Submitted to OCAD University in partial fulfillment of the requirements for the degree of Master of Design in Strategic Foresight and Innovation

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SELLER BEWARE

THE FUTURES OF CONSUMER CULTURE



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Toronto, Ontario 2019

Seller Beware: The Futures of Consumer Culture by Kate Kudelka

Submitted to OCAD University in partial fulfillment of the requirements for the degree of Master of Design in Strategic Foresight & Innovation Toronto, Ontario, Canada, April, 2019 © Kate Kudelka, 2019

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ABSTRACT

The values of an industrial society are deeply rooted in Consumer Culture. Now, as a result of the Fourth Industrial Revolution, we are beginning to transition into a post-industrial society. That evolution will bring a shift in societal values, including our reliance on consumption as a primary means of self-actualization and status projection. Recognizing that trends in goods and services consumption are a result of the economic, technological, and social fabric that they inhabit, this paper explores the futures of consumer behaviour for senior management and industry consultants interested in understanding the consumer landscape ahead. By examining the history of consumer culture, we can better understand the societal function of consumption in the present. By examining the present, we can identify the markers of the societal evolutionary shift that is upon us. By exploring the potential futures, we can determine the business opportunities that may arise and make active decisions about the priorities for our organizations in an economy with evolving consumers values. Many of the systems that have thrived over the past 200 years are incompatible with the Fourth Industrial Revolution. Short-term interests cannot be prioritized over longterm vision, but long-term vision cannot be realized without short-term survival. By providing a picture of the barriers to economic participation that are likely to emerge as we fully transition into the Fourth Industrial Revolution, we can make more conscious choices about how we respond to them - both as individual organizations and at a societal level.

KEYWORDS

Consumer Culture, Post-Industrial Society, Fourth Industrial Revolution, Design Futures, Societal Values, 2x2 Matrix, GNB Matrix, Scenario-Building, Windtunnelling, Trend Scanning, History of Consumer Culture, "Future of Consumption", Evolving Product, Evolving Consumer, Evolving Marketplace, Digital Labour Adoption, Ownership Economy, Access Economy, Gig Economy, Future of Work

ACKNOWLEDGEMENTS

Matt Swift, Michele Mastroeni, Zan Chandler, Stephen Davies, Gina Page, Louise Slobodian, Gary Hanrahan, Thelma Kudelka, and the Telescope Collective: Merwad Abdallah, Fran Quintero Rawlins, Lesley Foulds, Ziyan Hossain.

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INTRODUCTION

From the beginning of the first industrial age, economical progress has been intrinsically entwined with the evolution of consumer behaviour. In addition to developing the mechanical tools that enabled the production of goods and proliferation of services, progress also required the development of a consumerist society. In order to sustain the economic growth, a culture was formed that reshaped our values and expectations, tying them inexorably to the accumulation of tangible goods. The first three industrial revolutions reinforced this model of human behaviour.

The fourth industrial revolution, however, is changing the rules. The economics of scarcity that prescribed values in the 20th century are being rewritten with the rampant spread of digitization. New business models are breaking old rules and blindsiding their legacy competition. The uncertain future of work is dismantling old patterns of consumer behaviour, and as a result, the fundamental understanding of capital itself is changing. We are in a new technological "Wild West", where change is happening at a

How might we better understand the nature of our society's relationship with consumerism, in order to anticipate how it is shifting in the rapid evolution of our technologies and economic systems?

breakneck pace and governments and other legacy institutions are struggling to keep up, let alone compete.

But evolution doesn't happen in a vacuum. As with the earlier industrial revolutions, for change to take hold, it needs to build a consumer base. To survive, it nurtures its clientele to become accustomed to the new world order. As such, our consumerist culture is in flux: not disappearing, but definitely evolving. For businesses to thrive in the emergent economy, they need to understand their changing audience. This inquiry is intended to explore the potential futures of consumer culture, and provide a set of recommendations for businesses looking to remain relevant in a rapidly changing landscape.

This is not about predicting the future. This is about understanding how we got here, what is currently propelling this shift, and how this evolution is likely to affect the way we do business. The economy is changing, and we, as both consumers and purveyors, are changing with it. Understanding the key drivers underpinning that change can allow us to ride the wave of revolution, rather than be swept under by the unstoppable rush towards the future. Indeed, by recognizing the opportunities the emerging future holds, we can be a part of shaping it.

Timeframe:	10-15 Years
Geographical Scope:	North America (but with an understanding of the global impact)
Audience:	C-Suite, Strategic Consultants, Retail Business Leadership

A Note on Investigating Cultural Change

As this project is about understanding an evolution of culture, a slightly unorthodox futures approach was required. Rather than starting with the signals of the future in the present, instead we needed to look back to determine the underpinnings of our current culture through understanding its roots. By recognizing the original emergence of consumerism and the needs that it satisfied for us in the first three industrial revolutions, we can better comprehend the function it holds in our society today. In looking forward through our futures work, we can then extrapolate how those functions might be satisfied in the future, given the emergent changes we see in the present.

INTRODUCTION

A Roadmap to Seller Beware

Understanding the Past

The first section will explore the past, through a reflection on the causes of our consumerist society and an understanding of the underlying principles that lie at the centre of our consumption culture.



The second section deals with understanding the present, and the shifting forces that are disrupting old societal patterns and making room for new patterns and models to surface by exploring emerging trends and indicators of change that are impacting our evolving economy.

Imagining the Future

The third section will expand these signposts into projections of potential futures and the potential opportunities and challenges that they present.

Shaping our Tomorrow

The final section will explore the possible changes to the nature of our consumerist society that may be resulting from the impact of the Fourth Industrial Revolution.

Fig. 1 - A Diagram of the Overarching Structure of this Investigation

A GLOBAL CONCERN

The World Economic Forum has identified the Future of Consumption as one of the key areas of concern. The following is excerpted from their Systems Initiative exploration:

Shaping the Future of Consumption - World Economic Forum

In order to achieve the future that the System Initiative envisions, navigating through the uncharted territories of digital disruption will give rise to critical challenges that will need to be addressed:

» Managing the evolution of key demographic shifts around the world including the rise of the millennial generation in parallel with a growing aging society, and the rise of the middle class in emerging economies in tandem with increasing income inequalities.

» Meeting consumer demand for convenience, instant gratification, personalization, services and experiences over products, or access versus ownership.

» Embracing ground breaking technologies, such as Artificial Intelligence (AI), Internet of Things (IoT), Autonomous Vehicles/Drones, and Robotics, and thereby managing the massive transformation of business and operating models that will ensue.

» Ensuring inclusive value creation by addressing societal challenges (divides such as young versus old or rural versus urban, data privacy and security, and new skills and employment models to support digital enterprises of the future) while also establishing environmentally-friendly solutions to help communities prosper and businesses grow. Forum's platform for public-private collaboration presents leaders with the opportunity to tackle these challenges head-on.

METHODOLOGY

This project is broken down into four major sections: The Past, The Present, The Future, and The Path Ahead. This methodology section will be broken down in a similar structure. While this project could have been undertaken using a variety of methods or approaches, I had two propelling intentions while choosing the methods to undertake this study.

» If we want to understand where we're going, we need to take the time to understand where we've come from and its influences on the structures of our society.

» If we want our work to be relevant, it needs to reflect the capacities of our audience, not just our own. Sometimes a simpler method is most appropriate because of its accessibility.

These will be explored in more detail below, as they become relevant in the methodologies chosen.

The Past - Literature Review & Analysis

When starting my research into the Fourth Industrial Revolution, I was struck by how integral our societal values system was to the developments that were emerging. I realized that, in order to understand the emerging changes, I needed to understand the systems from which they were emerging. However, In order to understand those systems, I would need to understand whence they came. All of this led me back to delve into the last major societal shift, exploring our evolution from an Agrarian Society to an Industrial Society.

My literature review covered a wide range of scholars, including historians, economists, political writers, and academics, and studied the evolution of the past 200 years from three particular perspectives: innovations in technology, emergent trends in our economic systems, and the resulting impact on the fabric of society. This framework emerged from an analysis of the industrialization of humankind, the gravitation towards consumerism, the precursive factors of technological innovation, and the impact of our economic systems on determining societal priorities. The historical literature review was drawn from approximately 30 sources. For this investigation of the past, these sources were largely books written by scholars with particular expertise in either economic, technological, or Western societal history. The publication dates ranged from 1940 to 2019.

The process of this review was somewhat exploratory. While I moved chronologically through history, starting with the precursive factors that led to the First Industrial Revolution, the focus of my research evolved with the new knowledge that was discovered. My original project was not focused on Consumerism, but rather a broader economic perspective of change. It was only through my research that I came to understand the reverberating impacts of this critical thread of inquiry. My eventual research question did not emerge until the



Fig. 2 - An illustration of the narrowing of my research focus over the course of my literature review.

bulk of my historical and present-day research was complete, and I had to revisit my literature review to address gaps in my knowledge, once my direction had been finalized. The process by which I identified and satisfied these knowledge gaps is explained in the next paragraph.

The diagram below illustrates the principles of my exploratory approach to my literature review (Fig. 2). While the three broad areas of study were an investigation of the change in societal values, technological innovations, and the evolution of economic models and priorities, to understand their impact both on a macro and micro scale, I needed to explore both the outward and inward-facing facets of their relationships with each other. My investigation covered a wide spread from the surface-level systemic effects on a macro scale of political, technological, and economic influence to the micro impacts on employment systems, family & social groups, and, eventually, individual's self-perception. Through this process, I was able to ensure that I had a holistic understanding of the impacts of these three categories on the ongoing evolution of society throughout the first three industrial revolutions. The model is adapted from the environmental scanning approach of Joseph Voros, who based his approach on the work of Ken Wilbur, Don Beck, and Chris Cowan (2001).

Generally speaking, a given subject might be explored from multiple perspectives. For example, the formation of the early trade unions might have been addressed differently from the perspective of a historian and an economist. By looking at these related developments through the lens of multiple experts, I was able to get a more nuanced understanding of their interrelated impacts on consumer culture. In terms of process: once I had



Change in Societal Values

Fig. 3 - An illustration of the guiding principles of my exploratory literature review (Modelled after the Environmental Scanning 4 Quadrant approach of Joseph Voros).

determined that a subject was potentially relevant to my overarching topic, I would search for references to the same phenonmenon in the work of authors who specialized in a different field of research. By combining and comparing these reports, I was able to develop a clearer understanding of how the subject would fit into my multi-faceted approach.

During this research process, I came to understand the extent of the interweaving between society, technology, and economy. When I finally arrived at the Fourth Industrial Revolution, I realized that consumerism represented a deeply rooted societal value that would need to be addressed in order to understand how our behaviours might evolve moving forward. This led to my development of the key "Lessons from Consumer History" that reflect the positioning of consumerism within our 21st Century lives. With this understanding in hand, I was able to move forward into an investigation of the current signals and trends in society, technology, and economy.

The Present - Trend Scanning & The Development of Key Uncertainties

Concurrent to uncovering the historical roots of our consumerist culture, I began to collect signals of change emerging from the here-and-now. Using a combination of undirected viewing and informal searching which evolved into an intentional conditioned viewing and formal searching (Choo, 1999), I cast a wide net for signals of evolution from the research web indicated in the diagram on the previous page (Fig. 2). I was also looking for signals that related directly to the consumerist model of society, including both steps away from that cultural paradigm and escalations of it. For the most part, these were sourced from academic journals, traditional news media, and pop culture.

Having collected a significant number of signals, I started to analyze them to determine clusters of similar signals, and eventually settled on 34 trends across three categories: The Evolving Customer, The Evolving Marketplace, and The Evolving Product. With these data sets, I was able to start analyzing for recurring themes, underpinning constants, and incidents with particularly resonant impact. From these I uncovered the drivers and uncertainties upon which the remainder of the project would be built.

When determining which dimensions of uncertainty would form the basis of the project moving forward, I considered the query set out by Ogilvy and Schwartz, "Which forces are most likely to define or significantly change the nature or direction of the scenarios?" They continue, "This assessment should be measured by two criteria-how uncertain are you of its outcome and how important is it (2004)." Initially, I had narrowed my uncertainties to a set of six:

- » The Rate of Digital Labour Adoption
- » Consumer Preference for Ownership v. Access
- » Consumer Prioritization of Data Privacy
- » The Transition from an Economy of Scarcity to an Economy of Abundance
- » Government Intervention in Corporate Monopolies
- » Intellectual Property is Maintained/Made Irrelevant

Upon deeper exploration, the final three were discarded for various reasons. Primarily, these were either because A) the expected effect of the uncertainty would likely take place outside of the 10-15 year timeline that the project was operating within, or because B) the chance of a significant impact would depend on a specific, significant event taking place that would cause an aberration from the current trajectory of our societal development.

The Future - GNB Matrix, Scenario-Building

Given that the intended audience for my work is C-Suite Senior Management and industry consultants, I knew that maintaining credibility would be a chief concern. Engaging in a foresight practice that relied on too much individual judgement or which relied on too complicated a methodology would be potentially distancing from the professional practice of my desired audience. As such, my requirements for a foresight method were that it:

» Be simple to execute and straightforward to explain, and

» Provided a small number of resulting scenarios that could be used as demonstrations of the practice, rather than providing an expectation of accuracy



Fig. 4 - Initial Scenario-Building Brainstorm for Uncertainty Quadrants

With these criteria, I settled on the GNB matrix (2x2 matrix), as this clearly met the requirements I had set out above. As Bishop, Hines, and Collins describe in their paper on the various types of foresight practice:

"The reason for using scenarios in the first place is the uncertainty inherent in predictive forecasting. We never have all the information; theories of human behavior are never as good as theories of physical phenomena, and finally we have to deal with systems in chaos and/or emergent states that are inherently unpredictable. Scenarios [which utilize dimensions of uncertainty], then, are constructed by first

7 INTRODUCTION

identifying specific sources of uncertainty and using those as the basis for alternative futures, depending on how the uncertainties play out (2007)."

They describe the process of using the GBN Matrix:

"The matrix is based on two dimensions of uncertainty or polarities. The four cells represent alternatively the four combinations of the poles of the two uncertainties, each of which contains a kernel or logic of a plausible future. Each kernel is then elaborated into a complete story or other presentation, and the implications for the focal issue or decision are discussed (Bishop, Hines, & Collins, 2007)."

Having extrapolated these four images of the future, based on the combinations from my two key uncertainty axes, I was able to postulate some potential opportunities and challenges for each future. By structuring these by industry sector, I hope to demonstrate the ripple effects of Consumer Behaviour throughout the economy, rather than proceeding with a myopic view that only took into account the direct implications on the retail sector.

The Path Ahead - Windtunnelling

Having constructed the images of the future, I wanted to be able to provide some constructive knowledge that would help companies navigate the identified futures. In order to approach the analysis with a systematic and sufficiently rigorous approach, I made the decision to use windtunnelling as a means of being able to understand how our consumer values might evolve in each future scenario. As Dr. Wendy Schultz explains, "[Windtunnelling] applies a consistent, and systematic assessment of actions against possible future conditions (2018)."

While this type of analysis is usually used for more short-term strategic planning, I felt that adapting this methodology would provide a mechanism to ensure a thorough and thoughtful analysis. By running the four futures through the "Lessons from Consumer History" that I had discovered in my historical research, and by instituting a 5-point colour scale which helped me to track the significance of change that would be experienced in each future, I was able to extrapolate how these foundations of consumerism might fare in each of the postulated futures. The goal of this exercise was not to predict the likely changes, but rather to identify the current values that are at risk for change. With these trends revealed, I was able to draw out the likely areas of oncoming change in consumer behaviour that organizations should expect by the end of the next decade. By identifying these changes, I hoped to provide a roadmap for companies to recognize how they will need to adapt their business models in order to remain relevant to an evolving consumer.

able to select their desired market segment, then shape their offering to match the segment of the future that they are most likely to gravitate towards (with the understanding that all four futures are likely to co-exist, in one form or another). This would be a very pragmatic approach to help create practical value for an organization from what would otherwise be a fairly academic exploration.

THE PAST

UNDERSTANDING THE RISE OF CONSUMER CULTURE

"We believe that our identities are reflected in our anti-capitalist beliefs rather than in our thoroughly capitalist behaviours as consumers and actors in the structures of capitalism (Clarke, 2017)."

Two hundred and fifty years ago, a confluence of technological progress (with inventions such as the steam engine and machine tool industry), new economic models (such as joint-stock ventures and shared capital investments by communities of land owners), and societal innovations (such as intellectual property law) led to the First Industrial Revolution. However, the Revolution did not simply result in technological advances, but rather, the emergent way of life reflected a new set of values and practices by which the Western World would be ruled. Agrarian society was disrupted and replaced with the new consumerist society.

In order to understand the results of this complex relationship between society, economy, and technology, we need to understand how it has come to be. We need to recognize how our consumerist values have been shaped by the evolution of these interwoven influences.

The following section discusses the values that have emerged around our consumerism. The intent is to better understand the impact of consumerism on our emotional and intellectual lives, as well as our physical ones. If we can understand how past enabling technologies and economic systems have contributed to the role of consumerism in our society, then we can better project how emerging technologies and economic systems may affect our societal values in the future. That is to say, when we understand the relationship between our values and their precursive factors, we can begin to understand how the current technological growth of the Fourth Industrial Revolution may impact our economic and social systems. Understanding that impact means that we can better prepare for the changes ahead.

(For the sake of brevity, what follows is the summary learnings from my exploration of the first three Industrial Revolutions. For the full exploration of the evolution of consumerism, please find "A Somewhat Brief History of Consumption Culture" as Appendix 1, page 100.")



Fig. 5 - The Intersection of Society, Technology, and Economy that Created the Conditions for the Rise of a Consumerist Society.

LESSONS OF CONSUMER HISTORY

UNDERSTANDING THE RISE OF CONSUMER CULTURE

"The values of people in industrial societies are as industrial as the products they use every day (Malaska, 1999)."

There are key lessons to be learned from our consumerist history, if we want to navigate the change in consumption habits that lies ahead. The following five "Lessons of Consumer History" are the result of a synthesis of my literature review that investigated the first three industrial revolutions. These lessons reflect the function of the emergent consumerism in the lives of the average person in Western civilization. While they are not universal truths, they are a reflection of the overall trends that developed as society became industrialized.

A Note on the Development of these "Lessons of Consumer History"

These "lessons" were developed through a review of my accumulated knowledge, recognizing the recurrent trends that were reinforcing cultural and consumption behaviours. I scoured my reflections, looking for repeated behaviours or precursive factors for change. These signals were not restricted to the act of purchasing, but included other factors, such as employment, that impacted an individual's capacity for consumption. The criteria that potential trends needed to meet was:

- 1. Signals of the consumption behaviour recurring at multiple points in history;
- 2. Evidence that the behaviour fed into a further entrenchment of consumerism as a societal model.

After determining the notable trends, I clustered them into categories and developed the "lesson" which best described their impact on societal conduct.

KEY LESSONS OF CONSUMER HISTORY

1. People consume based on their capacity to do so.

As the First Industrial Revolution taught us, Capitalism survives on the flow of resources. If your customers have neither money, nor time to spend it, they can't give it to you. **The 'Fordist compromise'**, which recognized the necessity of providing high wages with a 40-hour work week, **was instituted to help maintain a balance between mass production and mass consumption** (Cross, 1993). As Cross describes, it "won wage-earners to steady work to pay for their constantly expanding consumer needs, thus providing capitalists with disciplined workers and reliable markets (1993)." With guaranteed incomes, the average family could afford to participate in a 'keeping up with the Jones' economy. Past luxuries, such as electric washing machines and two-car households, frequently became the norm.

Companies need to be prepared to offer compensation that is sufficient for their employees to be active consumers. However, as individual organizations are just looking to deliver their investors as good a return as possible, it falls to the regulating bodies to help manage this facet of successful Capitalism. Taking the "teeth" out of government can actually work against corporate interests, in the long term. Alternately, companies need to be prepared to offer their products and services for less, or to be creative about how they monetize their offerings.

2. Labour markets eventually stabilize themselves.

In many ways, the massive shift from an Agricultural Society to an Industrial Society mirrors the change that we are entering from an Industrial Society to a Post-Industrial Society. In the mid-1800s, 30% of the agricultural labour force were replaced by automatic threshing machines (Brynjolfsson & McAfee, 2014). These workers then migrated to the urban centres to labour in factories. When old jobs die, new professions emerge to take their place. This is challenging for individuals put out of work during the period of change. However, in the long term, economies stabilize and new work emerges to replace old professions.

However, many argue that this current paradigm shift of work in the Fourth Industrial Revolution is unlike any that have come before, and will not be as simple to resolve. They argue that the scale of job displacement that digital labour will create will be beyond what the labour market is capable of absorbing. This position is not without merit. In the First Industrial Revolution, the jobs lost were low-skilled labour, and the jobs created were low-skilled labour. This time around, our current systemic change is replacing low-skilled labour jobs with jobs of the future that do not currently exist. This will be disruptive for the masses, and the transitional period will be fraught with a mismatch of education and skills to the challenges of the new working model. However, as the CEO and founder of x.ai, Dennis Mortensen, said in an opinion piece for Quartz:

"When industrialization killed the agriculture jobs that employed almost three quarters of the population, people dreamed up new ways to keep fellow humans working. We crisscrossed the country with highways. We took to the skies in flying machines. We built computers. We birthed entire industries around entertainment, healthcare, and education (2018)."

People are resilient, both as individuals and en masse. Old systems may die, but new systems will take their place. New business models replace old business models. New use of human capital will replace old use of human capital. But as long as there is human capital to be made use of, whether by genuine need or by exploitation, that capital will be employed.

3. Consumerism fills a meaning vacuum.

As Adam Smith illuminates, if we are not participating in meaningful work, our minds have no cause to stretch themselves (1776). Without this stimulus, we crave other forms of personal fulfillment. Peter Stearns expands on this idea:

"Alterations in work required compensation through consumer enjoyments. Jackson Lears has pointed to the growing unease of middle-class business and professional people as opportunities for independent entrepreneurship increasingly turned into the thralldoms of middle management or corporate law offices. With work less symbolically rewarding, consumer gains could fill the gap (1997)."

His colleague, Jackson Lears, described this human need to find means of self-actualization as such:

"By the early twentieth century [the bourgeois ethos of perpetual work, compulsive saving, civic responsibility, and a rigid morality of self-denial] had begun to give way to a new set of values sanctioning

11 THE PAST: LESSONS OF CONSUMER HISTORY

periodic leisure, compulsive spending, apolitical passivity, and an apparently permissive (but subtly coercive) morality of individual fulfillment. The older culture was suited to a production-oriented society of small entrepreneurs; the newer culture epitomized a consumption-oriented society dominated by bureaucratic corporations (2000)."

Successful product offerings tap into far more than the service they provide, but rather fill a psychological hole in a consumer's sense of self. As historian Gary Cross posits:

"A consumerist society involves large numbers of people staking a real portion of their personal identities and their quest for meaning - even their emotional satisfaction - on the search for and acquisition of goods. This characteristic is the hardest but most essential aspect of consumerism to pin down. It means that people begin to appreciate the time spent looking for consumer items as a valuable part of life and not simply as a necessary evil in a struggle for survival (Cross, 1993)."

Historian John Benson, borrowing from the scholarship of cultural historians Joan Thirsk, Neil McKendrik and Gary Cross, described the new consumer society as that "in which choice and credit are readily available, in which social value is defined in terms of purchasing power and material possessions, and in which there is a desire, above all, for that which is new, modem, exciting and fashionable (Benson, 1994)." Economic participation, however slight, is empowering, and often cathartic.

4. Consumption can solve problems, and cause them.

The Industrial Revolution also brought a marked difference in the social structures and operational models of the family unit. Historian Ruth Schwartz Cowan explains it as such:

"Before industrialization the family was the basic social unit. Most families were rural, large, and selfsustaining; they produced and processed almost everything that was needed for their own support and for trading in the marketplace, while at the same time performing a host of other functions ranging from mutual protection to entertainment.... Under industrialization the family is much less important. The household is no longer the focus of production; production for the marketplace and production for sustenance have been removed to other locations (1976)."

She argues that as their reliance on each other for the production of basic needs diminished, "families became atomized (Cowan, 1976)." That is, the social bonds that held them together began to slacken, until all that held them together as a family unit was, "consumption, socialization of small children, and tension management (Cowan, 1978)." Indeed, this fracturing of the family unit was only exacerbated by the entry of women and children into the formalized world of work. Rather than contribute to the household through unpaid domestic labour, women and children were now contributing anywhere from 47 to 54 percent of the real wage income of the household (Rose, 1992). In order to ensure the viability of the family's financial situation, "Very poor families may have continued to have large families because their subsistence depended on many wage earners (Rose, 1992)."

This raised the general income level of the average family, though it frequently required that they spend the new income on time and labour-saving domestic devices or services. With its means of production functioning exponentially more efficiently than previously thought possible, the 20th Century ushered in the potential for average citizens to access a quality and quantity of manufactured goods that was previously unimaginable.

Additionally, the eventual post-war manufacturing boom gave rise to an economic prosperity that gave individual families the means by which to participate more fully in the new consumerism.

5. Consumerism gives people the illusion of transcending their class.

When mass production provided the middle class an opportunity to spend like the wealthy, the wealthy worried over preservation of their status.

"Earning power and the ability to afford particular living standards do increasingly anchor a consumerist class hierarchy, replacing legal privilege and other prior trappings of status. But consumerism is also an open invitation, and individuals from various groups both aspire to and achieve the capacity to enjoy consumer items outside their accepted group boundaries (Stearns, 1997)."

Stearns goes on to describes the complaint of the elite of the early 19th century, that people would wear clothing that was inappropriate because it was indistinguishable from the clothing worn by those with a higher social standing. Even the consumption delivery methods fed into this new paradigm. By the end of the 1800s, the department store had established itself as the new medium for purchasing goods, one which allowed for window-shopping, and turning the acquisition of goods into an experience, rather than just a practical chore. "With these stores, people were exposed to an unprecedented profusion and variety of goods and encouraged to whet their appetites by window-shopping or strolls through luxurious commercial surroundings (Stearns, 1997)." With access to these goods, not just to buy, but also to ogle and covet, consumers could begin to see themselves actualized through the acquisition of these objects. This experience was not reserved to those inhabiting cities; mail-order catalogues gave country cousins an opportunity to share in the same product experiences as their city kin.

However, in our current context, with income inequality on the rise, perhaps this will be used as a way to maintain the illusion that the gap is not as wide as it actually is, and lessen the ire of the masses against their financial "betters". If I use the same cell phone as Tim Cook, perhaps our lives are not so very different after all.

FROM PAST TO PRESENT

As explored in the previous pages, consumerism, fueled by technology and evolving economic systems, has reshaped our societal values. These consumerist values have replaced self-actualization with consumption to fill the meaning void in our lives. They have given us the illusion of transcending our class. They have given us the satisfaction of solving problems, which were, in fact, caused by consumerism. These values have fueled themselves in a self-perpetuating cycle that convinces us that we can define our value by our consumption of goods, while making those goods less durable, less satisfying, and more accessible than ever before.

This value structure has, in turn, shaped the priorities of the Fourth Industrial Revolution. With these values in mind, let us turn our attention to the current demonstrations of these values as we explore the signals and trends of the Fourth Industrial Revolution.

THE PRESENT

UNDERSTANDING THE CURRENT CONSUMER LANDSCAPE

In order to understand where we are headed, we need to take stock of where we are. A trend scan is a tool for interpreting emerging innovations and attitudes into a meaningful and manageable structure for analysis. By surveying the developing advances that are appearing in our global landscape, we can uncover the underlying trends that are driving the changes. By understanding those drivers, we can extrapolate their long-term repercussions.

In the following pages, you will find a wide array of signals and trends that reflect the changing beliefs and behaviours of our technological, economic, and societal systems. While this collection is by no means exhaustive, it demonstrates a broad inquiry into the changing attitudes of our society. You will note that many of these trends do not directly relate to consumerism. That is because we need to understand the larger picture of our societal values in order to determine the effect they will have on specific behaviours.

The trends have been broken down into three categories: The Evolving Product, The Evolving Consumer, and The Evolving Marketplace.



Fig. 6 - The Cycle of Evolving Consumption

THE EVOLVING CONSUMER

NEW VALUES, NEW EXPECTATIONS, NEW CONSTRAINTS

With increasing financial instability, consumers are more demanding than ever.

From new goods to new business models, digitization is bringing about a new paradigm of consumerism. With access to everything, at any time and for minimal cost, consumers can both be more selective of quality and less concerned with longevity. This evolution is being driven by both the supply and demand of goods.

On the supply side, the ease of connection to digitized goods is making simple access equally as desirable as ownership. In some cases, more desirable, as ownership locks the consumer into relationship with one good, whereas access to multiple options allows for more nuanced consumption, based on the consumers' desires rather than the purveyors.

On the demand side, the new standards of the gig economy and precarious work are leaving consumers with less means and interest in locking themselves into "big ticket" purchases or long-term financial relationships. However, with the impending labour market shortage that the retirement of the Baby Boomers will bring, employers need to offer a more rewarding work experience to attract and retain quality talent. Again, perhaps reflective of the "meaning vacuum" that emerges with a change in our consumption habits, workers are seeking out employment that fulfills their need for a sense of purpose.

Beyond "stuff", consumers are looking to reinforce their sense of self and community, particularly as the "noise" of constant information streaming is constantly calling into question our place in the world.



(Attila, n.d.)



(Skeeze, n.d.)

RELATED TRENDS

- Increasing Information
 Overload: Overwhelming amounts of incoming data
 make it harder to stay current on industry trends and technological advances.
- » Rapid Technological Change: With the number of tasks being reallocated to digital labour such as robots and Al, competitive workers need the digital literacy that allows them to communicate with both human and electronic co-workers.

WORKFORCE SKILLS GAP

Rapid technological change is leaving many workers behind.

Brynjolfsson and McAfee describe the effects of rapidly changing technologies as such: "When technology eliminates one type of job, or even the need for a whole category of skills, those workers will have to develop new skills and find new jobs.... The optimistic argument maintains that this is temporary. Eventually, the economy will find a new equilibrium as entrepreneurs invent new businesses and the workforce adapts its human capital. But what if this process takes a decade? And what if, by then, technology has changed again?.... Faster technological progress may ultimately bring greater wealth and longer lifespans, but it also requires faster adjustments by both people and institutions (2014)." Over the long term, our workers will adapt to the needs of the new ways of doing business. However, in the short term, technological change is likely to leave a lot of workers in the pre-digital revolution dust.

FROM WAR TO WEB

ManpowerGroup undertakes a project with private tech industry to identify and retrain, "military veterans with engineering experience as a population with relevant adjacent skills that could be easily adapted, developed and applied (2018)." The first class graduated in Fall 2017, all participants receiving job offers, many at a payscale 2-3 times what they had previously been earning. As ManpowerGroup describes it, "By identifying a skillset with growing market demand, and tapping an underutilized segment of the workforce with adjacent skills and enrolling people with proven learnability, we unleashed their potential, developed valuable talent and changed lives (2018)."

A NATION OF NERDS

Finland rolls out a program to teach 1% of its population the fundamentals of AI, in order to help fuel the country's competitiveness in AI application (Delcker, 2019).

DISRUPTED CAREERS

Predictions made that up to 1/3 of the workforce will find themselves in need of a new job (Manyika et al, 2017).

CONSCIOUS UNCOUPLING

Accountings of job growth and productivity uncoupled in the 1990s, meaning that increases in an organization's productivity could be attained by means other than growing the workforce (Brynjolfsson & McAfee, 2014).

ENTERPRISE IMPLICATIONS

It is natural that businesses should want to take advantage of the benefits of digital labour. However, maintaining the public's good will requires ensuring that the displaced work force are adequately supported for retraining. Petitioning government for subsidies that can allow staff to retrain in these new technologies both supports them in their evolving careers and helps the business owner by ensuring that they have access to staff with the necessary training to support their new technologies.

ECONOMIC IMPLICATIONS

New technologies breed new industries. In the words of Andrew McAfee, "When industrialization killed the agriculture jobs that employed almost three quarters of the population, people dreamed up new ways to keep fellow humans working.... We birthed entire industries around entertainment, healthcare, and education (2014)." As Aaron Levie, describes it, "AI can seem dystopian because it's easier to describe existing jobs disappearing than to imagine industries that never existed appearing."



(Extremis, n.d.)

RELATED TRENDS

- Increasing Demand for Bespoke Solutions: people are used to getting the experience they want, when they want it. This includes the workplace.
- » Extended Adolesence: New employees are coming to the workforce with a distorted view of the role of their employers, often seeking far more emotional and practical support than ever.

A QUESTION OF VALUES

More employees are demanding workplaces that align with their values and purpose.

As Millennials make up a growing percentage of the workforce, they are bringing along with them a desire to more deeply integrate their personal and professional lives. In order to attract up-and-coming talent, employers need to be able to both articulate their values and purpose, and act them out in meaningful ways. This commitment to a greater purpose and tangible approach to organizational culture can set an organization apart, branding it as a desirable place to devote time and talents.

WORK/LIFE BALANCE

Companies such as Netflix, LinkedIn and General Electric are beginning to offer unlimited vacation days as a means of attracting top talent (Sine, 2017).

NOT ON MY CAMPUS

250 protestors at the University of North Carolina tore down a statue commemorating the "sons of the University who died for their beloved Southland 1861-1865". Known as "Silent Sam", debate over the statue's removal had been raging for the past 10 months, with many students and faculty frustrated by the lack of action by the administration (Vera, 2018).

A MATTER OF MEANING

The U.S. Labor Department reports that workers are quitting their jobs at the fastest rate in almost twenty years. In April 2018, 3.4 million Americans quit their jobs, double the number who were laid off in the same period. In most cases, workers are seeking higher pay and more satisfying work, and often finding it. According to the Federal Reserve Bank of Atlanta, "Job-switchers saw roughly 30% larger annual pay increases in May than those who stayed put over the past 12 months (2018)."

ENTERPRISE IMPLICATIONS

Organizations who want to compete for talent need to be willing to invest in their corporate culture. Team-building, volunteering, flexibility, and meaning are beginning to hold as much sway as salaries and benefit packages. Successful organizations will need to take a far more holistic approach to employee welfare in order to attract top talent.

ECONOMIC IMPLICATIONS

With users more able to connect with the goods and services they want, when they want them, the new standards for engagement are higher than ever before. Increasingly, citizens expect that their governments and employers will be able to maintain a similarly bespoke relationship, one that will reflect their ideals, as well as their interests.



(Free-photos, n.d.)

RELATED TRENDS

 Proliferation of Digital Labour: With robots able to perform tasks more cheaply and reliably, digital labour has arrived as a viable alternative for employers.

THE DEATH OF THE 9 TO 5

The full-time, permanent jobs of the past 80 years were the exception, not the rule.

The early industrial revolutions required factory owners to make intensive capital investments in order to capitalize on the production innovations of the day. In order to show returns on that investment, employers needed staff who were reliable. Thus, the Standard Employment Relationship (SER) was born, engaging employees with job security and competitive wages. However, this employment model only works in a climate of continuous growth. New business models require less human capital and more organizational innovation to meet similar returns, and a smaller capital investment to start and operate a business. Employers no longer require the SER to attract talent. Instead, the flexibility of the gig economy can provide the labour an organization requires at a fraction of the cost.

BLUE-COLLAR ROBOTS

Amazon makes massive capital investments into integrating robotics into their warehouses as part of their long-term competitive strategy to reduce the need for human workers (Galloway, 2018).

YOUR MONEY OR YOUR LIFE

In an attempt to not create problems with their employers, workers often find themselves risking permanent injury or dismissal. As described by a a new Canadian, "In this time, I know that there is something happening in my back. I stopped work, working, and I told the supervisor I should go home. I can't continue. Do you know what he told me? He told me, "If you will go now, I will tell [temp agency] that you have a problem in your back and they will not bring you here again!" Nobody cared (Premji, 2017)."

WHY BOTHER?

As little as half of the employment occuring in Western economies still falls under the Standard Employment Relationship. Researcher Jim Stanford explains, "As it becomes cheaper and more effective for employers to monitor employee performance and obedience through increasingly intrusive forms of technology, they face less compulsion to provide positive inducements to workers to elicit performance (like permanent work or superior wages) (2017)."

ENTERPRISE IMPLICATIONS

Organizations can take advantage of the precarious work climate by competing for top talent in untraditional ways. A key skill will be recognizing which roles require stability and the acquisition of institutional knowledge, and which roles can benefits from a more fluid workforce. Appealing to top talent in either category is dependent on understanding their needs and offering responsive compensation packages, potentially including flexible hours, shortened work weeks, higher salaries, or workplace perks.

ECONOMIC IMPLICATIONS

Healthy markets require supply and demand. However, with more instability in personal finances, consumers are less likely to spend as freely as they do in more assured circumstances. Maintaining a customer base means ensuring adequate employment in order that they might have the means of economic participation.



(Fancycrave1, n.d.)

RELATED TRENDS

- » Increased Anxiety/ Depression: Engaging with the world is becoming a more stressful proposition, intensifying mental health episodes in a greater percentage of the population.
- » Declining Public Trust: More information being posted from indescriminate sources makes it becomes harder to discern truth from fiction, leading the public to question if anyone is still worth listening to.

INFORMATION OVERLOAD

As we become more digitally connected, our mental circuits are in danger of overloading.

Navigating our world is getting more complex. Or rather, it seems as though the complexity is growing because we have more information flowing through our everyday lives than ever before. Futures researchers Kurki and Wilenius describe the changes by explaining that, "Complexity increases as a result of increased communication, and the past decades have seen the vast expansion in the amount of potential nodes to be reached within a global, technology enabled network (2016)." They further explain how our current institutions are unable to respond appropriately to this complexity because of outdated decision-making methodologies that don't take the new influx of data into account.

IO SCHOLARSHIP

A new academic discipline emerges around Information Overload which investigates cognitive overload, sensory overload, communication overload, knowledge overload, and information fatigue syndrome (Schmitt et al, 2017).

ROBOT INTERPRETERS

Businesses are increasingly adopting RPA (Robotic Process Automation) technologies which act "human", but can input & consume information from multiple IT systems (Davenport & Ronanki, 2018).

OPEN INFORMATION

Organizations like Wikipedia

and the Khan Academy have championed this open access to knowledge by providing free, accessible content this is free of advertisements, often supported by private donations.

INFORMATION PENETRATION

Smartphone penetration is above 65% across even poorest populations in developing nations and refugee camps, giving citizens increased access to knowledge, and a more prominent voice in society. It has resulted in increased entrepreneurship, created new marketplaces, spurred activism and increased access to data and communications (Wigginton et al, 2018).

ENTERPRISE IMPLICATIONS

With more information readily available, corporations will increasingly rely on Artificial Intelligence to discern the important or relevant data. Unfortunately, AI carries the inherent bias of the programmers, which could prevent pertinent data from reaching decision-makers. Companies will need to guard against this through careful quality control measures and regular AI auditing processes.

ECONOMIC IMPLICATIONS

As the quantity of information that consumers are expected to process only grows, the difficulty in discerning good information from bad get s more challenging. This uncertainty breeds distrust and apathy. A disgruntled public can be unreliable consumers, as the tensions grow and the risk of significant push-back increases. "Bread and Circuses" will be required to ensure the ongoing stability of the status quo.



(Altman, n.d.)

RELATED TRENDS

- » Long-tail Markets: Consumers are becoming used to getting exactly what they want, but smaller purveyors can struggle to match the delivery capabilities of their largerscale competitors.
- » Access Economy: Customers can access goods or services without ownership changing hands.

WHAT I WANT, WHEN I WANT IT

Immediate access is only a transaction away.

As a society, we have developed a taste for instant gratification. The National Technology Readiness Survey found that there was 58% growth in the On-Demand economy in 2017, representing spending of \$75.7 billion, compared to \$48.0 billion in 2016. This spending was the result 41.5 million consumers making an on-demand purchase, almost double the number of customers from the previous year (Bell & Colby, 2018). With more workers relying on precarious work and multiple jobs to build enough income to sustain them financially, the on-demand economy offers the flexibility they need. With major corporations such as Amazon and Apple facilitating instant purchases and immediate delivery, our baromter for reasonable access has been reset, meaning that the On-Demand economy is here to stay.

DIAPERS ON DEMAND

Amazon offers "Prime Now", where for a \$7.99 surcharge, customers can have their item delivered within the hour (Amazon Prime Now, 2018).

NOT JUST FOR THE WEALTHY

Forbes reports that, "46 percent of [on-demand service] consumers have an annual household income of less than \$50,000 (2016)." This demonstrates that consumer participation is not reserved for the wealthy as a luxury service (Alton, 2016).

GAMING THE GIG ECONOMY

On Demand options for On Demand Entrepreneurs - Apps such as "Mystro" are being developed to help on-demand entrepreneurs to game the system to ensure that they are making the most money possible at any given time (Buhr, 2017).

ZERO FRICTION USER EXPERIENCE

Successful companies such as Spiffy, a rapidly growing mobile carwash and oil change service, focus on a "zero friction" approach to user experience, building up a repeat consumer base through the ease by which customers can use their service (Mitchell, 2018).

ENTERPRISE IMPLICATIONS

In order to stay competitive, businesses need to examine their consumer channels to ensure that they are as streamlined as possible. Often, pleasing the customer can mean taking a hit to the bottom line. However, in today's climate, not pleasing the customer is an almost sure-fire way to find yourself losing customers to companies willing to go the extra mile.

ECONOMIC IMPLICATIONS

Economist Scott Galloway: "In 2015, Amazon spent \$7 billion on shipping fees, a net shipping loss of \$5 billion.... Amazon is going underwater with the world's largest oxygen tank, forcing other retailers to follow it.... The difference is other retailers have just the air in their lungs and are drowning. Amazon will surface and have the ocean of retail largely to itself (2017)."



(Stocksnap, n.d.)

RELATED TRENDS

- » Tech Addiction: People are relying more on feedback from their devices.
- » Normalization of Data Gathering: Consumers are used to trading data for goods & services, and now they want to make use of it themselves.

QUANTIFIED SELF

Data-fueled decision-making isn't just for corporate analysts anymore.

Between Instagram "Likes" and pedometers in our phones, our lives are being increasingly quantified. We have access to infinitely more data about ourselves than ever before, and people are using it. Previously, quantifiable data in our personal lives was primarily restricted to influencing our financial decisions. Now, personal analytics is a movement, the "Quantifiable Self", and people are amassing their data to make decisions about their physical and mental health, and even their relationship with their friends and society.

QUANTIFIED FEELINGS

Moodnotes provides an app which allows users to track and analyse their feelings, providing a service like a, "personal trainer for your mental health (Stinson, 2015)."

YOUNG AND HUNGRY... FOR DATA

In a study of U.S. teens and young adults (aged 14-22), "Nearly two-thirds (64%) say they have used mobile apps related to health, including for fitness, sleep, meditation, and medication reminders.... Nearly four in ten (38%) say they have used apps related to mental well-being, such as meditation, stress reduction, and depression (Rideout & Fox, 2018)."

THAT'S A LOT OF STEPS

Fitbit grows to more than 25 million active users in 2017 (Fitbit Inc., 2018).

SOCIAL CREDIT

China introduces a "social credit" system which operates like a behavioural credit score. Citizens with low scores can have their access to goods and services restricted, such as travel, financial services, education, and specific employment opportunities. A positive score gives you access to better interest rates, discounts on utilities, can improve your online dating profile. Scores are impacted by actions such as, "bad driving, smoking in non-smoking zones, buying too many video games and posting fake news online (Ma, 2018)."

A PICTURE IS WORTH....

259 people died taking selfies between October 2011 and November 2017 (Bansal, Garg, Pakhare & Gupta, 2018). That's a lot of 'sad face emojis'.

ENTERPRISE IMPLICATIONS

The public have spoken. They are actively seeking resources with a slick user interface that can collect their data and help them lead happier, healthier lives. However, enterprises hoping to stay relevant in this space need to put adequate resources into data security. One significant breach could destroy any trust you've gained with your customer base, regardless of how seamless your interface.

ECONOMIC IMPLICATIONS

With the growth of the personal analytics field, there is need for artificial intelligence that can help interpret consumer data. However, Al is only as reliable as the programming behind it. Inherent bias can distort findings and must be monitored against, particularly as it impacts public policy. If data is being harvested, attention must be paid to the methods of the harvesters, not just the fruits of their labour.



A PRECARIOUS CAREER

More workers are relying on piecemeal employment in order to make ends meet.

With full-time, permanent positions becoming scarce, employees are at the mercy of the gig economy. In order to meet their financial requirements, they accept piecemeal contract positions, often from multiple sources and frequently without pension or benefits. The resulting insecurity leaves the population more dependent on the social security net and less willing to spend on "big ticket" items such as education and property.

(Splitshire, n.d.)

RELATED TRENDS

» Increasing Income Inequality: With investments in education no longer worth the financial risk, the gap between the haves and have nots only increases.

FIGHT THE POWER

The New York Taxi Workers Alliance won a landmark victory which legislates a cap on ride-sharing company vehicles and requires Uber and Lyft to pay their drivers a minimum wage. The action was taken in response to a slate of taxi driver suicides over the past year, reflecting the instability in the market. A medallion that used to sell for \$1 million is now selling for \$200,000. Time will tell whether the ride-sharing corporations will adhere to the regulations put in place (Brooks, 2018).

YOU DO WHAT YOU GOTTA DO

In relying on gig work to patch together a living wage, workers often end up relying on physically demanding work, often at the expense of their health. As bike courier, Sam Riches, describes, "When you're broke, your body becomes your last resort, a mostly reliable means to make money that also comes with great precarity. If you get injured in a low-wage job with no employment insurance, there's nothing to fall back on. You pay with your health (2017)."

ENTERPRISE IMPLICATIONS

Short-term contracts can be good for the bottom line, but they do come at a cost. Latent knowledge can be lost, and organizational culture can suffer from a constantly revolving door. Keeping a balance of permanent staff in key roles that require institutional knowledge while staying open to the new learning that can come with temporary employees, exposed to multiple work styles and processes, can improve chances for success.

ECONOMIC IMPLICATIONS

Young people are choosing not to attend postsecondary, afraid of shouldering the massive student loans in a gig economy. Seniors who have built a real estate nest egg may find that they are unable to sell their homes without young buyers entering the market. With more potential draws on the social security net than ever, governments need to plan on how to provide for more, while collecting less.



(France, n.d.)

RELATED TRENDS

» Declining Public Trust: Frustrated with making do with less, the runaway wealth of the rich only heightens the distrust of the average citizen towards a system that they see as failing them.

INCREASING INCOME INEQUALITY

The rich are getter richer, and everyone else is suffering for it.

According to the US Federal Reserve, "Four in 10 adults, if faced with an unexpected expense of \$400, would either not be able to cover it or would cover it by selling something or borrowing money (2018)." Meanwhile, Microsoft co-founder, Paul Allen, passed away in 2018 having failed to meet his contribution to "The Giving Pledge", an agreement signed by 40 of the world's richest people to donate half of their fortunes to charity. Despite having given away \$2 billion over the last eight years, and being named the "most generous living donor in America" by The Chronicle of Philanthropy, he died with almost double the wealth he'd amassed in 2010, when he signed the pledge. A classic demonstration of the reinforcing loops of financial prosperity.

THE NUMBERS ARE STAGGERING

According to Credit Suisse's global wealth report, the richest 1% now own over half of the world's wealth. On the other side of the coin, "the world's 3.5 billion poorest adults each have assets of less than \$10,000. Collectively these people, who account for 70% of the world's working age population, account for just 2.7% of global wealth (Neate, 2017).

INCOME FRAGILITY

"The economists Annamaria Lusardi, Daniel J. Schneider, and Peter Tufano conducted a 2011 study asking people about "their capacity to come up with \$2,000 in 30 days...." They concluded that, "Approximately one quarter of Americans report that they would certainly not be able to come up with such funds, and an additional 19% would do so by relying at least in part on pawning or selling possessions or taking payday loans... [In other words, we]find that nearly half of Americans are financially fragile (Brynjolfsson & McAfee, 2014)."

THE GAP WIDENS

The Economic Policy Institute reports that there was an average increase of 17.6% in the compensation received by CEOs of the 350 largest corporations in the US. The current CEO-to-worker compensation ratio is 312-to-1 (Mishel & Schieder, 2018).

ENTERPRISE IMPLICATIONS

With the average consumer finding that they have less disposable income to spend on necessities, let alone luxuries, consumers will be more careful with their hard-earned dollars. Businesses should expect that consuer feedback to grow and should be on the alert for any negative press that could turn customers away from their brand.

ECONOMIC IMPLICATIONS

Factory owners in the late 1800s learned their lesson, if your customers don't have the means of economic participation, products stay on the shelves. If our modern-day corporations want to remain viable, they need to ensure that their workers can afford their products and services. A disappearing middle-class is bad for business.



(S., n.d.)

RELATED TRENDS

- » Decline in Public Trust: as personal data is repeatedly shown to be insecure and used for unintended or nefarious purposes, trust in digital systems is eroded, regardless of whether maintained by public or private institutions.
- » Disappearing Middle Class: With the future of employment and income ripe with uncertainty, there is an interesting opportunity for different forms of currency to be explored, including the monetization of our personal data.

THE NEW PRIVACY NORM

Customers' expectations of privacy and user experience have changed.

Data has emerged as a new form of currency. As The Economist describes it, "This abundance of data changes the nature of competition.... By collecting more data, a firm has more scope to improve its products, which attracts more users, generating even more data, and so on.... Vast pools of data can thus act as protective moats (2017)." Platforms such as Google, Facebook, and Amazon make our day-to-day use of technologies more seamless and responsive, but the cost is our personal information. Many are not aware of the extent of our data being collected, and of how it is being used. As competition for our digital attention continues to increase, our data will only increase in value. This raises important questions about ownership, security, and monetization that need to be addressed as we inhabit our digital world.

THE RIGHT TO BE FORGOTTEN

EU introduces General Data Protection Protocol, giving citizens the "Right to be forgotten", which shows citizens how firms track and use their personal data, and the "Right to explanation", which grants EU citizens the right not to be subject to decisions made by automated systems (Byrne, 2018).

TWEET SUCCESS

After the 2010 earthquake in Haiti, researchers found that they could track cholera outbreaks via Twitter with equal accuracy to the official reports, but with a faster result which was available two weeks earlier than the official reporting (Brynjolfsson & McAfee, 2014).

BROKEN TRUST

In a study released by The Atlantic, 78.8% of respondents stated that they "were "very" or "somewhat" concerned about the privacy of their information on social media (Beck, 2018)."

ENTERPRISE IMPLICATIONS

As the breaches to personal privacy become more egregious, consumers will be faced with a stark choice - to opt in to digital participation with the knowledge that their data is no longer their own or to remove themselves from participating in the digital realm. Opportunties for investment include digital security and systems for monetizing data.

ECONOMIC IMPLICATIONS

We are in a data gold-rush. At present, consumers are more interested in the perks available through sharing data than concerned about the possible security risks. As new business models rely on monetizing this openness, the question emerges as to the destabilizing effect on the economy in the event of a data breach severe enough to actually breach the public consciousness.



(Adrian, n.d.)

RELATED TRENDS

- Accessibility of Information: The population has access to infinitely more data than at any other point in the history of the species.
 Whether you're looking to share or looking to listen, platforms are plentiful where consumers can make their feelings known.
- » User-generated Content: Users now expect to be part of the process. Whether it's giving feedback or determining direction, keeping abreast of user desires is now a major factor in keeping your business responsive to the evolving needs of the consumer.

THE POWER OF FEEDBACK

Never before has the consumer's opinion held so much sway.

A few bad reviews can destroy a restaurant launch. Poor user-reviews can affect the number of Uber fares a driver receives. A bad rating on eBay can restrict the number of customers willing to patron your online store. In a Winner-Takes-All market, there is no room for a sub-standard product or distributor, or even the appearance of being one. "The Customer is Always Right" has never been more enforceable.

OUTSOURCED SUPERVISION

Uber drivers are presented with almost immediate feedback from their riders through an inapp ratings system. "Producers receive evaluations from individual customers: the platform business retains the right to discharge producers whose ratings are considered inadequate. For the platform, this allows supervision and performance management to be outsourced, at low cost, to customers. For workers, of course, the system introduces enormous risks from unfair, arbitrary or inaccurate customer evaluations, and a compulsion to tolerate abusive or exploitive behaviour from customers for fear that their ratings may be adversely affected by complaining or resisting. But so long as it is legally permissible to discharge workers on the basis of unverified consumer survey responses, this ratings system will be a powerful and inexpensive weapon in employers' labour

extraction arsenal (Stanford, 2017)."

FIVE STARS FOR IMAGINATION

In April 2017, "The Shed at Dulwich" is ranked the number one restaurant in London, England on TripAdvisor, despite the fact that it doesn't exist. Vice reporter, Oobah Butler, accomplishes this through an imaginative campaign based on fake reviews posted to the popular travel review site (Butler, 2017).

DISAPPOINTING, BUT NOT SURPRISING

As The Guardian reported on a 2016 study about ride-sharing apps, "Rides for men with black-sounding names were cancelled more than twice as often as for other men. Black people faced notably longer waiting times to get paired with drivers. Women were taken on longer routes (Ramaswamy, 2017)."

ENTERPRISE IMPLICATIONS

With a decline in disposable income, increased consumer awareness can result in a level of accountability for businesses to ensure that they are providing high-quality goods or services. However, this is a system that is easily manipulated as social media is frequently a first-stop for malcontents to drive notoriety based on political or social agendas rather than an objective reflection of quality.

ECONOMIC IMPLICATIONS

With large corporations fueling reinforcing loops of processes designed to increase their market share and dominate the competition, the data that consumers feed back into the system not only provides them with a better user experience, but also helps to reinforce the emerging monopolies in the tech sector.

ORGANIZATIONAL CHANGE



(Comicon, n.d.)

RELATED TRENDS

- » Evolution of JiT production: Controlling the supply chain in-house means an opportunity for more customization at less cost.
- Entitlement Culture: Consumers are used to getting exactly what they want, when they want it.

FIND YOUR TRIBE (AND BUY THE TEE SHIRT)

Easy access to infrastructure has enabled niche

markets to thrive.

With the efficacy of modern manufacturing and the accessibility of niche markets, the demand for bespoke or customizable product is growing. As Brynjolfsson and McAfee wrote, "Technology has not just lowered marginal costs; in many cases it has also lowered fixed costs, inventory costs, and the costs of searching. Each of these changes makes it more attractive to offer a greater variety of products and services, filling small niches that previously went unfulfilled (2014)." Long-tail businesses no longer need to support traditional infrastructure, and the lower capital costs allow them to offer a more diverse offering through established digital channels.

READING PROFITS

Aspiring authors can find their niche audience through Amazon's self-publishing service. In fact, self-published eBooks account for \$575M in Amazon sales, 25% of Kindle's total eBook revenue (Alsever, 2016).

POPULARITY YOU CAN BANK ON

Content creators use YouTube as a platform for establishing their brand and connecting with likeminded followers. Those who can harness their own particular corner of the market have parlayed their success into careers as social media influencers or by transitioning into mainstream programming. In 2017, the top ten highest paid YouTube stars of the year each made over \$10M, including Ryan ToysReview - a seven year-old kid with a YouTube channel dedicated to reviewing toys (Forbes, 2018).

AS YOU LIKE IT

From high heels to athletic kicks, customizable shoes are available to design and purchase online at a variety of price points. Major brands such as Nike and independent shoemakers such as Shoes Of Prey allow individuals to custom design their ideal fit and fashion (Shoes of Prey, 2018) (NIKEID, 2018).

ENTERPRISE IMPLICATIONS

For budding entrepreneurs, there has never been an easier time to enter the marketplace. With platforms designed to get you up-and-running with minimal infrastructures, it seems that all you need to get started is a good idea and a savvy marketing strategy. However, scaling the business is a much more challenging prospect, especially with mid-sized businesses regularly falling to large corporate challengers.

ECONOMIC IMPLICATIONS

While platform infrastructures are allowing microentrepreneurs to carve out a niche, their dependency on the major players is reinforcing their dominance in a Winner-takes-all market. As a result, mid-sized businesses will find it more challenging to eke out a market, as their customers are poached from either end of the spectrum.



(Free-photos, n.d.)

RELATED TRENDS

- » Alternative Forms of Currency: With so much content flowing through our lives, corporations are beginning to take advantage of a new form of currency - our attention.
- » Increasing Information Overload: One way to avoid being overloaded with the vast amount of information is to live in digital feedback loops that send us back variations on the same story again and again, leaving us with less new information to process.
- » Tech Addiction: With technologies feeding us more of what we want to hear, it's comforting in an age of uncertainty to be buffetted by familiar and unchallenging narratives.

THE PROCRASTINATION ECONOMY Corporations have an astonishing level of

access, thanks to changing tech habits.

With the proliferation of smart phones, brands now have access to us in a whole new way. Rather than having their access restricted to the moments when we chose to engage with them by turning on our cable tv or opening a magazine, they can now access our "in-between" time every time we glance at our phones. This transactional exchange of our attention to their advertising in exchange for access to these entertainment and cultural tools has become normalized as an ongoing flow of information between us and these corporate brands (Tussey, 2018).

REINFORCING FEEDBACK LOOPS

Careful data monitoring by corporations identifies product or content themes that frequently appear in our digital footprints and then feed back similar content in order to retain all of our available attention and keep us returning to their digital spaces (Tussey, 2018).

RECLAIMING SPACE

Workers access media in the office as an attempt to exert agency over their workspaces. For example, an employee might stream Spotify through their headphones in order to better focus in an open-plan office space (Tussey, 2018).

SECOND SCREEN

The "Second Screen" phenomenon is becoming more prevalent, where consumers watch one form of content on their televisions, while scrolling for additional content on their phone or tablet (Tussey, 2018).

SNACK-SIZED CONSUMPTION

As opposed to the act of "bingeing" on media that occurs during concentrated hours of consumption, the Procrastination Economy provides us with a "snacking" option, providing us with bite-sized morsels of media that fill our in-between hours with micro interactions with our favourite digital products (Tussey, 2018).

ENTERPRISE IMPLICATIONS

For a creative marketer, the ubitiqitous nature of interactive technologies offer a wealth of opportunity to connect with your consumer. Savvy user research that explores the needs and practices of the consumer can provide insight into potential opportunities to influence their behaviour.

ECONOMIC IMPLICATIONS

In a Winner-Takes-All market, every advantage needs to be exploited in order to remain competitive. As consumers, we benefit by the proliferation of curated content. However, it is critical to remember that these curators bring their own bias and purpose to these interactions, with the intention of convincing consumers to purchase their product.



(Dokumol, n.d.)

RELATED TRENDS

 Information Overload:
 Overwhelmed by the continual bombardment of information, many are taking a break from technology in order to get some much needed space from the constant news stream.

TECHLASH

Frustrated and overwhelmed, consumers are seeking a respite from tech.

In a 2018 op ed, columnist Marcel O'Gorman opines that Silicon Valley believes that "a sleepwalking consumer is the best consumer (2018)." Well, the sleepwalkers are waking up. The public is pushing back after a year where Facebook was revealed to have turned a blind eye to election manipulation, Google considered releasing a censored search engine in China, and Amazon defended its "domineering business practices (Foroohar, 2018)." This doesn't begin to address the concerns regarding the tech world's gender equality issues and emerging #metoo scandals. Frustrated by privacy breaches and a widening inequality gap, and overwhelmed by streams of real and "fake" news, consumers are exhausted. Many are opting to unplug or, at least, be far more selective about the products and platforms with whom they choose to engage.

THE CALL IS COMING FROM INSIDE THE HOUSE

Salesforce CEO, Marc Benioff, sounded off about the addictive nature of Facebook at the World Economic Forum, saying that the "product designers are working to make those products more addictive," and that it needs to be addressed, "exactly the same way that you regulated the cigarette industry (Levy, 2018)."

THE BREAKING POINT

1-in-4 Americans deleted their Facebook account, following the Cambridge Analytica scandal, while over 40% reacted by taking a break from the app for at least a few weeks (Perrin, 2018).

COMBATTING WIFI WITH LO-FI

A growing number of smartphone users are opting to turn their displays to greyscale, in order to help combat the psychological effect of colour on their device usage (Tussey, 2018).

DO NO HARM

Members from many of the leading tech firms came together to discuss the creation of a Global Data Ethics Pledge, essentially a hippocratic oath for tech developers (Simonite, 2018).

ENTERPRISE IMPLICATIONS

Bad customer experience is the kiss of death with savvy and jaded consumers. With so many options available, many are suffering from decision fatigue and looking for an excuse to walk away from it all. As such, ethical breaches that may have been overlooked in the past are no longer as easily forgiven, and companies now need to account for more than just their bottom line.

ECONOMIC IMPLICATIONS

2018 was a wake-up call for many about the dangers of leaving the tech industry unchecked and unregulated. While time will tell whether it is too late to close the lid on this "Pandora's Box", there is certainly a much heightened scrutiny that tech companies are likely to face moving forward.

THE EVOLVING PRODUCT

CUSTOM GOODS FOR A MASS CONSUMER

Digital goods and services are changing the game.

Many of the trends in the following section are reflective of a key change in the nature of goods, as made possible by digitization. In the words of Brynjolfsson & McAffee, "Digitization, in other words, is the work of turning all kinds of information and media - text, sounds, photos, videos, data from instruments and sensors, and so on - into the ones and zeros that are the native language of computers and their kin (2014)."

The impact of Digitization on our society, culture and economy cannot be overstated. This shift is facilitating a fundamental alteration in the way that we operate, from an economy of scarcity to an economy of abundance. Let us return to the example of media. Whereas when movies were available in analogue form, they had a finite presence. I may have a copy of Die Hard which I choose to watch. If you wanted to watch it, you would need to borrow my copy at which point I could no longer watch it until you returned it to me. The limitations on the use of the object were innate. The more that the analogue copy of the video was watched, the more the quality was degraded until the content was no longer accessible and a new copy would need to be purchased.

Compare this with today's digital version. The movie, being digitized, is now cheaply and easily replicable. Rather than it being limited in scope of use, I can duplicate it and share it with you and all of our friends for next to no cost. As Brynjolfsson & McAfee put it, "Analog dollars are become digital pennies (2014)." We can then all share in the experience of watching Bruce Willis vanquish Hans Gruber at the same time, with no limits on geographical proximity. The resource cannot be used up. It is not finite. It is non-rival. As economy blogger, Ben Thompson, describes, "Content has always been monetized by proxy, whether it be paying for newspapers (or advertising space in those newspapers), paying for CDs, or paying for cable TV. The shift to digital has exposed these proxies for the rent-collection mechanisms they are (2015)." This is a fundamental shift in how we will interact with the world around us, as we learn to better balance our use of resources between traditional resources that are finite and the new resources which are not.



(NeONBRAND, n.d.)


RELATED TRENDS

- » Information Overload: People are trying to find meaningful ways to interact with the massive amounts of information that they are bombarded with on a daily basis.
- » Emerging Business Models: Disrupting traditional business models means taking advantage of the technological opportunities that are emerging, often by using a new tech in an innovative way.
- » Privacy v. Usability: Sharing information can improve user experience, but striking the balance that maintains user privacy is tricky.
- » Consumers as Creators: Hamessing your users to fuel your service means a feeback loop that can ensure that you are constantly current, if you're listening.

THE NETWORK EFFECT

Smart companies are taking advantage of the fast-flowing streams of information.

Economist Robert Jensen studied an Indian fishing village to understand the impact of introducing cell phone technology on their economy. As Byrnjolfsson and McAfee summarized, "Fish prices stabilized immediately after phones were introduced, and even though these prices dropped on average, fishermen's profits actually increased because they were able to eliminate the waste that occurred when they took their fish to markets that already had enough supply for the day. The overall economic well-being of both the buyers and the sellers improved, and Jensen was able to tie these gains directly to the phones themselves." The digital revolution has resulted in an interconnectedness that is changing how we harness information. The collection and dispatch of data is the new gold rush, and the successful are finding ways to exploit the expanding network effect.

USER AS CO-CREATOR

The user is recruited as co-creator. New business model emerges that utilizes data gathered by users as the chief input to drive service delivery, modelled by apps such as Waze (Brynjolfsson & McAfee, 2014).

THE EVOLUTION OF THE UNION

Uber driver's find empowerment through online forums, sharing data about compensation, pricing schemes, company policies, safety tips, and identify potential wage theft (Rosenblat, 2018).

NO ASSETS, NO PROBLEM

It took the Marriott International hotel chain 58 years to reach

1 million hotel rooms, with real estate assets totaling \$985 million. Airbnb reached the same number of available rooms in just 7 years, without having to invest their resources into capital assets (Hagiu & Rothman, 2016).

SWIPE RIGHT ON FEWER OPTIONS

Tindr is so 2015. Newer dating apps such as Hinge or Coffee Meets Bagel create value by intentionally harnessing a smaller network. Hinge users are only presented matches who are "friends of friends" through connections on Facebook, and Coffee Meets Bagel users are only presented with one potential match per day. Limiting their network effect is the value differentiator (B., 2015).

ENTERPRISE IMPLICATIONS

As we increasingly rely on digital information to fuel our personal and professional lives, there is an opportunity to harness the collective to build opportunities for change and disruption to the status quo. Learning to interpret and creatively innovate based on that information will be a key skill required for those hoping to take advantage of the Network Effect.

ECONOMIC IMPLICATIONS

Companies who can harness their users can find a distinct advantage in the market, with built-in feedback loops that can provide a competitive edge. This means that the more responsive, agile competitors can find a foothold in industries longdominated by legacy players, opening the door for disruption.



(Beard, n.d.)

RELATED TRENDS

- » Proliferation of Digital Labour: More companies are adopting digital labour, but true intangible value is found in how it is positioned to collaborate with human employees.
- » Increasing Workforce Skills Gap: Spreading Al technologies require a workforce that is capable of communicating with the new technology, in order to harness its full potential.

INTELLIGENCE AUGMENTATION Adopting AI doesn't mean ignoring the value of

our human contribution.

As Brynjolfsson and McAfee put it, "We've never seen a truly creative machine, or an entrepreneurial one, or an innovative one. We've seen software that could create lines of English text that rhymed, but none that couple write a true poem.... Programs that can write clean prose are amazing achievements, but we've not yet seen one that can figure out what to write about next (2014)."

CHECKMATE

Freestyle Chess demonstrates the superior collaboration of man and machine. As explained by Garry Kasparov, "The teams of human plus machine dominated even the strongest computers. The schess machine Hydra, which is a chess specific supercomputer like Deep Blue, was no match for a strong human player using a relatively weak laptop. Human strategic guidance combined with the tactical acuity of a computer was overwhelming (Brynjolfsson & McAfee, 2014)."

EMERGENT SKILLSETS

New "in-demand" competitive professional skill sets emerge: ideation, large-frame pattern recognition, and complex communication (Brynjolfsson & McAfee, 2014).

CONSCIOUS UNCOUPLING

PathAI breast cancer screening has improved biopsy accuracy from 85% to 99.5%. "These systems aren't doing this by replacing doctors, but by arming them with better information, faster. The average pathologist sees 50 slides per patient, each containing hundreds of thousands of cells. While assessment of every cell is a near-impossible, time-intensive task for a human, AI can detect abnormalities and present them for review in minutes. Pathologists then apply their experience, judgement, and holistic knowledge of the patient to assess each case (Byrne, 2018)."

ENTERPRISE IMPLICATIONS

Al technologies require human direction to determine their use. In-demand skills such as creative-thinking, systems-thinking, digital literacy, and complex communication will become critical for employers hoping to get the most out of their investment.

ECONOMIC IMPLICATIONS

The human race is at a precarious point. With the destabilizing effects of climate change, global political instability, and decreasing public trust, we are people in need of solutions to very complex problems. Only by harnessing the best of our humanity and our technology can we hope to emerge from this precipice of global catastrophe.



(Florian, n.d.)

RELATED TRENDS

- » Information Overload: Pocket computers are amazing tools, but the constant bombardment of information is overwhelming. Consumers are starting to push back and enact their own limits.
- » Global Instability: When feeling overwhelmed by the world, people are taking refuge in digital worlds. Between gaming, social media, and streaming, tech gives us a million different ways to escape from the world outside.

TECH ADDICTION

Constant tech engagement has become the default setting of our lives.

With the proliferation of tech into every sector imaginable, consumers are faced with options for integrating technology into every aspect of their lives. From work to play, or from wellness to indulgence, or from the mundane to the existential, there's an app for that. Consumers are offered a smorgasboard of ways to implement technology into their lives, and they are reveling in the available options. However, there is a dark side to this abundance, as consumers sacrifice more of their autonomy and privacy in order to reap the benefits of improved convenience and capability.

THE ULTIMATE IN INTEGRATED TECH

Following a recent trend in Sweden, US company Three Square Market has had 50 employees volunteer to embed microchips under their skin which can be used in conjunction with various machines around the office such as vending machines, computers, and photocopiers (Ma, 2018).

BFF

Motorola releases a study that found that 53% of GenZ respondents described their phone as a "best friend", and were looking for a better phone-life balance. They identified three major areas of concern: compulsive checking, excessive phone time, and emotional overdependence (Motorola, 2018).

BE YOUR BEST SELF

Bulletproof Alpha Labs is using technology to "improve your body's overall performance and wellbeing" through biohacking. Rather than relying on the traditional diet and exercise, they use harvested biometric data to build regimens including cryotherapy, electron therapy, VR float tanks, and atmospheric cell training (Converse Townsend, 2018).

TRASH TALK

Consumers can now purchase a \$200 "Smart" garbage can, which senses when you walk up to it and opens its lid, or when you're just walking past and don't need to use it. A command of, "Open can", also gets it to flip its lid. It can't do anything about your aim though (Segran, 2019).

ENTERPRISE IMPLICATIONS

Consumers are both craving and resenting the integration of tech into their lives. Savvy operators need to ensure a seamless integration of their product into customer's lives or risk being swept aside in favour of a better user experience. With so much on offer, there is no need for the customer to settle for anything but the best.

ECONOMIC IMPLICATIONS

With people relying on tech as their defult engagement with the world, the expectation is increasing that it will also solve the wicked problems of the world. While exploring solutions to these problems, civic organizations would be well-served to take a more holistic approach, recognizing that we need to account for human change management, not just miraculous tech interventions.



(Freestocks.org, n.d.)

RELATED TRENDS

- » Increasing Dependence on Precarious Work: Nnew platform-based businesses are not only disrupting old business models, they're also destabilizing the Standard Employment Relationship between employers and their workers.
- » Rapid Development of New Technologies: As new technologies emerge, creative entrepreneurs are poised to find new ways to harness them for disruption.

OLD CATEGORIES, NEW ENTRANTS Emergent tech is leveling the playing field for new entries into old categories.

The Platform Business Model has rocked traditional production of goods and services to its core by providing innovative means of participation. They often require a comparably minimal capital outlay and operational overhead, while allowing for a more bespoke response to the consumer. AirBNB allows you to act as a hotelier by repurposing your apartment as rental space. Facebook does not create any content, but relies on the free content generated by its users. A Zipcar subscription allows you access to vehicles without purchasing them. Forward-thinking companies allow individuals to gain access to goods and services, undercutting the legacy institutional offerings, while the reaping a significant financial reward with minimal risk or expense.

EMPLOYING THE MICRO-HUSSLE

Sharing economy is on the rise. One example is the rental website, Fat Lama, which allows individuals to rent out their personal items. Chaz Englander, co-founder, explains the impact of the platform: "We've already seen users buying DSLRs and drones purely because they know they'll be able to make their money back by renting them out on the platform – much like how people have started buying properties to rent on Airbnb over the last decade (Hannah, 2017)."

INTANGIBLE VALUES

The World Bank has launched a longterm investigation into how value is attributed in platform-based business models, as the traditional metrics struggle to take into account the full value in the exchange of intangible assets (Moulton, 2018).

DEMAND-SIDE ECONOMIES

Demand-side economies of scale emerge for successful Social Media enterprises. "If your friends keep in touch via Facebook, that makes Facebook more attractive to you, too. If you then join Facebook, the site becomes more valuable to your friends as well (Brynjolfsson & McAfee, 2014)."

UBER COMES TO CANADA

Canadians spent \$241 million on peer-to-peer ride services between November 2015 to October 2016 (StatsCan, 2017)

ENTERPRISE IMPLICATIONS

The tectonic plates of the business world are shifting. If legacy institutions want to survive, they need to learn to be adaptive, flexible, and responsive to changes in the landscape. Tried and true methods need to be regularly interrogated against the new norms of consumer culture, if companies are to survive the radical changes ahead.

ECONOMIC IMPLICATIONS

Platform business models have significantly contributed to the increasing prevalence of precarious work. "The growing relative importance of service industries, and the decentralisation of other kinds of production, have contributed to less capital-intensive, smaller scale production in which employers may worry less about recruiting and retaining a stable workforce (Stanford, 2017)."



(Diz Play, n.d.)

TECH BEGETS TECH

With emergent technologies being combined and repurposed at an astronomical rate, the potential for innovation seems limitless.

The exponential rate of technological innovation is not simply a result of Moore's Law. Rather, the combining and recombining of technologies has created a field where innovation isn't just about creating something new, but also finding new purposes and combinations for previous tech. Through harnessing individual technologies as they have continued to evolve, developers are able to create a new technology that is far greater than the sum of its parts.

RELATED TRENDS

 Moore's Law: the incredible rate of technological change is heightened by the infinite possibilities of recombinant innovation

DRIVING INNOVATION

The massive strides in Autonomous Vehicle technology are thanks to the integration of multiple technological advances in different fields over the past few decades. A combination of sensor technology, GPS tracking, artificial intelligence, user experience design, and countless other developments have led to an imminent revolution in the way that we transport people and goods in the 21 st Century (Brynjolfsson & McAfee, 2014).

WHAT'S IN YOUR POCKET?

An emergent business model relies on harnessing the technology that is in their consumer's pocket, channeling it through the business' platform, and building a service based on the data collected. Examples such as Waze rely on the proliferation of everyday tech, and find new ways to harness and monetize the attributes that have been installed for other purposes (Brynjolfsson & McAfee, 2014).

WHEN LIFE GIVES YOU LEMONS

A new town in Norway is being constructed around a Data Centre in order to harness a traditionally overlooked by-product of the data transfer process, the waste heat that is created. "In the design for the new data center at Lyseparken, instead of fans, a liquid cooling system will send extra heat to a district heating system, which connects to businesses in the area, heating each building via the floor (Peters, 2018)."

ENTERPRISE IMPLICATIONS

Recombinant innovation lends itself to situations where emergent solutions can change the economic playing field very quickly, often placing legacy institutions at risk for irrelevance. This change is not inherently bad, but it does mean that there is a tension between the old and the new, both looking to find a way to dominate in a Winner-takes-all market.

ECONOMIC IMPLICATIONS

With automation potentially freeing up more of our time and energy for investing into the creative application of emergent technologies, the potential for disruption of "the way we've always done it" will only increase. New solutions to old problems will become the new normal, and we will begin to adapt to the rapid change that is increasingly defining how we move through our professional and personal spaces.



(McKenzie, n.d.)

RELATED TRENDS

- » Emerging Disruptive Business Models: Forward-thinking companies are reimagining access/ownership to allow people to interact with their needs/desires in innovative ways.
- Intensifying Impact of Recombinant Innovation: Technology companies are finding new ways for us to solve old problems, through recombining emergent tech solutions.
- » Winner-take-all Economics Flourish: With one digital provider able to service all needs, competing corporations need to come out on top, or risk irrelevance.

DIGITAL ECONOMICS

"Analog dollars are becoming digital pennies (Brynjolfsson & McAfee, 2014)."

Digitization has fundamentally transformed ownership. Goods and services are now accessible any time and any place, frequently at a minimal cost and with minimal hassle. Digital goods have two distinct advantages. First of all, they are non-rival, meaning that the same good can be accessed by multiple people at the same time without a degradation in quality. Secondly, they are cheaply and easily replicable, making them quick and cheap to distribute and re-distribute. Additionally, whereas old goods had a finite lifespan and would need to be replaced, digital goods can be tapped into when required and the minimal maintenance left to the responsibility of the corporate owner. With this revolutionary impact on the balance of access vs. ownership, legacy organizations are ripe for disruption in a rapidly expanding number of industries. We are on track to evolve from an economy based on scarcity to an economy of abundance.

TIME IS MONEY

Digitization has demonstrated its ability to increase efficiency. For example, a study was done where participants were asked to answer a question using Google (7 minutes) and at the library (22 minutes) (Brynjolfsson & McAfee, 2014).

CAPITALIZING ON YOUR ASSETS

In an attempt to make use of increasingly outdated bricks & mortar stores, Office Depot is repurposing areas of its retail stores into co-working space (Locker, 2018).

THE VALUE OF A DOLLAR

Consumer Surplus is suggested as a way to attempt to determine a concrete value for the time consumers spend online. It compares the amount a consumer pays for something to the amount it actually costs. (eg. if you read a free online newspaper, but would have been willing to pay \$1, that's \$1 of consumer surplus) (Brynjolfsson & McAfee, 2014).

ENTERPRISE IMPLICATIONS

As our technologies rapidly evolve, the potential for digitization to expand into new industries increases. Goods that we now can only imagine as being physical/ tangible objects may find a digital counterpart that either provides access to the good or bypasses the original need with the modified digital experience of it. If businesses are to stay relevant, they need to be prepared to adapt.

ECONOMIC IMPLICATIONS

Digitization is changing the game. With its replicability and universality, it has the opportunity to fundamentally change our economy. Protecting our interests in the emerging economy will be determined by our ability to restrict information and safeguard IP, with both abilities definitely challenged in a digital economy.



(McGhee, n.d.)

RELATED TRENDS

- » Increased Customization/ Long-tail expectations: If consumers can't find exactly what they are looking for, they will build it themselves.
- » Emerging Disruptive Business Models: Content generation is a significant expense. Harnessing the creative power of your consumer base effectively means exponentially lower running costs for a business.

USER-GENERATED CONTENT Savvy businesses are turning to their own customers to drive demand.

With easy-to-use tools available for armchair auteurs to make their own visions come to life, users are embracing the opportunity to spread their own "home-grown" content. Whether it is memes on Facebook, miniseries on YouTube, or paid placements by influencers on Instagram, the user is building the platform's brand and providing the content that drives other users to engage. This free content is changing the business model for legacy content creators, as traditional economic principles of "if you build it, they will come" no longer apply. Competition is no longer restricted to your competitors, but expanded to your consumers, and revenue streams are drying up as customers question the need to pay for content when it is so freely available.

SALACIOUS SUCCESS

Self-published books make up approximately 15% of the USA Today best-seller list each week. When broken down by genre, in the Romance sector, that percentage jumps to 50% (Chen, 2019).

#1 OPTION FOR CUTE KITTEN VIDEOS

300 hours of video are uploaded to YouTube every minute (Moloney, 2018), where users watch 1 Billion hours of video every day ("Press -YouTube", 2019).

MARSHMALLOWS MAKE HISTORY

Fans of the Veronica Mars tv franchise pooled their resources to the tune of \$5.6M to fund a feature film based on the cult television series. The project was the third highest funded project

in Kickstarter history, with 90,000+ backers contributing to the campaign (Thomas, 2014).

FIFTY SHADES OF GREEN

Following the success of the Fifty Shades of Grey book and movie franchises, producers are looking to fan fic to find the next new thing. Up next, Anna Todd's series *After* originally based on fan fiction about former One Direction band member, Harry Styles - is finding runaway success, garnering her a six-figure deal for the publishing rights (Odell, 2014). Currently, the book has 15 million copies in circulation (in over 30 languages) and the movie is due out this year ("Anna Todd", 2019).

ENTERPRISE IMPLICATIONS

As economist Joel Waldfogel remarked, "There are winners and losers here. There are some people who are able to make money creating things that in the past made none. There are some people who once made more, and now they make less because of competition (Chen, 2019)." Bottom line: quality content targeted at the right audience can have legs, but the days of skating by with mediocre product are over.

ECONOMIC IMPLICATIONS

Aggregator businesses that can facilitate transactions with near zero cost of supply, distribution, or customer acquisition are the clear champions of our Winner-Take-All economy. In particular, businesses that can harness their customers to provide their product have a significant fiscal advantage over those who must be content creators as well as content distributors.



(Kern, n.d.)

RELATED TRENDS

- » The Death of the 9 to 5: With the Standard Employment Relationship a thing of the past, people are participating in the economy in new ways, in order to meet their financial obligations.
- » The Network Effect: Companies like Airbnb and Uber provide an easy entrance for economic participation for people who want to expand their earning potential.
- » Disruptive Business Models: Legacy goods and service providers are facing an adaptor-die scenario, as new offerings disrupt their comfortable, and unresponsive, business models.

THE RISE OF THE ACCESS ECONOMY

Ownership is becoming less desirable, and possible, as financial precarity expands.

Lawrence Katz, an economic professor from Harvard, describes the current economic situation, "In the 1940s and '50s, around 90% of American children grew up to have more financial resources and better jobs than their parents.... A current American adult has only around a 50% chance of doing better than their parents (Anzilotti, E. 2018)". While Millennials have been accused of killing everything from department stores to light yoghurt (Bryan, 2017), there is minimal appreciation of the financial situation that has led to this state. In light of financial precarity, and with a wealth of options available, many are choosing the cheaper and more tailorable approach of accessing the experience of a good or service, rather than committing to ownership.

.....

THAT'S A LOT OF LOONIES

\$1.1 billion was spent on peer-to-peer private accommodation services by Canadians between November 2015 to October 2016. (StatsCan, 2017).

SHARED EX-BEER-IENCE

Independent craft brewers rely on mobile canning companies to package their products. Co-owner of West Coast Canning, Kevin Pederson, explains, "With packaging equipment being so expensive, canning lines especially, it doesn't make too much sense for most of these breweries to buy their own equipment for the number of times they will run it during the year.... It allows us to offer an as-you-go basis to the breweries and providing that convenience has been integral to growing our market." (Brownlee, 2016)."

BUT WHO CLEANS OUT THE FRIDGE?

In an annual global survey, Deskmag Magazine estimates that by December 2018 there will be 1.7 million people working at 19,000 co-working spaces around the world (Foertsch, 2018).

PRET-A-PORTER

Multiple clothing rental companies have emerged as a way for fashionistas to access designer goods at affordable subscription rates ("Renting Is The New Black", 2017). Rent the Runway, for example, has been valued at \$770 million, with more than 9 million members and more than \$100 million in revenue ("2018 Disruptor 50: No. 9 Rent the Runway", 2018).

ENTERPRISE IMPLICATIONS

The opportunities for micro-entrepreneurship have never been more plentiful. While participants are free to set their own levels of engagement, the terms of said participation are set by powerful corporations, interested primarily in their own bottom lines.

ECONOMIC IMPLICATIONS

Cities are discovering the dark side of the access economy as rents surge due to short-term rentals. This represents just one disruption of many that are changing the financial structures of municipalities. With local residents feeling the pinch, pressure on government to regulate these renegade industries will only increase.



(Spiske, n.d.)

RELATED TRENDS

- » Declining Public Trust: As the institutions that hold our data repeatedly fail to keep it secure, is it any wonder that public trust is eroding?
- » New Currencies: Data is now a recognized commodity, in a way that it has not been appreciated before, which means that we are beginning to see a prescribed valuation emerge.

PRECARIOUS DATA

Our data has high value, and not just for those interesting in operating legitimately.

As an article from tech blogger, Ciara Byrne, puts it, "Cybercrime is in many ways the perfect crime: low risk, scalable, and highly profitable (2019)." In 2018, billions of people were affected by cybercrime, including data breaches and cyberattacks (Byrne, 2019). In a 2011 article about the emerging trend, she explained, "Technology has allowed cybercriminals to become more like high-growth startups." Mark Goodman, a cybercrime specialist, describes the scale of the trend by saying, "Datacrime can be scripted and automated and it scales. If you take a gun or a knife and stand on a street corner, there's only so many people you can rob. You have to do the robbery, run away from the scene of the crime, worry about the police, so you can't really rob that many. You can't walk into Wembley stadium with a gun and say 'everybody put your hands up'. But you can do that from a cybercrime perspective (Byrne, 2011)."

KIDS THESE DAYS

During the annual hacking convention, DEFCON, an 11-year-old boy hacked into a replica of the Florida state election website and changed voting results. It took him less than 10 minutes (Regan, 2018).

A COSTLY VACATION

Marriott International revealed that over 500 million people had their personal information stolen from their guest reservation system, as reported by the Federal Trade Commission. "The hackers accessed people's names, addresses, phone numbers, email addresses, passport numbers, dates of birth, gender, Starwood loyalty program account information, and reservation information. For some, they also stole payment card numbers and expiration dates. Marriott says the payment card numbers were encrypted, but it does not yet know if the hackers also stole the information needed to decrypt them (Gressin, 2018)."

AI IS FOR THE BLACK HATS TOO

Al is coming to Malware. Max Heinemeyer, a director of threat hunting for cybersecurity company Darktrace, warns, "Artificial intelligence is going to supercharge malware in the next couple of years (Byrne, 2019)." He goes on to warn that machine learning means that new malware is getting better at smart targeting and avoiding detection.

YOU CAN'T TRUST ANYONE

59% of companies reported a data breach caused by a third party or vendor (Byrne,2019).

ENTERPRISE IMPLICATIONS

Deputy technical director for cybersecurity operations at the National Security Agency, Josiah Dykstra, warns that, "Everything is a double-edged sword in cyber. The same things that we can use for defense can be used against us (Byrne, 2019)." Companies need to be vigilant against digital threats, both of their own data, and their consumers' data.

ECONOMIC IMPLICATIONS

Data is more valuable than ever before. Recognizing that value is critical, if institutions are going to devote the appropriate resources to keeping it safe.



(StockSnap, n.d.)

RELATED TRENDS

- » Information Overload: When overwhelmed by the world, why not kick back and feel in control by making the small but definitive decisions of online shopping?
- » What I Want, When I Want It: With the new retail at our fingertips, instant gratification is only a click away.
- » The Ad Game Declares a Winner: Advertising has become more targeted and more omni-present, bringing the temptation ever closer.

A HEMISPHERE OF HOARDERS North Americans are accumulating more "stuff"

than ever before.

When we are being bombarded with unending streams of stories and images of disasters from around the world, both man-made and natural, is it any wonder that humans are addicted to the dopamine hit they receive when they purchase a new iPhone case or bulk pack of socks off of Amazon. As Elizabeth Cline, a consumer scholar, commented, "There's no reason not to shop-because clothing is so cheap, you feel like, 'Why not?' There's nothing lost in terms of the hit on your bank account (Semuels, 2018)." With supply chains, and waste disposal chains, largely opaque, the true cost of our shopping addiction is hidden from us, leaving us willingly ignorant about the impact of our consumption habits.

THAT'S A LOT OF STUFF

Americans spent \$240 billion on small goods in 2017, double the amount spent in 2002 (adjusted for inflation)(Semuels, 2018).

A GARAGE AWAY FROM GARAGE

The number of "self-storage" facilities in the US has doubled in the last two decades (Semuels, 2018).

FROM RAGS TO DITCHES

In 2015, Americans threw out 16 million tonnes of textiles, up 68% from the year 2000 (Semuels, 2018).

MILENNIALS KILLED THRIFT

Students at Michigan State moving out of their dorms at the end of last year left behind almost 148,000 pounds of goods (such as towels, appliances, or unopened food and personal care items), an increase of 40% from only 2 years ago (Semuels, 2018).

ENTERPRISE IMPLICATIONS

The backlash against our out-of-control consumption habits has already begun. New focus on sustainability and transparent supply chains is beginning to penetrate the mainstream. Smart companies are looking ahead to find viable options now, in preparation for the swing that is coming.

ECONOMIC IMPLICATIONS

While the cost of producing goods has significantly declined over the past few decades, the era of cheaply producing disposable goods may not last all that much longer. Governments are looking ahead to the environmental repercussions of so much waste and natural degradation, and stricter regulations may be around the corner.

BIG TECH DEFINES THE MARKET

Winner-takes-all economics leave mid-sized

competitors in the dust.

The current and emerging marketplace is being defined by Winner-Takes-All economics. "Big Technology" is winning, and in their success they are driving all other business to adapt, be absorbed, or die. Joseph Schumpeter, Austrian political economist, forecast that this would take place as a form of "creative destruction." Brynjolfsson and McAfee describe the process, as it relates to the technological booms of the past few decades:

"Each innovation not only created value for consumers but also wiped out the previous incumbent. The winners scaled up and dominated their markets, but were in turn vulnerable to the next generation of innovators.... As more and more industries become increasingly digitized and networked, we can expect the Schumpeterian dynamic to spread (2014).... With digital goods capacity constraints become increasingly irrelevant. A single producer with a website can, in principle, fill the demand from millions or even billions of customers...."

Let us explore Amazon as an example: Amazon was responsible for 25% of "all new office space leased or built in the United States" in the fourth quarter of 2017 (Semuels, 2018). It has replaced the mall, the department store, the niche boutique, and it's coming for the big box chains. However, not only are we watching these retail channels systematically fall, we're subsidizing Amazon's ability to set the charges. For example, Amazon has been the recipient of over \$1 billion in state-awarded subsidies, with \$336 million of that occurring since 2015 (Bologna, 2017). While many states and provinces have sought to attract Amazon through the offer of subsidies, the promise of new jobs is rarely sufficient to make up for the losses sustained. A policy group with a focus on community development, the Institute for Local Self Reliance, released a report that showed that Amazon's expansion had resulted in the creation of almost 150 thousand jobs by the end of 2015. Unfortunately, the displaced sales from traditional retailers resulted in the elimination of 295 thousand jobs (Bologna, 2017). The further addition of insult to injury is Amazon's financial model. Amazon is structured for long term market dominance, through short-term loss:

"In 2015, Amazon spent \$7 billion on shipping fees, a net shipping loss of \$5 billion, and overall profits of \$2.4 billion. Crazy, no? No. Amazon is going underwater with the world's largest oxygen tank,



(Zeller, n.d.)

forcing other retailers to follow it, match its prices, and deal with changed customer delivery expectations. The difference is other retailers have just the air in their lungs and are drowning. Amazon will surface and have the ocean of retail largely to itself (Galloway, 2017)."

The tension that emerges from this model, however, is that governments and customers recognize that monopolies are bad for consumers. Less competition often results in higher prices and lower quality control. However, as the winners emerge more powerful than ever, their influence over political regulation, as well as consumer buying habits, ensures that their interests are protected. Scott Galloway uses Uber to demonstrate this:

"Uber, for example, operates in blatant contravention of the law in many, perhaps just about all, of its markets. It has been banned in Germany; Uber drivers are fined in France (but Uber pays the fines); and various U.S. jurisdictions have ordered Uber to cease operations. And yet, investors - including governments - are lining up to hand the company billions.... Uber not only evades the regulations traditionally applicable to car-for-hire services; it also evades labor law by posing as an app that links independent drivers - a posture that nobody seriously believes.Yet despite all of this, Uber continues to sign up drivers and riders at a serious pace - myself included - because its basic service and simple app are vastly superior to the coddled, protected taxi model. Uber has recognized that if an industry is broken enough, consumers will conspire to violate the law in favor of a far preferable service. And, in the long run, do you really think Congress is going to fight both Wall Street and millions of consumers? (Galloway, 2017)."

With Winner-Takes-All dynamics, there is no middle ground. Players can either participate as contributors in the systems that dominate, or they can scramble to salvage the long-tail, niche markets to which they can cater a high level of specialization.



(McGhee, n.d.)

WINNER-TAKES-ALL ECONOMICS

Winner-Takes-All Economics have emerged as a critical repercussion of the digitization of the Fourth Industrial Revolution. Brynjolfsson and McAfee describe it as such:

"When there are capacity constraints or significant transportation costs, then the best seller will only be able to satisfy a small fraction of the global market.... Other inferior sellers will also have a market for their products. But what if a technology arises that lets each seller cheaply replicate his or her services and deliver them globally at little or no cost? Suddenly the top-quality provider can capture the whole market. The next-best provider might be almost as good, but it will not matter. Each time a market becomes more digital, these winner-take-all economics become a little more compelling.... When there are many small local markets, there can be a 'best' provider in each, and these local heroes frequently can all earn a good income. If these markets merge into a single global market, top performers have an opportunity to win more customers, while the next-best performers face harsher competition from all directions.... Suddenly, second-rate producers can no longer count on consumer ignorance or geographic barriers to protect their margins (2014)."



(Pexels, n.d.)

RELATED TRENDS

- » Income Inequality: Consumers who are stretching their dollars further and further to make ends meet are happy to find solutions which allow them to access goods and services through alternative monetization models.
- » Digital Economics: The Economics of Abundance are disrupting the Economics of Scarcity, forcing companies to find new models in order to remain viable.

NEW CURRENCIES

Corporations are finding new ways to monetize their consumers.

With the widening gap in income inequality and the average consumer facing a more stark financial insecurity than has been seen in recent history, customers are less free with their disposable income than they used to be. As such, corporations are looking for new models of monetization. Much as Uber gets around having employees by calling their drivers "entrepreneurial customers", we are starting to see consumers viewed through a similarly altered lens. Rather than the consumer being the paying customer, corporations are finding new ways to monetize their consumers' behaviour in order to attract a different set of customers. Whether its attracting add revenue by marketing the attention of their viewers or selling the data collected on consumers' online habits, the marketplace is shifting to follow the money and use its priorities to determine the best way to harness the consumers' available resources.

TIME IS MONEY

In 2013, users collectively spent 200M hours each day on Facebook, 10x the man hours used to build the Panama Canal (Brynjolfsson & McAfee, 2014). Time is the new currency. "One's presence on Facebook triggers a series of transactions that benefit both Facebook and third parties. Without us being there, these transactions will not exist (Manu, 2014)."

YOUR ATTENTION OR YOUR LIFE

A "Free-mium" model allows gaming apps use advertisements as a way for users to "buy" more lives. Players can gain access to additional content or gameplay by viewing ads.

WHO NEEDS MONEY ANYWAYS

Trading apps such as "Bunz" connect users to exchange surplus goods, negating the

need for a monetary exchange "Bunz is where people trade" (2018).

BED AND BARTER

As reported by The Guardian, "more than 450 properties in 60 countries have signed up to offer hospitality in return for goods or services instead of cash," as part of Barter Week, an annual event held during November. Hosts list their accommodations, along with a trade wishlist for their guests, such as painting a wall, tango lessons, or creating a website (Wilson, 2018).

BLOCKCHAIN GOES MAINSTREAM

Bitcoin is awaiting a decision in September by the US Securities and Exchange Commision on whether the Bitcoin Exchange Traded Fund (ETF) will be approved and the currency will be tradeable on the stock exchange (Bambrough, 2018).

ENTERPRISE IMPLICATIONS

With the uncertainty of economic futures, given the instability of consumer income due to precarious work and the gig economy, smart companies are building their own business models that find new ways to monetize their consumers into assets, rather than customers.

ECONOMIC IMPLICATIONS

Digitization was a game changer. The new economics won't support the old systems, and savvy organizations need to think ahead creatively to understand the opportunities, and challenges, ahead.



(Chaney, n.d.)

RELATED TRENDS

- Information Overload: With more information flowing than ever before, regulating accuracy becomes almost impossible.
- » Domesticated Democracies: The rise in monopolies has only served to increase citizen apathy. When government regulators appear to have lost their "teeth", the citizenry question whether their best interests are still being considered.

DECLINING PUBLIC TRUST Propaganda is spewing from every direction and consumers are losing their faith.

Athough "Fake News" has dominated the headlines over the past few years, the rise of the information age has led to a deep-seated challenge for the public: with a massive amount of information available, put forth by multiple agencies with their inherent conscious and unconscious biases, how are people to tell truth from fiction. The resulting uncertainty has eroded our public trust. Whether it is with large corporations or political leadership, the public is losing confidence in the ability of our societal custodians to deliver truth in this complicated information age.

POWER PLAY

Michael Cohen, lawyer of U.S. President Donald Trump, plead guilty to campaign finance violations, including making illegal campaign contributions at the request of Mr. Trump (Van Voris, Berthelsen & Hurtado, 2018).

FAKE NEWS

Facebook shuts down hundreds of pages and accounts after an investigation discovered that they were being operated by Iranand Russian-based agents in a massive campaign of "coordinated manipulation (Sullivan, 2018)."

THERE'S POWER IN NUMBERS

On a coordinated day of action spawned by The Boston Globe, more than 300 news publications ran editorials about the freedom of the press. The action was taken in response to President Trump's "frequent attacks on the media" where he has called the mainstream news outlets "the enemy of the American people (Reiss, 2018)."

NO MARKET FOR THE TRUTH

News media companies are struggling to stay financially viable as advertising dollars flee to the major tech companies who can deliver a much better ROI. Reuters announced mass layoffs of 3000 employees in the next two years. Vox, Vice, Buzzfeed, and Mic have all announced major layoffs and have seen their valuation plummet (Thompson, 2018). Even the New York Times which has weathered the advertising exodus reasonably well have seen their ad revenues drop by 7.5%, and that's including an increase of \$23M in revenue from online ads (Leonhardt, 2017).

ENTERPRISE IMPLICATIONS

In order to maintain public trust, businesses must prioritize authentic interactions with their customers. Any hint of prevarication or obfuscation can mean a loss of trust by your constituency. Moreover, an emphasis on transparency can become a key differentiator, allowing for a unique positioning in the marketplace.

ECONOMIC IMPLICATIONS

Public trust is critical in maintaining the status quo. When the citizenry become disenfrachised, it fosters a ripe breeding ground for new economic and political regimes. Ideologues with persuasive systems and policies can gain ground. If unable to maintain the appearance of trustworthiness, those who crave political and societal relevance need to be prepared to adapt to evolving circumstances.



(Tchompalov, n.d.)

RELATED TRENDS

- » Information Overload: People are exhausted from being bombarded with bad news on a daily basis, and apathy is beginning to feel like the only practical solution.
- » Tech Addiction: With a sense of our species' precarity growing, people are looking to tech to provide a magical solution to our human problems.

WORLD ON FIRE

Political unrest is permeating the globe, and our arbitrary borders are proving an ineffective means of keeping discord at bay.

Between climate change, "fake news", and declining public trust, the political climate around the world is in the midst of a turbulent time. Paper democracies are demonstrating the flimsiness of our nations' checks and balances, while select powerful groups are determining the political playing field by manipulating the impressionable masses. While in the short term, this serves to keep the powerful in power, the long term effects are more uncertain. With environmental catastrophe looming, our planetary survival may depend on our ability to transcend borders and think collectively.

DISPLACED POTENTIAL

As reported by the UNHCR, "We are now witnessing the highest levels of displacement on record." In fact, 30 people become newly displaced every minute. The latest totals show that by the end of 2017, 68.5 million individuals were forcibly displaced. That's the approximate equivalent to the entire population of France (UNHCR, 2018).

NEFARIOUS NEIGHBOURS

In addition to their interference in the U.S. 2016 election, evidence now points towards Russian manipulation in 19 European nations, by means such as waging disinformation campaigns and funding far-right parties. They are even suspected of sponsoring a coup in Montenegro (Noack, 2018).

CLIMATE CHANGE IS HERE TO STAY

In 2015, "water crises" were listed as the world's leading threat by members of the World Economic Forum. According to the Pacific Institute, "In 2017, there were more than seventy incidents [of disturbances around the world involving water], dozens of them deadly, mainly in the Middle East and Africa." This is compared to 1997, in which there were three incidents (Wilkinson, 2018).

THE WORLD IS LITERALLY ON FIRE

In North America, the 2018 National Climate Assessment has determined that the area of land destroyed by wildfire in the last 40 years has doubled as a result of climate change (U.S. Global Change Research Program, 2017).

ENTERPRISE IMPLICATIONS

Companies with a desire to go the distance need to balance their short-term and long-term goals. Concentrating too much on the short term successes, by catering to the desires of the current political powers-that-be, could limit potential longevity when political tides turn.

ECONOMIC IMPLICATIONS

With the implications of climate change beginning to be experienced through increased flooding, forest fires, and drought, climate refugees are likely to result in a migratory global population. Balancing the needs and wants of the nation with emerging global responsibilities will be a challenging prospect.



(Grone, n.d.)

RELATED TRENDS

- » Workforce Values Gap: The next generation of workers expect a deeper level of engagement/enjoyment out of their work experiences.
- Workforce Skills Gap: Employers are trying to find new ways to help bridge employees skills into new and emerging technologies

GAMIFICATION OF WORK

Disguising professional tasks as a leisure pursuit, gamification uses the psychology of gaming to the advantage of employers.

As stated in a report published by Katzcy Consulting, "Competition makes for great storytelling. Conflict is universally understood, and tension and interest are created as athletes and spectators eagerly await the outcome of the contests, equally ready to laud the winners and criticize the losers. There's a common desire to prevail and learn from the contests, uncovering the reasons behind a defeat and understanding the strategies that led to a win (2016)." Companies are recognizing the cultural zeitgeist of gaming and applying it for their own purposes. This allows them to dress their corporate training or performance tracking in a more engaging platform, often succeeding in controlling behaviour through well-crafted experience design.

COMPULSION LOOPS

Uber uses gamification in their app design as a way to entice drivers to work longer hours or in less lucrative neighbourhoods. When attempting to sign off, drivers are told how close they are to meeting their previous week's totals or an arbitrary financial goal for the day, as set by the corporation, in order to encourage a few more fares before shutting down for the day (Scheiber, 2017).

GAMEPLAY MODE

Katcy Consulting releases a paper at the request of the National Initiative for Cybersecurity Education (NICE) led by the National Institute for Standards and Technology (NIST) which explores using cybersecurity games to develop the next generation of security experts

(2016).

XP (EXPERIENCE POINTS)

My Marriot Hotel allows players to manage a "virtual hotel restaurant kitchen", including buying equipment and ingredients, hiring and training employees, and serving guests. When their virtual restaurant has turned a profit and has a sufficient customer satisfaction rating, players move on to other areas of hotel operations. The game was conceived to foster a greater awareness for the public of what it takes to run a hotel. Successful players are directed to a "Try it for real" button which directs them to the careers section of the hotel chain's website. According to the company, one-third of players choose to be directed to the employment site (Lauby, 2012).

ENTERPRISE IMPLICATIONS

Employers are beginning to recognize that they need to address their employee's means of engaging with work, not just the outputs, if they are going to maintain satisfied, engaged workers. Gamified user design has the benefit of being able to tap into employee's psychological response on a hidden level, allowing companies to get the most out of their staff, often without the employee even recognizing it.

ECONOMIC IMPLICATIONS

As workforce demographics skew towards Millenials and the Global generation, more workers expect their employers to engage in a deeper way, tapping into their need for feedback and their desire to connect with a larger purpose. Their values often blur the line between work and leisure. Gamification offers a bridge between these expectations and the productivity requirements of their employers.



(V., n.d.)

RELATED TRENDS

- » Rapid, Recombinant Tech Development: As techonologies evolve and recombine, the capabilities of Digital Labour will only increase.
- » Workforce Skills Gap: With the rapid evolution of technologies changing the face of work, employers will likely struggle to maintain a workforce with the skills and capabilities required to keep up with the ever-emerging requirements of business.

EMPLOYING DIGITAL LABOUR Efficient, replicable, and consistent: digital

labour is here to stay.

Digital labour has been making waves as businesses discover how it can be integrated into new and existing systems to increase efficiency and consistency. Automation, AI, and robotics can execute the routine tasks to which they are best suited, leaving an opportunity for humans to concentrate on creative and strategic tasks. As tech writer Will Byrne suggests, "Automation will release humans from the need to perform specific tasks. Those will mostly be non-creative and non-personal tasks that can be broken down into relatively predictable parts. These are chores you didn't want to do to begin with.... For a lot of folks, they're just a dreadful set of tasks that came along with your otherwise pretty exciting job (2018)."

BUT DO I STILL NEED TO TIP?

Amazon introduces "Prime Air" where goods are delivered by drones, automating the delivery process (Amazon Prime Air, 2018). DoorDash pilots a food delivery service using robots for trips under two miles (Samuelson, 2017).

FREEING UP FACE-TIME

Cancer centre uses AI to make hotel recommendations, determine which families need help paying bills, and address staff IT problems. Outcomes include improved patient satisfaction and financial performance, and a decline in time spent on data entry by care managers (Davenport & Ronanki, 2018).

AFFORDABLE AND EFFECTIVE

Estimations made by robotics experts

reveal that robots can replace human workers in factories for a cost of approximately \$4/hour, a massive cost-reduction for manufacturers (Brynjolfsson & McAfee, 2014).

ALEXA, HOW DO I DO LAUNDRY?

Saint Louis University is installing 2,300 Amazon Echo Dots in their on-campus living spaces to allow students to "focus on what matters most: their education (SLU Alexa Project, 2018)."

BUT IS IT ART?

Christie's will auction off the "Portrait of Edmond de Belamy", a fictional figure whose image was created by Al using an algorithm that interpreted a data set of 15,000 portraits from the 14th to 20th centuries (Ifeanyi, 2018).

ENTERPRISE IMPLICATIONS

Digital labour can be used to vastly improve a business' productivity and efficiency, however it needs to be deployed in a way that considers the best use of resources. Digital labour is best used to replace rote or routine tasks, and can be used as a means to free up human capital for creative or evolving tasks. Research has shown that the most productive use of these emerging technologies is in conjunction with human capital, rather than a full substitution of it.

ECONOMIC IMPLICATIONS

Digital Labour is fundamentally changing the Future of Work across the globe, both directly, with the jobs being replaced and enhanced, and indirectly, with its impact on adjacent systems such as education and social security programs. The integration of Digital Labour is not inherently good or bad, but rather, the eventual moral of this story will reflect whether humankind harnessed the emerging opportunity for the betterment of our shared long-term existence or the satisfaction of our individual short-term desires.



(Colas, n.d.)

RELATED TRENDS

- » Income Inequality: Money is power and with the gap between the haves and havenots growing, so is the ability to influence government policy.
- » Disruptive Business Models: New business models are emerging, and being adopted by both enterprise and consumer, faster than governments can regulate them.

DOMESTICATED DEMOCRACY

Power is gained by appealing to the majority of the people, or by proffering the highest bid.

Politics have always been intimately intertwined with Big Business. However, it has reached such an imbalance that industries can operate in flagrant opposition to the law with little to no penalty. Governments, desperate to keep their citizens employed and engaged, subjugate themselves to the desires of these massive conglomerates. For the corporations, it is a risky game. In order to maintain public good will, they must ensure that their product is so desirable that it overrides the consumer apprehension that they are supporting a nefarious organization. However, if the enterprise is successful in managing the optics, there is great opportunity for financial gain.

OFFSHORE ADVANTAGE

A study done in 2016 identified that 73% of U.S. Fortune 500 companies had money secreted away to tax shelters around the world (Phillips, Gardner, Kitson, Robins & Surka, 2016). While this practice is legal, it has significant social impact. Collectively, the Fortune 500 companies are, "Holding nearly \$2.5 trillion in accumulated profits offshore (Phillips, Gardner, Kitson, Robins & Surka, 2016)." If repatriated, the unpaid taxes would generate \$717.8 billion dollars in revenue for the government (Phillips, Gardner, Kitson, Robins & Surka, 2016).

THE CUSTOMER IS ALWAYS RIGHT

Uber operates illegally in many of its markets, relying on its superior product to entice users. "Uber has recognized that if an industry is broken enough, consumers will conspire to violate the law in favor of a far preferable service. And, in the long run, do you really think Congress is going to fight both Wall Street and millions of consumers? (Galloway, 2017)."

NOT WHAT YOU BARGAINED FOR

Amazon has been the recipient of over \$1 billion in state-awarded subsidies. While many states and provinces have sought to attract Amazon through the offer of subsidies, the promise of new jobs is rarely sufficient to make up for the losses sustained. Amazon's expansion had resulted in the creation of almost 150 thousand jobs by the end of 2015. Unfortunately, the displaced sales from traditional retailers resulted in the elimination of 295 thousand jobs (Bologna, 2017).

ENTERPRISE IMPLICATIONS

Domesticated democracy most benefits the power players. However, for savvy business owners, there are gains to be made by taking advantage of government programs and subsidies.

ECONOMIC IMPLICATIONS

While the current systems are beneficial to those in power and provide short-term stability, over time they are detrimental to the citizenry at large. The gradual decline in their circumstances eventually leads to revolt or disintegration. As the system requires citizen participation, long-term views determine that it then makes sense to ensure that they are content and engaged.



(Splotramienny, n.d.)

RELATED TRENDS

» Sustainable Manufacturing: Producing more parts on site from fewer materials could result in less transportation pollution, and potentially more onsite recycling.

JIT PRODUCTION EVOLVES

Just-in-Time manufacturing revolutionized the production process, but it's about to face its own disruption.

When Just-in-Time manufacturing was introduced in the 1980s in Toyota factories in Japan, businesses quickly saw the advantages. Maintaining a smaller stock of parts meant lower real-estate and storage costs, and a more efficient flow of materials through the production process. However, with the advent of 3D printing and other manufacturing innovations, the JiT model is ripe to be disrupted. What potential changes could be ahead when JiT meets Digitization, a process that takes the concept of "on demand" to the next level.

JIT PRINTING

Brynjolfsson & McAffee highlight the next phase of JiT production, as businesses can 3D print their own parts as neccessary onsite, rather than waiting on a delivery (2014).

JEAN GENIES

Levi's develops a new technology which allows them to reduce their dye lots from thousands of different chemical formulations to a few dozen, through a finishing process which can accomplish the desired colour and fading with ozone dryers and infrared light, resulting in more efficient manufacturing and far fewer negative health effects for their workers (Segran, 2018).

JIT, MEET AI

With the increasing sophistication of AI and robotics, the ability of manufacturing processes to diagnose and repair their own faults and inefficiencies gets ever closer. "Machinery could respond to these problems as they arose, providing instant, timely solutions (alter the timing, cooking the peaches a little longer until they reach the proper temperature; changing the fill parameters of the paint line) so that no bad product ever gets created in the first place (Welsh, 2018)."

ENTERPRISE IMPLICATIONS

Digitization can bring the opportunity for companies to vertically integrate their supply chain by bringing the production of composite parts in house. By doing so, companies can capitalize on maximum resource flow efficiencies. and appeal to customers with concerns over questionable ethical practices in contemporary manufacturing by increasing transparency.

ECONOMIC IMPLICATIONS

With companies able to bring more production of materials "in-house", middle-men manufacturers will likely need to revamp their production from making final goods to preparing natural and synthetic resources. This potential call for resources in a more malleable state could affect the flow of the supply chain, particularly as the balance begins to tip into a mainstream adoption.



(Petterijokela, n.d.)

RELATED TRENDS

- » Decline of the Standard Employment Relationship: Employees can no longer rely on the type of steady, financially-stable, consistent employment that their parents and grandparents enjoyed.
- » Increasing Financial Inequality: As the gap between the 1% and the 99% continues to widen, the ability for the individual to affect change on institutions of power decreases.

CORPORATE FIEFDOMS

The corporation has never been more powerful, and employees are feeling the effects.

Disruption has come to many legacy industries, dispacing old business models with new inventive ones. Frequently, however, the victims of these changes are not only the corporations being displaced, but also the employees who now find themselves working as part of the Gig Economy. With workers rapidly losing their jobs to automation, a glut of unemployed and underemployed have entered the precarious employment pool. These workers are desperate to make financial ends meet in an economy that assumes that they are as financially flush as previous generations, and therefore willing to accept employment conditions that are a significantly less stable and attractive than those found in recent memory.

ENTREPRENEURIAL CONSUMERS LOYALTY IS NOT REWARDED

By positioning drivers as "entrepreneurial consumers" rather than employees, companies like Lyft and Uber limit their obligations and responsibilities generally held by traditional employers (Calo & Rosenblat, 2017).

FOR YOUR SAFETY AND OUR PROFIT

Companies are integrating IoT Wearables as performance trackers, such as a boot that vibrates if an employee is carrying a heavier weight than is recommended or a GPS alerting that a miner has suddenly dropped 10 metres (Wheelwright, 2017). Advantages to the companies that adopt these measures include lower insurance premiums, less corporate liability, and the ability to better understand procedural inefficiencies (Stevenson, 2017). Loyal Uber drivers receive fewer wage promotions when they are regular drivers who routinely take on hours driving for the company. Occasional and sporadic drivers are more likely to be offered incentives to encourage them to take on more hours (Rosenblat, 2018).

OVERSIGHT EQUALS LOWER WAGES

Increased surveillance can lead to lower wages. "As it becomes cheaper and more effective for employers to monitor employee performance and obedience through increasingly intrusive forms of technology, they face less compulsion to provide positive inducements to workers to elicit performance (like permanent work or superior wages) (Stanford, 2017)."

ENTERPRISE IMPLICATIONS

Corporations are at an advantage as precarious work establishes itself as the new normal. As the desire for steady employment increases, employees are more likely to sacrifice their rights and dignities for the sake of consistent work. Those unwilling to submit to their employer's decrees can be easily replaced by those who are willing to accept these dictates for the sake of a regular paycheque.

ECONOMIC IMPLICATIONS

In order to sell their products, companies need to have workers with both the money and time to spend. In the early 1900s, labour laws were enacted not only to protect the worker, but also to enable a new consumer class to emerge. In 2018, we seem to be finding ourselves regressing to an earlier model, with corporations finding work-arounds to the very regulations that built their consumer bases.



(Kraft, n.d.)

RELATED TRENDS

- » Disruptive Business Models: Online shopping is forcing bricks & mortar stores to reconsider the value of their real estate assets.
- » The Rise of the Access Economy: Many entrepreneurs and small businesses are using coworking spaces, rather than shackling themselves to the commitment of a long-term mortgage or rental contract.

RETAIL EVOLUTION

Bricks and Mortar stores aren't dead, but they are evolving.

While the past few years have seen thousands of physical retail stores close, the trend slowed considerably in 2018 (Segran, 2019). Retail stores provide an opportunity for customers to interact more tangibly with the brand, and can build a stronger sense of brand loyalty. "Brands expect that customers will come into the store to check out products, but may purchase the product online. And many brands will also use the stores as a place to forge a strong sense of community by hosting talks, parties, and other gatherings there (Segran, 2019)." While the old model of physical retail store locations is certainly struggling, companies are finding that new models of real world interaction can deepen their relationship with their customer base.

FROM ONLINE TO IRL

Casper, the direct-to-consumer mattress company is slated to open more than 200 retail stores across the US and Canada over the next three years (Thomas, 2018). This leads the trend of establishing bricks and mortar boutiques that many successful online retailers are pursuing, including Allbirds, Everlane, Naadam, Cuyana, Outdoor Voices, MM.Lafleur, Away, Tamara Mellon, and Glossier (Segran, 2019).

GO GO GADGET CHECKOUT

AmazonGo stores open in major centres, using AI and facial recognition software to render the stores cashierless. The company hopes that reducing the amount of time required for "checking out" will help them to emerge as the most convenient option for busy consumers (Soper, 2018).

EVOLVE OR DIE

Staples reinvents itself as a work hub to remain relevant. David Boone, the CEO of Staples Canada, explains, "We've designed this new store with community in mind. With Staples Studio Coworking, a café, the Solution Shop and thousands of new products, this redesigned location is a working and learning hub. We want to bring people together who are focused on personal and professional growth, to be an inspiring, affordable place for entrepreneurs, businesses and students to work, meet and collaborate (Patterson, 2019)."

ENTERPRISE IMPLICATIONS

Retail companies need to carefully consider their business models in order to remain relevant. It's no longer enough to be cheapest, most accessible, or most tailored to your consumers' needs, you need to be all three. The companies that are capable of flexibility and learning are most likely to survive.

ECONOMIC IMPLICATIONS

As more share of the sale of goods and services moves online to a global market, local business can suffer. Governments need to ensure that they are protecting the viability of small and medium-sized enterprises, without alienating the public, who have become accustomed to the perks of the online giants.



(Simon, n.d.)

RELATED TRENDS

- » Corporate Fiefdoms: With Winner-Takes-All economics running rampant, those who can pull away from the pack are able to define the market not just compete in it.
- Declining Public Trust: With ad dollars shifting from traditional media to tech companies, the public service institutions that rely on those revenues, such as news organizations, are failing, leaving the public to rely on new and untested sources of information.

THE AD GAME DECLARES A WINNER Big tech companies have won the ad audience,

and it's the customers who will pay for it.

Josh Constine of TechCrunch describes the edge that digital providers have for influencing their customers: "Spotify used its own playlists to control which songs became popular, and the artists and record labels became beholden to cutting it sweeter deals to stay visible. Amazon looks like the best place to shop because it makes merchants fiercely fight to offer the lowest prices and best customer experience.... Internet companies are gaining great influence by becoming marketplaces that connect customers with suppliers when previously customers preemptively chose a particular supplier. These platforms not only gain enormous amounts of data on customer preferences, but they also hold the power to point customers to certain suppliers that are willing to play ball (2018)."

FOLLOW THE MONEY

Online advertising revenue increased by 32% between 2015 and 2017, while Social Media ad revenue doubled during the same time (PricewaterhouseCoopers, 2016; Interactive Advertising Bureau, 2018). 90% of the 2017 growth went to either Google or Facebook (Ballentine, 2018). Even Microsoft, still ostensibly a software company, was reported to have made \$4 billion in advertising revenues last year, primarily through LinkedIn and Bing (Thompson, 2018).

HUNGRY?

Uber Eats intgrates advertising that targets users in a geographic area, providing timed incentives for ordering from the same restaurant. "This triggers a sense of urgency to hurriedly buy through Uber Eats (and not check competitors)... With Uber Eats Pool, Uber is flexing its ability to influence where you eat, training you to trust where it points you when businesses eventually pay directly to be ranked higher in its app (Constine, 2018)."

ENTERPRISE IMPLICATIONS

With the overwhelming majority market share of revenue dollars making their way to tech giants like Google and Facebook, smaller companies need to find their niche if they want to survive. Take advantage of long-tail opportunities to stay relevant to your customer base.

ECONOMIC IMPLICATIONS

Monopolized advertising only serves to reinforce the Winner-Takes-All economics of the Second Machine Age. Without regulatory intervention, this runaway train is unlikely to self-correct into a more balanced marketplace.

DIMENSIONS OF UNCERTAINTY

KEY UNCERTAINTIES OF OUR EVOLVING ECONOMY

While the trends of the previous section amass into several deep drivers of change, there are three that emerge as most impactful over the next 10-15 years to which it would behoove the business community to pay particular attention. This futures exploration will investigate the interplay of two key uncertainties:

- » The Rate of Digital Labour Adoption
- » Consumer Preference for Ownership v. Access

While there are many drivers affecting technology, economy, and society, these two factors are the most uncertain as to which way public opinion (and dollars) will trend. By exploring these factors, we can imagine their potential impact on consumer behaviour.

The next section will explore each of these uncertainties in further detail.

THE RATE OF DIGITAL LABOUR ADOPTION

The Fourth Industrial Revolution is upon us. Amazon is staffing its warehouses with robots (Galloway, 2017). Artificial Intelligence is screening for breast cancer (Jennings, 2011). However, these innovations are not solely being applied to technological moonshots. Automation and AI are taking up the routine and repetitive jobs in both blue and white collar work. Integrating AI can enhance the features, functions, and performance of our products, enable better decision-making, optimize internal business operations, free up workers for more creative tasks, and capture and apply knowledge where needed (Davenport & Ronanki, 2018). While we are only in the beginning stages of understanding the impact and reach of automation and AI in our lives, we are able to see that it has the potential to completely revolutionize our world of work. Let us take the example of the electronic spreadsheet.

Before the existence of personal computing and Microsoft Excel, the spreadsheet was an actual sheet of paper, often several taped together filling the "greater part of a full-sized desk (NPR, 2015)", built by a team of accountants. As they are now, spreadsheets were designed to present a detailed way to look at a business by tracking revenue, expenses, and other numerical variances. Each time that a change emerged, say an increase in the cost of a required supply, the rippling adjustments would need to be input manually. It could take up to a day to make all the subsequent alterations, even if the client only asked for a minor change (NPR, 2015).

However, the original conceiver of the electronic spreadsheet, Dan Bricklin, felt that there was a smarter way to manage this manual process. NPR host David Kestenbaum recounts, "Bricklin looks at the Apple II and thinks, you know, this could be my magic blackboard. He thought it could do what accountants were doing on paper with their giants spreadsheets and their erasers. So he wrote a little program for the Apple II."

As Allen Sneider, the first registered user, described, "I was flabbergasted.... For anybody working with spreadsheets – mainly accountants – I mean, this was like a godsend. I mean, you wouldn't have to do this drudgery work over and over again (NPR, 2015)." As Kestenbaum summarized, the machine was better at the work than the accountants were. It was faster, taking seconds to do what would previously have taken days, and it didn't make mistakes.

Of course, a change like this would have a monumental effect on the accounting industry. Kestenbaum explains, "If it only takes a couple hours to do a spreadsheet and you're billing by the hour, you're going to make less money for a particular job, right? You're going to need fewer workers ... The spreadsheet both killed jobs and it created jobs. While the number of bookkeepers and accounting clerks fell, the electronic spreadsheet actually meant more jobs for regular accountants (NPR, 2015)." The official numbers back that up. Since 1980, there has been a loss of 400,000K bookkeeping and accounting clerk jobs in the United States, and an addition of 600,000K accounting jobs. This impact reflects only one industry's application of the program's use, though the spread of the technology was far broader. Bricklin explains:

"It let doctors do better calculations for anesthesiology before their open-heart surgery. It was used by a company to decide where to put which slot machines on the casino floor. My mother, who was a principal of a middle school, she was using the spreadsheet to be able to keep track of who's in what class and all. And it wasn't until a couple of years later, she said, Daniel, do you know that it can do calculations? I said, Mom, I gave you demos (NPR, 2015)."

However, even more transformationally, the spreadsheet changed the fundamental philosophy of how we do business. As NPR co-host Jacob Goldstein put it, "Spreadsheets basically gave birth to modern Wall Street, to

this world we have today (NPR, 2015)." Author Steven Levy described the influence of the new technology in an article originally published in 1984 (reprinted by Wired Magazine in 2014). "The spreadsheet is a tool, and it is also a world view – reality by the numbers (Levy, 1984)." He goes on to explain how the spreadsheet provides, "the ability to create scenarios, explore hypothetical developments, try out different options. The spreadsheet... allows the user to create and then experiment with a phantom business within the computer (Levy, 1984)." Kestenbaum and Goldstein reflect on the outcome of this business practice evolution:

"Wall Street became obsessed with this what-if question. What if we got a slightly better interest rate on our loan? What if these two companies merged? What if we structured the deal this way? Wall Street is the place where, you know, you change one number, you move pennies around in a spreadsheet, you change something at, like, the third decimal place, and suddenly, at the bottom of the spreadsheet, the last number is, like, a million dollars larger. And so because of this, the spreadsheet becomes the language of Wall Street. Today, the spreadsheet is the way people in finance talk to each other. It's the way they decide, is this a billion dollar deal? Is this a \$950 million deal? Should we do this deal at all? Wall Street is basically a bunch of Excel spreadsheets flying back and forth (NPR, 2015)."

This 'what-if' question has left an indelible mark on our culture. Kestenbaum remarks, "Spreadsheets have left us in a different world.... It's a world where we are constantly asking what if.... What if I flew on Thursday instead of Friday? What if I took 78 instead of Route 280? Where is traffic better? What if I stopped exercising? What if I ate more vegetables? (NPR, 2015)." We can see the ripples through our increasing dependence on having our own personal data tracked through applications and accessories such as FitBit for tracking our health or Mint for tracking our personal finances. We are increasingly attempting to create a better version of ourselves through the manipulation of our personal data and the massaging of our digital projections.

The illustration provided by the development of the electronic spreadsheet is a simple labour-saving device - one early application of simple digitization that rocked entire industries and affected the nature of our society. The reality of the breadth of implications that digital labour has had on our evolution in the economic, social, and cultural realms is astonishing. The magnification of that impact once we start to examine the coming effects of artificial intelligence and automation that replace human physical labour or intellectual judgement (for better or worse) is staggering.

On a micro-level, the effects of digital labour adoption registers through the uncertainty it brings to economic stability and the future of work. As Brynjolfsson and McAfee write, "It would take the average American only eleven hours of labor per week to produce as much as he or she produced in forty hours in 1950 (2014)." **At minimum, the coming work revolution will be a reorganization of current labour distribution.** Those with a combination of digital and creative skills will likely thrive. Those who undertake manual or more repetitive work may see those jobs disappear. That is not to say that there will be massive unemployment, necessarily. As we saw with the electronic spreadsheet example, there was a net gain in the number of positions available, it just reflected a significant shift in the nature of those jobs.

With more work precarity, people are likely to be less free with their spending. With a more rapid pace of change due to evolving technologies and business models, corporations are likely going to need to invest more in their workforce in order to maintain an agile talent base. A rapid adoption of digital labour would mean a lot of unskilled workers (both blue and white collar) looking for employment in a professional world that doesn't know what to do with them anymore and potentially driving us faster toward alternative currencies. Traditionalists assert that, by taking a more measured approach with a slower rate of adoption, we may be able to manage the evolution of our workforce alongside the technologies, maintaining a customer base with the means of traditional economic participation. With such a potent impact on both micro and macro economics, this critical uncertainty of the rate of digital labour adoption is a key factor to watch in the upcoming decade.

Risk of Replacement by Digital Labour

(Brynjolfsson & McAfee, 2014)

	MANUAL LABOUR	COGNITIVE LABOUR
NON-REPETITIVE LABOUR	SAFE FROM DISRUPTION Examples: • Hairdresser • Chef	SAFE FROM DISRUPTION Examples: • Financial Analyst • Designer
REPETITIVE LABOUR	AT RISK OF DISRUPTION Examples: • Assembly Line Worker • Driver	AT RISK OF DISRUPTION Examples: • Data Entry Clerk • Customer Support Worker

Fig. 7 - A Table Illustrating the Risk of Replacement by Digital Labour (as extrapolated from Brynjolfsson & McAfee, 2014)

Digital labour has the possibility of affecting both manual and cognitive labour. As illustrated in this table, the element that is key to its effect may be the degree of repetition in the work. Non-repetitive labour, shown in green, is likely to be less affected compared to the more repetitive jobs shown in red. Robots and Al and other digital tools are already effective at repetitive labour – from assembling cars to expanding "smart" knowledge bases to answer customer service enquiries. On the other hand, the differences in each head of hair or meal to prepare or clothes to design or data to analyze will likely keep people employed, as digital labour still struggles to manage highly complex tasks.

OWNERSHIP VS. ACCESS

In 2015, recognizing the growing phenomenon, PricewaterhouseCoopers released a consumer intelligence study on the Sharing Economy. The research revealed what many forward-thinking entrepreneurs had already discerned, that for many, access to goods and services is replacing the traditional values around ownership. Of the United States adults familiar with the sharing economy:

- » 86% agree that it makes life more affordable;
- » 83% agree that it makes life more convenient and efficient;
- » 76% agree that it's better for the environment;
- » 78% agree that it builds a stronger community; and

» 63% agree that it is more fun than engaging with traditional companies (PricewaterhouseCoopers, 2015).

Even more revealing is that **43% agree that owning today feels like a burden.** Richard Steinberg, the CEO of BMW's new car sharing division, describes the emerging market, "Millennials are not so much interested in spending their hard-earned money on buying a car. They're not interested in parking, insurance, vehicle acquisition. But they still have mobility needs (PricewaterhouseCoopers, 2015)." Jonathan Haskel, co-author of Capitalism without Capital: The Rise of the Intangible Economy, understands that, "Consumers will be able to be more flexible but they will also have to change their lifestyle (Masters, 2017)." This, however, is the point.

> "Young people in particular pay higher attention to an improved quality of life instead of accumulating wealth and material property as status symbols. For them it is more important to live intensively by using resources effectively than only to work instead of experience merely to chase values. Owning things is perceived as emotional baggage that keeps you from living – sharing means being free to do whatever you want (Beutin, 2018)."

Lifestyles are changing. The Standard Employment Relationship is disappearing (Stanford, 2017). Housing costs, for both homeownership and rentals are skyrocketing in major urban centres. The gig economy, much like the movement to work of women and children in the First Industrial Revolution, is forcing the outsourcing of many household jobs and maintenance that used to be done personally.

> "Time and money are unequal pleasures. Industrialism is biased toward producing goods rather than leisure: this is what usually happens when investments are made in 'labour-and-timesaving' technology. The accumulation of material wealth has reduced time to money; potential leisure is often sacrificed to

THE SHARING ECONOMY IN MULTIPLE FORMS

It is important to recognize the distinction between the Access Economy and the Sharing Economy.

The Access Economy

refers to economic participation through the **impermanent** acquisition of goods and services, whether by rental, subscription, or alternative business models that do not result in the changing of hands of capital assets.

The Ownership Economy

refers to preferred models which favour the **accumulation of assets**, with the ownership of a given item transferring from one entity to another.

The Sharing Economy

can exist in both an Access and and Ownership Economy. In the Access Economy, it is evident in business models that allow individuals to leverage their assets for the temporary use and enjoyment of others. In the Ownership Economy, it can manifest as joint or collective ownership of capital assets. In turn, these could be leveraged as commodities in the Access Economy.

As the previous example shows, the **Access and Ownership Economies do not exist to the exclusion of each other**, but rather co-exist. The question being tabled is about the values-based cultural preference of one over the other, and the prevailing business models that will take precedence as a result. work in order to earn the wherewithal to pile up still more goods. This consumerist bias has been acquired in a long historical process; but it reached its modern extreme only recently. Consumerism is not an inevitable stage in industrial development. Rather it has been a choice made within complex cultural, political, and social contexts (Cross, 1993)."

The concept remains true, despite the change from goods being temporary assets rather than permanent ones. This is a complicated time, as we are in the transition between the industrial and post-industrial eras. Still rooted in the values of our consumerist age, our economics and technologies draw us forward into a new system of societal operation.

As Brooke Masters, columnist for *Financial Times*, notes:

"This transformation has a precedent. Many companies shifted to an asset-light model years ago – supermarkets and professional services firms sold and leased back their stores and offices, airlines started leasing rather than buying aircraft, and big tech groups such as Apple hired other companies, most notably Foxconn, to make iPhones.... For the most successful companies, the decision to focus on intangible assets, such as intellectual property, has been a huge boon. The move allows them to grow rapidly without having to invest in building factories or hire enormous amounts of staff (Masters, 2017)."

BMW is responding to this shift by repositioning their product from "premium cars" to "premium mobility" (PricewaterhouseCoopers, 2015). Recognizing that the younger generation is not their traditional client base, as most "starter" cars tend to be further downmarket, they see this as an opportunity to claim part of their competitor's market share. It's a smart strategy for building early brand loyalty as well.

Despite the opportunities, there are challenges to this new model for purveyors:

"If drivers stop buying their own cars and instead sign up for a rental service or use Uber's ride-hailing app, each individual vehicle will receive a lot more use. That means carmakers will face pressure to produce fewer, better-made cars that are able to withstand constant usage. The obvious parallel would be to supplying a laundromat versus a home: commercial machines must be faster, heavier and stronger (Masters, 2017)."

Not only businesses, but also entrepreneurial customers, experience the ramifications of participating in this new model. Ruth Fowler described her reliance on participating as an Airbnb host to The Guardian:

"It's not that I enjoy losing my spare bedroom and my privacy to entertain out of town visitors: I use the platform to be able to pay rent while I go through a difficult financial time. Ten nights a month, I have to tolerate a stranger using my bathroom to get 20 nights blissfully alone with my son. In a city where the median wage is \$28,000 a year and the median rent for a one bedroom is now \$2,000 a month, I may not have a home for me, my son and my pets without it (2017)."

In increasingly precarious financial times, with the gig economy flourishing and income inequality at an all-time high, people are looking for options that allow them economic participation with maximum return on lifestyle investment and minimum capital outlay. However, the traditions of culture run deep. Ownership still holds social capital. Whether it remains that way over the next decade is left to be seen.

CERTAINTIES IN AN UNCERTAIN TIME

The past few pages have explored the key uncertainties that will be further explored in this document. However, it is important to recognize that these will be deeply impacted by many driving factors of whose impact we can be more confident. The sidebar on the following page briefly explores several of these drivers. While they are not a focus of this exploration, we need to recognize their inevitable impact on the futures that will be postulated. They provide the context for the world to come. In the tapestry of life, they are the warp, while the uncertainties are the weft. While not remaining constant, they are far less prone to change and their expected outcomes are significantly more predictable. A truncated list appears below, but a more fulsome exploration can be found as Appendix Two (p. 116)

UNDERPINNING DRIVERS OF OUR TUMULTUOUS TIMES

Data - Convenience versus. Risk

Despite the repeated data breaches of the past few years, consumers continue to allow for the regular scraping of our data from apps and electronics with the trust that those companies have their best interest at heart. Barring a catastrophic event, it is unlikely that this consumer behaviour is likely to change.

The Degradation of Intellectual Property

The First Industrial Revolution was built on the emergence of intellectual property law. It seems fitting that our move to a post-industrial society should be predicated on the increasing irrelevance of it. With the replicability of digitization and manufacturing becoming more accessible, business models need to adapt to ensure their value isn't tied up in assets that are so easily hijacked.

Thriving Monopolies

The new Winner-Takes-All economics are the result of complex financial and political maneuvers that condition the market to accept such arrangements. When corporations hold the power, governments frequently find themselves toothless against the demands of Big Business.

Economy of Abundance

Digitization is fueling a technological, economic, and societal revolution. As more of our lives become available in digitized formats, the economics of scarcity that prevailed in the 20th century will be forced to evolve as well.

Environmental Destabilization

Despite the ongoing efforts by many to reverse the environmental damage caused by the past 200 years of industrial values, the environment continues to degrade at an alarming rate. With our global ecosystem in a perilous state, many are asking why governments aren't stepping in to do more.

Global Unrest

With resources in decline, more global and local citizens displaced, and nationalist fires being stoked by inflammatory public figures, it can seem as if the world is a tinderbox just waiting on a spark.

FROM PRESENT TO FUTURE

The previous section has explored the behavioural embodiment of consumerism in the present. We have recognized the trends impacting our functional consumption actions, and categorized them into those with certain and uncertain futures. With this clearer understanding, we can turn our attention to building models of potential futures in order to understand how these key factors may interact with each other to affect cultural change and alter our societal relationship to consumption. The following section will begin this process by establishing the method by which we will begin to sketch the future.

THE FUTURE

THE FUTURES FRAMEWORK

Note: A deeper exploration of this method can be found in the Methodology section. This section is intended to set context for the chapters immediately following.

The following section explores how the critical uncertainties listed above can be mapped to reveal potential futures. This is not an exercise in predicting the future. Rather, **elements of the four futures posited below will likely exist concurrently, with aspects of each emerging as technology and society shift to adjust to developments in the other.** The purpose of this exercise is to explore the opportunities and challenges that exist within each version of the future so that we might be prepared for the probable openings in the marketplace ahead. By recognizing the likely opportunities now, we can position ourselves for long-term prosperity by preparing ourselves for the disruptive emergence to come.

We begin our exploration of the disruptive emergence to come by constructing them into a simple 2x2 matrix:



Fig. 8 - The Construction of the 2x2 Matrix of Key Uncertainties of the Future of Consumer Behaviour

59 THE FUTURE: THE FUTURES FRAMEWORK

From here, we develop our understanding of each quadrant. The matrix allows us to explore emergent futures based on a recognition of the change currently underway in technology, society, and the economy. We extrapolate the potential changes based on current trends and in recognition of the underpinning drivers that are unlikely to change. By investigating each area, we determine four valuable variants of the future. Each provides challenges and opportunities to business interests and can be harnessed for increased success with careful planning and foresight. As a result of this process, the following quadrants emerge:

The Consumer Behaviour Futures

- 1. Ignorance is Bliss (Slow DLA and a Maintenance of the Ownership Economy)
- 2. Keeping up with the Jetsons (Rapid DLA and a Maintenance of the Ownership Economy)
- 3. Prosperity Bubble (Slow DLA and the Surge of the Access Economy)
- 4. Piecemeal Prosperity (Rapid DLA and the Surge of the Access Economy)

OWNERSHIP ECONOMY

SCENARIO TWO: SCENARIO ONE: **KEEPING UP WITH IGNORANCE IS BLISS** THE JETSONS (Slow DLA & (Rapid DLA & Maintenance of the Maintenance of the **Ownership Economy**) Ownership Economy) **SLOW RATE OF RAPID RATE OF DIGITAL LABOUR DIGITAL LABOUR ADOPTION** ADOPTION SCENARIO FOUR: SCENARIO THREE: PIECEMEAL **PROSPERITY BUBBLE** PROSPERITY (Slow DLA & Adoption of (Rapid DLA & Adoption the Access Economy) of the Access Economy)

ACCESS ECONOMY

Fig. 9 - Mapping Consumer Futures against the Key Uncertainties Matrix

THE FUTURES

The following section is an explanation and exploration of the four proposed futures which are set in the year 2030. By understanding the challenges and opportunities of each future, we can be better prepared to respond when we see them emerge as target consumer groups or openings in the market. Although they are likely to coexist in the real world, by separating them out in our foresight work, we can better identify the needs of both the consumer and supplier in each. This allows us to view the potential opportunities with more specificity, and make more pragmatic decisions about our own strategic planning.

A Note on Methodology:

While many scenario-building exercises recommend a more extreme approach to positing futures, I have taken a narrower scope in terms of the plausibility of the imagined futures. This is intentional. With an intended audience of business professionals and senior management, I recognized that accessibility is key. In order to help those unfamiliar with foresight practice appreciate the applicability of futures work, I have chosen to restrain my scenarios to the "Plausible" rather than the expansive "Possible". As demonstrated by the "Futures Cone" illustration below, originally based on the work of Hancock and Bezold (1994) but here adapted by Voros (2003), this aligns the scenarios much closer to the "Probable" timeline than is usually explored in futures work. While the advantage of more "fantastic" futures can provide a more vivid emotional response and provoke a more dramatic reaction, it can also be easier to dismiss as "Science Fiction". For the purposes of this project, with its goal to demonstrate the practical applications of futures work for a business context, I felt that a more restrained approach would foster a more receptive response from the intended audience by providing more easily processed, practical value.



Fig. 10 - The "futures cone" - Adapted by Joseph Voros, based on the work of Hancock and Bezold.

HOW TO USE THIS SECTION

As mentioned, aspects of the futures presented here will likely all co-exist in the actual future. Exploring them allows for identifying where an organization's current and desired market segments are likely to exist. Alternately, you can determine which market to pursue based on the attractiveness of the opportunities presented. As you will see, some of the futures presented offer brief opportunities for short-term investments, while others are intended to identify the positioning for best long-term advantage.

With an understanding of an organization's strategic long-term goals, this document is intended to provide a window into the leverageable events that will likely present themselves in various forms over the next 10-15 years.

A Roadmap to the Structure of each Future Exploration

Each future contains four distinct sections that can be used in different ways to inform an organization's long-term strategic planning. Below you will find a brief explanation of the sections and their potential use.

DESCRIPTION OF THE FUTURE:

Each future exploration begins with a narrative description. Although there is much overlap, these descriptions are divided into two categories: Values & Society, and Work & Economics. The first is intended to portray a sense of the decision-making drivers that are impacting how individuals are making consumption choices. In this section, for example, you will see the factors that may affect their willingness to take on debt or make luxury purchases. The second section looks at the employment and economic systems that are impacted by the given future. This section is more likely to discuss the futures of work structures, economic drivers, education, and other institutional systems that are affected.

Use: This "snapshot" provides a glimpse at the future to establish context and highlight key emergent issues.

PERSONA:

This section is intended to provide an example of the personal experience of a resident of the particular future. It explores their values, work (and income), consumption habits, and long-term prospects. It also includes a barometer of critical data such as their willingness to take on debt, autonomy in decision-making, and trust in public institutions.

Use: By taking this micro view of the impact of the future on an individual, organizations can gain a deeper understanding of the priorities and challenges of their market. Additionally, when we recognize that all of these futures are likely to co-exist, organizations can identify their target market through these personas, and then use the future as context and consumer research to proactively hone in on their target market.

EMERGENT OPPORTUNITIES:

This section indicates a selection of potential opportunities for capitalizing on the indicated future, divided by sector.

Use: By no means exhaustive, it is intended to spark the imagination of organizations to see the potential in each future for evolving their business model, developing new offerings, or accessing a new market.

PROGNOSIS:

This section is intended to provide a context about the longevity and impact of each future on a long-term view of cultural development. This section indicates whether the proposed future is transitory or a new paradigm, and key factors that will define the given future.

Use: Organizations can understand the likely timelines and barriers to emergent opportunities, and prioritize their actions accordingly.

IGNORANCE IS BLISS

SCENARIO ONE: IGNORANCE IS BLISS (Slow DLA & Maintenance of the Ownership Economy)

SLOW RATE OF DIGITAL LABOUR

ADOPTION

With the slow adoption of digital labour, in this potential future, fulltime, permanent employment is maintained for the time being. This leads consumers to assume that the financial security they currently enjoy is here for the long haul. Accumulation of personal debt is rampant. The debt is in service of buying into capital assets which the general public assumes will appreciate as they always have, providing a potentially rotten nest egg for the future.

VALUES & SOCIETY

Although the Bank of Canada recently raised interest rates for the purpose of discouraging an incautious approach to debt accumulation, the public continues to amass alarming quantities of consumer debt. The slow integration of digital labour has lulled the masses into assuming that their jobs are secure and that the digital revolution of the Fourth Industrial Age will pass them by unscathed. There are signals that the Standard Employment Relationship, with its permanent, full-time jobs and unwritten social contract of lifelong employment, is starting to erode. However, at present, unemployment is low, access to relatively affordable goods and services is high, and the general public feels financially and socially secure. Big ticket items like houses, cars, and investments still feel within reach for most consumers, and the popular belief still holds firm that investments made in these assets now will pay dividends in the long run.

Because of this sense of stability and security, people feel empowered to advocate for their personal values. While this has promoted aspects that are generally beneficial to society, such as a call for companies to become more environmentally sustainable and to be more socially responsible, it also encourages more nefarious values as demonstrated by the increasing boldness of hate groups and extremism. With their next meal and mortgage payment taken care of, whether by their paycheque or access to loans, people have the time and financial resources to allocate to their causes. As the economist and financial historian Diane Coyle writes:

"It is not poverty and despair that cause revolutionary activity in modern times, but rather comfortable prosperity. Skipping school to hurl stones at the riot police and evade tear gas is a luxury indulged in only by young people who are not really worried about finding a job when they need one (2014)."

WORK & ECONOMICS

For thriving businesses, the focus during this time is on incremental efficiencies, rather than massive, destabilizing overhauls. Organizations are concentrated on the slow integration of digital labour technologies with a managed approach that ensures seamless transitioning. This results in a longer timeline, but the slower replacement of the workforce causes fewer morale issues while maintaining productivity. Disruption happens slowly, industry by industry. When it occurs, the disrupted institutions are generally unable to adapt in time to preserve their legacy status.

Streamlining processes to find peak performance with minimum resources is the order of the day. This is particularly critical as there is a growing public outcry regarding environmental sustainability. Consumers are finally starting to wake up to the catastrophic environmental damage of the 20th century, and are pushing corporations to adopt more responsibility for the full cycle of their products and their production practices. This has the unintended impact of encouraging more-analog companies to move their businesses (and jobs) offshore to welcoming countries who are willing to overlook the environmental damage. Conversely, forward-thinking companies see it as a call to move towards the efficiencies of digitization. While moving operations outside of Canada or the United States does not improve a company's popularity, a corporate legacy still holds weight with the consumer and a long and positive history with a brand can sway consumer spending habits. For those who have lost their jobs, most of the opportunities available require taking a significant pay cut. The jobs that remain are those that are cheaper to staff than install robotics, and the margins are getting thinner each year.

For those organizations that are not yet under threat of disruption, the Standard Employment Relationship is still very much the norm. With the increasing technological changes that are appearing, employers looking to retain talent are using access to ongoing education and professional development as a signal that they are invested in their employees. Thus, the best employees are rewarded with a better chance at job security when digital disruption does eventually occur, and those who have not demonstrated that they are worth keeping current are far more likely to find themselves on the inevitable chopping block.

Winners: Legacy Industries (temporarily)

Losers: Big Data

The following pages provide two tools for businesses to harness for their professional evolution. The first is a persona which can be used both to further understand the proposed future, and also to recognize the market segment that is likely to emerge. Secondly, I have provided a table (Fig. 11) to help businesses recognize the potential opportunities in this vision of the future. While by no means exhaustive, it is intended to provide examples of the types of opportunities that may emerge.

IGNORANCE IS BLISS - PERSONA

SKYE ANDERS, 25 (HALIFAX, NS)

Masters Student, Dalhousie University; Part-time Employee, Amazon Warehouse

VALUES - Goals & Priorities

- Asserting their values through their brand loyalty by supporting companies whose values align with their own.
- High expectations of meeting the economic prosperity accomplishments of their parents (middle class Richmond Hill, Ontario).

WORK

- Currently pursuing a Master of Philosophy degree, with the expectation of becoming a University professor. (There are 30 people in their graduating class). They anticipate completing their doctorate by 28.
- \$30K Student Loan Income (\$12K Annual Tuition Costs, \$5K Scholarship Income)
- \$10K Annual Income, Part-time Warehouse Associate
- \$12K Annual Rental Income, from roommates

CONSUMPTION HABITS

- \$180K Expected total student debt, Undergraduate through PhD graduation.
- Anticipates first home ownership by 25, 'forever' home ownership by 30, Cottage ownership by 40 (with power boat).
- With the down payment loan from their parents, they have just entered a 25-year mortgage for a starter home in a Halifax suburb. They are renting out the extra bedrooms to 2 of their school colleagues.
- Day-to-day expenditures are fairly minimal. However, they will spend up to 10% more to support LGBTQ-friendly brands.

LONG-TERM PROSPECTS

- Long-term employment plans do not anticipate the potential disruption to traditional higher education that is likely to occur.
- Professional field does not have many practical applications, outside academia.
- Student debt burden will be significant, and will hamper other professional goals.
- In the future, with many unable to afford to enter the housing market, the home may not retain the value of its purchase price.


(Askhadova, n.d.)

SKYE'S BELIEFS - AT A GLANCE

I am comfortable taking on consumer debt.

I have complete autonomy over my spending decisions.

I believe my employer has my best interests in mind.

I am comfortable sharing my personal data.

I have trust in government and legacy industries.







STRONGLY AGREE





EMERGENT OPPORTUNITIES IN THE

	FINANCE & MANAGEMENT		
OPPORTUNITIES	 » Job Insurance: Providing consumers the opportunity to purchase protection against the possibility that their jobs are made redundant by digital labour. » Identifying and investing in top talent now will help buy their loyalty in the coming, more volatile, labour market. 		
CHALLENGES			
	RESEARCH & DEVELOPMENT		
OPPORTUNITIES	 Finding efficient processes for making environmentally sustainable goods financially viable will help with organizational viability in the long term. Disruption is inevitable. Managing organizational change early to develop a more flexible and adaptable workforce and processes will help organizations respond to business model challenges when they occur. Invest in becoming your own disruption, rather than waiting for an upstart to do it. Investigate the unsustainability in your current business model and build projections of alternate modes of monetization. 		
CHALLENGES	 With such a stable market, it's easy to fall into the trap of thinking that you have longer to accomplish change than you likely do. Err on the side of progress in order to avoid a costly surprise. 		
	MANUFACTURING		
OPPORTUNITIES	 Transitioning to more environmentally sustainable practices now, while your consumer base is mostly stable, can help you weather more volatile conditions later. Though automation is far cheaper than it used to be, it is still a significant capital investment. Ensure that investments made have the potential to be versatile, should your needs evolve down the road. Take advantage of the current stability to invest in incremental progress. Advantages you can put in place now will improve your odds of survival once disruption hits. 		
CHALLENGES	» Many businesses will be forced with an eventual choice: automate, relocate offshore, or significantly drop wages to remain competitive. All of these options reflect a public relations challenge. Investing in operational efficiencies can help to stem the tide, but decisions will need to eventually be made.		
	Fig. 11 - Emergent Opportunities in the "Ignorance is Bliss" Future		

Fig. 11 - Emergent Opportunities in the "Ignorance is Bliss" Future

"IGNORANCE IS BLISS" FUTURE

	TRANSPORTATION		
OPPORTUNITIES	» Shipping is likely to be status quo during this period, but change is coming. Take the opportunity to research means of shipping that download risk to the transportation company. It may be time to outsource, as we enter the uncertainty of what self-driving vehicles will mean for the mass transportation of goods.		
CHALLENGES	 So many competing entries in automated and electric vehicles creates uncertainty in the future of transportation Investing in one that may flame out could be costly. 		
	RETAIL		
0 OPPORTUNITIES	 When consumers feel financially secure, they are more likely to shop by their values. Savvy retailers can cater to these niche markets as a way to build brand loyalty. Taking advantage of the consumer's will to buy can provide you with a tidy nest egg with which to make improvements, as we see Amazon doing so successfully. However, if your business model includes providing financing, consider downloading that business onto an outsourced company. This arena is likely to get volatile. 		
CHALLENGES	» Making the move to offshore or automating your workforce too early can poison you in the public's perception. Be careful not to make drastic shifts too early.		
	DISPOSAL/END-OF-LIFE		
OPPORTUNITIES	» Find efficiencies through improving your approach to the full cycle of your products. There may be opportunities to gain value through aspects of your process that are currently being regarded as waste.		
CHALLENGES	» As the effects of climate change gain more visibility and result in climate refugees seeking asylum, public opinion may prioritize corporate responsibility for the full-cycle of product life. Be prepared by identifying a plan now, becoming a corporate leader, rather than racing to catch up later.		

Fig. 11 - Emergent Opportunities in the "Ignorance is Bliss" Future (Cont'd)

Prognosis

This future represents the least change from our current state; however, it is the least stable. Its inclusion indicates that disruption is happening on a longer timeline, rather than positing that there will be a reprieve. Smart organizations recognize that this future will inevitably be disrupted by a combination of the other three futures and will use this period of stability to prepare for the longer term change that is coming.

KEEPING UP WITH THE JETSONS

OWNERSHIP ECONOMY

SCENARIO TWO: KEEPING UP WITH THE JETSONS (Rapid DLA & Maintenance of the Ownership Economy)

> RAPID RATE OF — DIGITAL LABOUR ADOPTION

The migration of work from humans to robots results in high unemployment and escalating civil disruption. However, necessity provides opportunities for alternative models of economic participation. In such uncertainty, consumers prefer putting their available resources into capital assets which can not only retain their value, but create value. Resources are frequently pooled in order to benefit from an increased return on a collective (and therefore larger/pooled) investment.

VALUES & SOCIETY

With high rates of unemployment and financial insecurity there is increasing civil unrest. Protests are getting more uncontrollable, and Toronto Police Services released a statement last week warning that "future incidents of violence will be met with the requisite force to subdue the situation." Most of the protests centre around institutions and symbols which propagate the growing disparity between the wealthy and the poor. Last week, a car bomb was detonated in front of The Toronto Club, a bastion for the country's richest citizens. The explosion, which resulted in significant property damage and minor injuries to several unnamed members, was claimed by the anti-poverty action coalition, Fight Inequality. In their statement, they claim, "For too long, the wealthy elite in this country have been protected from the harsh realities of the situation they have created. Fight Inequality will continue to tear down their barricades until they are forced to reckon with the damage they have caused to the working class."

Even the less revolutionary are finding their own ways to make their dissatisfaction known. The "Techlash" is rampant, as more consumers are seeking an "unplugged" option. Personal data is shared sparingly, with consumers more vocal about the need to secure their information. In fact, industries have arisen around creating shadow profiles to enact business online, in ways that redirect away from a person's actual identity.

Public trust in government and other legacy institutions such as education and healthcare is low. Citizens feel that too little was done to mitigate or prepare for the loss of jobs that came with the adoption of digital labour by most major industries. With such high unemployment, personal debt has become a risky proposition and is avoided whenever possible. Belief systems that emphasize the necessity for strong familial ties and traditional values are thriving, as these social behaviours reinforce the economic realities that require families to pool resources and skills in order to maintain a reasonable quality of life. Society has shifted quickly to an "us first" mentality, prioritizing the welfare of the individual and their family above all other considerations.

69 THE FUTURE: SCENARIO TWO - KEEPING UP WITH THE JETSONS

WORK & ECONOMICS

For the vast majority, economic participation centres around "Me, Incorporated". Individuals have created systems by which to monetize their personal assets and resources. It also informs the nature of capital investments. For example, an investment in solar panels might allow for excess energy to be sold back to the grid. Families, whether by blood or by choice, frequently come together for the sake of making larger investments possible, such as the purchase of a home or vehicle. Joining together to purchase monetizable assets, such as 3D printers or indoor vertical farming kits, can be a savvier investment than limiting spending to an individual's financially feasible "single-serve" option. With little traditional employment available, human resources are frequently harvested at home, in tending gardens or taking in mending or various piecework. Whatever assets can be monetized, are monetized – from time to attention to capital goods. Alternative modes of transaction, such as bartering, are frequently practiced and gaining more mainstream acceptance.

In this goods-based economy, a focus on capital assets breeds a capital mindset. The priority is in acquiring enduring assets, rather than indulging in fleeting services. As such, consumers call on manufacturers to provide durable products, sustainable through repair rather than replacement. With expectations high, profits are possible through increased efficiencies and streamlining within the production process. Processing costs are low, thanks to the cheap technological options provided by the combination of automation, robotics and their increasingly valuable returns. As such, supply chains have moved locally, in order to minimize transportation costs. Those businesses that do need to ship long distance have invested in self-driving vehicles, in order to minimize their long-term running costs. Thriving business models tend to share themes of whole-cycle monetization. For example, the detritus of an earlier stage of manufacturing would be sold to another producer for their use rather than discarded, or the byproducts of the manufacturing process, such as heat or friction, are harnessed into serviceable or monetizable assets. An early groundbreaker in this field was the City of Kalundborg, Denmark, where they have a 21-point exchange where local industries utilize the runoff from each other to fuel their own organization. Fer example, the "fly ash", created during the burning of coal for electricity, is harvested and used by a neighbouring company in the production of cement ("Kalundborg Symbiosis", n.d.)

In order to survive, businesses must remain agile. The disruptions that started slowly during the first two decades of the 21st century are arriving with much more rapid frequency now. One of the most impactful was the privatization of most higher education institutes. With the inflexibility of traditional educational institutions leaving most of their graduates with knowledge that was rapidly becoming obsolete, many could not justify taking on the debt of a formal higher education, particularly when there was less likelihood of a steady job at the end of it. Instead, corporations scour high schools and technical institutes to find the best and brightest and enroll them at their privately-run training facilities. For this expenses-paid education, the students commit to a set tenure to be spent working for the organization. Employees are encouraged to enjoy the perks of commitment through various benefits such as housing and vacations. While there are many who would want the work available, there are very few with the requisite skills who can actually compete for the rare positions offered. The middle class is rapidly disappearing. A person's social status is signalled via the number of people with whom they share accommodations. Those offered a space in the corporate colleges are the educational elite. Tenured corporate positions offer the easiest way to transcend a shared-resource existence into a single-family home and significantly more socio-economic clout. However, maintaining these positions means a lifetime of constant retraining and innovation, lest they be supplanted by a more current skill set.

Winners: Big Tech, Big Data (but with higher risk)

Losers: Working class

The following pages provide two tools for businesses to harness for their professional evolution. The first is a persona which can be used both to further understand the proposed future, and also to recognize the market segment that is likely to emerge. Secondly, I have provided a table (Fig. 12) to help businesses recognize the potential opportunities in this vision of the future. While by no means exhaustive, it is intended to provide examples of the types of opportunities that may emerge.

KEEPING UP WITH THE JETSONS - PERSONA

HELEN CAMERON, 72 (ETOBICOKE, ON)

Formerly retired school teacher, TDSB; Member of the Martin Grove Collective

VALUES - Goals & Priorities

- Maintaining a reasonable quality of life for her golden years.
- Disenfranchised by disappearing social supports, she now limits her spending to supporting local businesses with whom she enjoys a personal relationship.
- Highly distrustful of both government and big business.
- Recognizes the necessity of collaborative economics.

WORK

- \$25K Annual Pension CPP & Union
- \$8K Annual Pension Deceased Spousal Supplement
- \$12K Annual Income Membership in Martin Grove Collective
- Collective Responsibilities: Gardening her backyard for vegetables & fruits; Bi-weekly shifts at local farmers' markets; Solar panels installed on her roof, Hosting collective members while their homes are being rented as short-term rentals; Cleaning short-term rentals between tenants and the collective's fleet of 3 Uber cars, Weekly shifts child-minding for other collective members while they drive during peak Uber hours.

CONSUMPTION HABITS

- On a tight budget, and relies on the bulk buying power of her collective.
- Money is spent hyper-locally, whenever possible
- Luxuries are negotiated through non-monetary exchanges whenever possible, and the effects of the additional outlay are felt keenly.

LONG-TERM PROSPECTS

- Prior to her husband's passing, their combined income was sufficient to maintain their basic necessities. However, since she is now on her own, she relies on her participation in the collective to both supplement her income and provide cheaper access to goods purchased in bulk.
- With the additional funds provided by the collective, she has been able to maintain property tax payments on her paid-in-full family home.
- Struggling to keep up with the work demands of the collective; in talks to sell her home to the collective in exchange for reduced duties and lifetime occupancy.



(Balazs, n.d.)

HELEN'S BELIEFS - AT A GLANCE

I am comfortable taking on consumer debt.

I have complete autonomy over my spending decisions.

I believe my employer has my best interests in mind.

I am comfortable sharing my personal data.

I have trust in government and legacy industries.











EMERGENT OPPORTUNITIES IN THE

FINANCE & MANAGEMENT

OPPORTUNITIES	 Entrepreneurial customers will be looking for reliable, safe ways to run tabs on transactions. The transactions themselves are ongoing, rather than one-offs, and may be paid in money or alternative forms of compensation. Providing a secure and private non-invasive platform to do so could be a lucrative opportunity. Of interest is a joint-ownership platform that helps groups to manage co-ownership of capital assets, particularly those that will be leveraged for external monetization by the mini-conglomerate. Education is an excellent leverage point for this future. With such a high reluctance to take on debt, paid learning is a way to attract and retain talent, as well as encourage employees to stay loyal. 		
CHALLENGES	» With public trust so low, it is likely that consumers will turn to smaller, more local institutions. The name recognition that has heralded "trust" in the past may become more of a liability.		
	RESEARCH & DEVELOPMENT		
OPPORTUNITIES	» With the rapid adoption of digital labour, there will be a need to connect the robotics of the warehouse with the automation of the self-driving transport trucks. Providing a translation between systems could help organizations to bridge an emerging gap.		
0PP(» Declining public support for technology creates a louder call for tech companies to undertake more Corporate Social Responsibility projects. Using an organization's expertise for the betterment of society has never been more necessary for maintaining the bottom line.		
CHALLENGES	» Rapid digital labour adoption has created a backlash against new technologies. Big Tech is a frequent subject of protests, and public perception is an ongoing battle. Announce- ments of innovations and product launches need to be done in a far more considered way, or completely behind the scenes.		
	MANUFACTURING		
OPPORTUNITIES	» Consumers are looking for durability above all else. There is a call for goods to be more easily "fixable" than has been popular during the early 21st century. Providing kits of component parts may be a way to increase sales without requiring much new product or capital asset investment.		
CHALLENGES	» Climate change is making the acquisition of natural resources both more challenging and more expensive. Doing more with less is an operational necessity.		

Fig. 12 - Emergent Opportunities in the "Keeping Up with the Jetsons" Future

"KEEPING UP WITH THE JETSONS" FUTURE

TRANSPORTATION			
OPPORTUNITIES	» Micro-production facilities: the versatility of programmable robotics may mean the ability to maintain micro-production sites which can produce a wider variety of goods, rather than them being produced out of a central facility and then transported long distances.		
CHALLENGES	» Public backlash against the loss of driving jobs makes self-driving transport trucks a target for sabotage and expensive mischief. Investors need to be prepared for the additional financial risk and expense of maintaining this new, more efficient mode of transportation.		
	RETAIL		
OPPORTUNITIES	» With consumers calling for a longer shelf life on their asset investments, there is an opportunity for a return of the service department, as modelled by the Apple 'Genius Bar'. Improved product-lifetime service can also be a differentiator that drives consumers to choose your brand over a less-supported one.		
	» High unemployment means a lot of available human capital - with people's dispos- able income severely curtailed, consumers would likely be open to alternative models of "sweat equity". Savvy businesses could integrate this model in order to lower their own overhead costs.		
CHALLENGES	» Consumers are reluctant to take on debt. Pricing models need to reflect affordability or durability big ticket items need to have a convincing sales pitch to make them worthy of investment.		
	DISPOSAL/END-OF-LIFE		
OPPORTUNITIES	» With a higher value placed on capital assets, consumers will expect them to hold some of their value, even at end-of-life. Recycling programs that offer "trade-in discounts" on newer versions will help fuel repeat business.		
	» The new emphasis on repairing goods rather than replacing goods has created a demand for component parts. Fifty years of piling unwanted goods into landfills and the abundance of human capital available provides an opportunity to harvest these dormant potential resources. It's a dirty job, but it's an available one.		
CHALLENGES	» Many of our manufacturing processes are not designed to create products with significant longevity. It will take substantial time for the consumer call to ripple through the manufacturing process and actually result in less waste.		

Fig. 12 - Emergent Opportunities in the "Keeping Up with the Jetsons" Future (Cont'd)

Prognosis

Most likely scenario for outside urban centres, where DLA can still affect jobs, but where traditional values tend to hold longer. Access economy is not as financially viable outside of urban centres.

PROSPERITY BUBBLE

SLOW RATE OF DIGITAL LABOUR ADOPTION		
	SCENARIO THREE: PROSPERITY BUBBLE (Slow DLA & Adoption of the Access Economy)	

With steady employment minimizing concerns of financial instability, the Access Economy provides a backdoor to a more affluent lifestyle. It does this without having to maintain the expense of capital assets or long-term investments. The trappings of wealth are available to all, though this illusion of abundance masks a growing inequality between the rich and the rest.

VALUES & SOCIETY

In a service-based economy, access to abundance breeds an abundance mindset. Travel, luxury goods, and highend services are all now made more available to the lower and middle-classes. The temptation of improvements to their quality of life has consumers prioritizing their current comfort over their long-term financial stability. However, in the short-term, life is good. Individuals have more spending power, as their disposable income stretches far further. With the ability to determine and engage the aspects of culture and lifestyle that provide the most meaning for them, consumers are able to tailor their day-to-day lives to better reflect their desired experience.

Consumers are looking for the "new, now, next." With such a plethora of options available to them, and the disposable income to enjoy them, they are seeking out opportunities that help to satisfy their need for increasing status and self-actualizing through self-expression. Businesses are responding by providing reimagined versions of old products that allow consumers to set themselves apart. For example, AirBnB partners with TaskRabbit to provide upselling options to have in-home spa treatments during short-term rentals. In their flagships stores, Old Navy introduces on the spot screen-printing technologies that allow customers to enhance their purchases with their personal branding. Apple offers a new "concierge" package that uses your smartphone history to recommend apps and online services that meet your lifestyle goals, setting you up with a reservation at the hottest restaurant in town or qualifying you for a luxury upgrade for your weekend car rental.

However, this lifestyle comes with risk. While consumers are living a satisfying life that is providing a sense of meaning and a wealth of experiences, they are accumulating few assets. Should their full-time jobs be dissolved, perhaps through the slow integration of digital labour to the workforce or by disruption of their industries through new business models that render their positions obsolete, they have very little on which to fall back. Moreover, their period of prosperity has afforded them a luxurious lifestyle. When their full-time position is replaced by part-time contracts without pension or benefits, their fall from the illusion of affluence feels even more steep. Additionally, in order for them to fully participate in this service economy, they must agree to terms and conditions impacting their digital privacy. Personal data becomes an extra commodity that they must trade to maintain their new, elevated lifestyle.

WORK & ECONOMICS

For the vast majority, economic participation centres around "Me, Incorporated". As discussed in the previous section, the combination of an Access Economy and Slow Digital Labour Adoption creates prime conditions for entrepreneurial customers. They use the emerging digital platforms as a means to build a "side hustle" or self-directed part-time gig work. While this can be a benefit on an individual level, it can also destabilize the tradition of permanent, full-time work. As the last of the baby boomers retire, their permanent positions leave with them. Gig work becomes more and more acceptable, both for employers to offer and for workers to expect. In the short term, that provides both sides with more flexibility and the opportunity to adapt to a changing professional landscape. However, over the long term, it can leave more people with gaps in their healthcare and pension, requiring a deeper draw on governmental social security resources and a resulting increase in state expenses as they attempt to close the emerging gap. This becomes particularly evident as the first of Generation X approach their senior years without the means to retire, crowding the market for the Global generation just entering the workforce.

Corporate interests certainly thrive during this period, at least those that can weather the threat of disruption. The latest industry to fall has been grocery, led in Canada by the acquisition of George Weston Ltd. by AmazonFresh. Shortly after the purchase was announced, Amazon announced their intentions to expand the PC Express Pickup service in Toronto, Calgary, and Vancouver into an online ordering, full delivery service, free for the first year to Amazon Prime customers. Expansion of the service into all other major Canadian markets is expected in the next 3-5 years. Similar efforts in the United States have shown a reduction of 30% in traditional, in-person grocery shopping. Interestingly, since the American service launched, UberEats has seen a reduction in the use of their services by 8%.

With a contented population who are eager to access the services that innovative companies can provide, governments are hesitant to attempt to regulate the emergent service providers, not wanting to contend with the public outcry that would result. As the public's concern lies solely with maintaining the trappings of a high quality of life, the buried corporate costs of such a lifestyle are left mostly hidden. Data mining is rampant. Supply chains are kept intentionally opaque. Security is outsourced. It is a capitalist playground where the strong and the quick thrive, and the weak and the timid are rapidly replaced.

Winners: Working class, Middle class (Access to much higher quality of life through temporary access); Big everything - less angst against the system when more people are content

Losers: Everyone, in the long term (unsustainable)

The following pages provide two tools for businesses to harness for their professional evolution. The first is a persona which can be used both to further understand the proposed future, and also to recognize the market segment that is likely to emerge. Secondly, I have provided a table (Fig. 13) to help businesses recognize the potential opportunities in this vision of the future. While by no means exhaustive, it is intended to provide examples of the types of opportunities that may emerge.

PROSPERITY BUBBLE - PERSONA

KAYLA HUNT, 34 (MONTREAL, QC)

Office Manager at an BonVie Insurance; Entrepreneur

VALUES - Goals & Priorities

- Prioritizes lifestyle improvements over long-term investing
- Uses acquisition of experiences as a form of status-building
- Self-actualization is accomplished through self-expression, facilitated by the consumption of bespoke goods and services.

WORK

- \$45K Annual Salary full-time permanent position
- Employer recently laid off 80% of their customer support personnel, replacing them with an AI program.
- Employer released an internal memo announcing that, "the next five years will bring many exciting changes to the organization."
- \$5K Annual Income from her side business Special event hair & makeup styling
- Side business runs \$2.5K in annual expenses.

CONSUMPTION HABITS

- Chooses to rent, rather than buy housing, in order to maximize her disposable income.
- Vacations with AirBnB, in order to maximize the uniqueness of her experience and leave more funds available for additional bespoke experiences (such as spa treatments, etc.).
- Patronizes multiple businesses that turn traditional goods economies into a service. For example, instead of investing in clothes of which she may grow tired or which may cease to fit, she rents her wardrobe through a subscription service that allows her to indulge her fashion forward tastes at a fraction of the cost. (Also, car-share programs, meal subscription services).

LONG-TERM PROSPECTS

- Employer has begun the process of Digital Labour Adoption; odds of being made redundant are increasing.
- By prioritizing temporary goods and services, Kayla is not accumulating any capital assets. Her lifestyle is dependent on the maintenance of her current financial liquidity.
- As her self-perception is primarily defined by her consumption of goods and services, any downturn in her personal finances is likely to result in an increased strain on her mental health.



(Nix, n.d.)

KAYLA'S BELIEFS - AT A GLANCE

I am comfortable taking on consumer debt.

I have complete autonomy over my spending decisions.

I believe my employer has my best interests in mind.

I am comfortable sharing my personal data.

I have trust in government and legacy industries.













EMERGENT OPPORTUNITIES IN THE

	FINANCE & MANAGEMENT		
OPPORTUNITIES	 » Entrepreneurism thrives, so consumers are looking for avenues to acquire capital to develop their "side hustles". » During the "Prosperity Bubble", most skilled professionals are still coming from higher education. Working with those institutions now to ensure that students have the skills that will be necessary later is crucial to managing the coming disruption. 		
 Consumers, secure in their employment, are more than willing to take on debt to their lifestyle. However, when the jobs disappear to automation later, many will be left without a way to pay the bill. Long-term loans could prove costly to the lenders, unless to can find a way to download the risk. 			
	RESEARCH & DEVELOPMENT		
OPPORTUNITIES	 With government shying away from regulating Big Tech, this is the opportunity to experiment with innovative and boundary-pushing business models. When the tide turns against innovation later, once digital labour has started to really impact the labour market, you want these innovations to be already indispensable to the public. Consumers are looking for disposability without guilt. Finding ways to make environmentally-responsible materials more economically feasible can be a differentiator for companies wanting to set themselves apart from the pack. 		
CHALLENGES	» With business models in flux, disruption of legacy industries is having an indirect ripple through manufacturing. Products being dispensed and used in new ways have different life-cycles that require different priorities in their design and durability. Savvy product developers have their finger on the pulse of evolving consumer behaviour and are updating their old products to meet these new expectations.		
	MANUFACTURING		
OPPORTUNITIES	» Bespoke and customizable products are all the rage in a society that is looking to constantly pursue higher luxury options. Using new robotics technologies to manage these expectations of individualization efficiently can help manage your expenses while broadening your consumer appeal.		
CHALLENGES	» As consumers are more and more satisfied with having temporary access to products and services, rather than prolonged use, many manufacturers are reevaluating their customer and considering a B2B model. If your new customer is looking to acquire assets for a renting or resale model, they may be more inclined towards products with more durability than has been fashionable in the early 21st century.		

Fig. 13 - Emergent Opportunities in the "Prosperity Bubble" Future

"PROSPERITY BUBBLE" FUTURE

	TRANSPORTATION		
OPPORTUNITIES	» With self-driving vehicles just around the corner, this is a good opportunity to be reinvesting your profits into preparing your infrastructure for the changes that are coming.		
CHALLENGES	» Even by 2018, disruptive mobility services such as Lyft and Uber, had increased the traffic on streets in major cities by 160% (Schaller Consulting, 2018). By 2030, with ride services companies, fleets of car-share vehicles, and the increasing presence of self-driving vehicles added to traditional drivers, traffic has never been worse.		
	RETAIL		
OPPORTUNITIES	 Consumers are no longer instinctively looking to ownership as the preferred form of economic engagement. Companies relying on that form of customer transaction should explore alternate models (such as subscriptions or rentals) to open their goods and services to a broader market. This is a service economy - consumers want access to high-end lifestyle and there is a significant market for granting temporary access to the toys and experiences usually reserved for the very wealthy. 		
CHALLENGES	» With so many consumer options available, customers have high expectations when it comes to service and delivery. Same-day delivery, free shipping and unrestricted returns and exchanges are the standard. Companies need to be able to keep up with these expensive demands in order to stay competitive.		
	DISPOSAL/END-OF-LIFE		
OPPORTUNITIES	» Disposability is an asset in this future, as consumers are always looking to access the next, better version. However, one person's trash is another person's step up. There is a market for resale and renting down, if you can master directing the right products to the right customer.		
CHALLENGES	» Disposability creates a lot of waste, and we're running out of places for it to go. This is increasing the pressure on companies to take responsibility for the full life-cycle of their products.		

Fig. 13 - Emergent Opportunities in the "Prosperity Bubble" Future (Cont'd)

Prognosis

These tendencies towards lifestyle over longevity are already showing themselves, particularly amongst younger demographics in urban centres.

PIECEMEAL PROSPERITY

RAPID RATE OF DIGITAL LABOUR ADOPTION

SCENARIO FOUR: **PIECEMEAL PROSPERITY** (Rapid DLA & Adoption of the Access Economy)

ACCESS ECONOMY

With traditional work disappearing at a frantic pace, economic participation relies on a piecemeal approach. While this can help to even the playing field for those living in poverty, it does so at the expense of the middle class, widening the inequality gap between the wealthy and everyone else.

VALUES & SOCIETY

Entrepreneurship is no longer for upstarts and dreamers, it is the standard way of life. Grandmothers, teenagers, the disabled, the disenchanted... the gig economy has a place for them. People find the corners that match their skill sets and capabilities and hold on until a better opportunity comes along. Work is woven into the fabric of day-to-day life. Picking up a few Lyft fares as you drive yourself to your contract job. Popping out on your lunch break to hang someone's TV, courtesy of Taskrabbit. Stopping off at your apartment after work to meet your AirBNB guests, before heading to your neighbour's to crash (for a minimal fee and help with harvesting their balcony garden to sell at the local farmer's market). There is some degree of satisfaction in the autonomy of decision-making. Bakers bake. Growers grow. Accountants account. However, there is also rampant instability. Jobs can disappear at any time and no one has a rainy day fund. As such, people are always on watch for the next opportunity, continuously weighing it against the opportunity at hand.

With such a high level of professional uncertainty, traditional higher education succumbs to the inevitable disruption. Students can no longer justify spending \$50K on an education that had no realistic expectation of meaningful, financially stable employment. In its place, modular training specializations flourish such as coding academies, tailoring apprenticeships, and cooking schools. These dispose of traditional time-based approaches for a competency-based approach. Once students are able to demonstrate that they have mastered an aspect of the curriculum, they are moved on to the next, regardless of the amount of time spent on the subject. In this way, education is not only more concise, but also more bespoke. As competition is fierce between these independent institutions, expectations are high for the quality and customization of the education received.

The erosion of higher education is the final nail in the coffin of the middle class. The class distinction that was once demonstrated by better paying, more stable jobs is now made obsolete by the short-term contracts that are the standard. Better opportunities are now dependent on having the right skills at the right time in the right place, rather than being the result of "paying your dues". While this evens the playing field for emergent professional opportunities, it does it by making it more difficult for everyone. Of course, this instability also portends an emerging crisis in our social services, with a much higher demand on healthcare and social security. Many struggle with the decision of whether it makes sense to participate in the scramble for work, when they are already straddling the welfare line and any participation could put into jeopardy their reliable government income.

WORK & ECONOMICS

On a micro-level, economic interactions are frequently enacted on a person-to-person level, though the platforms that facilitate these interactions are digital. A gig economy requires the commoditization of trust, as the practical manifestation of work is frequently downloaded to an individual, interpersonal transaction. This generally translates to a downloading of risk as well, from the platform to the customer (entrepreneurial or otherwise). This is of obvious benefit to the corporations facilitating these interactions, as they get the profit with minimal accountability for the deliverable itself. It's critical to note that geographical borders are decreasingly relevant to the way that business is operated. While transactions are enacted person-to-person, the corporations facilitating them operate extra-nationally. They are in a position to take advantages of the benefits a nation can provide, but also to decamp as soon as those perks are called into question. Additionally, for the user, a chief cost of economic participation in this landscape is the willingness to part with your personal information. Digital platforms allow individuals the opportunity to cobble together a living, but in order to do so, users must subscribe to the data practices of the hosting corporations.

However, savvy entrepreneurial customers also have access to more, and cheaper, technology than ever before. Even digital labour tools, such as AI and robotics, are becoming more accessible to the layperson. For example, restaurants have begun using AI to interpret their sales reports, allowing them to introduce dynamic pricing to their menu items. A burger and fries that costs \$15.99 on Thursday night, increases to \$17.99 on Saturday evening, and \$18.99 after 11 p.m. Surge pricing is applied to alcohol in club districts on weekends with special events. Uber drivers subscribe to data mining sites that track social media posts to determine which neighbourhoods to haunt in order to find the most riders in need of their service.

On the macro scale, in order for businesses to remain competitive and avoid being swallowed by the Winner-Take-All giants, they need to be agile and focused on short-term returns. With industry shifting like quicksand under their feet, they need to be able to respond to openings that appear, move quickly to assert an advantage, and pivot when the venture ceases to be profitable. It's a question of short-term survival. Once the landscape begins to solidify, providing a better understanding of how digital labour will affect the market and the marketplace, organizations can start to think further ahead and make plans.

Winners: Entrepreneurs, Opportunists, Winner-Takes-All Corps, Big Data (economic participation means buying into their systems), Working poor are better off (in terms of being on more equal footing with the middle classes)

Losers: Middle class, Manufacturers (expectations of goods & services are higher, but risk is downloaded down the supply chain).

The following pages provide two tools for businesses to harness for their professional evolution. The first is a persona which can be used both to further understand the proposed future, and also to recognize the market segment that is likely to emerge. Secondly, I have provided a table (Fig. 14) to help businesses recognize the potential opportunities in this vision of the future. While by no means exhaustive, it is intended to provide examples of the types of opportunities that may emerge.

PIECEMEAL PROSPERITY - PERSONA

GABRIEL RAMIREZ, 53 (VICTORIA, BC)

Part-time Physical Therapist at Kingston BodyWorks; Multiple side jobs

VALUES - Goals & Priorities

- Number one priority is meeting baseline family expenses.
- 2 kids, both looking at modular software engineering bootcamps (\$18K tuition for a six-month program expected salary of \$70K upon completion).
- Wife, Mayra, has relocated to another province temporarily to help her parents build a financial strategy to make ends meet. Travels to spend time with the family one weekend every other month.

WORK

- \$25K Annual Salary part-time contract position
- \$12K Annual Income ergonomics consultant for tech start-ups
- \$8K Annual Income part-time Uber driver
- \$6K Annual Income co-proprietor of an AirBnB rental (additional rented apartments used exclusively for short-term rentals, run by a profit-sharing collective)
- All members of the family are expected to contribute to family income. High school aged children have part-time jobs with proceeds being split between their education funds and contributions to household expenses.

CONSUMPTION HABITS

- Spending decisions are made based on practical need. There is little room in the budget for indulgence in luxury goods and services.
- Purchases are weighed based on their economy and their ability to contribute to create income.
- The acquisition of capital assets is almost completely beyond the family's means.

LONG-TERM PROSPECTS

- Day-to-day finances are relatively stable, though precarious.
- Savings are directed towards potential income earning investments, such as education in thriving fields or shared capital assets.
- Minimal contingency funds for injury or retirement. Gabriel anticipates working in some capacity for the full duration of his life.



(Sison, n.d.)

GABRIEL'S BELIEFS - AT A GLANCE

I am comfortable taking on consumer debt.

I have complete autonomy over my spending decisions.

I believe my employer has my best interests in mind.

I am comfortable sharing my personal data.

I have trust in government and legacy industries.











EMERGENT OPPORTUNITIES IN THE

FINANCE & MANAGEMENT		
S OPPORTUNITIES	 Good ideas are prolific and ready to be acquired for the right price. When corporations come calling with deep pockets, entrepreneurs are willing to part with their intellectual property for the rare opportunity to bank a nest egg. Many citizens will be financially under-prepared for their retirement years. Facilitating ways to help seniors to monetize their assets and capabilities can be a lucrative business. Finding new ways to monetize old products through new customers (such as added B2B, C2C, or direct to customer streams) or new forms of revenue generation (such as adding advertising to existing product transactions) can maximize revenue in an increasingly competitive market. 	
CHALLENGES	» With more entrepreneurs and amateurs undercutting traditional companies by offering similar services for less, big companies need to find ways to get competitive. In this future, only the very big, and the very small, survive.	
	RESEARCH & DEVELOPMENT	
OPPORTUNITIES	» With entrepreneurism the new standard mode of employment, consumers are looking for UX/UI design the way that they were looking for easy website design in the 2010s. Customers are looking for an easy-to-use, "Squarespace 2.0" which would allow the average person to build their own UI with the help of a basic modular template.	
CHALLENGES	» With fewer people willing to take on the debt of higher education, finding talent can be a challenge. Companies looking for skills may need to hire based on potential, and up-skil their new hires.	
	MANUFACTURING	
OPPORTUNITIES	» Digital Labour Adoption is not just for corporations. Now that we've reached 2nd and 3rd generation for some of the automation and robotics technologies, they are becoming affordable for the average consumer. This makes technologies such as 3D printing and robotic assembly technologies available to small and micro-businesses. Micro-manufacturing can move into the condo next door.	
CHALLENGES	» Manufacturers are discovering that the new corporate business models are displacing the production risks onto the mid-sized and small facilities that are taking on the work of building their products. Victorious "Winner-Takes-All" corporations can dictate terms and leave producers scrambling to meet them or risk losing their business.	

Fig. 14 - Emergent Opportunities in the "Piecemeal Prosperity" Future

"PIECEMEAL PROSPERITY" FUTURE

	TRANSPORTATION	
OPPORTUNITIES	» With consumers looking for flexible opportunities to monetize their assets and capabilities, transporting goods can be a cost-saving measure with an outsourced model where professionals and amateurs can compete for bids through an online platform. While the risk and unreliability may notch upwards, the savings are significant.	
CHALLENGES	With the transition from traditional to self-driving vehicles well underway and the increasing scarcity of fossil fuels shifting the industry towards electric vehicles, the pricing model for transporting goods is taking some time to stabilize. As such, shipping costs can be unpredictable.	
	RETAIL	
OPPORTUNITIES	» With micro-entrepreneurship so prevalent, sales capabilities are at the forefront of many people's minds. Companies with expertise can translate their capabilities into market-able assets by providing training and advice to fledgling entrepreneurs and those looking to "level-up" their selling skills.	
CHALLENGES	» Few consumers have the means or inclination to buy a product or service outright. Retailers need to consider shifting their business model to one that is more accessible for the customers, or risk losing their business completely.	
	DISPOSAL/END-OF-LIFE	
OPPORTUNITIES	» Everyone is looking for opportunities to turn trash into gold, and this is extending into literal trash. With such an abundant and reliable resource, competition is hot to find a way to monetize this glut of garbage.	
CHALLENGES	» With so many micro-entrepreneurs operating in grey areas of regulation, it's hard to hold companies accountable for the environmental damage being caused. Complex "entre-preneurial customer" relationships make it easy for blame to be passed to the next patsy down the food chain.	

Fig. 14 - Emergent Opportunities in the "Piecemeal Prosperity" Future (Cont'd)

Prognosis

While all four futures will exist in some manner and for some demographics, it seems likely that the majority of workers will find themselves in this category eventually, even if it is just in part. Being prepared for this reality will help businesses to be the most resilient to disruption.

SHIFTING VALUES

UNDERSTANDING OUR SHIFTING SOCIETAL VALUES

As laid out in the previous section, the Fourth Industrial Revolution has the potential to cause seismic shifts in the practical expressions of capitalism, and in the priorities and values of our society. These will inevitably be caused, in part, by the disruption to our employment structures by the loss of countless jobs to digital labour. However, the ripples extend far further. In some of the futures we are drawn into closer community, while other futures have us operating more in isolation. Some prioritize play, while others prioritize work.

Given the lessons we learned about the role of consumerism in our societal values system, we now have the opportunity to interrogate them against the settings of the four proposed futures. By looking at these lessons through the lens of each future, we can begin to imagine how values might shift or evolve in the changing landscape.

The Evaluation Framework

Note: A deeper exploration of this method can be found in the Methodology section. This section is intended to set context for the section immediately following.

In the first chapter of this work, the Lessons from Consumer History were identified as:

- 1. People consume based on their capacity to do so.
- 2. Labour markets eventually stabilize themselves.
- 3. Consumerism fills a meaning vacuum.
- 4. Consumption can solve problems, and cause them.
- 5. Consumerism gives people the illusion of transcending their class.

As previously identified, these core principles are at the heart of our consumerist behaviours. In order for us to understand the potential changes in buying behaviours that the Fourth Industrial Revolution will bring, it is important to investigate the effect that the identified futures will have on these core principles. As the goal of this project is to establish a practical and pragmatic set of actions that organizations can undertake to prepare for the changes ahead, a rigorous review of these principles was necessary.

Windtunnelling our Consumer Values

In order to evaluate the persistence of each principle within the proposed futures, the "Windtunnelling" methodology was employed. Each lesson was assessed against each future to determine whether it would be likely to stop, slow, remain, increase, or escalate. Based on these assessments, analysis could be completed regarding the likelihood for these truths to endure into the Fourth Industrial Revolution, and to extrapolate what societal values shifts might emerge.

In order to execute this analysis, I laid out the "Windtunnelling Grid" with the four futures along one axis, and each of the "Lessons of Consumer History" on the other. By looking at each intersection as its own microcosm of potential change, I was able to identify the likelihood that the core consumer principle would be altered based on the circumstances of that future. With the individual analysis complete, I was able to take a broader look at the trends and determine the likelihood of each principle's persistence. This deepened understanding allowed me to provide a more informed dissection of the consumer behaviour changes ahead.

The complete Windtunnelling analysis can be found on the following page spread (p. 92).

FROM ANALYSIS TO SYNTHESIS

Following the Windtunnelling table, we will revisit the "Lessons from Consumer History" from the first section of this document in order to explore how these values are likely to evolve. By recognizing which aspects of our relationship with consumption are likely to change, we can identify how our own organizations are likely to fare in those developments.

The windtunnelling provides us with a narrow view of each lesson's strength in each future. However, by taking a step back to look at the overall trends, we can make educated guesses about which changes are most important. By recognizing whether a phase is transitional or the new standard, or whether a change will affect a small portion of the population or society at large, we can prioritize which pieces of information are most critical to give our attention. The "Key Lessons of Consumer History - Revised" attempts to synthesize this key information into a framework we have already established.

WINDTUNNELLING ANALYSIS

Consumer Futures - Windtunnelling

	Ignorance is Bliss (Slow DLA/Ownership)	Keeping Up with the Jetsons (Rapid DLA/Ownership)
1. People consume based on their capacity to do so.	In the "Ignorance is Bliss" future, this value absolutely holds true. The difference is that people consume based not soley on their current resources available, as was the case in the first half of the 20th Century, but rather on the amount of resources they are able to borrow. With assets in hand, it is easy to forget that these things are not actually yours, but belong to the holder of the loan until that loan is satisfied. Similar to the realities of the housing crisis in 2008, decisions are being made on 'bad information' with insufficient justification for the quantity and quality of loans being sought and delivered (NPR, 2008).	Consumers no longer make purchases on their individual ability to do so, but rather come together collectively to make purchasing decisions based on the capability of the group. With the state of the labour market and the limited options for economic participation on an individual level, there is a recognition that combining assets in small collectives is the only realistic path forward for amassing sufficient funds to make meaningful investments in capital assets. These investments are simply unattainable on an individual level.
2. Labour markets eventually stabilize themselves. While some jobs are being made redundant by automa any are simply lost to organizational streamlining an efficiencies. Many organizations are using this period o economic stability to ensure that their organizations ar better prepared for the more tumultuous times ahead. However, with a slower adoption of DLA, redundant we are able to be absorbed into the workforce more easily particularly possible because higher education retains relevancy in this future, so displaced workers are able to in this relatively stable economy.		Backlash against the Capitalist systems that led to the instability in individual financial situations has encouraged the population to rethink their relationship to goods and services. Priorities are now on goods that will serve a purpose, ideally one that will 'net positive' by leading to the creation of more resources. Rather than focus on the acquisition of goods for meaning, consumers are now looking to goods to help them solve practical problems of financial instability. Purchas- es are deeply considered, and have high standards to which they need to meet.
3. Consumerism fills a meaning vacuum.	The prevailing ethos is that point of working is for the acquisitions of things. Things that make our lives easier. Things that make our lives better. Things that provide meaning. Consumers, feeling secure in their work, are taking on more and more debt in order to invest in the assets that provide meaning and status in their lives. Their confidence that these assets will retain their value is a reflection of the value that they believe these assets bring to their lives.	Backlash against the Capitalist systems that led to the instability in individual financial situations has encouraged the population to rethink their relationship to goods and services. Priorities are now on goods that will serve a purpose, ideally one that will 'net positive' by leading to the creation of more resources. Rather than focus on the acquisition of goods for meaning, consumers are now looking to goods to help them solve practical problems of financial instability. Purchas- es are deeply considered, and have high standards to which they need to meet.
4. Consumption can solve problems, and cause them.	In this future, consumers are deeply entrenched in the idea that, "it takes money to make money." Debt is a necessary evil, because it allows for the car that will drive a person to work. A house is a symbol of stability that encourages an employer to invest in a worker's long-term employment. An investment portfolio will bring exponential rewards that will justify the initial costs of purchase. However, with jobs slowly eroding and significant financial instability on the horizon, these investments are likely to cause major long-term problems when loans require repayment and assets begin to lose their value.	Collective purchases allow for groups to harness their individually meager resources into more. However, operating micro-businesses with friends and family can be challenging. Relationships based on affection are now required to hold up to the different scrutiny of business partnerships. Navigating leadership, allocation of resources, expectations of invest- ment, and a myriad of other concerns can bring a new slate of pressures on relationships that used to be the relief from such problems, rather than the cause.
5. Consumerism gives people the illusion of transcend- ing their class.	With an ownership mindset, buying a home is a symbol of a person's civic participation, societal contribution, and economic consanguinity with the community. The same could be said of their purchase of a vehicle, an investment portfolio, etc. While consumers are taking on debt to acquire these "big ticket" items, they do so mainly to retain their current class status, rather than to reach for a new one. However, the lack of these possessions carries a significant stigma. Despite the slow erosion of the middle class, the illusion is maintained by individuals reaching the same level of apparent economic prosperity, while in reality those assets are supported by debt, rather than savings.	There is little illusion about "class" these days. Devoid of traditional work and scrambling to find ways to manage ongoing economic participation, people care less about transcending their class than they do about just trying to maintain the basic needs of their families. In fact, the class divide is more evident than ever, and people are angry about it. The illusions of equality have now been dispelled, and the stark reality has come home for those who were formerly blind to the growing disparity. The public demands account- ability and recourse for the systems that have given so much to so few and taken so much from so many.



Consumer Behaviour Principle is unlikely to change.

Prosperity Bubble (Slow DLA/Access)	Piecemeal Prosperity (Rapid DLA/Access)
This is true, but the model for consumption has changed. With an Access economy, consumers can participate based on their capacity, but the options available to them are broader and shallower. Their participation is equal to their resources, but their acquisition of assets significantly decreases, meaning that there is a net loss of resources, even though their quality of life may increase.	While this is true, there is a different value system underpinning this belief. Rather than the resources dictating the level of consumption, the required level of consumption is dictating the amount of resources that need to be pursued. Patchwork gigs are then assembled to make up the required resources. Because of this, the desire for consumption actually reduces. Less needs means less work that has to be acquired or created. By reducing your needs, you can reduce your work, and, hopefully, find some work/life balance.
With access to so much more than before, consumers are taking advantage of this period of seeming abundance to explore their personal identity. Endlessly customizable and bespoke options allow for complete self-expression. Consumers have never had more options for self-actualizing an exact version of themselves for the world to experience.	In the "Piecemeal Prosperity" future, consumption is not about self-actualization, it is about survival. The focus shifts from consumption of goods and services to the intake of resources. Self-actualization comes from putting your capabilities and skills into combinations that allow for you to create work for yourself. Meaning is created by the fulfillment of finding that your human capital is capable of carving out your own niche in the profes- sional world.
With access to so much more than before, consumers are taking advantage of this period of seeming abundance to explore their personal identity. Endlessly customizable and bespoke options allow for complete self-expression. Consumers have never had more options for self-actualizing an exact version of themselves for the world to experience.	In the "Piecemeal Prosperity" future, consumption is not about self-actualization, it is about survival. The focus shifts from consumption of goods and services to the intake of resources. Self-actualization comes from putting your capabilities and skills into combinations that allow for you to create work for yourself. Meaning is created by the fullfillment of finding that your human capital is capable of carving out your own niche in the profes- sional world.
The ability to access goods and services for less is a step towards the image of equality, though not representing any form of actual equality. This can help to "even the playing field" for those who are on the lower end of the economic spectrum. By having the same access to renting that Donna Karan suit, they can be taken more seriously in the job interview for a position that would normally go to someone that "looked more like they would fit in around the office." This temporary access model of consumption can open a lot of previously closed doors. However, it comes at a cost. With no actual accumulation of assets, the value of these experiences is transient. It has no actual accumulation of stability, and is therefore always perching on the edge of precarity.	In this future, the problems that consumption causes are potentially more visible than they are in the other futures. With a shift towards a focus on work, rather than consumption, it makes more visible the costs of consumption. Eating dinner out means taking three more Uber riders, whereas buying groceries for dinner means only taking one. The costs of consuming become more transparent, which makes it easier to see as a transaction, and therefor an objective question of priorities, rather than a subjective question of meaning or fulfillment. It is not so much that the value is less true, but rather than our understanding of the "problems" identified in the value statment becomes easier to define and prioritize.
Never has this been more true than in the "Prosperity Bubble" future. For little investment, consumers can experience the expression of themselves that they feel is most aligned to their desires, regardless of their actual financial limitations. Though it may only be temporary, it lasts long enough for the photo, and therefore exists as an artifact in the world for the expression of self. Having created the artifact, they are then free to pursue other versions of themselves as their desires evolve, rather than being forced to remain in the static expression of a long-term commit- ment.	The gradations of the class system are lost in this future, not because they are erased, but rather they are reduced to "haves" and "have nots". This evens the playing field for those in deeper poverty, buy does it by removing the illusion of the middle class and revealing their precarity. This future is not about consump- tion, but about work. Similarly, any potential of transcending class will come down to practical success, not illusions.

Fig. 15 - Windtunnelling Analysis of Principles of Consumer Behaviour against the proposed futures scenarios

RECOMMENDATIONS

LESSONS FROM CONSUMER HISTORY -REVISITED

Earlier, we explored key lessons to be learned from our consumerist history that help us to understand the role of consumerism in our modern lives. Now, having explored them against the potential futures that the Fourth Industrial Revolution may bring, we can revisit these values in order to explore how they might evolve.

1. People consume based on their capacity to do so, but the accompanying behaviours will shift as a reflection of the availability of individual economic resources.

In the 20th and early 21st centuries, this paradigm resulted in a quest for consumers to make the maximum asset accumulation possible, based on the availability of their resources. While on the surface this behaviour is likely to persist, the methods and drivers of this behaviour will undergo a significant shift.

The most significant shifts are projected in the occurrence of Rapid Digital Labour Adoption. In both futures, behaviours adapt to recognize the reduced access to financial resources, because of the destabilization of work. In an Ownership Economy, continued participation is fueled by a move towards collectivism. In an Access Economy, consumption is scaled to labour, with **the desired level of labour market engagement dictating the propensity for an individual to indulge in extraneous consumption**.

However, even in the Slow Digital Labour Adoption futures, this behaviour is not without concern. While the practice remains, or even escalates - as is projected in the case of the Ownership Economy - it does so by perpetuating a "hollow" system. Consumers are spending based on a false reality that their assets are secure and will retain long-term value. However, with the destabilization of work and the new economics of digitization, these investments are likely to deflate in value and leave their owners scrambling to adjust to their new economic reality.

Recommendation:

A key note for economic policy makers to acknowledge is that a once-burned, twice-shy public, facing the realities of unstable work and depreciating assets, is unlikely to be willing or able to take on additional debt. The economy is likely to slow considerably, or at least move towards a model of micro-transactions on a person-to-person level, rather than be wooed by the big ticket purchases and luxury spending that they have previously demonstrated. Though it may not occur within the 10-15 year window that this project inhabits, there is an economic transformation coming.

2. Labour markets eventually stabilize themselves, but frequently in ways that undermine legacy economic systems.

Humans are resilient, and challenges to our human systems are met with adaptation and innovation. However, the form this innovation will take can be unpredictable and disruptive to old systems. There is no reason to believe that the upcoming disruption to the world of work will be any different. As the futures models in this paper suggest, this disruption will likely take the form of alternative modes of

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economic participation, intensive entrepreneurship (which is, in itself, disruptive), and the destabilization of traditional capitalism.

In the Access Economy futures, the movement towards the Gig Economy results in a prioritization of the individual - "I must pursue the opportunities that provide the best short-term outcomes for me." Loyalty is discarded as a remnant of a previous era, and so organizational knowledge is only as enduring as the next round of contract talks. In the Ownership Economy futures, the system is revealed as particularly precarious by the instability of consumers' financial situations over the long-term. Though the collapse may not happen in the 10-15 year time frame that this paper explores, it is coming nonetheless. The increased draw on our social security systems will result in increased government pressure to regulate work and corporate responsibility. The backlash is coming, it is only the timing that is uncertain.

Recommendation:

The only means of resisting this disruption is through a slow and methodical approach to Digital Labour Adoption which would provide the means by which a redundant workforce could acclimatize into the emergent labour market. However, with the rapid development of technologies and the accompanying exponential effects of their recombinant applications, it seems unlikely that a measured approach will be pursued. As mentioned earlier, this iteration of work disruption is unlike that of the First Industrial Revolution. Whereas the move from farm to factory replaced low-skilled jobs with other low-skilled jobs, the nature of the work emerging from this disruption is less certain.

3. Consumerism fills a meaning vacuum, but only when income is secure.

This paradigm is particularly interesting because of just how clearly it divides along the Digital Labour Adoption divide. When work, and therefore income, is secure, consumers feel the freedom to use consumption to provide and project meaning in their lives. However, when that security is threatened, consumers' priorities shift. Rather than being a means of self-actualization, goods and services are viewed with far more pragmatic consideration. In an Ownership Economy, this pragmatism is expressed in the prioritization of goods that can provide ongoing return on investment. Indeed, autonomy in decisionmaking is ceded to collective interests for the opportunity for greater returns. In an Access Economy, the value assigned to goods is in direct correlation to the amount of work that it took to acquire said goods. This means that the value stands in a much clearer relief against the effort undertaken to acquire it, so the inflation of a good or service to provide self-actualization is revealed as the flimsy, artificial construction that it is.

Recommendation:

"Consumerism as meaning" is a luxury. With a far greater percentage of the population headed for income instability and labour market disruption, it is a luxury that few will be able to afford.

4. Consumption can solve problems, and cause them. (Unchanged)

Of all of the consumer lessons, this holds the most true. In most scenarios, this exists in a variation of "it takes money to make money". Similarly to the early 20th century, goods and services are frequently acquired to make life easier or to free up time to devote to professional endeavours. However, consumers are required to devote more of their time and resources towards working to afford the desired goods and services. It is an ongoing cycle that spirals downwards into increased consumption.

The only future where this cycle is broken is the "Piecemeal Prosperity" scenario. The cycle is chiefly impacted by the visibility of the system. The value of goods and services are more readily apparent

because the consumer sees the increased effort that it takes to acquire them. This visibility creates a more honest accounting of the value of the goods and services in question. Any inflated value of goods is stripped away and consumers can make a choice based on an items' actual rather than its ascribed value.

Recommendation:

Organizations need to be very clear on the actual and ascribed value of their offerings. They can ensure their continued value by making sure that their products reduce headaches, rather than causing them.

5. Consumerism gives people the illusion of transcending their class. However, this illusion is far more fragile than it appears.

This lesson is by far the most fragile. With the changes ahead, the growing disparity of income inequality will only become more and more apparent. This is most apparent in the futures with Rapid Digital Labour Adoption. Faced with the realities of their own income instability, consumers will take a hard look at the systems that have led to this growing — even gross — inequality. The disappearance of the middle class actually helps to even the playing field for those who have been living with income insecurity. At this point, class is reduced to two sectors – the haves and the have-nots.

The brittle nature of this lesson is also apparent in the Slow Digital Labour Adoption futures, though to a lesser extent. In the Ownership Economy, consumers strive to maintain their current standing, rather than reaching to exceed it. Even then, their ability to hold onto their social standing is built on an accumulation of debt, rather than an accumulation of assets. Even in the one future where this lesson is upheld, the "Prosperity Bubble" future, it is a temporary measure. Consumers revel in their ability to live beyond their means, but it is a house of cards.

Recommendation:

When income instability inevitably arrives, it brings an end to the illusion and leave consumers with the harsh reality of economic participation without appreciating assets or reliable employment. Organizations need to be prepared to weather the emotional response to this new reality, particularly if they appear to be a "part of the problem".

KEY INITIATIVES FOR FORWARD-THINKING BUSINESSES

In the previous section, we have identified the likely changes that will impact the role of consumerism in our society. However, change is not inherently bad. This evolution in our relationship with consumption opens up potential opportunities in how consumers interact with the marketplace. Especially for those organizations who can proactively enter the emerging market, there are opportunities to thrive.

In Figure 15 on the opposite page, there are a list of key initiatives by sector that savvy organizations would be prudent to start prioritizing in the short-term. By investing in these area of opportunity now, they will be in a far better situation to weather the changes ahead. The future will be upon us faster than we can imagine, and we need only look at the hospitality industry to see how rapidly new offerings, such as AirBnB and UberEats, can disrupt and replace legacy players. Companies need to use this current period of relative stability to ready themselves for the instability around the corner.

FINANCE & MANAGEMENT

» With the rise in entrepreneurship and income inequality, providing a secure and straightforward platform for individuals to collaboratively finance, manage, and profit-share capital assets would be a lucrative product development investment.

» With precarious employment redefining consumers' economic expectations, it is likely that their willingness to take on personal debt will decline. In order to maintain people's investment in current economic systems, some level of financial security is required. Over the long-term, investments in living wages and stable work contracts could pay off by maintaining the capitalist playground that modern business currently inhabits.

RESEARCH & DEVELOPMENT

» With public trust a precarious resource, companies at the forefront of innovation need to manage their relationship with consumers by investing in Corporate Social Responsibility initiatives.

» Precarious employment fosters entrepreneurship; entrepreneurship encourages disruption. The coming work instability will only feed into the uncertain futures of legacy companies. In order to remain viable, organizations should keep on the lookout for their potential disruptors, and acquire them to work to their advantage rather than their destruction.

MANUFACTURING

» As consumers are increasingly exposed to the economic repercussions of environmental damage, the call for responsible manufacturing and sustainable production of goods will only increase. Implementing the infrastructure now, during the calm before the storm, will help you get ahead of your competitors who are less forward-thinking.

TRANSPORTATION

» Self-driving vehicles are around the corner. Invest today's profits into preparing your infrastructure to manage the changes ahead.

RETAIL

» Consumers are looking for alternative business models to engage with their desired goods and services. If you have not already started looking at alternate models of monetizing your product offering, begin this process now. It is your best defense against disruption later.

» Consumerism as self-actualization is a luxury. Poverty requires a refocusing of values to meet basic needs over the creation of meaning.

DISPOSAL/END-OF-LIFE

» As the public calls for increased ecological responsibility and corporations begin to feel the impact of declining natural resources, a savvy company who can figure out how to commodotize the effects 50 years of shoveling indiscriminate waste into landfills would potentially have an almost unlimited supply of cheap, raw materials.

Fig. 16 - Key Initatives for Maintaining Future Success - by sector

CONCLUSION

I embarked upon this project with a much broader scope which encompassed a larger question of the Futures of the Western Economy. While too expansive to be practical, it provided me with a useful context for the subsequent work that was undertaken. It revealed that the structural underpinnings of the economic systems that have thrived since the First Industrial Revolution are beginning to fail. Our environment and societal inequality can no longer bear the weight of the continual growth of traditional Capitalism. Something crucial is about to give, and that will have significant ripples through the cultural stalwart that is consumerism.

Upon narrowing to my focus point to consumer culture, this project was conducted with a singular, pragmatic goal in mind: How can organizations involved in the business of selling goods and/or services make sure that their customers remain both capable of, and interested in, partaking in their wares? My interest in this project was to provide a practical understanding of the potential changes ahead so that businesses can use them to inform their strategic planning. I believe that forward-thinking organizations can navigate the choppy oncoming waters proactively or reactively, and that those who choose to prepare are far more likely to weather the storm. Furthermore, to continue the analogy, I believe there is an opportunity for organizations to plan on selling lifejackets or renting space on lifeboats. That is to say, there are opportunities for finding increased success in an uncertain future, provided that you make the appropriate investments in the here-and-now.

Key Subject Insights

If there was one critical idea from this work that those organizations should take away with them, it is this: **The systems that have thrived over the past 200 years are incompatible with the Fourth Industrial Revolution.** Change is coming. To survive, businesses need to be able to adapt in the moment while keeping a long-term view. Short-term interests cannot be prioritized over long-term vision, but long-term vision cannot be realized without short-term survival. Companies need to become accomplished at shifting offerings to match evolving consumer priorities. It is about building the capabilities required to identify emerging market opportunities, and repackaging or reshaping their products to fit the market opponing.

On a societal level, we need to remember that **consumer behaviour is the symptom of the system, not the cause.** When changes occur to the way that consumers participate in the economy, there are underlying drivers that create the conditions for that behaviour. If you want the behaviour to change, you need to address the drivers. For consumers to buy, they need to have money. For consumers to have money, within our current capitalist model, they need to have employment. For them to have employment, companies need to provide jobs. At an enterprise level, digital labour may seem like a solution to declining profits and an increasingly competitive market. However, on a macro level, it only exacerbates the underlying causes of consumer apathy.

These conclusions have been drawn from the recurring themes that have emerged throughout this exploration. I believe that this approach recognizes the practical requirements of organizations who need to balance their long-term 'wants' with their short-term 'needs'. It does not do so without taking some short-term 'hits', as reinvesting resources now against future returns can affect immediate returns.

It is also important to note that this project does not presume to explore the solutions for the economic challenges ahead. It simply recognizes that the first steps in addressing any challenge is to understand it. By providing a picture of the barriers to economic participation that are likely to emerge as we fully transition into the Fourth Industrial Revolution, we can make more conscious choices about how we respond to them - both as individual organizations and at a societal level.

Key Process Insights

In terms of my reflections on Futures Studies itself, I believe that the most valuable insight I have to offer is that **when studying cultural change, it is sometimes critical to look backwards in order to effectively look ahead**. Because culture emerges over time and is so deeply embedded in the structures of our lives, understanding its original formation and precursive factors can help us to appreciate the deep-rooted functions that it holds in our lives. Understanding those functions is critical for recognizing how they might evolve when faced with disruptive influences. As we know, futures studies are not just about recognizing that change will occur; we know that inevitability already. Rather, futures studies are about creating models of potential change that reflect the realities that we know to exist. Part of that "knowing" is having an accurate and meaningful understanding of the purpose that a given behaviour has in our lives, not just the manifestation of the behaviour. As such, when investigating culture, it is critical to have a clear understanding of the history that created said culture.

Further Research Opportunities

Given the limited scope of this project, there are several avenues of design research that were left unexplored. Future studies would explore the following arenas:

- Extended academic research on cultural formation theory and its relevance to the endurance of consumer culture.
- Primary consumer research to verify the conclusions regarding the function of consumerism in contemporary society.
- Feedback on the project processes and conclusions from experts in both academic and professional spheres.
- Practical application of "Key Lessons of Consumer History Revised" into a professional case study, in order to determine the best means of translating learning into a business context.

LOOKING TO THE FUTURE

The future is still in development. It will be determined by the priorities that we consciously and unconsciously put in motion through our actions in the present. It can be shaped. It can be ignored until it is upon us, and we are forced to deal with the repercussions of our disinterest. However, two truths stand firm: change is coming, and there is a window of opportunity in the here-and-now where we can help to shape the future into our preferred vision.

REFERENCES

2018 Disruptor 50: No. 9 Rent the Runway. (2018). Retrieved from https://www.cnbc.com/2018/05/22/rent-the-runway-2018-disruptor-50.html

Ambrose, S. (1996). Undaunted Courage. New York: Simon & Schuster.

Anna Todd. (2019). Retrieved from https://en.wikipedia.org/wiki/Anna_Todd

Anzilotti, E. (2018). "What We Have Right Now Is a Really Brutal Economy": Here's How to Fix It. Fast Company. Retrieved from https://www.fastcompany.com/40532249/what-we-have-right-now-is-a-really-brutal-economy-heres-how-to-fix-it

Ashton, T. (1948). The Industrial Revolution: 1760-1830 (4th ed.). London: Oxford University Press.

Avery, S. (2016). Growing Their Own Revenue: The Fiscal Impacts of Cannabis Legalization. Toronto: CIBC World Markets, Inc. Retrieved from http://research.cibcwm.com/economic_public/download/eijan16.pdf

B., J. (2015). Tinder: The dark side of network effects – Digital Innovation and Transformation. Retrieved from https://digit.hbs.org/ submission/tinder-the-dark-side-of-network-effects/

Ballentine, C. (2018). Google-Facebook Dominance Hurts Ad Tech Firms, Speeding Consolidation. Retrieved from https://www.nytimes. com/2018/08/12/technology/google-facebook-dominance-hurts-ad-tech-firms-speeding-consolidation.html

Bansal, A., Garg, C., Pakhare, A., & Gupta, S. (2018). Selfies: A boon or bane?. Journal Of Family Medicine And Primary Care, 7(4), 828. doi: 10.4103/jfmpc_jfmpc_109_18

Beck, J. (2018). People Are Changing the Way They Use Social Media. Retrieved from https://www.theatlantic.com/technology/archive/2018/06/did-cambridge-analytica-actually-change-facebook-users-behavior/562154/

Benson, J. (1994). The Rise of the Consumer Society in Britain, 1880-1980 (1st ed.). London: Longmond Group UK Limited.

Bernstein, W. (2004). The Birth of Plenty (1st ed.). New York: McGraw-Hill.

Beutin, N. (2018). Share Economy 2017: The New Business Model. Pricewaterhouse Coopers. Retrieved from https://www.pwc.de/de/ digitale-transformation/share-economy-report-2017.pdf

Bishop, P., Hines, A., & Collins, T. (2007). The current state of scenario development: an overview of techniques. Foresight, 9(1), 5-25. doi: 10.1108/14636680710727516

Board of Governors of the Federal Reserve System (2018). Report on the Economic Well-Being of U.S. Households in 2017. [online] Washington: Federal Reserve Board. Available at: https://www.federalreserve.gov/publications/files/2017-report-economic-well-being-us-households-201805.pdf [Accessed 6 Jan. 2019].

Bologna, M. (2017). Amazon Close to Breaking Wal-Mart Record for Subsidies. Retrieved from https://www.bna.com/amazon-close-breaking-n57982085432/

Bryan, C. (2017). RIP: Here are 70 things millennials have killed. Retrieved from https://mashable.com/2017/07/31/things-millennialshave-killed/#IU6b8OeqDZqO

Brynjolfsson, E., & McAfee, A. (2014). The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies (1 st ed.). New York: W. W. Norton & Company.

Byrne, C. (2011). Crimesourcing and how data criminals are like startup employees. Retrieved from https://venturebeat. com/2011/09/23/crimesourcing-crime-as-a-service-and-how-data-criminals-are-like-startup-employees/

Byrne, C. (2019). The new ways we could get hacked (and defended) in 2019. Retrieved from https://www.fastcompany. com/90287253/cybersecurity-cybercrime-threats-defenses-2019?utm_source=postup&utm_medium=email&utm_campaign=Fast%20 Company%20Daily&position=2&partner=newsletter&campaign_date=01072019

Canada GDP Growth Rate. (2018). Retrieved from https://tradingeconomics.com/canada/gdp-growth

Chen, A. (2019). An economist explains what digital technology means for the future of popular culture. [online] The Verge. Available at: https://www.theverge.com/2019/1/4/18168457/digital-renaissance-joel-waldfogel-music-books-movies-television-technology-interview [Accessed 6 Jan. 2019].

Choo, C. (1999). The Art of Scanning the Environment. Bulletin For The American Society Of Information Science.

Clark, G. (2007). A Farewell to Alms: A Brief Economic History of the World (1st ed.). Princeton: Princeton University Press.

Clarke, M. (2017). Education and Democratization: Moving Beyond the Service of Goods to Write the Poetry of the Future. Scottish Educational Review, 49(2). Retrieved from https://ray.yorksj.ac.uk/id/eprint/2729/1/Clarke%20SER%20Nov_2017.pdf

Connor, P. (2018). Where Syrian refugees have resettled worldwide. [online] Pew Research Center. Available at: http://www. pewresearch.org/fact-tank/2018/01/29/where-displaced-syrians-have-resettled/ [Accessed 19 Jan. 2019].

Constine, J. (2018). How Uber will become an ad company, starting with Eats Pool. Retrieved from https://techcrunch. com/2018/12/10/uber-ads/

Cowan, R. (1976). The "Industrial Revolution" in the Home: Household Technology and Social Change in the 20th Century. Technology And Culture, 17(1), 1. doi: 10.2307/3103251

Coyle, D. (2014). GDP: A Brief but Affectionate History (1 st ed.). Princeton: Princeton University Press.

Cross, G. (1993). Time and Money: the making of consumer culture. London: Routledge.

Culkin, J. (1967). A Schoolman's Guide to Marshall McLuhan. Saturday Review. Retrieved from http://www.unz.com/print/SaturdayRev-1967mar18-00066/ - VOLUME & ISSUE NUMBER FROM REF LIBRARY?

Cuthbertson, A. (2019). Cryptocurrency markets surge following JP Morgan U-turn. Retrieved from https://www.independent.co.uk/life-style/gadgets-and-tech/news/bitcoin-price-latest-cryptocurrency-market-latest-jpm-coin-jp-morgan-a8784501.html

Davenport, T., & Ronanki, R. (2018). Artificial Intelligence for the Real World. Harvard Business Review, 96(1), 108-116.

Davis, F. (2016). We shape our tools and, thereafter, our tools shape us. Retrieved from https://medium.com/@freddavis/we-shape-our-tools-and-thereafter-our-tools-shape-us-1a564cb87484

Davis, M. (2009). Comrade or Brother?. London: Pluto Press.

Delcker, J. (2019). Finland's grand Al experiment. [online] POLITICO. Available at: https://www.politico.eu/article/finland-one-percentai-artificial-intelligence-courses-learning-training/?utm_source=pocket&utm_medium=email&utm_campaign=pockethits [Accessed 6 Jan. 2019].

Dennin, J. (2016). Apple, Google, Microsoft, Cisco, IBM and other big tech companies top list of tax-avoiders. Retrieved from https://mic.com/articles/155791/apple-google-microsoft-cisco-ibm-and-other-big-tech-companies-top-list-of-tax-avoiders#.2sxGoODzr

De Vries, J. (2009). The Industrious Revolution (1st ed.). Cambridge: Cambridge University Press.

Erickson, A. (2018). Revisiting the U.S.-Soviet space race: Comparing two systems in their competition to land a man on the moon. Acta Astronautica, 148, 376-384. doi: 10.1016/j.actaastro.2018.04.053

Foertsch, C. (2018). 1.7 Million Members Will Work in Coworking Spaces by the End of 2018. Retrieved from http://www.deskmag.com/ en/1-7-million-members-will-work-in-coworking-spaces-by-the-end-of-2018-survey Foroohar, R. (2018). Year in a Word: Techlash. [online] Ft.com. Available at: https://www.ft.com/content/76578fba-fca1-11e8-ac00-57a2a826423e [Accessed 6 Jan. 2019].

Fowler, R. (2017). The reluctant Airbnb host: why I rent my spare bedroom to pay my own rent. Retrieved from https://www. theguardian.com/technology/2017/aug/01/airbnb-host-rent-housing-crisis-los-angeles

Freemium. (2019). Retrieved from https://en.wikipedia.org/wiki/Freemium

Galloway, S. (2017). The Four: The Hidden DNA of Amazon, Apple, Facebook, and Google (1st ed.). New York: Portfolio/Penguin.

Gressin, S. (2018). The Marriott data breach. Retrieved from https://www.consumer.ftc.gov/blog/2018/12/marriott-data-breach

Hagiu, A., & Rothman, S. (2016). Network Effects Aren't Enough. Retrieved from https://hbr.org/2016/04/network-effects-arentenough

Hindy, L. (2018). Germany's Syrian Refugee Integration Experiment. [online] The Century Foundation. Available at: https://tcf.org/ content/report/germanys-syrian-refugee-integration-experiment/?agreed=1 [Accessed 19 Jan. 2019].

History of Facebook. (2019). Retrieved from https://en.wikipedia.org/wiki/History_of_Facebook

Huizinga, J. (1954). The Waning of the Middle Ages. New York: Edward Arnold.

Interactive Advertising Bureau. (2018). IAB Internet Advertising Revenue Report: Full Year 2017 and Q4 2017. New York City: IAB. Retrieved from https://www.iab.com/wp-content/uploads/2018/05/FY-2017-IAB-Internet-Advertising-Revenue-IAB-Webinar-Presentation-05-10-2018.pdf

Irwin, N. (2014). You Can't Feed a Family With G.D.P. The New York Times. Retrieved from https://www.nytimes.com/2014/09/17/upshot/you-cant-feed-a-family-with-gdp.html

Jennings, K. (2011). My Puny Human Brain: Jeopardy! genius Ken Jennings Describes What It's Like to Play Against a Supercomputer. Retrieved 25 February 2018, from http://www.slate.com/articles/arts/culturebox/2011/02/my_puny_human_brain.html

Kalundborg Symbiosis. Retrieved from http://www.symbiosis.dk/en/

Kurki, S., & Wilenius, M. (2016). Trust makes this organisation unique. European Journal Of Futures Research, 4(1). http://dx.doi. org/10.1007/s40309-016-0095-z

Lears, T. (2000). From Salvation To Self-Realization: Advertising and the Therapeutic Roots of the Consumer Culture, 1880-1930. Advertising & Society Review, 1(1). doi: 10.1353/asr.2000.0009

Leonhardt, D. (2017). Opinion | Thank You, Readers. Retrieved from https://www.nytimes.com/2017/11/23/opinion/thanksgiving-note-new-york-times.html?rref=collection%2Fsectioncollection%2Fopinion-columnists

Levenson, E. (2018). Maker of 3D-printed guns begins selling blueprints, despite court order. Retrieved from https://www.cnn. com/2018/08/28/us/3d-printed-guns-cody-wilson-blueprint/index.html

Levy, A. (2018). Salesforce's Marc Benioff unplugged for 2 weeks, and had a revelation that could change his industry. [online] CNBC. Available at: https://www.cnbc.com/2018/12/30/salesforce-marc-benioff-talks-tech-ethics-time-magazine-and-vacation.html?utm_ source=pocket&utm_medium=email&utm_campaign=pockethits [Accessed 6 Jan. 2019].

Levy, S. (1984). A Spreadsheet Way of Knowledge. Harper's. Retrieved from https://www.wired.com/2014/10/a-spreadsheet-way-of-knowledge/

Malaska, P. (1999). A Conceptual Framework for the Autopoietic Transformation of Societies. Turku: Finland Futures Research Centre. Retrieved from http://www.utu.fi/fi/yksikot/ffrc/tutkimus/hankearkisto/Documents/futu_5_99.pdf

Maloney, K. (2018). 7 Astonishing Facts About YouTube That You've Never Heard. Retrieved from https://www.huffingtonpost.com/

kathleen-maloney/7-astonishing-facts-about_b_14630278.html

Manjoo, F. (2009). Jurassic Web. Retrieved from https://slate.com/technology/2009/02/the-unrecognizable-internet-of-1996.html

Masood, E. (2016). The Great Invention: The story of GDP and the making and unmaking of the modern world. New York: Pegasus Books.

Maslow, A. (1967). A Theory of Metamotivation : the Biological Rooting of the Value-Life. Journal Of Humanistic Psychology, 7(2), 93-127. doi: 10.1177/002216786700700201

Masters, B. (2017). Winners and losers in the sharing economy | Financial Times. [online] Ft.com. Available at: https://www.ft.com/ content/c97eaa72-eaf8-11e7-bd17-521324c81e23 [Accessed 19 Jan. 2019].

McKee, D. (2017). Neoliberalism and the legality of peer platform markets. Environmental Innovation And Societal Transitions, 23, 105-113. doi: 10.1016/j.eist.2017.04.001

Milman, O. (2018). 'We're moving to higher ground': America's era of climate mass migration is here. [online] the Guardian. Available at: https://www.theguardian.com/environment/2018/sep/24/americas-era-of-climate-mass-migration-is-here [Accessed 19 Jan. 2019].

Molteni, M. (2018). Why DNA Is the Most Exciting Programming Language Today. Retrieved from https://www.wired.com/story/ wired25-sean-parker-alex-marson-crispr-dna-programming/

Morey, R. (1940). Basic Needs of Man in Society. The Journal Of Educational Research, 34(1), 1-14. http://dx.doi.org/10.1080/0022067 1.1940.10880967

Mortensen, D. (2018). Automation may take our jobs-but it'll restore our humanity. Retrieved from https://qz.com/1054034/ automation-may-take-our-jobs-but-itll-restore-our-humanity/

Moulton, B. (2018). System of National Accounts: Developments since 2008. The World Bank. Retrieved from https://unstats.un.org/ Unsd/nationalaccount/docs/SNA_Since_2008.pdf

National Gross Domestic Product by Income and by Expenditure Accounts (IEA). (2018). Retrieved from http://www23.statcan.gc.ca/ imdb/p2SV.pl?Function=getSurvey&SDDS=1901#a2

NPR. (2008). The Giant Pool of Money [Podcast]. Retrieved from https://www.thisamericanlife.org/355/transcript

NPR. (2015). Spreadsheets! [Podcast]. Retrieved from https://www.npr.org/templates/transcript/transcript.php?storyld=389027988

Odell, A. (2014). This 25-Year-Old Turned Her One Direction Obsession Into a Six-Figure Paycheck. Retrieved from https://www. cosmopolitan.com/entertainment/books/a32330/after-author-anna-todd-interview/

Ogilvy, J., & Schwartz, P. (2004). Plotting your Scenarios. Emeryville: Global Business Network. Retrieved from http://www.meadowlark. co/plotting_your_scenarios.pdf

O'Gorman, M. (2018). The techlash is coming. [online] The Globe and Mail. Available at: https://www.theglobeandmail.com/opinion/ article-the-techlash-is-coming/ [Accessed 6 Jan. 2019].

Our History. (2018). Retrieved from https://www.ebayinc.com/our-company/our-history/

Our History. Retrieved from http://www.adstandards.com/en/AboutASC/ourHistory.aspx

Patterson, C. (2019). Staples Rebrands and Unveils World's 1st "Working, Learning & Growing Store". Retrieved from https://www. retail-insider.com/retail-insider/2019/1/staples-rebrands-and-unveils-worlds-1st-working-learning-growing-store

Perrin, A. (2018). Americans are changing their relationship with Facebook. Retrieved from http://www.pewresearch.org/fact-tank/2018/09/05/americans-are-changing-their-relationship-with-facebook/

Phillips, R., Gardner, M., Kitson, K., Robins, A., & Surka, M. (2016). Offshore Shell Games: The Use of Offshore Tax Havens by Fortune

500 Companies. Citizens for Tax Justice, Institute on Taxation and Economic Policy, U.S. PIRG Education Fund. Retrieved from https://uspirg.org/sites/pirg/files/reports/USP%20ShellGames%20Oct16%201.2_FINAL.pdf

Press - YouTube. (2019). Retrieved from https://www.youtube.com/yt/about/press/

PricewaterhouseCoopers. (2015). The Sharing Economy. PricewaterhouseCoopers LLP. Retrieved from https://www.pwc.com/us/en/technology/publications/assets/pwc-consumer-intelligence-series-the-sharing-economy.pdf

PricewaterhouseCoopers LLP. (2017). IAB internet advertising revenue report 2016: full year results. Interactive Advertising Bureau. Retrieved from https://www.iab.com/wp-content/uploads/2016/04/IAB_Internet_Advertising_Revenue_Report_FY_2016.pdf

Ramaswamy, C. (2017). 'Prejudices play out in the ratings we give' – the myth of digital equality. Retrieved from https://www. theguardian.com/technology/2017/feb/20/airbnb-uber-sharing-apps-digital-equality

Renting Is The New Black: 5 Places To Rent Designer Dresses & Clothing Online. (2017). Retrieved from https://www.thegoodtrade. com/features/7-places-to-rent-designer-dresses-and-clothing-online

Rose, S. (1992). Limited Livelihoods: Gender and Class in Nineteenth Century England. London: Routledge.

Rosenblat, A. (2018). The Network Uber Drivers Built. Retrieved from https://www.fastcompany.com/40501439/the-network-uber-drivers-built

Schaller Consulting. (2018). THE NEW AUTOMOBILITY: Lyft, Uber and the Future of American Cities. Brooklyn: Schaller Consulting. Retrieved from http://www.schallerconsult.com/rideservices/automobility.htm

Schultz, W. (2018). Manoa Scenario Building. Presentation, Blanquerna Futures Summer School.

Segran, E. (2019). Simplehuman has seen the future, and it's full of robot trash cans. Retrieved from https://www.fastcompany. com/90288123/simplehuman-has-seen-the-future-and-its-full-of-robot-trash-cans?utm_source=postup&utm_medium=email&utm_ campaign=Fast%20Company%20Daily&position=1&partner=newsletter&campaign_date=01072019

Segran, E. (2019). The surprisingly bright future of retail. Retrieved from https://www.fastcompany.com/90281205/ the-surprisingly-bright-future-of-retail?utm_source=postup&utm_medium=email&utm_campaign=Fast%20Company%20 Daily&position=2&partner=newsletter&campaign_date=01022019

Semuels, A. (2018). Denver Says Not So Fast, Amazon. Retrieved from https://www.theatlantic.com/technology/archive/2018/11/amazons-hq-finalists/575071/

Semuels, A. (2018). 'We Are All Accumulating Mountains of Things'. Retrieved from https://www.theatlantic.com/technology/archive/2018/08/online-shopping-and-accumulation-of-junk/567985/

Shaw, J. (1999). The influence of space power upon history 1944-1998. Air Power History, 46(4). Retrieved from https://eds.b.ebscohost.com/ehost/detail/detail?vid=0&sid=39d63b80-aa57-4100-bb26-5b5d3f94f92c%40sessionmgr102&bdata=JnNpdGU9 ZWhvc3QtbGI2ZSZzY29wZT1zaXRI#AN=2623930&db=fth

Simonite, T. (2018). Shoul Data Scientists Adhere to a Hippocratic Oath?. [online] WIRED. Available at: https://www.wired.com/story/ should-data-scientists-adhere-to-a-hippocratic-oath/ [Accessed 6 Jan. 2019].

Smith, A. (1776). An inquiry into the nature and causes of the wealth of nations (Book v, Chapter i, Part iii, Article ii).

Soper, S. (2018). Amazon Will Consider Opening Up to 3,000 Cashierless Stores by 2021. Retrieved from https://www.bloomberg.com/ news/articles/2018-09-19/amazon-is-said-to-plan-up-to-3-000-cashierless-stores-by-2021

Stanford, J. (2017). The resurgence of gig work: Historical and theoretical perspectives. The Economic And Labour Relations Review, 28(3), 382-401. http://dx.doi.org/10.1177/1035304617724303

Stampler, L. (2019). Amazon Will Pay a Whopping \$0 in Federal Taxes on \$11.2 Billion Profits. Retrieved from http://fortune. com/2019/02/14/amazon-doesnt-pay-federal-taxes-2019/
Stearns, P. (1997). Stages of Consumerism: Recent Work on the Issues of Periodization. The Journal Of Modern History, 69(1), 102-117. doi: 10.1086/245442

Stiglitz, J., Sen, A., & Fitoussi, J. (2010). Mis-measuring our lives: Why GDP Doesn't Add Up. New York: The New Press.

Targowski, A. (2005). From the Cold War to Internet Cathedral. International Journal Of Information And Communication Technology Education, 1(2), 87-99. doi: 10.4018/jicte.2005040108

The sharing economy in Canada. (2017). Retrieved from https://www150.statcan.gc.ca/n1/daily-quotidien/170228/dq170228b-eng. htm

Thomas, L. (2018). This company plans to open 200 mattress stores across the US, as Mattress Firm struggles. Retrieved from https://www.cnbc.com/2018/08/08/casper-to-open-200-stores-across-the-us-as-mattress-firm-struggles.html

Thompson, B. (2015). Aggregation Theory. Retrieved from https://stratechery.com/2015/aggregation-theory/

Thompson, D. (2018). The Media's Post-Advertising Future Is Also Its Past. Retrieved from https://www.theatlantic.com/ideas/archive/2018/12/post-advertising-future-media/578917/?utm_source=pocket&utm_medium=email&utm_campaign=pockethits

Tweedle, S. (2015). The world's first smartphone, Simon, was created 15 years before the iPhone. Retrieved from https://www. businessinsider.com/worlds-first-smartphone-simon-launched-before-iphone-2015-6

UNHCR. (2018). Syria emergency. [online] Available at: https://www.unhcr.org/syria-emergency.html [Accessed 19 Jan. 2019].

U.S. Global Change Research Program. (2017). Fourth National Climate Assessment. Washington: U.S. Government. Retrieved from https://nca2018.globalchange.gov

Voros, J. (2001). Reframing Environmental Scanning: An Integral Approach. Victoria: Swinburne University of Technology.

Voros, J. (2003). A generic foresight process framework. Foresight, 5(3), 10-21. doi: 10.1108/14636680310698379

Vosko LF, MacDonald M and Campbell I (2009) Introduction: gender and the concept of precarious employment. In: Vosko LF, MacDonald M and Campbell I (eds) Gender and the Contours of Precarious Employment. London: Routledge, pp. 1–25.

Ward, A. (2019). The Pentagon calls climate change a national security threat. Trump isn't listening.. [online] Vox. Available at: https://www.vox.com/2019/1/18/18188153/pentagon-climate-change-military-trump-inhofe [Accessed 19 Jan. 2019].

Welsh, T. (2018). IoT Becomes IIoT... and It Is Changing Everything. Retrieved from https://www.manufacturing.net/blog/2018/11/iot-becomes-iiot-and-it-changing-everything

What we're driving at. (2010). [Blog]. Retrieved from https://googleblog.blogspot.com/2010/10/what-were-driving-at.html

When was the first computer invented?. (2018). Retrieved from https://www.computerhope.com/issues/ch000984.htm

Wilson, A. (2018). Swap stops: Barter Week offers 'free' stays in exchange for skills. Retrieved from https://www.theguardian.com/ travel/2018/oct/26/swap-stops-world-barter-week-exchange-skills-for-accommodation

Images

Adrian. Thumbs-up [Image]. Retrieved from https://pixabay.com/photos/thumbs-up-like-keyboard-thumb-high-3685420/ Altman, G. Drone [Image]. Retrieved from https://pixabay.com/photos/drone-logistics-drone-package-drone-2816244/ Askhadova, Aisha. Untitled [Image]. Retrieved from https://unsplash.com/photos/f3yVDEu9v1o Atilla, H. Black Friday [Image]. Retrieved from https://pixabay.com/photos/black-friday-feedback-internet-buy-2989044/ Balazs, Benjamin. Granny [Image]. Retrieved from https://pixabay.com/photos/granny-elder-flower-senior-elderly-1280445/ Beard, Owen. Untitled [Image]. Retrieved from https://unsplash.com/photos/K21Dn4OVxNw Bowman, Slava. Untitled [Image]. Retrieved from https://unsplash.com/photos/pkKeuRiDa2QComicon [Image]. Retrieved from https://pixabay.com/photos/comicon-comix-naples-246597/ Colas, Randy. Untitled [Image]. Retrieved from https://unsplash.com/search/photos/politics Chaney, Natalie. Untitled [Image]. Retrieved from https://unsplash.com/photos/KaLSXcB-crY Christy, H. I Want You for the Navy [Image]. Retrieved from https://en.wikipedia.org/wiki/Women in the World Wars#/media/ File:WWINavyYeoman1.jpg Deluvio, C. Untitled [Image]. Retrieved from https://unsplash.com/photos/vKEwDELIFbg Dizplay. Untitled [Image]. Retrieved from https://unsplash.com/photos/PIrOQrqewLE Dokumol. Computer [Image]. Retrieved from https://pixabay.com/photos/computer-scrap-technology-garbage-2049019/ Extremis. Community [Image]. Retrieved from https://pixabay.com/photos/community-pancake-feed-breakfast-897760/ Fancycrave1. Ipad [Image]. Retrieved from https://pixabay.com/photos/ipad-tablet-technology-touch-820272/ Florian, Olivo. Untitled [Image]. Retrieved from https://unsplash.com/photos/Mf23RF8xArY France [Image]. Retrieved from https://pixabay.com/photos/france-villandry-castle-inside-88379/ Free-photos. Conference Room [Image]. Retrieved from https://pixabay.com/photos/conference-room-table-office-768441/ Free-photos. Woman [Image]. Retrieved from https://pixabay.com/photos/woman-sitting-counter-phone-828888/ Freestocks.org. Untitled [Image]. Retrieved from https://unsplash.com/photos/11SgH7U6Tml Grone, Perry. Untitled [Image]. Retrieved from https://unsplash.com/photos/IbLgFFIADrY Kern, Victor. Untitled [Image]. Retrieved from https://unsplash.com/photos/UdGEXZtlx-E Kraft, Roman. Untitled [Image]. Retrieved from https://unsplash.com/photos/IDiHzFfxQP4 McGhee, Sam. Untitled [Image]. Retrieved from https://unsplash.com/photos/KieCLNzKoBo McGhee, Sam. Untitled [Image]. Retrieved from https://unsplash.com/photos/UC5FpqofFOk McKenzie, Andre. Untitled [Image]. Retrieved from https://unsplash.com/photos/iGYiBhdNTpE NeONBRAND. Untitled [Image]. Retrieved from https://unsplash.com/photos/lhsaTDKzdwg?utm_source=unsplash&utm_

Nix, Joanna. Untitled [Image]. Retreived from https://unsplash.com/photos/h2pnXHMz8YM Petterijokela. Google [Image]. Retrieved from https://pixabay.com/photos/google-view-camera-car-vehicle-2361156/ Pexels. Candy Crush [Image]. Retrieved from https://pixabay.com/photos/candy-crush-device-electronics-game-1869655/ S., J. Monitoring [Image]. Retrieved from https://pixabay.com/photos/monitoring-camera-3822541/ Simon, Amazon [Image]. Retrieved from https://pixabay.com/photos/amazon-notebook-laptop-mobile-447033/ Sison, Ronny. Untitled [Image]. Retrieved from https://unsplash.com/photos/3vzaG52ZCJY Skeeze. Solar Panels [Image]. Retrieved from https://pixabay.com/photos/solar-panels-installation-workers-1794467/ Spiske, Markus. Untitled [Image]. Retrieved from https://unsplash.com/photos/466ENaLuhLY SplitShire. Car [Image]. Retrieved from https://pixabay.com/photos/car-driver-driving-vehicle-407166/ Splotramienny. Prostetic [Image]. Retrieved from https://pixabay.com/photos/prostetic-proteza-3d-print-druk-1273183/ Steam Engine. [Image]. Retrieved from https://pixabay.com/en/engine-engineering-portable-steam-1297837/ StockSnap. Architecture [Image]. Retrieved from https://pixabay.com/photos/architecture-building-infrastructure-2557567/ StockSnap. Cold [Image]. Retrieved from https://pixabay.com/photos/cold-weather-winter-jacket-2557517/ Tchompalov, Vlad. Untitled [Image]. Retrieved from https://unsplash.com/photos/gzVgFhovsP0 V., Franck. Untitled [Image]. Retrieved from https://unsplash.com/photos/U3sOwViXhkY Women's Fashion - 1891. [Image]. Retrieved from https://www.publicdomainpictures.net/en/view-image. php?image=77312&picture=womens-fashion-illustration

Zeller, Samuel. Architecture [Image]. Retrieved from https://unsplash.com/photos/VK284NKoAVU

APPENDIX A

A SOMEWHAT BRIEF HISTORY OF CONSUMPTION CULTURE

"We believe that our identities are reflected in our anti-capitalist beliefs rather than in our thoroughly capitalist behaviours as consumers and actors in the structures of capitalism (Clarke, 2017)."

In order to understand the relationship between society, economy, and technology, we need to understand how it has come to be. Our societal values have been shaped by our consumption habits, which have been shaped by our economy, which have, in turn, been shaped by our technologies. When we understand the relationship between those values and their precursive factors, we can begin to understand how the current technological growth may impact our economic and social systems.

The following chapter outlines a brief and inexhaustive roadmap through the development of our consumerism, and demonstrates how the technological and economic evolutions not only impacted our practical expressions of daily life, but also shaped the very values that determine our wants and needs.

Caught in the Malthusian Trap

From the Neolithic Period, which began in approximately 10,000 BC, to the dawn of the First Industrial Revolution, population was dictated by the resources available to sustain said population's basic needs. Essentially, when periods of bounty occurred and resources were abundant, population would grow. However, with the growth of population, the strain on sustaining resources for that population increased, eventually leading to a resource catastrophe the point at which the needs of the population outstripped the resources available (See Figure 12). At this point, the population would begin to decrease, perhaps because of catastrophic events such as famines, but also as result of social factors such as a postponement of marriage because of the uncertainty of whether or not an individual would be able to support a family. Less workers means less land in production, which only intensified the lack of available resources. However, with a production innovation or other



Fig. 17 - Diagram of the Challenge of the Malthusian Trap

turn of fortune that produced a better harvest, the cycle would begin again, with population growth following this return of increasing resources. This cycle is known as the Malthusian Trap, coined by Thomas Malthus who was a late 18th Century economist who "devoted his life to the quantitative study of humankind (Bernstein, 2004)." As economist Gregory Clark explained, "The basic outline of world economic history is surprisingly simple.... Before 1800 income per person - the food, clothing, heat, light, and housing available per head - varied across societies and epochs. But there was no upward trend.... The Malthusian Trap ensured that short-term gains in income through technological advances were inevitably lost through population growth (2007)."

The "Malthusian Trap" theory demonstrates the intrinsic self-correcting systems of population growth which dominated throughout the history of humanity. This pattern remained essentially consistent from 10,000 BC through to the early 1800s (See Figure 2). However, the economic and social upheaval of First Industrial Revolution also fueled a phenomenon known as the Great Divergence, which identifies the growing income inequality that emerged between societies that were participating in the rapid technological advancements and those that were left behind.



Fig. 18 - From Clark, A Farewell to Alms: A Brief Economic History of the World, 2007

The First Industrial Revolution changed the very nature of prosperity, making growth possible at an unprecedented and almost unimaginable level. But what were the factors that made this trajectory shift possible? In "The Birth of Plenty", historian William J. Bernstein hypothesizes that there were four key developments that prepared the Western world for the Industrial Revolution (2004):

- 1. The Emergence of Intellectual Property Rights
- 2. The Acceptance of Scientific Rationalism
- 3. The Proliferation of Capital Markets
- 4. The Increasing Efficiencies in Communications and Transportation

From Agrarian to Industrial: The Precursive Factors of the First Industrial Revolution

The First Industrial Revolution changed the very nature of prosperity, making growth possible at an unprecedented and almost unimaginable level. But what were the factors that made this trajectory shift possible? In "The Birth of Plenty", historian William J. Bernstein hypothesizes that there were four key developments that prepared the Western world for the Industrial Revolution (2004). As you will see below, these factors were largely the result of recognizing the value of intangible assets such as intellectual property, operational efficiencies, and the development of human capital. The key developments were:

1. Property Rights - the emergence of IP

As Bernstein wrote, "Innovators and tradesmen must rest secure that the fruits of their labors will not be arbitrarily confiscated, by the state, by criminals, or by monopolists (2004)." While physical property rights were reasonably developed by this point in history, the emergence on Intellectual Property rights had a more complicated evolution. The first recorded 'patent' was granted in Renaissance Italy in 1471, with the Venetian Senate passing the first patent law a few years later in 1474:

"We have among us men of great genius, apt to invent and discover ingenious devices; and in view of the grandeur and virtue of our City, more such men come to us every day from diverse parts. Now, if provisions were made for the works and devices discovered by such persons, so that others, who may see them could not build them and take the inventor's honor away, more men would then apply their genius, would discover, and would build devices of great utility and benefit to our commonwealth."

However, in England, the matter of intellectual property was not viewed so progressively. Proliferation of ideas and inventions was dictated by the Crown, and used to assign monopolies as a means of royal favour. It was not until 1852 that the British monarchy would divorce itself from the patent system (Bernstein, 2004).

The true leaders in the development of the patent system and the protection of Intellectual Property were the early American colonies, many of which had sophisticated patent procedures predating the American Revolution. By 1790, the first American patent law had been passed, and in 1836, Congress created the role of 'Commissioner of Patents' with a staff of professional assistants who could better manage fraudulent claims and institute a more rigorous evaluation procedure. As Bernstein writes, "it would be no accident that the material manifestations of the nineteenth century's new prosperity – factories, steamships, railroads, and telegraphs – were created by men hypnotized by the prospect of the great profits made possible by the new legal system (2004)."

THE FIRST INDUSTRIAL REVOLUTION

Key Inventions:	Steam Engine, Machine Tool Industry, Chemical Manufacturing
Key Production Innovations:	Machine Production, Organized Labour Movements
Economic Impact:	Emergence of Modern Capitalism, Rise of the Factory System, Foundations of Modern Banking, Evolutions in Consumerism
Societal Impact:	Increased Urbanization, Women and Children enter the Formal Workforce, Traditional family structures begin to degrade

2. Scientific Rationalism - Recognizing the Value of Human Capital

All major innovations are borne out of a discovery process. Whether this is an emergent discovery that is recognized and capitalized upon or a meticulously rehearsed experimentation that provides the moment of enlightenment, innovation requires a system of contextual understanding for it to be meaningful. The innovation does not exist in a vacuum, but rather it exists within a system, and its degree of success can be measured by its impact on the systems which it inhabits. In the late 18th Century, this system of thought could be understood as Scientific Rationalism. As Bernstein noted, "Economic progress depends on the development and commercialization of ideas. The inventive process requires a supportive intellectual framework - an infrastructure of rational thought, if you will, with a reliance on empirical observation and on the mathematical tools that support technological advance (2004)." For centuries, the understanding of the natural world and its forces were dominated by organized religion. Historian Johan Huizinga wrote, "The idea of a purposed and continual reform and improvement did not exist (1954)." Bernstein issued a similar, more specific, sentiment, "It did not much bother the average sixteenth-century European that no real social, intellectual, or scientific advance had occurred for a thousand years; the human condition was universally assumed to be static (2004)." The evolution of the Scientific Method, with its origins in the work of Sir Francis Bacon in the early 1600s, provided a rational underpinning to the advancement of technology, and provided an alternative to the immovable worldview of the Church. Innovation, which had previously been the work of "craftsmen and inventors" began to harness the expertise of scientists, driven by the capital provided by forward-thinking investors.

3. Capital Markets - Operational Efficiency through Combined Resources

As Bernstein wrote, "Capital is... required to develop schemes and ideas. Since almost no entrepreneur has enough money to mass-produce his inventions, economic growth is impossible without substantial capital from outside sources (2004)." He uses the example of Thomas Edison's invention of the incandescent light bulb to illustrate this concept:

"Although a wealthy man, Edison could only afford to turn out a small number of bulbs. Producing them for the mass market required building large factories, hiring thousands of trained workers, and purchasing large amounts of raw materials, tasks that not even the nation's wealthiest individuals could manage alone. Worse, light bulbs were worthless without a reliable supply of electricity. Anyone wishing to sell the first light bulbs would have to build power generating stations and a transmission grid to move the electricity (2004)."

Investors could mitigate their risk through subscribing to the new syndicated model of investing, which emerged in the 17th Century. This allowed them to diversify their portfolios and spread the potential losses among a collection of investors (Bernstein, 2004). These 'joint-stock' companies were the precursors to the giant, multinational corporations that rule our financial systems today. The growth of these 'joint-stock' enterprises was a significant contributor to the increase in available investment capital in the centuries leading up to the First Industrial Revolution. An example of this is the regulatory change in 1826 which permitted the small, privately-owned banks to combine and set up shop throughout England, rather than just in the London environs. Prior to this, large capital loans would need to be drawn on multiple institutions, and often those institutions would need to draw loans on each other in order to provide the requested funds (Ashton, 1948). This ready access to cheap capital meant lower interest rates and larger loans for borrowers seeking to build large-scale capital investments such as factories, canals, and eventually railways and steamships.

"The chief contribution of the banks to the industrial revolution consisted in the mobilizing of short-term funds and their transfer from areas where there was little demand for them to others that were hungry for capital. In the agricultural counties landlords, farmers, and dealers paid in to the local banks the bills and cash they received as rent or payment for produce. The banks remitted the bills to their correspondent bank in London which, after collecting them, found itself with considerable funds. These it used to discount bills for banks in industrial centres, which were thus in turn able to lend to their clients currency or cash.... The marriage between the thrift of the South and East and the enterprise of the Midlands and the North was both happy and fertile. It meant in effect that rural England was providing foodstuffs for the growing urban communities without requiring an immediate return, and that industrial England was thus able to use its own resources to put up factories and construct canals and railways which benefitted manufacturing and agricultural areas alike (Ashton, 1948)."

4. Fast & Efficient Communications and Transportation - Operational Efficiency through Simplified Access to Markets

Innovations in transportation and communication technologies during the First Industrial Revolution provided an exponential improvement in the infrastructure required to facilitate the production and selling of goods. Prior to the Industrial Revolution, the pace of world had been relatively consistent. As Stephen Ambrose wrote:

"A critical fact in the world of 1801 was that nothing moved faster than the speed of a horse. No human being, no manufactured item, no bushel of wheat, no side of beef, no letter, no information, no idea, order or instruction of any kind moved faster. Nothing had moved any faster, and , as far as Jefferson's contemporaries were able to tell, nothing ever would (1996)."

Innovation may have started to flourish during this period, but it was critical that innovators be able to get their products to market. As Bernstein phrased it, "[Entrepreneurs'] innovations will languish unless they can quickly and cheaply put their products into the hands of consumers (2004)." During late 1800s, prominent landowners recognized this reality and banded together to create large-scale infrastructure projects that would improve their ability to get their products to market and build trade in their region. Historian T.S. Ashton wrote, "In England, it was... commercial necessities that led to improvements in the means of communications: the men who made the new roads, bridges, canals, and railways were civilians, employed not by the State, but by individuals, or companies of men, eager to develop the trade of the area from which they derived their personal incomes (1948)."

Even the early, less-enduring improvements in these critical currents of goods and information were revolutionary in their advancement of innovation. The canal system in England did not thrive past the widespread introduction of the steam-engine, but it provided a very necessary step in the advancement of transportation technologies, both by making commodities such as coal, iron, timber, and stone more practically and economically accessible, and by training, "a new race of engineers, equipped to meet the calls which the age of the railways was to make on their skills, endurance, and capacity for disciplined effort (Ashton, 1948)."

The Human Capital of the First Industrial Revolution: Work Culture & the Labour Movement

While the above factors were identified as being critical to the technological advancements of the First Industrial Revolution, they also had meaningful repercussions on the social and cultural developments of the day. Technological innovations both improved the living standards of the average person, as demonstrated by the 40% decline in the death rate (Bernstein, 2004). However, these disruptions to traditional modes of production created significant ruptures in the workforce. For example, 30% of the agricultural labour force in the mid-1800s were replaced by automatic threshing machines (Brynjolfsson & McAfee, 2014).

Furthermore, the new industrial workplace brought with it a significantly different culture of employment than the previous guild-based organizational structures.

"Men trained in the concern were appointed as managers and foremen; piece-rates and bonus schemes

were introduced to stimulate effort; and fines were imposed for drunkenness, sloth, and gaming. The new methods of administration, the new incentives, and the 'new discipline' were as much a part of the revolution as the technical inventions themselves: adaptation to them was the price the workers had to pay for the higher incomes that large-scale industry brought (Ashton, 1948)."

Many historians, such as Gregory Clark, argue that, despite the rise in family income, the general standard of living during this period significantly declined. As he explains,

"While foragers satisfy their material wants with small amounts of work, the modest comforts of the English in 1800 were purchased only through a life of unrelenting drudgery.... Hunter-gatherer societies are egalitarian. Material consumption varies little across the members. In contrast, inequality was pervasive in the agrarian economies that dominated the world in 1800.... So, even according to the broadest measures of material life, average welfare, if anything, declined from the Stone Age to 1800. The poor of 1800, those who lived by their unskilled labor alone, would have been better off if transferred to a hunter-gatherer band (Clark, 2007)."

Historian and economist Jan de Vries agreeing with this perspective, writes, "Evidence of prolonged work hours, expanded child labor, and the suppression of holidays and irregular work attendance [supports] the proposition that industrialization under capitalism brought with it an oppressive, unsought, and unnatural intensification of labor. Any resulting increase in real income... was paid for dearly by a massive erosion of leisure time (2008)."

The often-abysmal conditions of these early factories led to the rise of the early labour movement. In 1799, an Act was passed which allowed that, "any person who joined with another to obtain an increase in wages or a reduction of hours might be brought before a magistrate and, on conviction, sentenced to three months in prison (Ashton, 1948)." It took until 1824 for a new law to be passed which permit the organization of unions and other labour groups.

As a result of the ongoing pressure, governing bodies were pressed to determine standards of conduct that would allow for the continued development of industry, but preserve the reasonable well-being of the worker. Despite its delayed emergence and weak standards, "[the] Act of 1802 - the Health and Morals of Apprentices Act - limited hours of work and prescribed minimum standards of hygiene and education.... The basis was laid for that code of legislation which is one of the cornerstones of modern industrial society (Ashton, 1948)." A subsequent act was passed in 1819 which helped regulate the employment of children. This was in response, perhaps, to textile factories such a the one owned by Samuel Greg who employed 252 workers, 17% of which were under the age of ten, or the factory owned by M'Connel and Kennedy, where 48% of the 1,020 employees were under the age of eighteen (Ashton, 1948). Many of these factory 'apprentices' were working 12-15 hour shifts, six days a week. Ashton goes on to clarify:

"Whether the young or unskilled were well or badly treated depended very much on the character of the gang-master or artisan for whom they worked. But since, in most of these occupations, innovation was largely of a capital-saving nature, its effect was to increase not only output but also the share of the value of this that went to the worker. In income, at least, the gain to labour can hardly be in doubt (Ashton, 1948)."

However, it wasn't until the end of the 1800s that Trade Unionism took hold of the labour movement in England, growing from 750,000 members in 1888 to 6.5 Million in 1918 (Davis, 2009). While many of the original unions were gaining a reputation for 'losing their teeth', a new wave of unions were taking their place, encouraging a strike mandate for their operational model. As historian Mary Davis writes, "The organising principle was that of mass recruitment. Whereas old unionism had relied on the skill and scarcity value of labour, new unionism was dependent on sheer force of numbers for its success (2009)." Their primary demand was for the adoption of an eight-hour workday, which was voiced through a massive rally, "May Day" in 1890. This event, which combined

the efforts of many of the new unions, proved so popular that it forced the old unions to join ranks on the issue as well. However, this wasn't adopted as common practice until well into the 1900s.

Ultimately, manufacturers and factory owners were confronted with an uncompromising truth: the mass quantities of goods being produced required a larger market to which to sell, one that had both the means and time to engage in the consumer behaviour. As historian Peter Stearns explains, "Manufacturers had to encourage greater interest in consumption, lest they pile up unsold goods. This was one reason behind the expansion of real wages and of leisure time, for workers must be able to play some role in buying a growing array of manufactured items. Recurrent crises of oversupply drove the point home (1997)." The introduction of intangibles into their production processes had improved their output to the extent that they had far overshot their markets. Long-term sustainability meant developing their consumer base in the same way they had innovated their production systems.

A Changing Picture of Home & Family

The Industrial Revolution also brought a marked difference in the social structures and operational models of the family unit. Historian Ruth Schwartz Cowan explains it as such:

"Before industrialization the family was the basic social unit. Most families were rural, large, and selfsustaining; they produced and processed almost everything that was needed for their own support and for trading in the marketplace, while at the same time performing a host of other functions ranging from mutual protection to entertainment.... Under industrialization the family is much less important. The household is no longer the focus of production; production for the marketplace and production for sustenance have been removed to other locations (1976)."

She argues that as their reliance on each other for the production of basic needs diminished, "families became atomized (Cowan, 1978)." That is, the social bonds that held them together began to slacken, until all that held them together as a family unit was, "consumption, socialization of small children, and tension management (Cowan, 1978)." Indeed, this fracturing of the family unit was only exacerbated by the entry of women and children into the formalized world of work. Rather than contribute to the household through unpaid domestic labour, women and children were now contributing anywhere from 47 to 54 percent of the real wage income of the household (Rose, 1992). This raised the general income level of the average family, though it frequently required that they spend the new income on time and labour-saving domestic devices or services. In fact, early trade unions would advocate for equal wages for men and women, not to encourage equality, but to discourage employers from hiring women (Rose, 1992). It is also important to recognize the long-standing tradition of taking in piece-work that women undertook within their homes, often of onboarding others' domestic tasks such as laundry or sewing. In order to ensure the viability of the family's financial situation, "Very poor families may have continued to have large families because their subsistence depended on many wage earners (Rose, 1992)." However, even having children didn't prevent concern over what may occur once a worker was past their productive phase. "The fear of receiving a pauper's funeral was prevalent, and anything the household might manage to save would be likely to be put in a burial club to prevent such a calamity (Rose, 1992)."

"The values of people in industrial societies are as industrial as the products they use every day. (Malaska, 1999)"

With its means of production functioning exponentially more efficiently than previously thought possible, the 20th Century ushered in the potential for average citizens to access a quality and quantity of manufactured goods that was previously unimaginable. Additionally, the post-war manufacturing boom gave rise to an economic prosperity that gave individual families the means by which to participate in the new consumerism. Historian John Benson, borrowing from the scholarship of cultural historians Joan Thirsk, Neil McKendrik and Gary Cross, described the new consumer society as that "in which choice and credit are readily available, in which social value is defined in terms of purchasing power and material possessions, and in which there is a desire, above all, for that which is new, modem, exciting and fashionable (Benson, 1994)."

The Standard Employment Relationship (SER)

The large capital investments required to build and run industrial factories led to a fundamental shift in the labour relationship between employer and worker. Prior to these large-scale investments, labour tended to be 'put-out' or contracted. However, with such significant financial outlay involved, employers now could not afford the uncertainty of high turnover of workers. Fordist assembly lines required a consistent, disciplined workforce (Stanford, 2017). As Jim Stanford, an economist who specializes in the Future of Work, wrote, "The attendance and performance requirements of capital-intensive enterprises made it too risky to allow workers choice or discretion in working hours. Similarly, the job-specific skill requirements of mass production technologies enhanced the benefits to employers of a stable workforce, thus encouraging them to offer permanent jobs (2017)." Thus, the Standard Employment Relationship (SER) emerged, and dominated the Industrialized world for the majority of the 20th Century. This increase in employment stability rose particularly after the second World War, with "the engine of capitalist accumulation firing on all cylinders, and governments reinforcing expansion through Keynesian full-employment macro-economic policies (Stanford, 2017)."

The stability that the new SER afforded encouraged the rise of consumer culture. The 'Fordist compromise', which recognized the necessity of providing high wages with a 40-hour work week, was instituted to help maintain a balance between mass production and mass consumption (Cross, 1993). As Cross describes, it "won wage-earners to steady work to pay for their constantly expanding consumer needs, thus providing capitalists with disciplined workers and reliable markets (1993)." With guaranteed incomes, the average family could afford to participate in a 'keeping up with the Jones' economy. Past luxuries, such as electric washing machines and two-car households, frequently became the norm. However, it is important to note that this employment boom was both gendered and racially-unequal.

THE SECOND INDUSTRIAL REVOLUTION		
Key Inventions:	Electricity, Internal Combustion Engine, Indoor Plumbing, Standardization of Machine Tools, Telegraph	
Key Production Innovations:	Assembly Line, Factory Efficiencies based on Flow of Materials	
Economic Impact:	Market Stabilization through Labour Regulation	
Societal Impact:	Emergence of Modern Consumerism, Dual Income Family Economics	

"Women, immigrant or racialized workers, and workers in numerous sectors of the economy (especially decentralised, highly competitive service sectors such as cleaning or hospitality) were far less likely to attain stability and permanency in their work (Vosko et al., 2009). Indeed, the SER was always gendered, in the sense that the incomes earned by the core workforce in permanent, full-time positions were understood to constitute a 'family wage': sufficient to support the (assumed male) worker's entire family, including his spouse (who, if engaged in paid employment at all, would not expect the same compensation or entitlements)."

The Rise of Consumer Culture: A Celebration of Tangible Goods

In his book about the making of 'consumer culture', historian Gary Cross describes the characteristics of a consumerist society:

"A consumerist society involves large numbers of people staking a real portion of their personal identities and their quest for meaning - even their emotional satisfaction - on the search for and acquisition of goods. This characteristic is the hardest but most essential aspect of consumerism to pin down. It means that people begin to appreciate the time spent looking for consumer items as a valuable part of life and not simply as a necessary evil in a struggle for survival (1993)."

As this ideal was not possible for the average citizen in the society of the pre-industrial age, "It was only in the later nineteenth century that the fruits of maturing industrialization could be translated into an unprecedented array of goods amid growing prosperity and leisure time and with new supports for distribution in outlets such as department stores and mass advertising (Stearns, 1997)." Stearns goes on to describe how, "Earning power and the ability to afford particular living standards do increasingly anchor a consumerist class hierarchy, replacing legal privilege and other prior trappings of status. But consumerism is also an open invitation, and individuals from various groups both aspire to and achieve the capacity to enjoy consumer items outside their accepted group boundaries (1997)." He describes the complaint of the elite of the early 19th century, that people would wear clothing that was inappropriate because it was indistinguishable from the clothing worn by those with a higher social standing.

In a pre-Industrial society, large families are a distinctive feature, as the ability to pool resources in order to meet fundamental requirements was a distinct survival advantage. Indeed, the early stages of consumerism, "concentrated primarily on clothing and household goods (Stearns, 1997)." However, post-Industrialism, smaller family units were the norm, resulting in more households and encouraging more individual purchasing of goods. As Stearns explains:

"The dramatic decline in the birth rate had various sources, which differed somewhat depending on social class, but the desire to think of children in terms of a range of consumer options, and the need to expect greater outlays for each child because of the consumer goods parents would be expected to buy, certainly entered strongly into such decisions, particularly in the middle class (1997)."

Purchasing trends quickly spread from practical household products to those based in leisure practices. In the 1850s, the commercial greeting card industry was born, moving traditional celebrations such as Christmas and Valentine's Day from the handcrafted sphere to the commercial, and eventually helping to develop new, exploitable holidays such as Mother's Day (Stearns, 1997). Additionally, market segments expanded. For example, manufacturers and advertisers who had traditionally directed their children's products only to parents began to direct marketing efforts to appeal directly to children as well. Practices such as "parentally granted allowances" emerged, encouraging children to become consumers as well (Stearns, 1997).

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A significant shift in the early days of consumerism was reflected in not only what people were buying, but where and how they were buying it. By the end of the 1800s, the department store had established itself as the new medium for purchasing goods, one which allowed for window-shopping, and turning the acquisition of goods into an experience, rather than just a practical chore. "With these stores, people were exposed to an unprecedented profusion and variety of goods and encouraged to whet their appetites by window-shopping or strolls through luxurious commercial surroundings (Stearns, 1997)." But these new goods were not solely available in the cities. Mail-order catalogues gave country cousins an opportunity to share in the same product experiences as their city kin. These catalogues relied on the emerging advertising industry, which became much bolder in both style and tone. As Stearns explains, "The tenor of the messages changed as well.... Silk goods, still described in terms of price and utility in American newspaper product lists as late as the 1890s, by 1900 were touted as "alluring," "bewitching".... Products, in other words, were increasingly associated with pleasure, even sensuality (1997)."

Shifting Values: The new Psychology of Consumerism & Commodification

This evolution in the tone of advertising signaled a deeper shift in our relationship to consumer goods. Increasingly, these goods were now given the responsibility of satisfying our emotional needs, not just our practical ones. This isn't to say that humans haven't always had an emotional connection to our possessions, but rather that this relationship was commercialized and manipulated on an unforeseen scale. Stearns explores this idea, as it pertains to child-rearing techniques:

"Indeed, most child-rearing experts...and middle-class parents began to recommend the use of acquired objects as direct emotional targets for children, at least by the 1920s. As early as the 1880s, in fact, American girls were able to buy caskets and mourning clothes for dolls, to train in the proper expressions of Victorian grief. Dolls were also recommended as objects of attachment to replace fathers now absent for longer periods at work. Four decades later, up-to-date American parents were learning that personal acquisition helped deal with other emotional issues as well. With a decline in the employment of servants in middle-class homes, using things to help distract children was a growing temptation, and given adult consumerism it was a perfectly logical extension. Thus parents learned that new toys and clothes should be purchased for a toddler to limit his jealousy on the arrival of a new baby. One child's birthday should be the occasion to bring presents for siblings as well, again to limit rivalry. Store-bought dolls could also help limit children's fears. Anxious about strangers? Let the stranger hold a desired new item and the child will gradually overcome fear of approaching (1997)."

This values shift in how we viewed our possessions began to have deeper impacts, as it started to colour how we interacted and responded to all aspects of life. Stearns explains one example of a shift in perception:

"The new stage of consumerism, finally, generated a new level of commodification as various activities were now seen as specialized items to be evaluated through the same lens applied to consumer goods. Advertising, the new movies, and other innovations such as the beauty pageant (a product of the 1920s) increased the commodification of women's bodies. Pornography, though hardly new, was increasingly redefined through commodification. Women used for pornographic display became more and more interchangeable, tied to a single basic body style (1997)."

Several arguments have been made for what was underpinning this shift to a consumerist mindset, from growing prosperity providing the means to an increasing habitual practice that evolved over time. However, a compelling argument can be made for another contributing factor. As work became more rote and less creative, more routine and less challenging, humans were forced to find a different means of self-actualization. As economist Adam Smith wrote, "The man whose whole life is spent in performing a few simple operations, of which the effects are perhaps always the same, or very nearly the same, has no occasion to exert his understanding or to exercise his

invention in finding out expedients for removing difficulties which never occur (1776)." Peter Stearns expands on this idea:

"Alterations in work required compensation through consumer enjoyments. Jackson Lears has pointed to the growing unease of middle-class business and professional people as opportunities for independent entrepreneurship increasingly turned into the thralldoms of middle management or corporate law offices. With work less symbolically rewarding, consumer gains could fill the gap. The same held true for the growing lower middle class, one of the leaders in consumerist interest in faddish items, from cigarettes to radios.... Women, confined as housewives far more than in the eighteenth century, could see in consumerism a powerful opportunity for expression and for a public life of sorts. In the United States, immigrants easily turned to some forms of consumerism as a ready justification for an abandonment of home that made them quietly uneasy (Stearns, 1997)."

His colleague, Jackson Lears, described it as such:

"By the early twentieth century [the bourgeois ethos of perpetual work, compulsive saving, civic responsibility, and a rigid morality of self-denial] had begun to give way to a new set of values sanctioning periodic leisure, compulsive spending, apolitical passivity, and an apparently permissive (but subtly coercive) morality of individual fulfillment. The older culture was suited to a production-oriented society of small entrepreneurs; the newer culture epitomized a consumption-oriented society dominated by bureaucratic corporations (2000)."

In essence, the new-found ease with which we were able to fulfill our basic needs created a vacuum which consumerism filled. With our desires for psychological and physiological safety and satiety met, our desires evolved. The craving for self-actualization, previously superseded by the imperative to satisfy our basic needs and satisfied through the holistic creative endeavours required to do so, emerged and sought an accessible outlet. Consumerism, with its siren call, provided just such a fulfillment to a civilization unused to its emerging disposable income and leisure-time. Even the anti-establishment movements of the 1960s were fueled by these imperatives. As Coyle writes:

"It is not poverty and despair that cause revolutionary activity in modern times, but rather comfortable prosperity. Skipping school to hurl stones at the riot police and evade tear gas is a luxury indulged in only by young people who are not really worried about finding a job when they need one. Likewise, one can afford to experiment with drugs, free love, personal liberation, and self-discovery only in a prosperous economy. By 1968, there had been a quarter century of absolutely extraordinary growth (2014)."

Measuring Prosperity in a Consumption-Based Society

With consumerism at the heart of our society's functioning behaviours, the measurements for prosperity that emerged were understandably tied to the consumption of goods and services. The health of our economy was determined by the amount of our consumption. The importance of the Gross Domestic Product (GDP) metric in the shaping of the economy cannot be overstated. Indeed, in 1999 it was revealed as "one of the great inventions of the 20th Century" by the US government's Commerce Department. The Commerce Secretary at the time, William Daley, described its importance as such: "Think of it this way, a doctor can only make a diagnosis and prescribe a treatment after first sitting down and piecing together all the test results that have been taken. And economic policy makers are very much like doctors. So what the GDP account have done is to give us the tools to make those critical decisions (Masood, 2016)."

In fact, the GDP was initially developed in the 1930s as a response to the lack of useful data available to government decision-makers during the economic crisis of the Great Depression. The first attempt at amassing a useful snapshot of the country's economic standing was the work of Simon Kuznets who created the first accounting of national income in the USA. However, economist John Maynard Keynes felt that this did not accurately represent the impact of government spending and the role that government can have in stimulating economic growth. Taken up by Richard Stone after Keynes death, by 1953 the GDP had emerged in essentially the form we know it today and was adopted as a fairly universal standard for world economies to assess their prosperity and growth (Masood, 2016). Today, the system of collecting and interpreting the data to form the GDP is determined by the System of National Accounts (SNA), a product of the World Bank. Minor revisions have continued as the economies and business models have evolved, with major updates released in 1968, 1993, and 2008 (Moulton, 2018), though the essential model has remained the same (See Sidebar).

But why is this data important? As Stiglitz, Sen, and Fitoussi state, "In effect, statistical indicators are important for designing and assessing policies aiming at advancing the progress of society, as well as for assessing and influencing the functioning of economic markets.... In the "information society," access to data, including statistical data, is much easier. More and more people look at statistics to be better informed or to make decisions (2010)." It has been said that, "To manage an economy without indicators of how well the economy was doing has been described like trying to fly an airplane without instruments (Stiglitz, Sen & Fitoussi, 2010)." The GDP was intended as a way for governments to have a more "accurate account of their economies (Masood, 2016)" in order for them to make more informed decisions when making decisions that impact the country's economy. Essentially, it is, "Regarded by many as a proxy for prosperity, a single number meant to indicate if countries and their citizens are doing well or badly (Masood, 2016)." The GDP determines this by how much businesses are producing and understanding consumption patterns. Masood describes it's intent:

"In practical terms... GDP is defined as an indicator of spending. It is the sum of what we spend everyday, from the contents of our weekly shopping to the large capital spending by businesses. GDP also includes the myriad things that our governments pay to produce, from relatively inexpensive things such as libraries and streetlamps to naval dockyards and nuclear weapons, whose cost is calculated in the billions (Masood, 2016)."

This statistical marker has become the universal standard for assessing economic prosperity. Governments rely on it for both making and justifying policy decisions. As economist Diane Coyle describes it, "This single measure of "the economy" tends to dominate political contests, and governments' fortunes seem to rise and fall with the difference between plus 0.2 percent and minus 0.1 percent in one quarter's GDP numbers. The latter may mean recession, the former reelection (2014)."

In Coyle's book, GDP: A Brief but Affectionate History, she describes the effect that the GDP can have on our global understanding of nation's economies. She explained how a simple accounting update by the Ghanaian government in 2010 changed how they calculated the price index (which balances against any inflation when calculating the Real GDP). Literally overnight, Ghana's GDP increased by 60%. This also changed its classification from a "low-income" country to a "low-middle-income" country, as defined by the World Bank and used by organizations to determine whether assistance will be granted in the form of aid and inexpensive loans. Coyle expands her explanation to include more of the continent:

"Africa as a whole probably is not as poor as we've long thought.... In each case where old weights have been used for years, there will be large upward revisions in the estimated real GDP when the weights are updated. This could profoundly change our impression of the character and weakness or strength of these economies; one estimate suggests that for twenty years sub-Saharan African economies have been growing three times faster than suggested by the "official" data (2014)."

So the GDP is an instrumental tool for determining not only how our economies function within our own borders,

but on a global scale as well. However, there is ample evidence that the underlying presumptions upon which this scale is built are deeply flawed. As Nicholas Sarkozy explains:

"We knew that our indicators had limitations, but we went on using them as if they didn't. They made communication easier. Above all, these indicators were a key component of our vision of the economy and society and of an ideology that had spread all over the world; calling them into question seemed so outrageous that no one would even seriously consider it (Stiglitz, Sen & Fitoussi, 2010)."

UNDERSTANDING THE GDP - A PRIMER FOR THE NON-ECONOMIST

Gross Domestic Product is the market value of all final goods and services produced within a country in a given period.

Market Value: The value of the goods & services at market during the period in question

Final Goods & Services: To avoid counting the same goods toward the GDP measurement more than once, goods are only accounted in their final form. For example, a bale of unprocessed cotton, a spool of cotton thread, or a bolt of denim would not be counted towards the GDP, but the jeans they are used to create would be counted towards the GDP.

Within a Country: GDP measures the production of goods and services within the geographic boundary of a country, without prejudice about who is creating the goods (eg. the nationality of the firm or the producers). Gross National Product (GNP) reflects the production of goods by firms or individuals who belong to a specific country, regardless of their geographical location.

Y=C+I+G+(X-M)

GDP=Consumption of goods by households + capital Investments by firms (& new homes by households) + Government spending + (eXports by domestic firms - iMports to households and firms)

Trade deficits: When a country's Imports of goods & services outstrip their Export of goods & services.

GDP does not include:

- » Illegal goods & services (drugs, black market goods)
- » Unpaid goods & services (babysitting your granddaughter)
- » Transferred goods & services (e.g. re-selling a home or car)
- » Many intangible assets

Real GDP: GDP, adjusted using the market value of goods during a baseline year, in order to get an uninflated perspective on productivity gains.

A Problematic Tool of Assessment

The GDP is a highly flawed means of measurement. As Nicolas Sarkozy said, "We remain locked into an index of economic progress that includes only what is created and not what is destroyed (Stiglitz, Sen & Fitoussi, 2010)." This is particularly relevant when governments make economic policy decisions that result in a higher GDP in the present by borrowing against the future economy. The key to strong economic longevity is through sustainability - balancing the needs of the current economy with the requirements of the future economy. However, our consumption-based society has long been prioritizing current growth over long-term sustainability. This primary means of assessment has allowed us to turn a blind eye towards our deeply flawed societal model by cloaking it in a veil of "progress" as determined by GDP growth.

From Industrial to Post-Industrial: Setting the Stage for the Second Machine Age

In 1944, the Germans launched the first ballistic missile, from German-occupied Holland to Great Britain. This was the "first strategic use of rocketry and ballistic guidance technology, and gave the world its first glimpse of the potential of space power (Shaw, 1999)." This new revelation that space was emerging as a competitive landscape launched the nations of the world into an unprecedented race to gain the technological edge, led by the Soviets with their launch of the first successful satellite in 1957. As Captain John E. Shaw explained:

"The shock of Sputnik's success registered its effect on many levels. Many were surprised by the symbolic and ideologically profitable act of surpassing the United States in technology. But some saw Sputnik clearly for what it was—the implied ability, for the first time, for a nation in the Eastern Hemisphere to make a direct attack on the supposedly insulated continent of North America. The vast oceans and airspaces could no longer protect America, and a new weapon had emerged that changed the entire strategic balance of offensive warfare (1999)."

The Space Race between America and the Soviet Union fueled an extraordinary burst in progress. The defining attitude change could be felt in two specific shifts: the "belief that technology can solve great problems" and "the precedent that the federal government can fund and direct scientific and technological progress on a large scale (Shaw, 1999)." Andrew S. Erickson expands on this idea, stating that, "Central to its advantage over the USSR was the United States' successful development and implementation of several management and organizational processes for developing technology (Erickson, 2018)." He posits that it was the combination of systems

	THE THIRD INDUSTRIAL REVOLUTION
<i>Key Inventions:</i> Communications	Digital Technologies, Personal Computing, Information & Technologies
Key Production Innovations:	Innovations to Access to Information, Just-in-Time Manufacturing, Platform-based Business Models
<i>Economic Impact:</i> Property	On-Demand Economy, Sharing Economy, Fake News, Intellectual Issues, Gig Economy
Societal Impact:	Privacy Concerns, Information Overload

engineering, operations research, and project management which allowed the US to gain the edge on the Soviet Union in the race to the moon (Erickson, 2018). These structural building blocks then provided a framework for the rapid tech development that followed. From digitization, through personal computing and the internet, to automation and artificial intelligence, the technological developments of the Second Machine Age changed how we interact with each other and with the world.

The Enabling Technologies of the Fourth Industrial Revolution

All of the emerging technologies of the third and fourth Industrial Revolutions were based on one key technological advance - that of the transition from analogue to digital. Digitization is the reduction of information to digital form.

This digital technology has enabled the incredible surge in innovation over the last 30 years. The next section will explore a few of the key developments that have reshaped our modern world.

Personal Computing

The digitization of information set the stage for the revolution in Personal Computing of the 1980s. The reality of the breadth of implications that personal computing had on our evolution in the economic, social, and cultural realms is staggering. All the more so because of the brief amount of time in which it has all taken place.

The astonishing rise in computing power can be summed up in the following example. In 1996, the US Gov Accelerated Strategic Computing Initiative developed the ASCI Red, the fastest supercomputer in the world at that time. It was designed for calculation-intensive tasks such as simulating nuclear tests. It took up 1,600 square feet of floor space, and used up to 800 kilowatts of electricity per hour. It was also the first computer to reach one teraflop, that is, one trillion floating point operations per second. By 1997, it had reached 1.8 teraflop. The cost of the computer was \$55 million. Ten years later, in 2006, a computer was released with the same capabilities. It was the Sony PlayStation 3 game console, which used .025% of the electricity to run and was available for around \$500. It sold approximately 64 million units around the world (Brynjolfsson & AcAfee, 2014).

The boundless possibilities of computing are pushing our imaginations further and further. However, this rate of

THE FOURTH INDUSTRIAL REVOLUTION		
Key Inventions:	Artificial Intelligence, Robotics, Quantum Computing, Biotechnology,	
Vehicles	Nanotechnology, The Internet of Things, 3D Printing, Autonomous	
Key Production Innovations:	Automation	
Economic Impact:	Threat of Increasing Unemployment, Rise in Entrepreneurship, Return to Predominantly Precarious Work	
Societal Impact:	Programming Bias, Increasing Inequality	

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advancement is not restricted to personal computing. As Scott Galloway wrote, "Consider that the telephone took 75 years to reach 50 million users, whereas television was in 50 million households within 13 years, the internet in 4,... and Angry Birds in 35 days (2017)."

The Internet

As Cold War tensions increased in the 1950s, the US government was faced with a quandary. Should a nuclear war break out, how could they maintain communications across the vast country should the current infrastructure be destroyed? After 5 years of development by Paul Baran and the RAND corporation, the foundation of the ARPANET was conceived, the precursor to our modern internet (Targowski, 2005). Based on the principles of how a human brain functions, the ARPANET broke down information into small blocks known as "packets", which were then transmitted digitally. This resulted in a higher quality of transmission, as the digital information did not degrade as analogue information was prone to do (Targowski, 2005). The system also integrated redundancies, with the information packets being sent along a variety of routes before being rebuilt at the final destination. This reduces vulnerability since there is no centralized control of the system (Targowski, 2005). This system created the building blocks of the modern internet, and was the first step in the radical transformation of communication and information accessibility.

Automation

In 2004, a Grand Challenge was issued by the Defense Advanced Research Projects Agency (DARPA). Competitors were asked to, "Build a completely autonomous vehicle that could complete a 150-mile course through California's Mojave desert (Brynjolfsson & McAfee, 2014)." There were fifteen qualifiers. Brynjolfsson and McAfee described the events of the race:

"Two vehicles didn't make it to the starting area, one flipped over in the starting area, and three hours into the race only 4 cars were still operational. The "winning" Sandstorm car from Carnegie Mellon University covered 7.4 miles (less than 5 percent of the total) before veering off the course during a hairpin turn and getting stuck on an embankment. The contest's \$1 million prize went unclaimed, and Popular Science called the event "DARPA's Debacle in the Desert (2014)."

Only 6 years later in 2010, Google announced in an understated blog post that for some time, their autonomous cars had been driving successfully, in traffic, on American roads and highways ("What we're driving at", 2010).

Artificial Intelligence

In early 2011, the Artificial Intelligence system developed by IBM known as Watson competed against the top two human contestants to ever play the TV game show, "Jeopardy". After recognizing that his loss to the Al was inevitable, runner-up Ken Jennings quipped (as an addendum to his Final Jeopardy answer), "I for one welcome our new computer overlords (Davenport & Ronanki, 2018)." In an article he wrote for Slate magazine later that year, he expanded, "Just as factory jobs were eliminated in the twentieth century by new assembly-line robots, Brad (Rutter) and I were the first knowledge-industry workers put out of work by the new generation of 'thinking' machines. 'Quiz show contestant' may we the first job made redundant by Watson, but I'm sure it won't be the last (2011)." Watson pulled the winning answers from 15 terabytes of reference works, housed on 2,880 processor cores (Davenport & Ronanki, 2018). Jennings explained the process the Al used to find the Jeopardy answers:

"The computer's techniques for unraveling Jeopardy! clues sounded just like mine. That machine zeroes in on key words in a clue, then combs its memory (in Watson's case, a 15-terabyte data bank of human knowledge) for clusters of associations with those words. It rigorously checks the top hits against all the contextual information it can muster: the category name; the kind of answer being sought; the time, place, and gender hinted at in the clue; and so on. And when it feels "sure" enough, it decides to buzz. (Jennings, 2011)"

Watson was originally developed as a tool for the healthcare industry. Brynjolfsson and McAfee note that, "IBM estimates that it would take a human doctor 160 hours of reading each and every week just to keep up with relevant new literature (2014)." The hope with developing Watson was that the healthcare professionals' time could be optimized, allowing them more time to complete the areas of the job that require human judgement and interaction, while allowing Watson to match patient's symptoms, history, test results against all high-quality published medical information to formulate diagnosis and treatment plans (Brynjolfsson & McAfee, 2014).

The Emerging Values of the Fourth Industrial Revolution

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Watson's database, which consists of approximately two hundred million pages of documents, including an entire copy of Wikipedia. It used to include the Urban Dictionary as part of its repository of knowledge, however this was removed after it started to include curse words in its responses (Brynjolfsson & McAfee, 2014).

"The technology tools that we are shaping and that are

now starting to shape us are at the edges of our comprehension. These will happen so fast it will soon make us question the very nature of what it means to be human. We have to understand how tools are shaping us, and how to cope with that shaping in the time of hyper-change (Davis, 2016)."

The Fourth Industrial Revolution is upon us, and the changing values it is has brought are finally being acknowledged by the business community. It is not only technology that is shifting. Automation and AI are taking up the routine and repetitive jobs in both blue and white collar work (Davenport & Ronanki, 2018), leading to instability in employment. Consumers with less financial security are adopting the concept of Access over Ownership. Content that used to be restricted to paying customers is now free for anyone with a Smartphone in their pockets. The infrastructure of running a business is now manageable through a handful of apps instead of a team of twenty and a "bricks and mortar" HQ, meaning that access to capital is no longer the barrier to entrepreneurship that it once was. The foundation of how business operates has been rocked, and we are just beginning to understand the repercussions.

While we are only in the beginning stages of understanding the impact and reach of these changes in our individual lives, we can see that they have the potential to completely revolutionize our economy. In order to navigate the changes ahead, we need to stare unflinchingly at who we have become and extrapolate the repercussions of the key innovations of the Second Machine Age into a better understanding of how they are shaping us into the future.

APPENDIX B

UNDERPINNING DRIVERS OF OUR TUMULTUOUS TIMES

This section identifies and discusses the underpinning drivers that will have significant impact on the evolution of technology, society, and the economy over the next 10-15 years. These will have critical impact on the development of the Key Uncertainties identified above: the Rate of Digital Labour Adoption and the Consumer Preference for an Access or Ownership Economy.

Data - Convenience versus. Risk

Despite the repeated data breaches of the past few years, consumers continue to allow for the regular scraping of our data from apps and electronics. The convenience of having your computerized systems "know" you is just too tempting of an inducement. While incidents like the Cambridge Analytica scandal and the Marriott International data breach may make us question the advisability of sharing so much of ourselves online, consumers are continuing to agree to cryptic and confusing terms of service agreements with the trust that those companies have their best interest at heart. Barring a catastrophic event, it is unlikely that this consumer behaviour is likely to change.

Thriving Monopolies

The emergence of Winner-Takes-All economics has already been discussed in this paper. There's an outstanding issue, however. These new economics are the result of complex financial and political maneuvers that condition the market to accept such arrangements. We need only look to the nightly news to see evidence of the influence of commerce over society. From political Super PACs influencing elections to tech companies operating in blatant disregard for local law (as discussed in 'The Evolving Marketplace' section above), the current climate is clear. Economic priorities are determining the growth agendas for all of Western society.

A study done in 2016 identified that 73% of U.S. Fortune 500 companies had money secreted away to tax shelters around the world (Phillips, Gardner, Kitson, Robins & Surka, 2016). While this practice is legally legitimate, it has significant social impact. The number one offender was Apple, with \$214.9 billion held offshore, avoiding more than \$65 billion in United States taxes. Collectively, Fortune 500 companies are, "Holding nearly \$2.5 trillion in accumulated profits offshore (Phillips, Gardner, Kitson, Robins & Surka, 2016)." If repatriated, the unpaid taxes that these funds would be worth would equal \$717.8 billion dollars (Phillips, Gardner, Kitson, Robins & Surka, 2016). To provide a scale for the effect such an influx of public funds could have, the 2015 United States budget deficit was \$439 billion (Dennin, 2016).

While government regulation could help shape the other factors at play in this changing economy, it seems unlikely to occur. When corporations hold the power of removing jobs to countries with more favourable corporate conditions, governments frequently find themselves toothless against the demands of Big Business.

Economy of Abundance

As previously mentioned, digitization is fueling a technological, economic, and societal revolution. As we move into the future, the repercussions of digitization will only become more pronounced. Today, almost all of our media and entertainment is streamed or accessed through digitized sources. We access our news digitally, our work digitally, and our communication with friends and family digitally. More and more of our vehicles' systems have been digitized, and self-driving cars have been on our streets for nearly a decade ("What we're driving at", 2010). The advancement of 3D printing allows individuals to print unregistered firearms from the comfort of their own basements (Levenson, 2018). CRISPR technology allows scientists to cut and paste fractions of genomes. As genetic scientist Alex Marson states, CRISPR has the potential to, "Write new code in the language of genetics (Molteni, 2018)."

Thirty years ago, these types of advances were the imaginings of science fiction. Thirty years from now, they will likely be commonplace. Moreover, due to the economics of digitization, they may well be available for minimum cost and maximum access. Cheap and limitless replicability are redefining economic norms as good and services can now be delivered faster and with less resources than ever before. As more of our lives become available in digitized formats, the economics of scarcity that prevailed in the 20th century will need to evolve as well.

Environmental Destabilization

Despite the ongoing efforts by many to reverse the environmental damage caused by the past 200 years of industrial values, the environment continues to degrade at an alarming rate. Climate change is escalating, with even the United States Department of Defense identifying it as a national security threat (Ward, 2019). As The Guardian reports, "By the end of this century, sea level rises alone could displace 13 million people" in the United States (Milman, 2018). But it isn't just real estate at risk. The same article highlights that, "By 2050, Texas county, the largest wheat-producing county in Oklahoma, could spend an extra 40 days a year above 90F (32C) compared with now (Milman, 2018)." Higher temperatures equal both more precarious farming and a higher risk of wildfires. With our global ecosystem in a perilous state, many are asking why governments aren't stepping in to do more. Economist Ehsan Masood has a suggestion, linking environmental devastation to positive economic outcomes:

"GDP has the ability to reward countries that destroy environmental resources. For example, if forest land is cleared to grow crops or build houses or factories, then that will result in an increase in GDP, because the acts of building, producing, and farming mean more production, more consumption; more spending. If, for example, more pedestrians are hospitalized because of the effects of inhaling vehicular fumes, then there is more public health spending, and more public health spending helps to increase GDP (2016)."

Global Unrest

The past decade has seen the beginning of a trend that will only continue to grow in the coming years: the mass migration of climate refugees. As reported by the United Nations High Commissioner for Refugees (UNHCR), "Over 5.6 million people have fled Syria since 2011," and an additional 6.6 million people have been displaced internally (UNHCR, 2018). Of these, approximately one million have resettled in Europe, mainly in Germany, Sweden, and Austria (Connor, 2018). Germany, with approximately half of the new migrant population, has seen a rise of a far-right, anti-immigrant political movement (Hindy, 2018). They are not alone. In North America, there has been a distinct rise in the prevalence of these populist movements. With resources in decline, more global and local citizens displaced, and nationalist fires being stoked by inflammatory public figures, it can seem as if the world is a tinderbox just waiting on a spark.