to consulting - Stephanie quickly realized she was uninterested in traditional MBA paths and wanted a long-term path where she was passionate about the work she did, the people she was surrounded by, and the long-term impact she was able to deliver.

She sought an intersection between her love for gaming and technology, which culminated in a summer product management internship at Electronic Arts (EA) in the San Francisco Bay Area. During her time in the Core Mobile Gaming group at EA, Stephanie had the opportunity to work on titles such as Apex Legends and Plants vs. Zombies. It was this experience that ultimately shifted her career trajectory towards product management.



While at EA, Stephanie was exposed to a world completely different to her previous experience within accounting. Although there were some applicable transferable skills that she developed in previous roles, the bulk of the work was opposite to what she'd previously been exposed to.

Stephanie explained that the goal in accounting is to inspect the historical financials and ensure there aren't any discrepancies in the reported figures and reality. In product management, Stephanie saw there weren't many comparisons that could be made, but rather she was building something new from scratch. This experience not only challenged her critical thinking skills, but also made her realize how much she enjoyed owning a product and controlling its development.

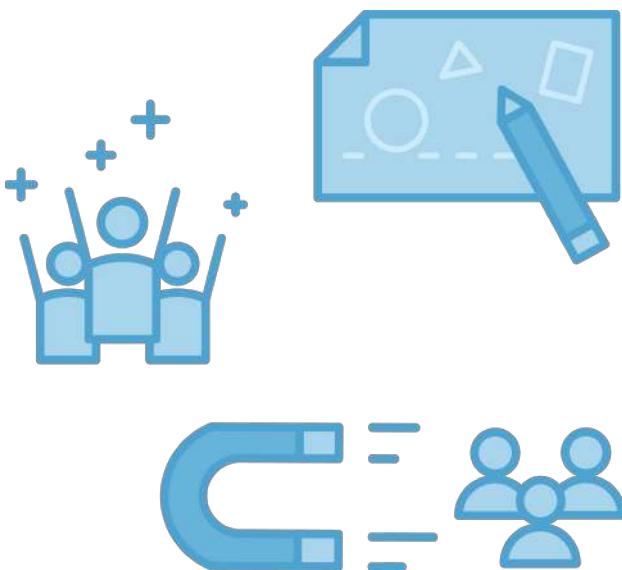
Having had such a positive experience combining both her creativity and problem-solving skills at EA, Stephanie knew that working in product management was how she wanted to explore her new passions. Stephanie explained that an ideal career for her would need to consist of the opportunity to work with intelligent individuals and truly make an impact through applying her creativity and collaboratively developing new, innovative products. To her, "working with smart people and building cool stuff" was something she significantly emphasised when considering her next career move and it only made sense that she chose to work at Amazon, one of the most innovative companies in the world, for her full-time role after graduating from Wharton.

At Amazon, Stephanie has had a large hand in building Amazon One, which is an exciting new product looking to change how consumers interact with loyalty cards, payments and accessing their accounts, while ensuring their identity is secure. Amazon hopes Amazon One can be an innovation that makes everyday activities effortless through providing consumers with increased convenience. Amazon explained, "Amazon One is a fast, convenient, contactless way for people to use their palm to make everyday activities like paying at a store, presenting a loyalty card, entering a location like a stadium, or badging into work more effortless. The service is designed to be highly secure and uses custom-built algorithms and hardware to create a person's unique palm signature." This technology is already being implemented in several Amazon Go stores and will be a greater part of the Amazon ecosystem in the near future.

Since getting her first taste of product management just over 4 years ago, Stephanie has had the chance to reflect on her career within the space. To her, the key to success as a Product Manager is blending a mix of core skills in a Product Manager's toolkit with being a "scrappy" individual who has a strong work ethic. She believes customer acquisition skills, the

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ability to prototype and being able to motivate a team are all crucial skills Product Managers need to have within their skillset. Having dealt with failures when building products, she says the most crucial learning is to own one's mistakes when they occur and learn how to pivot going forward.



Thinking back on her journey as a SAF student, Stephanie highlights transferability of skills as the biggest takeaway in her career thus far. At PwC Bermuda, she understood the importance of accountability and how to act professionally in a work environment. As a manager at SS&C Corp, Stephanie learned how to effectively allocate her time in order to balance multiple projects and fulfill her various responsibilities. Within her current role in Amazon, she's enhanced her ability to effectively delegate and manage not only her own workflows, but also the workflows of others. Through it all, she recommends that current SAF students use the co-op system to explore and gain exposure to different career paths to find what they are passionate about.

September 2007

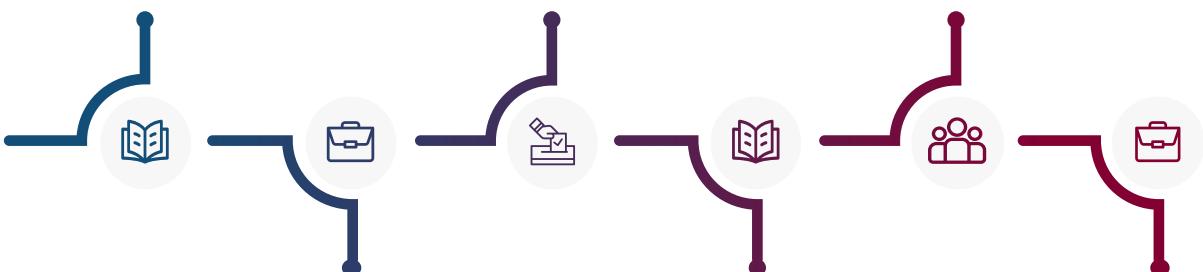
Began studies at the University of Waterloo in the Accounting and Financial Management program

July 2014

Started working at SS&C Global as an Alternative Fund Manager

May 2017

Began internship as a Project Manager intern at Electronic Art in the Core Mobile Gaming Group in San Francisco



October 2011

Started working full-time as an Assurance Associate at PwC in the Financial Institutions Group in the Bermuda office

September 2016

Commenced Master of Business Administration (MBA) studies at The Wharton School

July 2018

Started working full-time as a Product Manager at Amazon in the Amazon One group in Seattle



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A School of Accounting and Finance Student-Run Initiative