Technology for Good: A systems exploration into the future of the digital platform economy

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Abstract

The digital platform economy has grown exponentially over the last two decades, resulting in a tech-enabled culture that is shaping a modern society. The system, framed in a North American context, is primarily driven by the commoditization of personal data. In this case, 'big tech' - companies like Facebook, Amazon, Apple, Microsoft, Netflix and Alphabet (Google) - profits off of data-driven insights that are used to create personalized services, targeted offers, suggested products and recommended search. Personal data gets treated like an asset to tech giants in particular. It cements the competitive advantage of those digital platforms that are able to exploit data-driven insights, enabling a recurring system of digital platforms trying to capture more and more personal information. It is not to say that digital platforms do not provide benefits to their users and society as a whole. Yet, the digital platform economy has perpetuated a complex relationship between benefiting from its users, and providing a set of (perceived) benefits back. In the current system, there is a lack of transparency in how the data exchange truly operates, prompting concern for whether the design of this system makes users vulnerable by default. This results in rising uncertainty around how the ecosystem should best interact with digital platforms in ways that concern data rights, data privacy and utilization of personal data. Through foresight and systems-thinking methodology, this project will seek to explore an alternative future that views data in a balanced, and optimistic, perspective. The report will begin by analyzing the past, in order to understand how we got to the present, which will help to imagine a desired future where tech is used for good.

Acknowledgements

Grappling with what feels like the wicked problem of our age took me far beyond my comfort zone. Facing ambiguity was one of the questions I was asked during my interview to get into this Master's program, and it was effectively the biggest challenge that I had to see through. As they say, it takes a village, and I would not have been able to see the finish line had it not been for some remarkable people.

Thank you to my Primary Advisor, **Helen Kerr**, for your kindness, positivity and incredible support. I entered every one of our meetings with a long laundry list of messy thoughts, and left every meeting completely inspired. Without a doubt, it has been the greatest pleasure getting to know you, work with you and learn from you. I am honoured to have had you as my advisor.

To my loving **parents** - thank you for supporting my decision to take time off from my previous career to reset, to then support my decision again when I thought about taking more time off to go back to school. I don't think I could ever express how immensely grateful I am for everything you do for me, and for always, always listening. All my love.

To **Liv and Kasi** - I would be lying flat on the ground in a puddle of my tears if I did not have you both with me. Thank you for always being there for me. But I thank you even more for always forcing me to get up and get over it. Liv- you are the best baby sister for taking care of me and doing all the chores on my MRP weekends and for listening even when I was trying to explain incoherent thoughts. Kasi- you are my soul sister who showers me with unconditional love despite your fear of affection. I can't wait to have our weekends back.

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Preface

Everything can be overwhelming if we let it be. It seems like a big part of what stops us from making significant change circles around the notion that the issue may be too big, that it may take too long, or that it may cost too much to be justified. We face no shortage of problems in the world to be solved, whether they are the big, small or in between. These problems also weigh differently on different people and in different places. In 2020, a lot of the ugliest sides of the world were illuminated. The worst part of it was that these problems were not new, but they were new to a lot of us. For me, a lot of what was so difficult to come to terms with was that these problems were brought to our attention in plain sight, and if we paid attention, we would realize that a lot of what was going on was a direct result of our unwillingness to see. Whether it is the ongoing climate crisis, widespread racial and gender inequities, political divisiveness or growing wealth disparity- these are our problems. It is our responsibility to do better- to be better.

Framing this project felt too big at first, with too many moving parts, rapidly evolving as we speak. Research that I had collected as signals and trends with current events were littered with new events that brought more to light. But as the year progressed, I felt more and more inclined to figure out how I could frame this project as a way to shed light on how we can collectively understand the subject area. Shortly after, I had a conversation with my mum. I asked her how it could ever be possible to solve problems that, quite frankly, seem unsolvable. There seems to be too many things tangled in the web and the deeper I dove, the bigger the problems looked. She laughed, as she does when her oldest child starts throwing an internal tantrum. She told me that solving the world's most wicked problems may be improbable, but a way to approach it is to figure out how to make things better in your own world view. She said that if you were to make significant, sustainable change in your world view, other things would follow suit.

It was in this moment that I realized that my mum was explaining to me her take on how to approach systemic change. It could start with understanding the problem from your and other perspectives, allowing yourself to witness how change can affect other systems and other worldviews, and turning that into a problem-solving capability.

I acknowledge my bias in carrying out this research project with the initial thought that the future of the technology industry and digital platform economy must change course. Through this exploration, I am hoping to capture some of the why's and some of the how's. Though the outcome of this study will inevitably evolve, I believe that it will start with our willingness to see, to try to be less intimidated by the grandness of the issue and to approach the idea of change with a hopeful lens.

> As the world becomes increasingly heterogeneous, as events from far away places dramatically impact how, where, when, why and with whom we live and work, futures studies can help us recover our agency. By mapping the past, present and future; by anticipating future issues and their consequences; by being sensitive to the grand patterns of change; by deepening our analysis to include worldviews and myths and metaphors; by creating alternative futures; and by choosing a preferred and backcasting ways to realize the preferred, we can create the world we wish to live in.

- Sohail Inayatullah, Six Pillars: Futures Thinking for Transforming

Introduction

Introduction

An ambiguous future

What are digital platforms and why should we care?

Digital platforms have shaped the way that people live on a daily basis. In a general sense, it has been ingrained in our everyday lives so deeply in such a short period of time that for some, it may go unnoticed. A digital platform can be defined as a 'technology-enabled business model' that connects platform participants through a network that houses and allows sharing of products, services, information and data at scale (Hintermann et al). These companies provide 'digital services that facilitate interactions between two or more distinct but interdependent sets of users… who interact through the service via the Internet' (OECD, 2019). The staggering rise of the platform economy can be attributed to how digital platforms are able to provide a digital offering through multiple forms. Digital platform capabilities and offerings are constantly evolving and the complexity of these groups of platforms warrant boundaries to explore their impact in the modern world. Initially, companies were able to operate as either a 'software platform' (the ecosystem that enabled the function) or an 'application service' (the function that enabled the ecosystem) (Hopkins and Rymer, 2016). Today, digital platform companies are capable of being both a software platform and an application service, thus propelling their ability to scale. The way in which they are able to scale can also be directly enabled by the power of an data-driven, online network, where the exchange of goods and services are not limited by physical boundaries of a traditional marketplace and are fueled by intelligent insights, increasing the potential reach of any platform (Hintermann et al).

Today, many of us wake up every day from an alarm on our phones, as opposed to using a physical alarm clock. We set digital reminders and alerts so that we don't forget to complete a task. We scroll through social media to catch up on the lives of our friends and family. We have meetings with our work teams over video. We go to school online. We send money through the internet. The power that technology has given to us as users is monumental and has shifted the small efficiencies and tasks that we used to do through other mediums. On one hand, it has made life infinitely more convenient and it has allowed our society to make massive transformations not limited to single industries or markets. On the other hand, the digital platform economy is home to dangerously dominant technology companies - known as big tech - and the consequences of the sheer amount of power that they hold affect the same users that they initially set out to serve (Leyden & Schwartz, 2020).

The issue

Big tech holds an unprecedented amount of power in how these companies are able to operate (The Economist, 2020). The rate of technological advancement and change within the platform economy has made it challenging to determine an appropriate way to regulate these companies, and as a result, platform companies have been able to operate among outdated rules that are no longer able to draw clear boundaries, further enabling competitive capitalism.

Example

For one contextual example of a platform able to grow, consider Amazon. Over the course of two decades (2000-2020), Amazon as a corporation grew its revenue by approximately 12,000% (Figure 2). Amazon has captured its loyal customer base by providing services such as Amazon Prime (a membership option in the Amazon marketplace that allows customers to capitalize on free and/or faster shipping), low prices, logistical excellence and variety of commodities. The Amazon Prime membership, access and trust in service and offerings alone is enough to build a loyal customer base. However, the ability to provide items at a low cost in tandem with the previously mentioned benefits is what fuels Amazon's competitive advantage over potential peripheral competitors (Danziger, 2021). It is important to note that while this marketplace does house Amazon branded retail items, this marketplace is meant to provide the platform to connect buyers to third-party sellers (Uenlue, 2018). On top of charging any third-party fees to operate on the platform, there have been recent allegations against the tech giant, claiming that Amazon collects and distills information based on third-party's offerings and customer data to then present more personalized offerings at better or comparable prices on Amazon items (Mattioli, 2020). Recently, former Amazon employees have come forward through interviews to confirm this allegation, despite Amazon's efforts to deny the claim. Regulators in the both the US and EU are both investigating whether Amazon is exploiting the role that they have as operator of this marketplace, as being both a seller and operator has enabled them to capitalize on being the most attractive in the market space, eliminating and challenging all small-medium competitors that participate in the Amazon ecosystem. Amazon claims that all competitive endeavours are standard operating practices (Mattioli, 2020). If this is indeed true, Amazon's ability to evolve its business model and competitive practices, enabled by technology, has far outpaced regulators' ability to draw clear boundaries to protect the competitive ecosystem that has allowed platforms like Amazon to continue building its economies of scale (Uenlue, 2018).

The implications of this are many, and result in issues such as increased vulnerability on its users, unfair competitive markets, the spread of misinformation, inadequate data governance and disproportionate access to technology itself (Cusumano et al 2020). This project will seek to explore what would need to change or evolve systemically in order to prioritize the protection of people. As of now, the wellbeing of users and the bigger society have not been particularly prioritized, overshadowed by the 'wow-factor' and usefulness of the innovations in themselves. If the platform economy is indeed meant to act as a system that is symbiotic in nature, attention to the distributed benefits need to be considered. Issues mentioned above put society and users in a place of little control to have autonomy around how innovative tech affects them and how they should choose to participate in this ecosystem.

Research question: What are the futures of the digital platform economy?

The plural term futures implies that there is no way to predict a singular future, nor is it possible to imagine the most absolute and appropriate desired future outcome. This study will aim to explore one out of many possible futures utilizing the Causal Layered Analysis (CLA) tool that will position a complex idea in contextual surroundings. The CLA method will first be used to examine the issue today, and identify an inflection point where an alternative future can be built. This imagined future will be enriched by a literature review, horizon scan and expert interviews and will seek to identify what the barriers to adoption are in order to get to that desired future.

Platform refers to the architecture and make up of these networks and companies. This research will evolve under the premise that platform driven companies are likely here to stay. This study will aim to apply systems-thinking methodology to explore the technology industry to identify gaps, opportunities and leverage points that may arise.

Platform economy may refer to the expansive value creation that is catalyzed by networks, ecosystems and platform companies. Actors within the system are no longer siloed by offerings and capabilities, due to the stacking technology (the ability to use tech in tandem with each other) and commanding influence of how big tech sets the bar for a competitive landscape (Lang et al, 2019). The combination of platform companies and ecosystems of all sizes has helped create a formidable, data-driven economy where goods and services are made and traded at exponential rates and volumes.

What are the futures of the digital platform economy?

The scope of this research study is intentionally broad. The goal was to gain a holistic understanding of the digital platform economy which is continuously and rapidly evolving while also increasing in complexity. Approaching the problem area holistically may realize underlying commonalities within parts of this economy that may have been overlooked in the attempt to drive systemic change.

Purpose

This project will focus on uncovering critical leverage points within the system that can help in challenging fundamental business practices affecting the digital platform economy. This effort is undertaken in the hopes of outlining a possible pivot in the purpose of these companies towards solving meaningful issues by looking at the past, present and (potential) future.

Goals

1. Draw attention to the growth of the digital platform economy from a holistic perspective to understand the positive and negative impacts of how this sector has shaped a modern society
2. Introduce a new narrative that challenges the ‘business as usual’ approach to market participation and competition from an economic standpoint to initiate future conversations around a building purpose-driven ecosystems
3. Celebrate the potential of a technology-driven future by understanding and learning from past and present frictions to imagine a desired future that, despite high levels of uncertainty, feels intentionally optimistic

Methodology

This project combines tools and methods from foresight and systems-thinking fields. While framing the problem, it became evident that understanding the complexity of the systems required an optimistic lens, even if it felt counter intuitive. Key questions organically guided the stages of research, resulting in a cumulative curiosity into what a desired future could be.

To uncover this desired future, this project sought to understand how the past has influenced the present state of the system. It felt important to form a perspective on how we got here today and to uncover which parts of the past and present prevent us from being optimistic about the future and hopefully, to identify opportunities to challenge that. Therefore, the story of this report was framed by starting with the past, then to the present, and then to the future.

To create insights, this project began by first gathering information via literature review, which supported the collection of evidence and signals into a horizon scan. This felt important to truly understand the context of how the industry was evolving and to capture emerging trends. Expert participants were recruited to form a diverse set of interviews that helped to raise further questions and provide professional input into the subject area. The questions that they asked helped to expand the scope of research into areas that were not initially considered. From here, information was processed by way of the Causal Layered Analysis (CLA) and systems modelling. These two methodologies aimed to break down the information that could be converted into insights that would help to define a way forward. To use the processed information, care was taken to look beyond the current system's deeply held beliefs and barriers to change to identify what would need to occur in order to build a more balanced future.

The Past
Key questions framing this portion of the research

- How has the platform economy evolved over the past 20 years?
- What important drivers of change over the last 20 years brought us to today's platform economy?

Methods used:

Literature Review
Broad exploration to help define boundaries of the research study, aimed at identifying key characteristics and inflection points that brought us to today. This literature review captured questions, trends and information from a diverse set of sources, including media releases, opinion pieces, peer-reviewed journal articles, social media articles, and corporate white papers.

Timeline map
This visual timeline represents the evolution of the digital platform economy and to set context for the current state analysis. This timeline evolved into a foundational piece in setting the stage of the problem. It illustrates the growth rates of digital platform companies over the past two decades and outlines notable milestones and events that have shaped today.

The Present
Key questions framing this portion of the research

- What anchors users to the digital platform economy?
- Who has more to gain from the rise of digital platforms?
- What are the true problems that arise from the reliance on digital platforms?
- What are the signals of change?

Methods used:

Horizon Scan
A systematic literature review aimed at finding emerging signals of change to identify prevalent trends and recurring patterns. Emerging trends captured were classified using a STEEP-V lens (social, technological/scientific, environmental, economic, political, value). This was a critical method to use so that there could be a clear perspective painted to understand how the digital platform economy is evolving, and what or who could be helping to shape this.

Expert Interviews
Participants ranged from experts working in the technology or digital platform industry, as well as academics/researchers who focus on technology, platforms and digital trends. Interviews were semi-structured, and helped to challenge and validate assumptions from secondary research, as well as to help identify and enrich signals, trends, drivers of change and potential intervention points within the digital platform economy. It was important to note that due to the diverse group of experts that were interviewed, there was not necessarily a cohesive theme that emerged, other than the idea that the digital platform economy remains incredibly complex. Therefore, the expert interviews were more useful in helping to challenge the project assumptions and to capture questions that would help in diving into subject areas that may not have been initially obvious.

Causal Layered Analysis (CLA)
The core framework and approach to analysis in this study relied heavily on Sohail Inayatullah's Causal Layered Analysis (CLA). This is a foresight method that provides a structure to frame and enable synthesis of complex issues where system levels could be looked at through varying dimensions. Inayatullah (2004) explains that the use of the CLA is meant to provide deep understanding of contextual problems to create transformative, authentic, alternative futures. This defining feature of the CLA is that it is 'concerned less with predicting a particular future, and more with opening up the present and past to create alternative futures' (Inayatullah, 2004).

To analyze the issues of today, the CLA will first be approached starting from the litany which is often referred to as the problems that we can see. In this initial layer, findings relied on media, news, current events, trends and signals to set the stage to go deeper. To get to the root cause (myth/metaphor), further analysis continued through the systemic causes layer where we would be able to understand the structures in place that directly enables the litany level. The next layer, the worldview, describes underlying paradigms and mental models that enable the issues and aims to determine which stakeholders exist within it. At the bottom of the model, the myth/metaphor is shown to articulate unconscious values that establish a particular worldview. The goal of this current state analysis is to identify potential leverage points to reframe the system as a whole to imagine a desired alternative future. An alternative future was built from the current state CLA.

Systems maps and archetypes
Visual models were created to illustrate relationships and tipping points to begin to identify leverage points for change.

A Future
Key questions framing this portion of the research

- What does the future of the digital platform economy look like?
- Is it possible for platform ecosystems to intentionally seek to solve systemic problems as part of their business as usual?
- How might we imagine different goals of the system?
- What are the barriers to change?

Methods used:

Alternative Causal Layered Analysis (CLA)
The future state CLA is built from the current state CLA. The current state CLA's myth/metaphor was contextually flipped to create an alternative myth/metaphor that would be more conducive to a desired alternative future scenario. This process starts from the myth, which will help to inform new characteristics of the worldview, systems and litany. Starting from the deepest layer of the system creates an opportunity to work at changing the goal and root cause of the issues at hand.

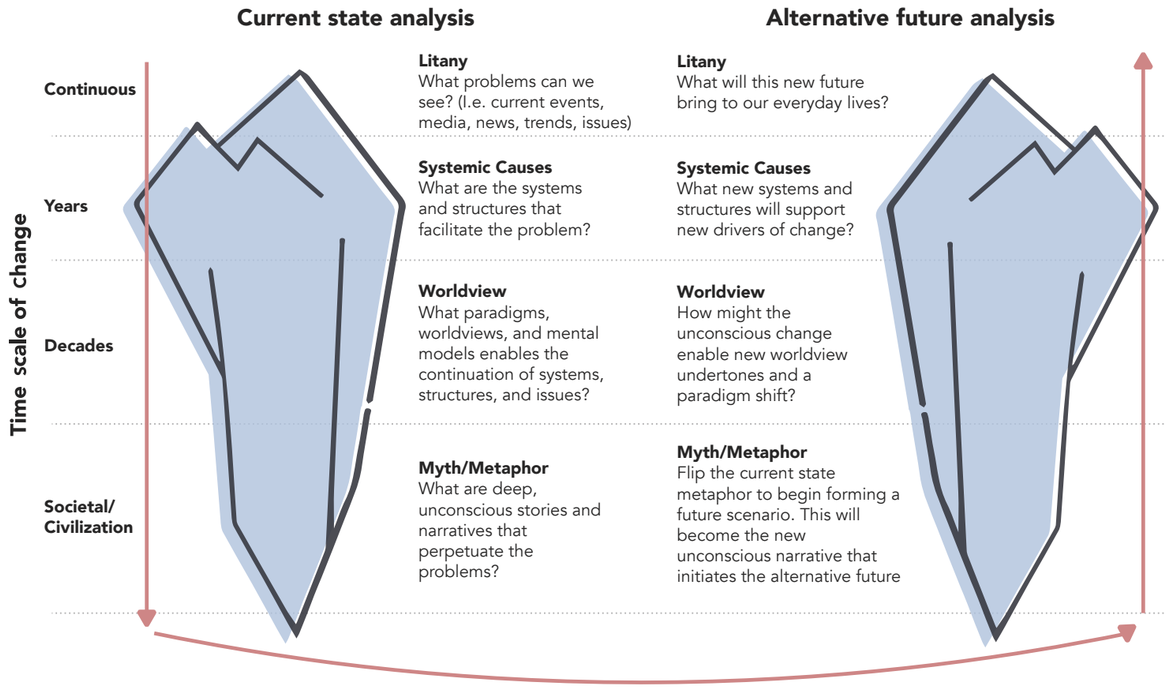

Figure One.
Causal Layered Analysis (CLA) model: Illustrating and deconstructing the current system to build an alternative future (Inayatullah, 2004).

Limitations of this study

Efforts were made to approach this research study comprehensively and holistically. The following limitations are acknowledged following the execution of this report.

Evolving landscape
The digital platform economy today is changing rapidly due to introduction of new regulations (across different countries) and a shift in acceptance of current business operations in society. The growth of the technology sector and platform economy has grown continuously over the last two decades, resulting in inconsistent literature review findings and expert opinions that made defining certain areas of this study challenging.

Primary research
This study could benefit from additional participants in the expert interviews. Though the insights from participants were significant, a larger and more diverse participant pool would have allowed for a richer data collection to validate and challenge assumptions.

A generative workshop could have facilitated a wider variety of insights in imagining alternative futures. Though this would have changed the methods and tools used in this study, a participatory workshop may have changed the overall scope and direction of the problem framing and solution building.

COVID-19 impact
The COVID-19 pandemic is not explicitly a limitation to this research study. However, it is important to note factors that may have hindered the content, findings and approach in exploring this research.

Firstly, the contextual circumstances of the pandemic have placed increased visibility on the digital platform economy in terms of its benefits, impact, advantages and disadvantages. As a result, it is possible that some of the focus that is on this evolving landscape is unique to 2020 and all that came with it. On the other hand, it is not the first time that the world has seen a pivotal year that shines light on existing problems, and with this ambiguity, it is difficult to say whether this should be considered an anomalous year.

Secondly, there were limitations in terms of facilitating and conducting primary research. Though digital platforms and resources allow for remote collaboration and connection, facilitating generative primary research such as workshops were physically restricted. Therefore, alternative methods were chosen to carry out the research.

Time limitation
Additional time may have allowed for more comprehensive planning to carry out additional primary research, including planning for participatory workshops and conducting additional expert interviews. The scope of this research study was partially dependent on the amount of time allotted to complete the project.

> It has become appallingly obvious that our technology has exceeded our humanity.

- Albert Einstein, Scientist

01

The Past:
How we got here

Part One

How did we get here?

Big tech and data-driven organizations have built their success through dominance in the market. Looking back two decades, big tech was initially made up of a handful of tech companies that were exponentially growing in size and economic value. This research study will consider 'big tech' companies to consist of Facebook, Amazon, Apple, Microsoft, Netflix and Alphabet/Google. In addition, research included enterprise platform companies such as IBM, Salesforce and Accenture to gain understanding of the context as companies that have dominated the competitive space that they are in. In order to effectively understand the digital platform economy, it will be important to set context for how these systems came to be, and will begin with looking at the past two decades.

The Big Shift

From product to platform to ecosystem

Historically, companies created products with the intent to sell or exchange that good, which would cater to different customer needs or wants, for profit. This created a singular revenue stream for an organization (Furr & Zhu, 2016). The shift to platforms was meant to provide a connection mechanism to facilitate more direct interactions between buyers and sellers within the system. The best transition to become a platform required a strong value proposition of the product itself in order to attract users to continue to participate in this exchange. A value proposition describes the key value that a company promises to deliver to its customers that motivates them to choose one company over another that serves as a competitive differentiator (Mullin, 2021). In this case, companies who could articulate and define what they were offering to customers would be more likely to succeed in this pivot. Platforms provide opportunities for companies to create additional value for themselves by building on their core offering and to the consumer by not limiting the exchange network to a linear relationship (McCallum & Van Alstyne, 2017). Successful platforms house networks of information, goods, services, suppliers and consumers which, if scaled, may lead to a strong platform ecosystem. These ecosystems are made up of products, platforms and stakeholders that collaborate to fulfill competitive and complementary offerings/partnerships. The ecosystem acts as a way for companies to leverage that broader competitive landscape to create even more additional value that is not necessarily limited to industry, size of company or geographical constraints (Lang et al, 2019).

Competition in ecosystems becomes complex, as ecosystems consist of structural elements that revolve around the actors (ecosystem participants- buyers and sellers), activities (value creation- ways in which products and services are exchanged, introducing new offerings, changes or development of services) and architectures (the infrastructure that facilitates the interaction between actors and activities) (Bohm et al, 2019). It requires some level of collaboration or interaction with each other to build additional value from the other's offerings, while also trying to maintain their competitive value proposition against similar players. As a result, this fuels innovation as companies compete to stake their claim on which role they want to play within the ecosystem (Jacobides, 2019). The role of power sits with the 'orchestrator' who manages and sets rules for the ecosystem, while also managing ecosystem participants to ensure that the collaboration or partnerships fits the goal of the ecosystem (competitive vs complementary offerings) (Lang et al, 2019).

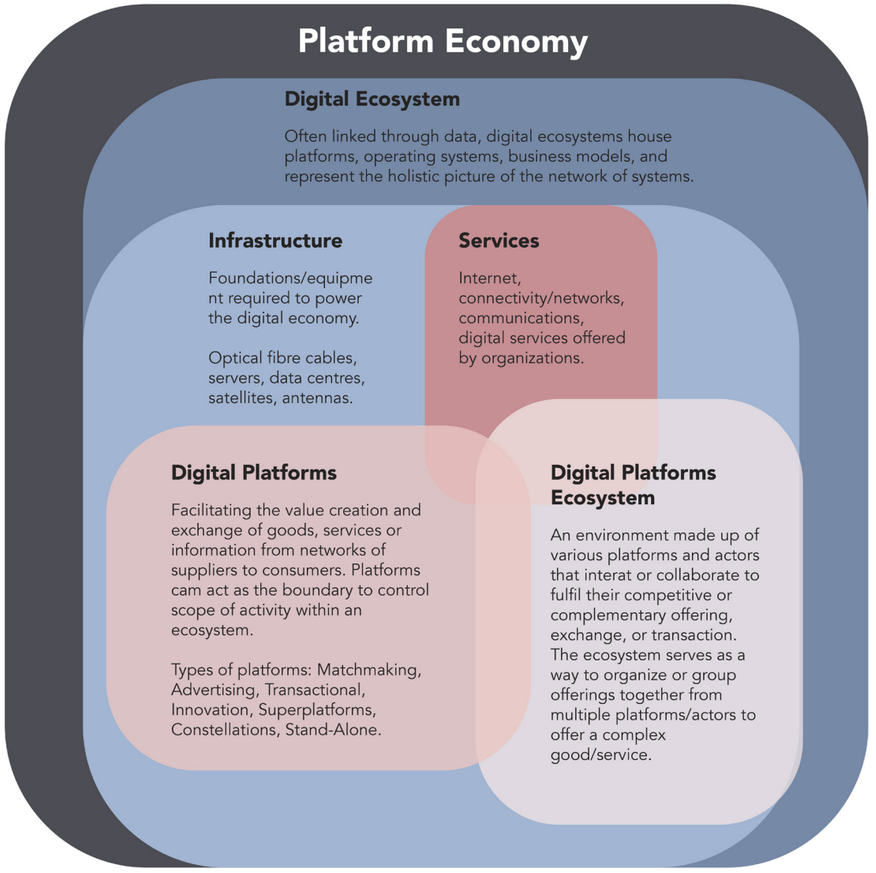

Figure Two.
The platform economy: high level mapping of intersecting elements

With this shift, the research will focus on two drivers of change that have been present for some time and will continue to have influence on the platform economy. Drivers of change are pressures or forces that cause change to a system (Ghiran, 2019). In this case, the focus on these two system drivers will shed light on how or why the current system is the way it is. Together, these system drivers have exacerbated the growth of the digital platform economy.

System driver 1:

Commoditization of personal data

There is definitive evidence regarding the collection of personal data and how it has evolved into a platform's competitive advantage. Used effectively, personal data can be translated into insights about users which are then exchanged or sold, depending on the platform that is doing the curating (Murphy, 2017). Big tech companies collect information that pertains to personal behaviours and decision-making which is then utilized to provide the utmost personalized offering through a given platform and is almost guaranteed to align with the needs or wants of that user. Lots of users do reap benefits from a personalized digital experience- it provides them benefits like targeted recommendations and relevant content. However, it poses substantial concern for privacy infringement and exploitation of personal information and due to the lack of governance and lack of clarity around what this data is being used for (Pringle, 2017). In this case, the user has become the product of which a company draws its insights. In this case, the three components that are most important to a data-driven organization are:

Data: When collected, data will be raw and unprocessed and can be qualitative (able to be

observed and understood) or quantitative (able to be measured or calculated) (Dykes, 2016). This is the foundation of digital platform companies in their attempt to drive personalization.

Information: After raw data is collected, it becomes useful to the organization when it is translated into information. This means that it is processed and organized to be analyzed to pull out actionable insights. Information serves as the bridge between the collection of data and making it useful to the digital platform.

Insights: After the data and information are synthesized, digital platforms draw conclusions around what the elements mean. These conclusions are then able to influence the decisions made around designing the platform, product or offering to be tailored accordingly.

Example

Arguably one of the most dominant streaming platforms is Netflix. A key feature that Netflix provides is personalized recommendations of content to watch. Netflix curates content per viewer to be displayed by collecting data and turning it into actionable insights by displaying personalized home pages, data-driven search algorithms and contextual communications in and off the platform (Netflix, 2020). This means that they are able to show you content that you are more likely to engage with, as opposed to an expansive list of every tv show or movie that lives on the platform.

In 2017, Netflix declared that 80% of their users' watched content came from insight-driven recommendations (WBR Insights, n.d.). Furthermore, insights are further gathered based on watch patterns from clusters of viewers that have similar preferences. With this, Netflix is able to holistically design the interface based on what the majority of viewers would typically want to see to improve the user experience of the platform as a whole. Due to the success in how Netflix augments its level of personalization, it has set the standard for what customers have come to expect (WBR Insights, n.d.). Now, any data-driven platform that contains similar volumes of products or content applies a content navigation to allow users to make efficient and effective interactions powered by the capabilities of the platform. Data-driven insights have become increasingly important in creating an experience due to the standards set by tech giants.

The relationship between platform and user now becomes more complex- there is a level of reliance on both ends where the platform requires personal data to form insights in order to provide a seamless experience, and the user has become accustomed to seeing only what has been identified as what they want to see. However, though there are mutual benefits, Netflix and other digital platforms are capitalizing on the commoditization of personal data. Since users cannot explicitly say how they want to participate, the benefits are not of equal value.

System driver 2:

Rise of convenience culture

The rise of convenience culture is, in part, a consequence to the commodification of personal data (system driver 1). Digital platforms have mastered the ability to provide the exact product, service or offering that a user wants as a result of personal data collection and insights created from this exchange. This heightened level of personalization has been able to provide users with the tool or offering to use at the exact contextual time needed, making life 'easier'.

In tandem with this phenomenon, big tech platforms have reached a level of scale that makes it easy for them to facilitate a system of instant gratification (Leahy, 2020). In this context, instant gratification refers to the expectation of immediate fulfillment without delay (Taubenfeld, 2017). Big tech platforms have the resources and capabilities to feed into this desire, providing services such as same day delivery of a product, insight-driven recommendations to make quick decisions or instant messaging (Anderson & Raine, 2012). This exchange has perpetuated users' reliance, addiction and dependence on these platforms to maintain the convenience lifestyle, thus further reinforcing the power that certain platforms hold over the people that use them (Telbis, 2019).

Example

This example builds on the previous example of Netflix. Netflix (along with other dominant streaming platforms) has transformed how people want to consume content. Before streaming, TV shows came out at a recurring schedule on cable- mostly weekly- where viewers had to tune in at the time it was airing. During this time, in the late 2000s, cable and broadcasting companies began to offer digital video recorders (DVRs) as part of their service offering, allowing users to record and watch shows at their own pace (Pink, 2017). This began to signal viewers' urge to consume content on their own time based on when was most convenient for them. Soon, streaming started to take over. Once platforms like Netflix became a staple for users wanting to control how they watched shows and movies, the expectation changed. With what is essentially a DVR in the cloud, viewers were able to watch any show stored on the platform, in any order, at any time (Palermino, 2015). Today, the culture of convenience and instant gratification is evident in the streaming industry, leading viewers to a culture of 'binge-watching' shows and movies (Palermino, 2015). Gone are the days when viewers willingly wait to watch shows week by week, and instead Netflix has seen an increase in viewerships in their original content when they release a TV show by the season, as opposed to by the episode. In other words, waiting for something is no longer a notion that modern viewers are willing to entertain.

Each sector of the digital platform economy has a story similar to this. Consumers participate in this ecosystem knowing that it will be faster, more relevant and more engaging than a non-digital platform experience.

Timeline: The rise of the digital platform economy

This timeline illustrates critical growth patterns of dominant platform companies over the last two decades. This research into the digital platform economy has been limited to primarily looking at the North American tech market.

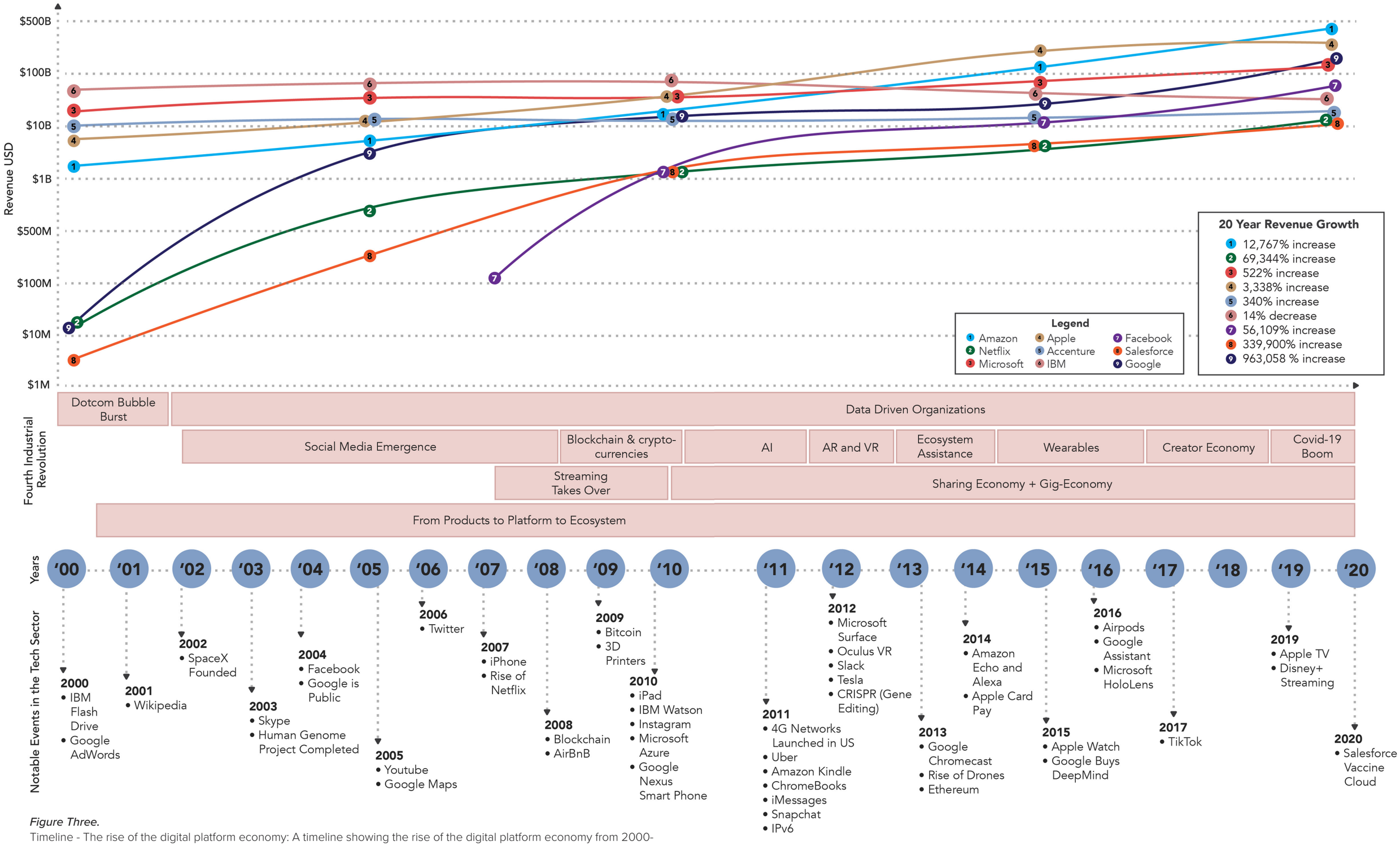

Figure Three.
Timeline - The rise of the digital platform economy: A timeline showing the rise of the digital platform economy from 2000-2020. Timeline highlights companies that have experienced higher than average growth within the sector.

How did this happen?

The timeline of tech players over the last twenty years paints a concrete picture on how the dominant digital platform companies have succeeded through a 'winner takes all' approach. The 'Success to the Successful' systems archetype allows us to understand why the reinforcing scenario looks the way that it does.

This archetype describes a scenario where bigger digital platform companies are set up to succeed based on systemic drivers. It describes their incentive to win based on how much of the market they can dominate (be the biggest, acquire the smallest), how big they can grow (bigger is better) and how to create useful data-driven insights to provide as personalized an experience as possible for users. The systemic structure of this archetype shows how the 'winner' of the scenario is rewarded with the ability to win again, thus creating a reinforcing feedback loop, penalizing the smaller competitors (Braun, 2002).

The success of these digital platforms can also be attributed to an unbalanced power dynamic. Since digital platform companies are able to act and react rapidly, we have seen regulatory bodies fall short in creating a firm sense of rules and governance in the North American market (Malan, 2018). Malan (2018) explains that regulations are not able to be put into place at the same pace as how digital platforms are able to innovate, thus creating an continuously outdated set of rules resulting in gaps where platforms can freely operate. With this, digital platform companies have been able to grow at exponential rates. Their current business operating model does not incentivize them to create their own boundaries, and they are rewarded by providing consistent opportunities to scale and expand their ability to capture more pieces of the market (Crawford, 2020). One expert participant suggested that the initial benefits that were provided to users still exist in the offerings that platform companies provide, but that the dynamic has changed. They explained that while the user benefits are still there and may have increased, the benefits to the platforms have exponentially increased, thus setting the stage for an imbalanced relationship between user and platform. In other words, the users provide more value to the platform than the platforms provide to the users- we have become the product.

Figure Four.
Systems archetype - Success to the successful

> Trust is a serious problem, we have to get to a new level of transparency – only through radical transparency will we get to radical new levels of trust.

- Marc Benioff, CEO, Salesforce

02.

The Present:
What we are dealing with now

Part Two

Framing the problem

This project will be analyzed in the context of the North American platform economy. In North America, platform companies operate within a system that supports capitalistic business models where success of a company is measured primarily based on economic value. The success of these digital platform companies has perpetuated our addiction to the benefits that the tech sector provides (MacGuineas, 2020).

In Part 1, the 'Success to the Successful' systems archetype was introduced, explaining that the dominant platforms are part of a reinforcing cycle of inevitable gains to themselves. This is an important theme to preface the approach to research in this particular study, as identifying the problem space does not automatically result in also identifying the solution that goes along with it. It will be challenging to imagine how to dismantle distinct problem areas to create a more sustainable future. However, understanding the problem space will help in identifying barriers and intervention points where we can begin to imagine alternative futures of the digital platform economy.

To understand the current state of digital platform economy today, the CLA will be used to illustrate the different issues in each of the systemic layers.

Current state analysis

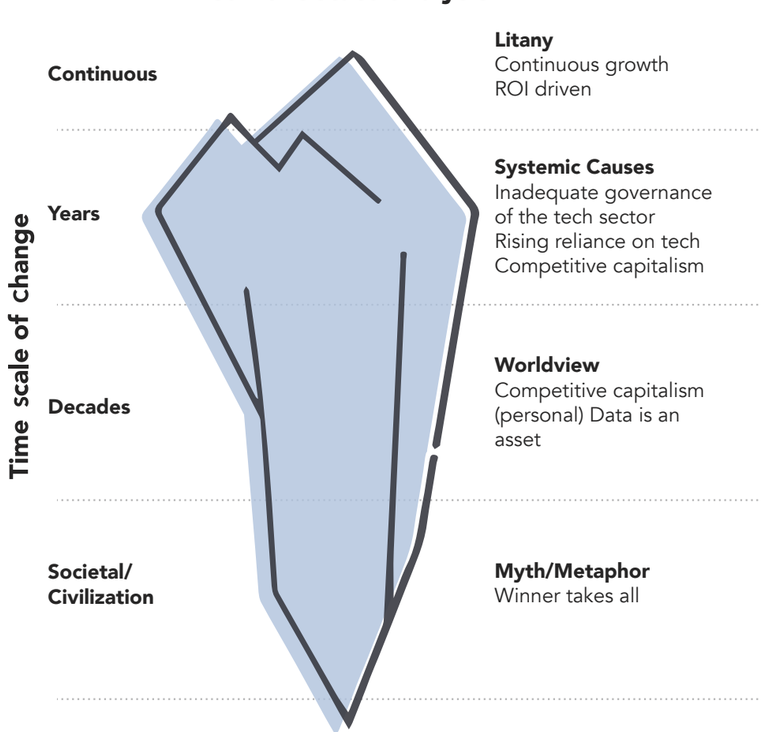

Figure Five.
Current state Causal Layered Analysis (CLA).

Litany

The current digital economy operates by a data value chain. Personal or consumer data is first collected, stored, and analyzed which changes it into useful data to be monetized by the digital platforms. Eventually, this data gets synthesized into a useful product or service offering to be used by consumers. This reinforcing system satisfies the platforms' demand for a continuous supply of their most important asset (United Nations, 2019). As a result, this pattern in the commoditization of data has allowed platforms to scale at an unprecedented rate, resulting in enormous profit in the market. Platforms are driven by creating more value through designing products and services that they know their audience seeks. The rise of platforms is concurrent with the evolution of the digital economy, with both public, private and individual networks seeking the benefits of technology that has now been ingrained into everyday life (Murphy, 2017).

The compounding benefits of this pattern has set the standard for what the business model in platforms looks like. Digital platforms, regardless of purpose, seek to scale to compete with the platforms that set the tone for what success looks like in the digital economy. Therefore, the expectation from investors and shareholders around successful platform companies lies in its ability to create a return on investment that is exclusive to the digital economy. As a result, the eroding goal of the platform seeks to maximize profit.

Systemic Causes

The lack of transparency in how the platforms operate since the conception of the digital economy has resulted in an inadequate governance of platform companies (Chew et al, 2018). To start, the system of data driven platforms provides a large volume of benefits to users and has fundamentally changed how we communicate, work, play and live. Until recently, policy and change makers did not question how exactly platforms operate, and at what cost. Platforms have been able to operate and innovate relatively freely, while users and governing bodies were blinded by the transformational disruption to life before technology. Governance and regulations plays a large role in shifting the power and control that platforms have over all networks and stakeholders (Chew et al, 2018).

The rise of the platform economy has cultivated a society that is heavily reliant on tech to perform everyday activities. Though users and governing bodies are becoming more technology and data literate, the reliance on digital platforms outweighs society's ability to discard the idea of living without technology (MacGuineas, 2020). The more we use a platform, the more behavioural insights are collected, which facilitates the platform's ability to create an even more so personalized experience, which reinforces our addiction to the benefits that it provides- and the more content users are with the service offering, the more loyal and entrenched users become (MacGuineas, 2020). To give this up would mean sacrificing convenience that has cemented our needs and expectations in this exchange. If a user who was only mildly concerned with how digital platforms operate, they could weigh the benefits they receive to be much higher than what the disadvantages would be to exit the ecosystem.

Worldview

The rise of big tech within the platform economy has embraced a 'data as an asset' business model (Johnson, 2019). For lots of businesses, data access and data manipulation is a competitive advantage, and does not often get shared, limiting interoperability and therefore limiting competition. The issue with managing data is that it is vast and complex, hidden under layers of systemic barriers that make it extremely challenging to audit and understand. Little accountability for a transparent inventory and intent to use and distribute has been forced onto these dominant platforms, making for an extremely attractive, scalable business model. In this scenario, users are just as much the product for platforms as the product itself (United Nations, 2019).

The ambiguity surrounding data has limited viable intervention points to begin a systemic change. In the platform and tech sector, data is seen as an asset that is a critical driver of economic success. Besides those who engage with data in their jobs, research, or education, little focus has been placed on data literacy for the masses. This results in a lack of agency for individuals to challenge the data exchange, creating what looks like a wicked problem (Centre for Humdata, 2019). A wicked problem can be most simply described

as a problem that seems impossible to solve. Buchanan (1992) talks about wicked problems in the context of social or cultural problems, where the issues have many roots and causes of high complexity that is ever-evolving, coupled with contradicting information about the issues, different ideas of how to solve for it or what the solution even should be, which makes it difficult to analyze. In this case, since there is not a universally accepted, agreed upon set of issues within the digital platform economy, it becomes something seemingly impossible to solve. For users, the benefits vary as some benefits are more important to some than others based on needs or wants, but more definitively based on socioeconomic status (occupation, income, etc) and therefore the issues faced on a granular level are not the same (Auvinen, 2017). Societies also view the issues facing the digital platform economy differently based on the country. For example, in the EU, issues of focus primarily revolve around data protection to support its citizens (Amaro, 2021), whereas the US has primarily focused on anti-trust and issues around market monopolization by tech giants in order to support fair competition (Holland, 2021). At a fundamental level, making an informed decision on how to solve for the 'data as an asset' rhetoric has become so complex, it is difficult to dismantle.

Myth/Metaphor

Big tech platforms have succeeded in operating in monopolies over their existence, contributing to the cannibalization of many organizations that sought to compete in the same markets. This has created a 'winner takes all' environment, where dominant platforms continue to grow at the expense of new market entrants (Vardi, 2019). In this environment, dominant platform companies either eradicate the competition due to sheer scale of resources available or through acquisition of potential incumbents (Mourdoukoutas, 2019).

Horizon scan: What signals of change exist in the current system that may influence the future?

Horizon scanning is a strategic foresight tool that can be used to search for emerging signals of change that may affect how we imagine the future in question. This scan was completed using a STEEP-V lens, which helps to identify trends in the following categories: social, technological, environmental, economical, political or values-based (See Appendix B for full breakdown of trends including signals, implications and questions). The process was supported by secondary research (literature review) to find signals that were drawn from current events, news and media, industry findings and patterns of behavioural change.

What do the trends say?

Trend 1: A value shift
Information access inspires society to rethink their personal beliefs

The rise of the digital platform economy over the last two decades has fundamentally changed how people access information and through which medium they consume it. Mediums can include social media, media networks or by communicating through word of mouth. This increased access to information gives people the opportunity to educate themselves to make decisions based on their interpretation and understanding of the issue. With more visibility on emerging social and environmental issues, societies and change makers are beginning to rethink the constructs that traditionally rule (Di Placido, 2020).

Signals show that more attention is being placed on questioning the 'business as usual' rhetoric where profit is the sole driver of an organization (Schwab & Vanham, 2021). Questions have arisen around what role the private sector plays in contributing to socio-economic or environmental issues. Notable organizations such as the World Economic Forum have built forums that discuss building ecosystems and businesses that drive sustainable change (Charrie et al, 2021). There is a growing understanding that businesses are capable of doing more than feeding their bottom line, and corporations are starting to buy into this new narrative. For people involved in the tech sector, there is an increasing interest on how tech can be used for good, and how the system can become more thoughtful, ethical and inclusive by nature (Tech for Good, n.d.).

In addition, this shift is fueled by consumers wanting to make more conscious decisions that align with their values, and with consumers having an option of choice in market, businesses will have to adopt new ways of operating to meet expectations from an ethics, trust and transparency standpoint (Latham, 2021). In other words, change is being fueled by a societal shift in values and deeply held beliefs.

Implications

Consumers could continue to pressure businesses to be more environmentally and ethically conscious at a fundamental level. If this happens, traditional business models would have to evolve to include the triple bottom line- people, planet, profit- which should involve a systemic overhaul of traditional capitalism (Kraaijenbrink, 2019). Though there is a rise in conscious companies (example: the B-corp- 'businesses that meet the highest standards of verified social and environmental performance, public transparency, and legal accountability to balance profit and purpose' (Certified B Corporation, 2021)), a wide-spread adoption of these practices may require participation of a fully circular economy (Giddens, 2018). The concept of a circular economy is not new, but today, it fails to gain traction due to current constraints of business and government models.

Shifting from a focus on shareholder capitalism to an idea of stakeholder capitalism is another concept that is not brand new (Schwab & Vanham, 2021). However, it is challenging to communicate the benefits of no

longer looking at monetary profit as a measure of success to the people that stand to gain from this. This shift in consumer values sheds light on a traditional system that was designed to benefit the shareholder. Shifting the system to benefit all involved (state, shareholders, stakeholders) could bring long-term value to any entity, including giving people the ability to also influence decision making, which could result in a more equitable economy (Schwab & Vanham, 2021). Stakeholder capitalism has met many skeptics that claim it is not possible to implement given the volume of dependencies that require revenue and profit to operate, but the values that it embodies could lend itself to a revitalized measure of profit.

Trend 2: Money makes the world go round
Private organizations drive foundational societal change

Large, private companies are starting to participate in and fund initiatives that affect the public. An example of this can be clearly seen over the COVID-19 pandemic, where digital companies such as Salesforce play a prominent role in offering a service called the 'Vaccine Cloud', which can be used to provide support to countries to manage the pandemic (Salesforce, 2021). On one hand, the amount of capital that it will take to engage systemic change around modern infrastructure in the world is substantial. This dynamic poses a challenge in determining who is responsible for building societal and environmental solutions, and potentially places more power into the hands of the private companies doing the funding (Schoettler, 2021). Despite good intentions, initiatives that are funded will likely be in the interest of the private company, which can be seen through the lack of tech-enabled infrastructure in developing nations (Brown et al, 2021).

Public-private partnerships are also becoming more prevalent in enabling innovation that makes quicker progress to implementation than if either entity did it alone. The success and failures of these partnerships are facilitating conversations globally around what can work and what cannot in the attempt to build innovative solutions for the future. Digital platforms are claiming space in public-facing industries like healthcare, transportation, telecommunications, energy and conservation. Private companies solve the need for capital and expertise, but increase government reliance on private assistance or partnerships to solve problems in the public space. An example of this may be the partnership between SpaceX and NASA, where in February of 2021, they successfully landed a rover on Mars, signalling the American intent to further space exploration in the near-term (Onanuga, 2021). Neither entity may have made the achievement alone, which means that as these transformational partnerships continue to form, focus will need to rest on the benefits that the relationship provides on a socio-economic and environmental level.

Implications

Depending on private companies to fund initiatives on a societal level contributes to a power dynamic where public entities rely on the private sector to survive. At a healthy level, public private partnerships can work. However, if there is a high reliance on private companies to be part of all larger initiatives, there is a blurred line in the capitalistic landscape (Bowles, 2020). Tech companies may also operate in a business model based on identifying gaps in the market where they are able to help public bodies solve real problems. They have started to solve important and widespread problems such as for-profit vaccine distribution tracking, environmental problems such as saving the Great Barrier Reef coral reefs (Consultancy Australia, 2021), and providing new health tech platforms for remote tele-health for access during a time of remote living (CB Insights, n.d.).

If private companies are able to fund new innovative projects, it could be challenging to eliminate bias completely. Powerful private sector companies are faced with deciding what problem they would like to be part of solving. This could elicit harmful bias on what is deemed immediately important (or what is most beneficially aligned with the company's offerings or goals), which could contribute to the growing disparity in how social innovation gets implemented in an inclusive, diverse and accessible way on a global scale (Brown et al, 2021).

Big tech has created an imbalanced competitive landscape where the system structure enables their success more than others. The same systems that have allowed big tech companies to succeed and scale has given them visibility and opportunity to partner with public entities to make positive change. If dominant companies are able to utilize their resources and platform to implement and scale significant change, this could have a detrimental impact on any less dominant companies hoping to make a comparable impact or enter the market.

Trend 3: Power to the people
Social media platforms fuel movements

Social media platforms have facilitated participation in collective conversations and play a large role in sparking social movements on a global scale. These movements have proven to be both positive (example: Black Lives Matter protests originating in the US in reaction to events in 2020 concerning police brutality (Belam, 2021)) and negative (example: protesters storming the US Capitol in Washington DC in reaction to the 2020 American Presidential election (McKinnon & Tracy, 2021)). Social platforms have allowed people to connect based on similar interests, beliefs and cultures and they have access to an infinite amount of information that can trigger action. These movements have inspired people across the political and social spectrum to take control of what they deem important, and to act on it. Community has never been more powerful to elicit change, shown by initiatives led by people for the people to help with the distribution and access to the COVID-19 vaccine (Melendez, 2021). Communities that exist on social media have discovered the power of their collective efforts, as seen when retail traders took control and made stock market trades based on information on Reddit- the manipulation of this caused the hedge funds who shorted the stocks in focus to lose millions of dollars, while also putting millions of dollars in the hands of the retail traders (Ballentine & Ponczek, 2021).

Societies are seeking decentralized avenues to create their new personal ecosystems. Trust in the institutions/governments has declined, exacerbated by the political, social and pandemic landscape of 2020. Access to information plays a role in how societies are able to form opinions and identify new value systems, contributing to distrust in legacy institutions that have not subjectively protected them in the way that the systems were intended to (Cahn, 2021).

Implications

Due to access to information in real time as well as the free market of social media, people are able to react and act in real time, while forming perspectives on issues that resonate with them. Social media platforms house groups of people with shared ideologies and value systems resulting in action being taken through community-led movements (McNabb, 2021). The growing distrust in the traditional social systems could continue to add fuel to the fire if systemic change does not occur. Recently, the need for systemic change has been raised in many areas, such as (but not limited to) racial inequity, politics, social welfare and the climate crisis (Hills & Menczer, 2020). Lack of change will result in increased resistance to abiding by societal norms and increased distrust in traditional systems, which could result in a rebellion that will fight for change. Perspectives could become more polarized than today, leading to a continuity of increased volatility in society (Anderson et al, 2020). Alternatively, demand for change fueled by the voice that people can carry, can inspire positive change.

Movements could cause a tilt in the power dynamic between people seeking systemic change and traditional institutions. When Reddit retail traders collectively challenged who benefited from the stock exchange, it empowered a large population of people who had any doubts of the system to fully embrace a movement that sought to decentralize the investment banking system (Ballentine & Ponczek, 2021). This movement was years in the making, and was successful because key players educated themselves enough about how the system worked and how to poke holes in it. Empowered communities could continue to challenge the status quo of institutionalized systems until it comes to a preferred state. It could be dangerous to adopt decentralized systems without knowing enough of its long-term implications, which could cause catastrophic impact on vulnerable communities.

Information that resonates with groups of people influences their value and belief systems. If there is a significant change in personal value systems, this could alter key inflection points such as where parents and guardians choose to send their kids to school, where people manage their finances, their political stance and

where people choose to do business (Hills & Menczer, 2020). This could incrementally impact current societal structures and norms such as what communities people choose to live in, who they associate themselves with and where they choose to work. The make-up of communities could change completely where they align on values and beliefs, as opposed to level of income, religion or race (Cahn, 2021).

Trend 4: The growing data economy
Rising dependency on tech to enable solutions

Tech companies have developed ways for governments and businesses of all industries to make operations and processes exponentially more efficient. However, for technology to work, it involves participation by its users and integration with its systems. Therefore, it has become apparent that while technology companies are dependent on society's data to effectively operate, its users are potentially more dependent on its offerings as part of their daily lives (Shavell, 2021). Tech companies profit from utilizing and sometimes exploiting personal data to create better insights, better products and better services (Kramer, 2021).

Implications

Tech companies have provided the utmost level of convenience for its users. This exacerbates our need and dependence for tech, creating an evolving and growing convenience culture. This shapes what products and services are brought to market, which then affects what products are services are brought to market after that. Consumers have bought into brand ecosystems that may not be able to stack with all or other technologies, further monopolizing the market (Cision PR Newswire, 2020)

Convenient and useful tech to users can be measured on how personalized the product/service is or becomes to them. In order for a high level of personalization, tech companies leverage an enormous amount of personal data to facilitate this interaction, encroaching on the issue of privacy and trust. In this regard, the users are paramount in facilitating the company's ability to succeed through collection of these insights and personal data, and through this, making them just as much a 'product' as the product offering itself (Jacobson, n.d.)

The growing distrust in big tech could provide a unique opportunity for competitors to enter the market to provide users with a comparable experience. As the tech sector continues to grow, so does the number of options that users have. Should the volatility of big tech governance continue, users could seek out alternative avenues in using tech (Shavell, 2021). This could continue the increasing number of challenger companies that are entering the market to compete with big tech (Hemerling et al, 2019)

The monopolization and hoarding of personal data for private sector profit could elicit open-data ideologies, where data in itself does not belong to a single entity. This would change the value of collecting personal data on a fundamental level. Data would no longer be valued as a proprietary asset, and the open-data model would require an entirely different governance model (Buscher, 2019)

Emerging demands for change

The horizon scan surfaced four dominant trends within the current state of the digital platform economy, riddled with signals of change that feel both daunting and promising in imagining a preferred future. Evidence across all trends suggested that society today is in a state of transformation and pivotal change. There is evidence supporting both the continuation of an unsustainable and less than ethical path, at the same time that there is evidence to support a fair, equitable and prosperous future.

Using the information that was uncovered during the horizon scan, in the context set by the current state CLA, there may be a chance to uncover opportunities to challenge the current state to enable a positive paradigm shift to facilitate technology for good.

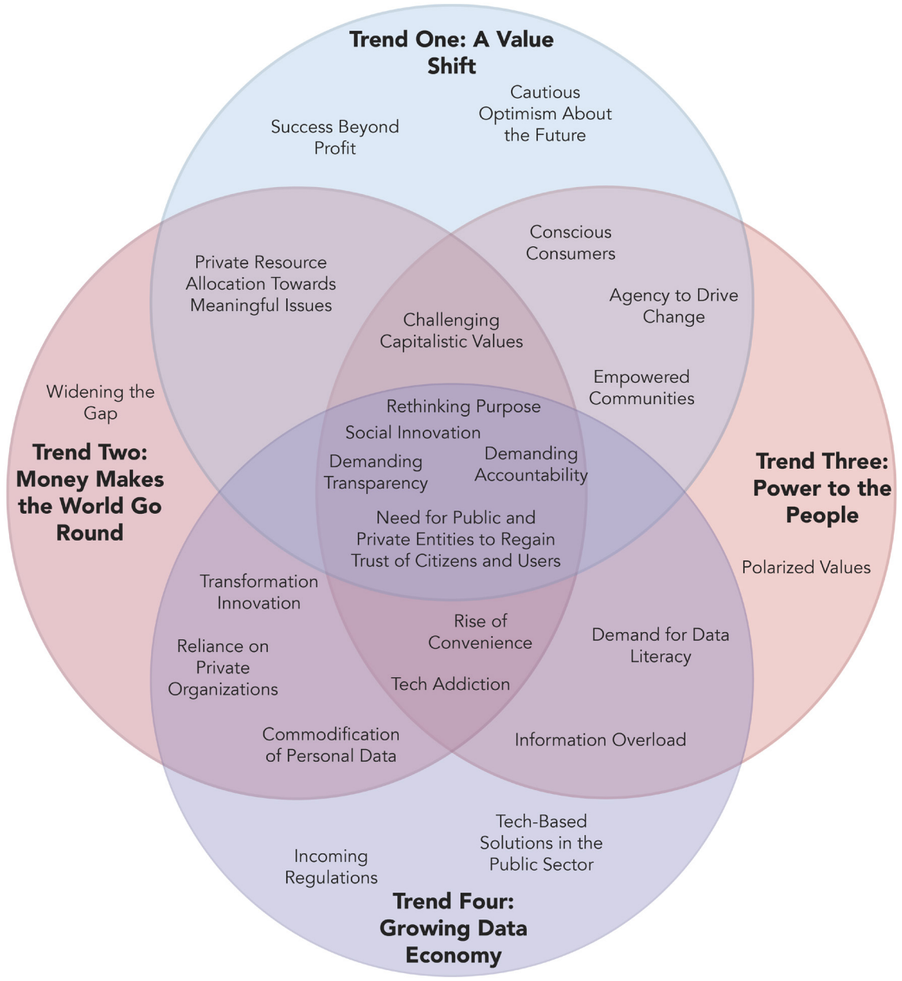

Figure Six.
Horizon scan recurring themes.

There were many common themes of change within the four identified trends. However, changes that were prevalent across all four emerging trends share a common thread- the need for the digital platform economy to make a pivotal shift in order to better protect its users. These changes are challenged by deeply held beliefs - system orthodoxies - but the horizon scan trends suggest that the system contains compelling discontinuities to disrupt the status quo.

System orthodoxies act as constraints that can prevent change from occurring (Knight, 2016). In the context of this project, it is important to first understand, and then challenge the deeply held beliefs that stem from the system orthodoxies in order to move forward and capture the innovation potential of evolving from the status quo. To support each orthodoxy, a relevant system archetype has been illustrated that depicts the message being told. A system archetype refers to a pattern of behaviour that can help to highlight the 'why' of the system structure. In other words, it helps to paint a clearer picture around why the problems keep repeating themselves (Braun, 2002). In this case, orthodoxies can help us to understand what is stopping us from changing, and the system archetype can help us to understand why.

The 'Seeking the Wrong Goal' system archetype describes this orthodoxy. Meadows (2008, p. 140) explains that determining the goal of the system will determine the actions and consequences that follow and is an imperative step in defining how the system may behave.

System orthodoxy 1

Financial profit is the most important measure of success.

This system illustrates the issue within this orthodoxy- digital platform companies are indeed succeeding in achieving the goal of maximizing revenue to meet shareholder expectations. This reinforces the rhetoric that the sole responsibility of a private company is to maximize return on investment and continuously seek to maximize profits (Schwab & Vanham, 2021). As a result, companies are less inclined to prioritize ethical operations and sustainability standards since this does not align with their immediate goals, and would likely hinder their potential to grow revenue at the desired rate. The timeline in Chapter 1 of this report aimed to capture how dramatic the growth of these dominant platforms has been over only twenty years. These platform companies operate under a business model where the bigger they get, the more profits, and the more profits, the more control they have over the market - which has now resulted in a market monopoly. Under this guise, there are no real incentives offered from regulators to legitimately convince a wildly profitable company to approach business in an alternative way (Vardi, 2019). One expert participant highlighted that bigger companies are thriving more than other companies because the market landscape reinforces and rewards the actions and outcomes of economic success, whereas the system lacks any kind of reward companies that are aiming to define success from a multifaceted perspective.

In the same vein, that economic success is an attractive contribution to a country's economic growth. One expert participant explained that in North American markets where the corporate sector is rewarded for driving the economy, it could be possible that governments were initially hesitant to inflict stronger laws or regulations on companies that could disrupt the economic gains to that particular area.

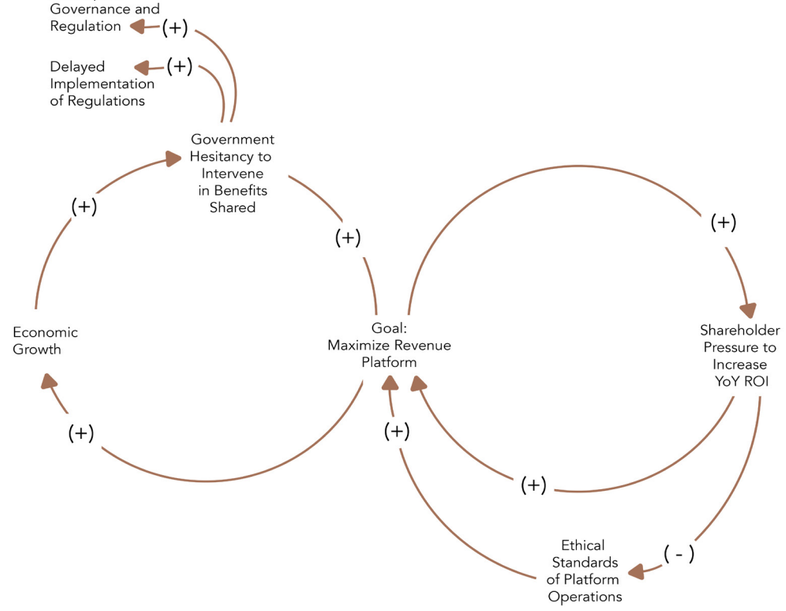

Figure Seven.
System archetype - Seeking the wrong goal

Insight for change:
We need to hold organizations responsible to be more intentional in addressing their purpose to include achieving criteria in addition to and beyond the bottom line, such as positive societal and environmental impact (Kennedy & Hemerling, 2019). In other words, the goals of the platform must change.

System orthodoxy 2

'Build it and they will come'
(Chait, 2013).

The 'Limits to Growth' system archetype is interpreted through this orthodoxy. Meadows (2008, p. 59) explains that physical systems that are exponentially growing, cannot maintain the rate of growth indefinitely due to finite resources available to facilitate this system. She maintains that there should be 'constraints' put in place to slow growth or intervene in the system's behaviour.

In parallel, in the rise of the digital platform economy, companies have been able to create a product, shift to a platform, enter an ecosystem and capitalize on networks of users. Companies that captured the market have been able to exchange offerings with users that have been widely accepted and adopted, which has facilitated the addition or reliance on big tech's products and services (MacGuineas, 2020). Platforms realized that they could increase their users, and therefore their revenue, by providing personalized offerings for 'free' to the consumer, reinforcing the users' buy-in to the system, perpetuating the exponential growth of these digital platforms (Mourdoukoutas, 2019). Today, social media platforms have given rise to the information age, where access to information (true or not) has inspired communities of people and movements to form opinions on areas that they may have not always had visibility into, resulting in increasingly conflicting perspectives on the tech sector as a whole (Ortiz-Ospina, 2019). Despite the access to information, the system lacks transparency in how digital platforms operate, specifically around collecting and analyzing personal data as a commodity for creating personalized products and insights. The combination of having enough information to ask questions, and not enough information to understand the answers results in growing distrust in the digital platform economy. Lack of trust in the system could eventually lead to users seeking the service elsewhere, which could eventually lead to loss of users, and potentially revenue, should they maintain their business-as-usual activities.

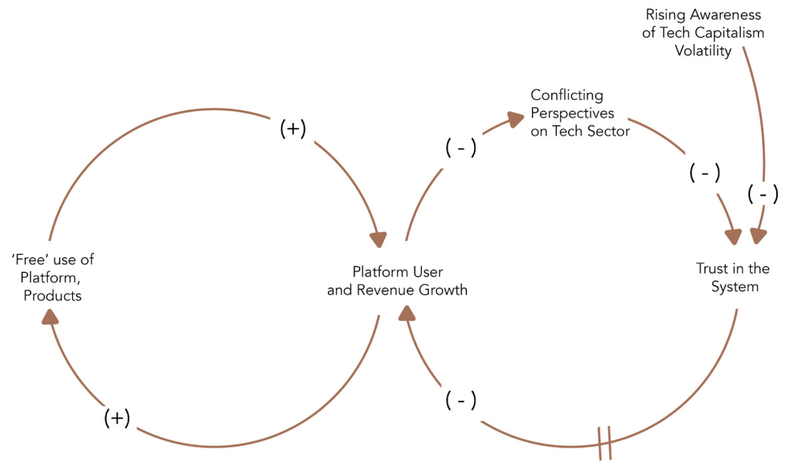

Figure Eight.
System archetype - Limits to growth

Insight for change:
We need to keep demanding more transparency and accountability to be able to trust the system. Consumers no longer need to use one provider for services and can choose a platform to engage with based on shared values, trust and understanding of the ecosystem offerings.

System orthodoxy 3

Government bears sole
responsibility to protect citizens.

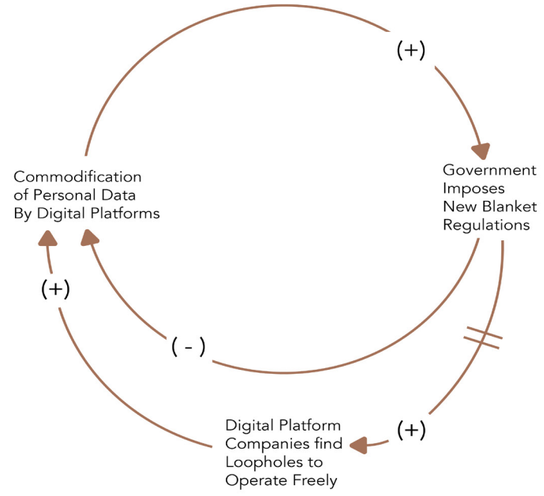

Figure Nine.
System archetype - Fixes that fail

The 'Fixes that Fail' system archetype is interpreted through this orthodoxy. Braun (2002, p.14) explains that this system arises when a superficial fix gets implemented that was made in haste in reaction to a problem symptom, which results in an unintended consequence, resulting in a reinforcing loop.

In this system, government bodies are uncovering the threats that dominant digital platform companies pose to their citizens. In reaction to data-driven platform companies exploiting the commodification of personal data, governments have been implementing broad regulations that are intended to fix problem areas. Ideally, the regulation put in place is meant to reduce the commodification of personal data to protect the people using the platforms. However, eventually, digital platforms are able to evolve in real time to find loopholes to continue operating. Therefore, if regulations are not able to draw concrete boundaries and rules, the lack of strong governance in policing these digital platforms will result in the continuance of the system, despite the intended solution (Arthur, 2017). One expert participant expressed that regulations are indeed imperative to solving the barriers to system change that exists today. However, the participant explained that determining the scope of the regulation would require technical expertise rather than a set of policy makers, and would benefit from a co-designed set of boundaries that come from a varied set of expert perspectives that are operating under a premise of shared values (Malan, 2018).

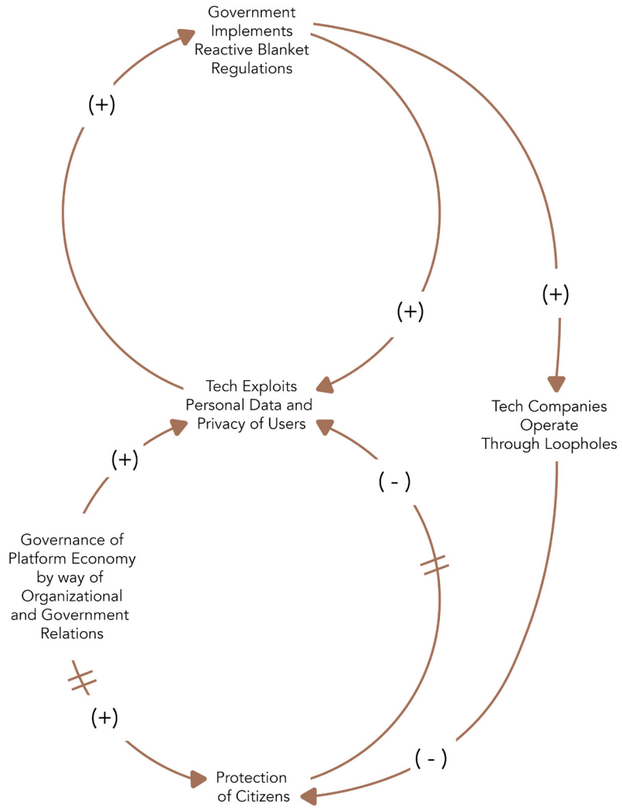

Figure Ten.
System archetype - Shifting the burden

In addition, the ‘Shifting the Burden’ system archetype is also interpreted through this orthodoxy. Braun (2002, p. 5) explains how this system illustrates that implementing superficial or short-term solutions is not a replacement for fundamental or long-term solutions that encapsulate deep understanding of the problem’s complexity.

Building on the ‘Fixes that Fail’ system archetype, the issue in this system hinges on a premature implementation of weak regulations, resulting in unintended side effects or consequences. Focus on determining the most impactful set of regulations will require systemic understanding of why these problems arise, and what is causing them to continue besides what can be seen on the litany level (Braun, 2002).

Insight for change:
Private and public entities share a responsibility to design regulations, services, products and systems that benefit and protect citizens (Charrie et al, 2021). Simultaneously, successful government regulations cannot be expected to be determined by policy makers only, especially at the granular level necessary for impact. Collaborators can iterate to find the best set of rules to implement governance in the digital platform economy, noting that continuous updates and improvements to the regulations should be expected to match the rate of change in the sector (Browne & Smith, 2019).

The winner takes all ecosystem

This systems map (Figure 11) aims to illustrate the networks of actors within the current context of the digital platform economy. The current state CLA explained that the deeply rooted narrative of the digital platform economy is that it operates in a ‘winner takes all’ ecosystem. To start, each network started with an introductory action or behaviour that, at a high-level, describes their ecosystem participation. To further explain how they participate in the system, the map shows how some actions or behaviours may lead to gaps, which may also lead to unintended consequences. Additionally, a connected path was drawn to identify the specific problem area that this research seeks to uncover, which was aimed to describe the issue within this ecosystem and how it has been exacerbated over time and across networks of actors.

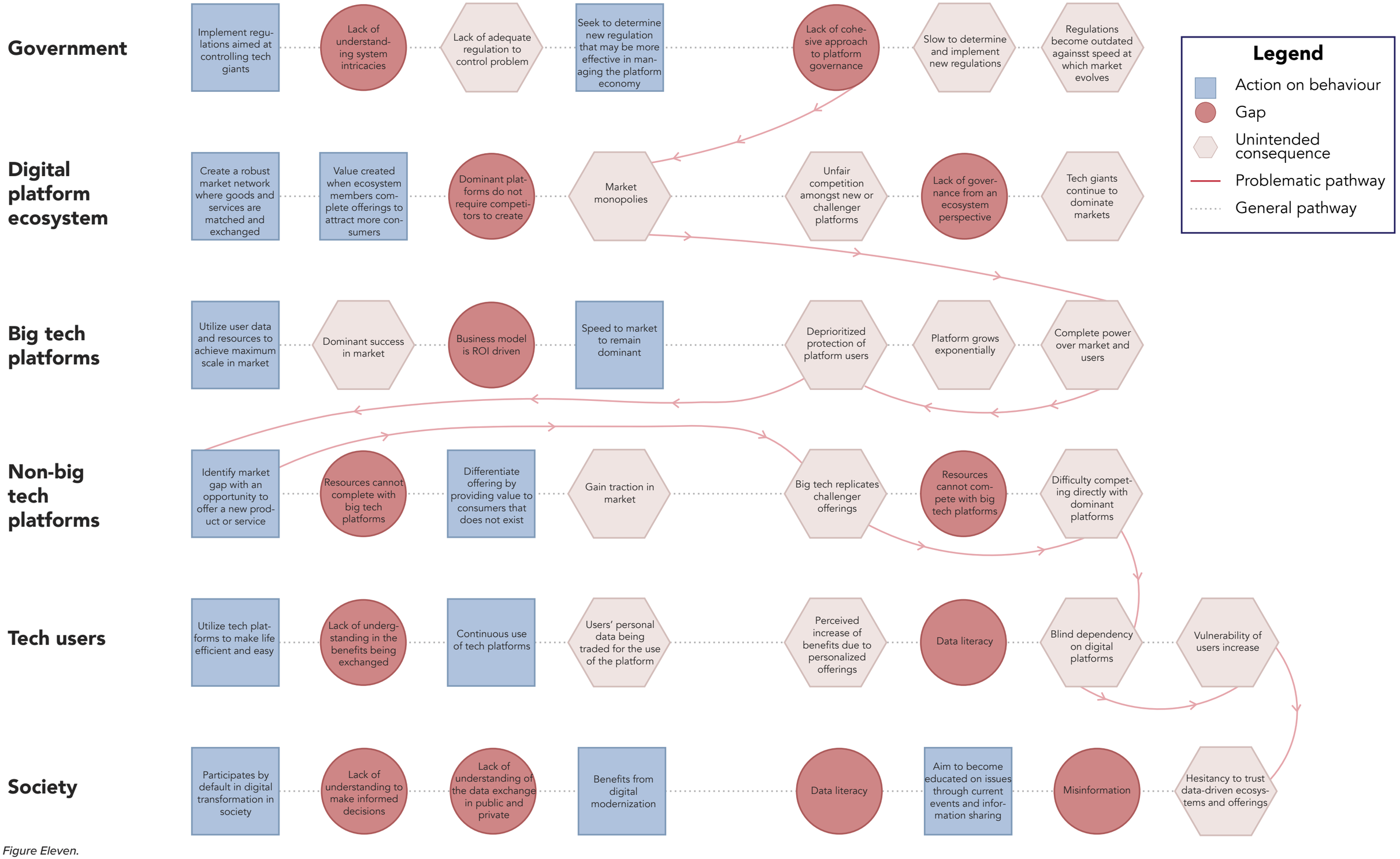

Figure Eleven.
Systems map - 'Winner takes all' ecosystem .

The System

The path begins at the government network level, identifying the lack of a cohesive approach to platform governance. This was meant to encompass regulations or policies set by the government as well as the lack of enforcement from governments to ensure that digital platform companies were also setting rules for operational governance internally (Chew et al, 2018). The resulting consequence is the market monopoly, held by big tech companies, which also results in a dangerous power dynamic where platforms are able to maintain control of users, markets and regulation management. Challenger companies enter the market to close gaps left by other market participants. Some are successful, but are forcefully challenged by big tech companies that eliminate the competitive threat by producing something similar at scale, thus making the competition difficult to overcome. Tech users will make decisions to use platforms that feel most beneficial to them which is most often enabled by the level of personalized experience. As a generalization, as users become more integrated into a platform's ecosystem, they are more inclined to stay- the perceived benefits empower users to blindly depend on that platform. This results in a level of vulnerability of the user with regards to data privacy, exploitation of personal data as a commodity and addiction to the platform itself. Should society maintain their position in serving the market, the lack of protection and guidance to people will exacerbate the growing distrust in the system due to the system ambiguity (Schwab & Vanham, 2021).

This type of ecosystem rewards platforms that are able to dominate the market that they are in, incentivized by higher revenues, faster growth and guaranteed users (and in tandem, personal data) (Vardi, 2019). In this argument, the collection, ability to analyze, manipulate and form insights from personal data is what gives these data-driven platforms their competitive advantage. The more usable personal data that digital platforms can collect about its users, the more personalized of a service they can provide, and the more personalized of a service- the more perceived benefits distributed to the user (Murphy, 2017). The key word in this argument is perceived benefits.

Bounded Rationality

In this context, users possess a very limited amount of bounded rationality. Meadows (2008, p. 106) explains that bounded rationality refers to people's ability to make relatively reasonable decisions based on the information that they receive. Based on the perceived benefits, users continue to participate in digital platform ecosystems without full understanding or visibility of information that may cause them to act differently. One expert participant explained that the benefits that users experienced in the past are becoming less beneficial as time goes on, meaning that users have become accustomed to receiving a predetermined set of benefits that have not necessarily been prioritized to evolve as social needs have evolved. The bounded rationality of users in this system are limited by 'information, incentives, disincentives, goals, stresses, and constraints impinging on that actor' (Meadows, 2008, p. 110). In other words, tech users are participating in the system based on the information that they understand and the rules that they accept. To improve the bounded rationality as a whole, it will require a systemic redesign of the platform economy as a whole, and a pivot away from the previously identified system orthodoxies, meaning that in order to allow people to make more informed decisions, transparency in the system must increase so that there is better understanding on what they are buying into.

> To design a solution, start with an exciting version of the future that you are capable of producing and then work backwards to the existing system. There is logic to this apparent madness. Ask children who like to solve mazes. They will tell you why you should start from the end.

- Jamshid Gharajedaghi, Systems Thinking, Managing Chaos and Complexity, a Platforms for Designing Business Architecture

03

The Future:
A way forward

Part Three

A way forward

The Problem

The system analysis surfaced a common thread across all stakeholder networks- personal data. Claiming that personal data alone is the problem is untrue, as data in itself is not inherently harmful. Users benefit from personal data insights through personalized networking, buying recommendations, efficient public services, innovative research and transformational new tech (World Economic Forum, 2011). However, as previously mentioned, the digital platform economy is largely driven by the commodification of this personal data, supported by the rise of convenience culture, resulting in the problem at hand- we have become complacent at continuously setting boundaries and managing the implications of personal data being utilized at a dangerous scale and speed in the hands of revenue and data-driven companies.

As personal data keeps growing in importance, there should be demand placed on identifying key opportunity areas to use it for good. Is it possible to rethink how personal data is valued so that network stakeholders can make more informed decisions? Is it possible to rethink how personal data can be used and exchanged? Is it possible to utilize the potential of personal data insights to drive sustainable social and environmental solutions?

How might we reimagine how we value data as a catalyst for change to inspire meaningful solutions to solve for social or environmental problems?

The COVID-19 pandemic has reinforced our desire to think longer term due to the ambiguity in our short term. This research is aimed at framing a complex system to understand holistic opportunities for change that can help to imagine a preferred future.

The approach

The alternative future is built upon the current state CLA, where the system levels were deconstructed to identify the ‘winner takes all’ metaphor at the core. The alternative future takes the ‘winner takes all’ metaphor and reframes it to initiate a change in system perspective. This new metaphor will then influence the worldview, system causes and litany of the future state.

This project utilizes a foresight lens to explore possibilities for the future.The desired alternative future was developed to encourage flexibility in thinking about the systemic elements that hold us to our current state and to assist with exploratory narratives that may help to challenge and embrace uncertainty (Inayatullah, 2008). As the world changes rapidly, and more specifically as the digital platform economy evolves at light-speed, this alternative future was specifically explored to imagine a balanced approach onwards. Hodgson & Sharpe (2007) note that to improve our capacity to imagine a vastly different future, it requires understanding the deep system structures that shape our worldview. Therefore, this imagined future shaped by CLA methodology, will aim to capture insights, opportunities and barriers to change that may support critical intervention points in supporting a sustainable socio-economic digital platform economy.

As mentioned, this alternative future will hinge on shifting how we view and value personal data. In tandem, the imagined future was loosely initiated by asking a question:

How might we imagine a future where digital platforms and ecosystems intentionally seek to solve meaningful problems, as part of their business as usual?

Alternative future: Show me the money

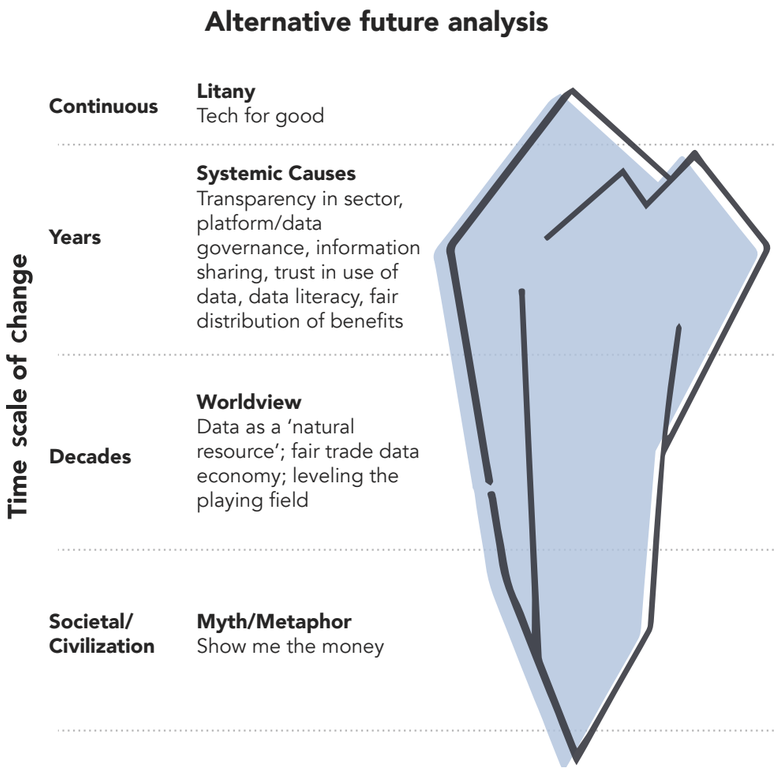

Figure Twelve.
Causal Layered Analysis (CLA) - future state

Myth/Metaphor:

'Show me the money' is a metaphor meant to describe ultimate transparency in the digital platform economy to promote sustainable socio-economic and environmental values. Different from the 'winner takes all' system view, transparency in operations and decision making can allow for a higher understanding and empower those within the system to make informed decisions.

Worldview:

Shifting from 'data as an asset' to 'data as a natural resource' describes a critical flaw in how we value the potential of personal data to solve societal problems. This change in perspective can catalyze the distribution of benefits that data can provide. To draw context, we can look to the United Nations Sustainable Development Goals (SDGs) as an example to understand this potential worldview. To create sustainability equilibrium, it requires an integrated economic, social and environmental balance which suggests that an imbalance, or priority of one over the others, would result in a declining quality of life (Dickens et al, 2020). In addition to achieving and maintaining the SDGs and managing the targeted implications, sustainable development hinges on natural resource protection and management (land, water, air and biodiversity), which Dickens et al (2020) refers to as the 'prerequisite to achieving sustainability'. The United Nations Development Agency (UNDP) notes that to achieve the SDGs, it will require a collaborative partnership between 'governments, private sector, civil society and citizens' (United Nations, 2021).

If we were to think about raw data in the lens of a natural resource, it has many implications. One implication would mean that data requires protection from exploitation. If the commodification of personal data means that there is profit to be made from it, this requires governance, regulation and boundaries around what a sustainable (and ethical) level of data insights extraction should look like. Similar to a natural resource, use of the resource does not have to be prohibited, but should be controlled to avoid depletion or collapse (Dickens et al, 2020). Another implication may be that we need to reconsider how we value data. Similar to natural resources, it is challenging to definitively measure the value of data because it is relative to what it is being used for. For example, coal as a natural resource is not as useful to society as is heat or electricity, which means that even though it comes from a similar source, coal and the utilities that it provides are vastly different in value (Mackellar & Vining Jr, 1989). A similar parallel can be drawn for data in that the insights gathered from data are far more valuable than raw data. One expert participant drew a similar conclusion in explaining that in their professional experience, data is of more value to certain players than others and that depending on who is using it and for what purpose, data is not inherently something that is exploited by default. Like a natural resource, there are limits to the amount of value that can be extracted from the data (or in this case, coal), but without clear boundaries around how this resource gets used, there is always the risk of exploitation. However, like coal, this is not to say that coal has no value, as coal is necessary to produce the utility, just like raw data is needed to produce valuable insights. With regards to personal data, people mostly give their data 'for free' to digital platform companies that provide them with a benefit from using the platform. However, if the value of raw data, data insights and use of data were to be fairly valued in relation to the cost of extracting the data (who it is being taken from, what it is costing them- privacy, time) and what it is being used for (economic, social, environmental impact), it is possible that this scenario can go from being a competitive advantage to being used to a sustainable opportunity. An example of a proposed fair-trade exchange comes from Andrew Yang, a New York based politician, who brought an idea forward called the Data Dividend Project (DDP). Yang explains that as tech users, items such as terms and conditions are among many elements that users blindly accept to be able to use the platform's service, and that this initiative would solve user ownership of data by associating a cost to the platform that wants to utilize it (Kelly, 2020). The DDP would take it a step further than guiding principles and be rooted in law, making it the standard for any entity hoping to harness personal data insights (Kelly, 2020). Others in the tech ecosystem are trying to come up with similar ideals, citing Yang's DDP initiative as surface level at best, which exacerbates the problems within the digital platform economy to begin with- the universal agreement on how the exchange should work is not yet cemented, and therefore each idea counters the next (Ongweso Jr, 2020). This being said, these are all signals that are pointing to a need for change within the digital platform economy- something that they can all agree on. This could play a significant hand in limiting the exploitation of data through a more holistic lens, which could reduce the ambiguity and abstract nature of understanding data.

This transparency is also meant to eradicate the anti-competitive markets that exist today and to level the playing field by removing access to data as solely a competitive advantage. If data is no longer a polarizing competitive advantage, a more fair data economy could exist. This fair trade system could enable individuals to share their data in exchange for a benefit of using the platform that is valued equal or appropriate. A collective value could be placed on the use of data based on the benefits and impact that it brings to the economy, society and environment.

Systemic causes:

Should data be treated as a natural resource and sustainably utilized, it would bring a needed transparency to the digital platform economy and the

peripheral systems. This transparency may result in a renewed and increased trust in the data and platform economy in knowing how personal data is being used. In contrast to the current system, transparency and trust in the system can result in empowered communities of people engaging in a symbiotic relationship in the personal data exchange. Data literacy (literacy or understanding in both privacy and data rights) is a key component of achieving the level of trust needed to empower individual decision making. To increase data literacy, focus should be placed on ensuring that there is a general understanding of what data is and how it works, how to draw conclusions and to recognize risk and reward in sharing or exchanging personal data (Sangani, 2015).

Shifting away from data valued as a competitive advantage could inspire more collaborative markets and impactful public-private partnerships. Increased partnerships and collaborations in the innovation space could lead to interoperability between entities as the norm that are able to more quickly facilitate sustainable development at scale. Signals from the horizon scan also pointed to public-private partnerships and why they are willing to collaborate. This is in part due to using resources or skills that one might have over the other to be more successful in a venture, such as the partnership between NASA and Space X that took the rover to Mars (Onanuga, 2021). Another signal explores how Accenture and the Australian Institute of Marine Science in their endeavour to utilize each other's strengths to enable coral reef conservation (Consultancy Australia, 2021). Historically, private companies have the capacity to innovate further, and public entities ensure trust frameworks from a citizen-centric perspective. As these partnerships begin to increase even more, impact-driven criteria and benefits must be identified to ensure there is no exploitation or unbalanced reliance on one side over the other.

Responsible sharing of data will require new regulations, co-created by diverse collaborators (government, private sector, data experts, etc) who are able to leverage expertise and knowledge to place boundaries around this new system that holds the new risks and rewards (Verhulst & Young, 2018). It will also require a collaborative effort to define integrated business models that take into account the sustainability pillars (economy, environment, society) to hold the organization accountable when developing their new value propositions. One expert participant explained that behavioural science plays a large role in determining how a system should be designed, meaning that if the organization is truly taking into account user behaviours, there will inherently be a system of shared values. This insight is in direct contrast to the current system, where the priority of the business is to drive profit. Should there be shared values, the organization can ensure benefits are more evenly distributed to those involved, meaning that the 'profit' gets attributed to more than the bottom line.

Litany:

The horizon scan highlighted emerging signals of change that support a 'tech for good' perspective of the digital platform economy. Trend 2, 'Money makes the world go round' highlighted an emerging trend that captured the private sector's involvement in driving digital transformation and making positive environmental and societal contributions. Though still a growing trend, it has promise to support a sustainable narrative. One example of a third party organization supporting open transparency of data is called Data Collaboratives. They facilitate the exchange of data from different sectors in order to accelerate solutions in the social and environmental space. Collaborations include companies such as Airbnb, Deloitte, IBM, LinkedIn, Microsoft, and multiple COVID-19 tracing apps just to name a few (Data Collaboratives, n.d.). The participation of some major digital platforms and private sector companies signals a emerging interest in sharing and collaborating using data to catalyze sustainable development.

An open data ideology may also support transparency that can empower citizens that are data literate to make informed decisions. One expert participant noted that COVID-19 is a good example of citizens willingly sharing data to mitigate the spread of the pandemic. They explained that despite the technicalities of whether the tracing efforts are effective enough, citizens are willing to opt-in to technology that may trace, monitor and track exposure to hopefully stop the spread of the virus which means that to a certain extent, if a person knows where their data is going and what purpose it serves, the sharing of personal data itself is not the pressing issue. On the other hand, not all COVID-19 tracing apps have been successful due to a lack of citizens using the service. Some of this is in relation to a lack of communication or campaign around why these apps are trustworthy and the benefits that they might provide, stemming from a lack of transparency in where this data is going and how it is being used (Saba, 2021). In essence, this is a key indicator of conflicting buy in around citizens that feel more data secure or data literate than others may be- some will use it and share their data because they understand the benefits and risks, and others will not use it because they do not understand the benefits and risks.

Should the previous example stand, this future could be vastly different from that of the current state analysis. Speculative elements could include:

- Higher value of data that holistically drives sustainability (economy, environment, society)
- Private sector plays a large role in scaling initiatives that affect the public
- Individual understanding and agency over how their personal data gets used by allowing personal data to be used in cases that they want to contribute to
- Robust open data networks that facilitate fair markets and protection of individuals
- If citizens feel safe to opt in to the data exchange, there could be a higher quality of public services due to trust in the data-driven economy- individuals, private sector, government part of an ecosystem that promotes societal well-being
- Traditional capitalism is challenged by socio-economic value shift
- Data insights leveraged by digital platforms and public entities to solve meaningful problems

> The key to good decision making is not knowledge. It is understanding. We are swimming in the former. We are desperately lacking in the latter.

- Malcolm Gladwell, Blink: The Power of Thinking Without Thinking

What are the barriers to changing this system?

Part of what is preventing this system from changing are the deeply rooted system orthodoxies that were first introduced in Part 2 of this report. In tandem, the system faces challenges around how truly global a system the digital platform economy is and how fast it evolves.

System orthodoxies revisited

System orthodoxy 1:
Financial profit is the most important measure of success.

This is a deeply held belief that exists in North America which supports capitalistic ideals in competitive markets. Without explicit regulations that change how private companies are allowed to operate, there is little to no incentive for the private sector to include a sustainability lens on their own accord. Big tech has been rewarded for their market dominance with extreme amounts of power over the competitive space and the actors within the ecosystem, making it challenging to shift this ideology.

System orthodoxy 2:
'Build it and they will come' (Chait, 2013).

Throughout the rise of the digital platform economy, big tech companies have succeeded in building products, platforms and services that they know will sell. So far, it has worked in their favour, resulting in enormous returns on investment that perpetuate their lead in the economy. Though we are seeing challenger companies become more prevalent and succeed in their domains, the quantity of consumers who move to the challenger companies is not significant enough to worry tech giants. In this case, even if tech users are not completely satisfied, they are too entrenched in the platform ecosystem to warrant an exit. Similar to the insignificant number (relative to big tech) of tech users who leave these ecosystems, the same context goes for inflicting consequences of true impact. One signal in the 'Money makes the world go round' trend of the horizon scan explains that when Brazil fined Apple in protest of reduced hardware sold, the fine amounted to 0.00007% of Apple's 2020 revenue- a negligible amount.(Mehta, 2021). This means that if tech giants face consequences that will not affect them in any real way, there is no incentive to change behaviour.

System orthodoxy 3:
Government bears sole responsibility to protect citizens.

Responsibility has fallen on governments and policy makers to create regulations that will control the digital platform economy. On one hand, it is accepted and recognized that the sector is in need of improved regulations, as was recognized in 100% of expert interviews conducted. However, current regulations are not robust enough to control the digital platform economy as it stands and requires an ecosystem approach to collaborative governance that involves a diverse perspective to mitigate unintended gaps (Chew et al, 2018).

Digital platform companies operate globally

Though this project was framed in the North American context, the implications on effectively regulating digital platform companies is a challenge. A shared global perspective on platform and data governance does not yet exist, and the regulations that do exist, vary by country which creates a fragmented approach to addressing an already ambiguous problem space (Chew et al, 2018). For example, the US regulates their digital platform economy based on industry-specific rules such as healthcare or retail and inconsistent state-specific laws, which means that depending where the company is located and what they are selling, the rules of operation can also vary (Chew et al, 2018).

The digital platform economy evolves more quickly than change can be implemented

As a direct result of how rapidly the digital platform economy changes, policy makers and governments are always in a reactive state. Alvin Toffler, a futurist, described accelerated disruption and the fear of the unintended consequences as 'future shock' (Downes, 2020). The fear stems from what tech giants have been allowed to become, and due to the power they hold, the resources they keep and their capability to be quick to market, regulators are at a disadvantage by default. This dynamic maintains the current system to remain as is.

Leverage points

Donella Meadows (2008, p. 145) describes leverage points as 'places in the system where a small change could lead to a large shift in behavior'. Meadows (2008) identifies twelve leverage points, ordered from 12 (easiest point of intervention, least effective) to 1 (challenging point of intervention, most effective) (Appendix C). The system analysis uncovered a vast sea of complex problems that exist in the digital platform economy, leading this project to primarily focus on data as the driving force for potential change.

As a result, this project focuses on understanding the systems, patterns and trends that shape the digital platform economy as a whole, as well as the people that participate in it. Using this information, the recommendation will seek to identify non-prescriptive areas of opportunity that could act as a catalyst for initiating a change of narrative around a possible future system. The following leverage points were identified as critical points of intervention that may bring the principles of the alternative future to light.

Information flows
Leverage point 6 out of 12
'The structure of who does and who does not have access to information' (Meadows, 2008, p. 156)

One major theme in the Alternative Future CLA model revolved around creating transparency in the digital platform system to empower actors within the ecosystem to make informed decisions. Meadows (2008) explains that a lack of information can be a common cause for a system to fail, and that instead of creating entirely new system infrastructure, providing the missing information can solve the problem. Similarly in this case, the goal is not to remove the collection or utilization of personal data from the equation since the data itself is exponentially useful and increasingly important once used fairly. However, this exists as a critical leverage point for actors in this ecosystem:

- Governments and digital platform companies: Hold each side of the relationship accountable for giving information to make more informed decisions. Governments have a holistic understanding of the digital platform ecosystem, but they lack the technical, granular level of information that would help them to make higher quality decisions to create resilient governance frameworks. For digital platform companies, business as usual in the current system contains limits to growth as their lack of transparency in platform operations has resulted in a declining trust from every other ecosystem participant. A collaborative approach to sharing information between these two entities could result in a more beneficial understanding of what a sustainable digital platform economy looks like.
- Tech users and society (individual actors): Individuals lack understanding in which of their personal data is being collected, how it is being analyzed and what it is being manipulated for. They understand that personal data is collected to create insights that create personalized experiences that much of the Western world enjoys. However, as the data economy grows, and the value of data to these digital platforms increases, there is a growing distrust from individuals that their data, now a commodity, is being exploited and their privacy is at risk. Providing missing information to individuals to improve their data literacy can give individuals agency to make informed decisions about how their personal data is utilized.

Rules
Leverage point 5 out of 12
'Incentives, punishments, constraints' (Meadows, 2008, p. 158)

Despite having varying objectives, each actor in the ecosystem can agree that the digital platform economy requires boundaries. In North American markets, the rules that exist in the current state system are fragmented due to different rules applying to different sectors of the tech market as well as rules varying by state. MacCarthy (2020) explains that the US relates digital platform companies at the same level of systematic importance as telecommunications, utilities and finance industries- meaning that all of the above are classed at the same level as critical or essential services to their citizens and other sectors that use them. Of course, this claim may not be entirely true in the sense that for essential services, the government is responsible to ensure that there is accessibility and affordability for all citizens, but there is no mandated standard of nationwide access to the internet as an essential service. For all the reasons stated, it is critical that the government actively updates, improves and iterates their approach to building clear, cohesive governance frameworks with regulations that protect the people.

Another factor to consider including is how the digital platform economy is incentivized to participate in a more balanced ecosystem. For some, a change in incentive could be a polarizing difference to what seems like autonomy over their transformative and profitable technology innovations. This part of incentivization is in relation to impending regulations. North America's fragmented approach to regulating the tech companies may result in rules that hinder innovation ecosystems. If it is the case that government bodies and digital platform companies each hold critical pieces of the regulatory puzzle, the best case scenario to foster both innovation and sustainable socio-economic and ethical operations would be to include a diverse set of ecosystem actors in any regulatory framework.

Goals
Leverage point 3 out of 12
'The purpose or function of the system' (Meadows, 2008, p. 161)

The purpose of dominant digital platform companies is to scale and to generate profits tied to that amount of growth. This is a broad, yet fair, claim to make that has many implications. In this context, it relates to the company's desire to reach as many people as possible. In big tech's case, it is their explicit desire to have market power on a global scale in each of their domains. Here are a selection of mission statements from American platform companies (emphasis by this author):

Google Search (2021): 'to organize the world's information and make it universally accessible and useful'
Facebook (2021): 'Give people the power to build community and bring the world closer together'
Netflix (2021): 'we want to entertain the world. Whatever your taste, and no matter where you live, we give you access to best in class…'
Microsoft (2021): 'to empower every person and every organization on the planet to achieve more'
Amazon (2021): 'We aim to be Earth's most customer centric company'

Again, the goal of scale may not directly correlate to unethical operations that seek to do harm and a mission statement of a company does not always literally translate into a company's desire to scale. However, in combination with the above leverage points (information flows, rules), tech giants have been able to reach their goals in a disruptive (and sometimes destructive) way while shaping much of the modernized human experience. This leverage point requires digital platform companies to redefine their purpose as an organization. If we allow digital platforms to hold as much power as they do with regards to personal data, insights, information and global reach, they have the unique opportunity in the private sector to shape and improve socio-economic and environmental impacts on a global scale. This means that their purpose must be designed in agreement that this level of power over shaping the modern world where their impact is not limited to their offerings, and has the ability to shape cultural, social and systemic change. Therefore, when redesigning a purposeful organization, it should be imperative that the drive to scale also includes the drive to positively impact the systems that it may touch, at that same scale (Hemmerling et al 2019).

> We don't think a sustainable society need be stagnant, boring, uniform, or rigid. It need not be, and probably could not be, centrally controlled or authoritarian. It could be a world that has the time, the resources, and the will to correct its mistakes, to innovate, to preserve the fertility of its planetary ecosystems. It could focus on mindfully increasing quality of life rather than on mindlessly expanding material consumption and the physical capital stock.

- Donella Meadows, Jorgen Randers, Dennis Meadows, The Limits to Growth: The 30-Year Update

What happens next?

Imagining the alternative future

The preferred future was contextualized using the CLA methodology to 'create space for transformative futures' (Curry & Schultz, 2009). It was meant to take the 'winner takes all' metaphor from the current state CLA and to pivot from that unconscious systemic view in order to demonstrate how a complex idea could be strategically positioned in contextual surroundings to gather insights of accomplishing a larger systemic goal. However, the intended take aways are the leverage points to be used as opportunities to create change that were drawn from the ideology of the alternative future scenario. These leverage points can be applied to an alternative future scenario, beyond the specific future described here, that may be developed by change makers in this space.

In this imagined future, the idea that data is an exploitable asset used to achieve superior competitive advantage was reconfigured to look at data as a 'natural resource' (Figure 12). Establishing this new narrative provides foundation to think about a paradigm shift, which will be necessary to unlock deeply held shared social and system beliefs that act as a source for all the systems to be able to exist (Meadows, 2008, p.162). This paradigm shift is a leverage point extremely difficult to achieve (leverage point 2 out of 12), and will require continuous attention to attempt to change the narrative and perspectives of this system.

The challenge

How might we imagine a future where digital platforms and ecosystems intentionally seek to solve meaningful problems, as part of their business as usual?

This question has been surfaced throughout this project to remind us that we are seeking change. It was framed as a 'how might we' (how will we accomplish this goal?) - instead of a 'can we' (is it possible to accomplish this goal?) on purpose. Not only is it necessary for the digital platform economy to begin taking ownership in how it affects the different pieces of the world, it is imperative to stand optimistically in moving forward in a tech-enabled world. In the alternative CLA, this project explored what would be different about going from a 'data as an asset' worldview to a 'data is a natural resource' worldview. When questioned about whether data in itself is an asset, or whether it was just a tool that supports human decision making, efficiency or scalable technology, expert participants had mixed interpretations. Some agreed that data in some ways is an asset, and that depending on the data collected, and how well it was manipulated, it provides a defining competitive advantage for whatever entity it belongs to. Others explained that data is a necessary component in driving tech solutions and therefore some of the benefits are things that users are not willing to give up, and therefore somewhat outweigh the potential risks.

In taking a holistic perspective, the meaning behind these worldviews still stands. 'Data as a natural resource' is meant to represent a commitment where, in a world that will benefit, use and trade data for generations to come, there must be a system that facilitates accountability, trust, transparency, enforcement and sustainability. Like any natural resource, data must be valued appropriately to help determine how much should be taken, and how much should be left alone. It should be measured and fairly shared between those who seek to participate in this exchange, signaling an importance of collaboration, co-creation, partnerships and fair competition. It was clear between all expert participants that data has a monumental capacity and potential to create positive impact from a socio-economic and environmental perspective. The same parallel can be drawn for data in the context of big tech platform companies, non big tech platform companies, public and private sectors. Dominant ecosystem participants are here to stay, and the future is going to be driven by technology in many ways (Freeman, 2020). That said, it can be best described as a true systemic issue. It may become less about how we get rid of dominant digital platforms and more about how we shift the system boundaries, system elements, rules and deeply held beliefs around how digital platforms are able to operate to ensure they are intentional in capturing benefits and impact on a meaningful level (Karabell, 2020). In other words, how might we leverage the scale and resources of these dominant digital platforms to solve for socio-economic and environmental problems?

Proposed recommendation

Big change comes from little changes

Norman & Verganti (2014) use the 'hill paradigm' to describe driving complex innovation through both radical and incremental ideologies. They describe incremental innovation to be reaching the highest hill that can be seen in plain sight, whereas radical innovation can be described as seeking the absolute highest hill, and concludes that both incremental and radical innovation should be used concurrently in design research, so that there are continuous strides forward in seeking the next and best innovation (Norman & Verganti, 2014). This can be interpreted through the lens of this project by looking at how we can drive systemic change in the issue of an unsustainable digital platform economy. Hirsh (2021) talks about how incredibly complex the issues of the digital platform economy are, resulting in intimidated global leaders taking misaligned approaches to manage the tech world. The intimidation is warranted, as no real consequences will fundamentally deter big tech platforms from operating (Mehta, 2021). Enter the 'hill paradigm'.

In this context, incremental innovation represents the guiding principles of the alternative CLA, focusing on how we enable the people (users and society) to feel empowered to make informed decisions. These guiding principles may be:

- Data literacy: Educating and empowering citizens to understand how data-driven decisions are made, so that they have more agency to make informed choices about how they choose to participate in the digital platform economy and data-driven economy
- Transparency in tech: Continuous communication around how personal data is being used and what organizations are using it operationally. Transparency gives citizens better understanding in the overall system, reducing reflex dismissals of an organization's intent
- Trust in actions: Data literacy and transparency in operations can facilitate trust in the system. If there is trust in the system, users are more likely to willingly participate in the ecosystem activities. If there are less uncertainty and hesitancy in the intentions of the organizations, citizens may feel more comfortable in sharing data and exchanging benefits

Radical innovation represents the guiding principles of the alternative CLA, focusing on how we build stronger and more robust policies and rules around how organizations operate to ensure they are making a positive impact. These guiding principles may be:

- Global governance frameworks: While regulations will inherently differ by country based on citizen needs, cultural behaviours and worldviews, there should be a globally approved framework that facilitates a more cohesive understanding on how digital platform companies should be allowed to operate. This can allow for less polarized approaches to regulation, making it difficult for platforms to find loopholes
- Adaptive regulation (Chew et al, 2018): Encourage continuous iterations of regulations to keep up with the evolving market. By setting regulations and waiting until it requires changing, it encourages a reactive state of creating boundaries, which will result in policy makers consistently playing catch up
- Promotion of shared values: Shared values refers to understanding who (society), what (purpose), where (environment) and why (ethics) the technology or offering is being designed. Digital platforms and technology solutions should be designed in this way by default, as opposed to only prioritizing profit

Approaching solution finding by making seemingly smaller changes while working at solving for bigger changes means that there will be a continuous and iterative effort that can capture the ebbs and flows of quickly evolving technology. This way, it becomes a collective and collaborative endeavour from all ecosystem participants to ensure an appropriate interpretation towards creating meaningful change (Norman & Verganti, 2014).

A hopeful future

This research project set out to explore, understand and ask critical questions about the digital platform economy to uncover key opportunities for sustained change using foresight and systems thinking methodologies. With this exploratory lens, this project can serve as a starting point for forming a more granular perspective on implementing change in the system that can support a desired future. The initial research question will be revisited as a summary as follows:

What is the future of the digital platform economy?

The future in this context refers to the leverage points that can provide powerful moments of intervention for the right people to enable change. This approach aimed to frame and explore an optimistic future, followed by identifying the changes that need to take place to get there (Inayatullah, 2008). Additionally, this optimistic lens for the future felt appropriate given the level of volatility and uncertainty that surrounds the current state of the digital platform economy. Meadows (2008) talks about the importance of expanding time horizons (looking at the short and long term view) to ensure that society understands that there can be good to come in the future, even if it feels the opposite in the present. With this perspective also comes an expansion of the boundary of caring, which describes the need for society to place practical benefits on having moral principles to play a positive role in the globally integrated ecosystem (Meadows, 2008, p. 184).

Platforms transcend industry and have become a necessary foundation for organizations to be competitive in the modern digital market. They provide a unique set of capabilities that create value by providing room for a unique business model, accelerated market activities, connection to a scalable ecosystem and potential for collaboration and interoperability (Elliott et al, 2018).

The platform economy has been designed to bridge the gap between digital and non-digital offerings between companies in the ecosystem. Though this project refers to the platform economy primarily as digital by default, it is important to note that these ecosystems can also include companies and/or platforms that provide a physical offering as well.

The platform economy refers to the network value creation that these relationships provide by exchanging information, data, services and/or products between buyers and sellers. The primary focus of the platform economy in this project was the use of data, and more specifically personal data, and how it has transcended the exchange of benefits between platform and user as well as its socio-economic impact.

What are the futures of the digital platform economy?

This question evolved to ask many others, as noted in the report, as the research progressed. The digital platform economy is here to stay- and rightly so. It provides enormous opportunity to scale innovative solutions in ways that a traditional marketplace cannot. However, there are significant implications to its potential for growth. The current incarnation of big tech is a concrete example of digital platform companies that lacked boundaries in their rise over the last two decades, and the current consequences (intentional or not) that risk the safety of people. The initial system driver- the commodification of personal data- was the pinnacle idea for imagining a different future as it was identified as the catalyst for many digital platforms' success. Findings suggest that properly measuring the value of data can help in bridging the gap between using tech for good, and using tech (only) for gain. Utilization of personal data insights can be a catalyst for change. It can be used beyond an organizational level to empower positive socio-economic and environmental development by strategically aligning insights and capabilities to achieve targeted goals.

Next steps

It is the intention of this project to make room for change by inspiring meaningful conversations to be held between citizens, organizations, private and public entities alike to begin to redesign a system where technology truly enables a better world. As mentioned, change to this degree will require an approach that embodies both incremental and radical innovation to create momentum in moving forward. The reason for this circles back to the start of this research journey, where any attempt to think about solving a problem as big as this, feels unimaginably impossible- a warranted reason as to why no concrete change has come of the volatility that we see from these markets. The narrative can begin to change by putting a hopeful foot forward and understanding that strides forward are still strides forward, no matter how small, and the sooner we start, the sooner we will see a change.

Change will come from enabling a sense of societal literacy in data rights, data privacy and data transactions to make informed decisions when interacting with data-driven processes and platforms. It will be imperative to create a sense of transparency to instill trust in how the system operates so that societies feel empowered to utilize platforms to their benefit. Additionally, the digital platform economy and all ecosystem participants will benefit from implementing clear and robust boundaries for operation. This will require global governance frameworks to establish how a shared set of values can enable more robust policy and regulation. Regulations should be iterative and flexible to change to be able to keep up with the rate of change at which the digital platform economy grows.

This report aims to serve as a starting point in a sea of starting points to begin solving the problems within the digital platform economy. While this research uncovered many system intricacies that helped with understanding the system at large, implementation can be supported by introducing related guiding principles into several speculative models that engage multi-stakeholder networks. Speculative models can help change makers approach larger issues, while identifying and prioritizing areas that have high potential to build a more balanced future in the real world. The opportunity to ideate and iterate on the next best steps for the sector provides a collaborative, low risk environment for a diverse set of ecosystem participants to co-create ideas around governance frameworks, best practices and plans for creating education networks centred around data literacy. The aim of these speculative models and collaborative practices could seek to imagine concrete structures that will create systemic change that both encourage a tech-enabled future and protect a tech-centric society.

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Appendix A: Glossary of terms

Agency:
An individual's capacity to feel control over their actions or to be able to act independently

Big tech:
Refers to dominant technology companies in market (i.e. Facebook, Amazon, Apple, Netflix, Microsoft, Alphabet (Google))

Causal Layered Analysis:
A method used to uncover underlying system causes and worldviews in order to build alternative futures

Digital ecosystem:
A network linked through data, digital platforms, operating systems or business models that serve purpose such as economic gain or innovation, where participants can interact with customers, partners, competition and industries

Digital platform:
A digital platform is a technology-enabled business model that connects platform participants, facilitating the value creation and exchange of goods, services or information from networks of suppliers to consumers.

Driver:
Internal or external pressures or factors that cause change to a system (European Commission, n.d.)

Foresight:
Refers to the practice of exploring plausible, coherent and usable futures which identifies insights to be used in productive ways (KerrSmith Design, 2017)

Horizon scan:
Refers to the systematic process of detecting and identifying emerging trends and signals relating to a particular issue

Leverage point:
'Places in the system where a small change could lead to a large shift in behavior' (Meadows, 2008).

Inflection point:
A turning point where there is a time of significant change

STEEP-V:
A structured taxonomy that allows routine and organizing of signals/trends into a way that makes sense for problem framing
Social: How things are run in the world (e.g. Healthcare, education, etc)
Technological: Innovations in technology and science
Environmental: Macro and micro environmental issues, including pressures connected with sustainability, climate change, localised issues
Economic: Exchange of value, time, money, markets and competitiveness
Political: Regulations, political viewpoints
Values-based: Societal shift, cultural perspectives, attitudes, shift in beliefs

System:
'A set of elements or parts that is coherently organized and interconnected in a pattern or structure that produces a characteristic set of behaviours, often classified as its 'function' or 'purpose' (Meadows, 2008)

Systems archetype:
'Common system structures that produce characteristic patterns of behavior' (Meadows, 2008)

System orthodoxy:
Constraints that can prevent change from occurring (Knight, 2016)

Systems thinking:
An approach to problem solving that views system by worldviews, larger structures, patterns, cycles from a broad perspective

Value proposition:
Key value that a company promises to deliver to its customers that motivates them to choose one company over another that serves as a competitive differentiator (Mullin, 2021)

Wicked problem:
A problem that can seem impossible to solve, where the roots and causes are of high complexity (Buchanan, 1992)

Appendix B: Horizon scan signals

Trend 1: A value shift (S,T,E,E,V)

Characteristics of Trend

The North American population has ample access to informational resources (social media, media networks, communities) to make their own decisions about what should be deemed good or bad. Signals question the 'business as usual' rhetoric of solely driving profit. Businesses are re-evaluating how they define profit as opposed to a single quantifiable bottom line. The status quo of what is acceptable is being challenged to adopt more ethical and sustainable practices. Therefore, consumers are making more conscious decisions in real time, forcing businesses to begin to do the same.

Signals of Change

- David Attenborough releases a documentary to highlight the scale of society's sustainability problem and warns of consequences (Di Placido, 2020)
- An organization aimed at enabling 'Tech for good' continues to advocate for a responsible tech sector that can solve societal and environmental problems (Tech for Good, n.d.)
- A McKinsey report outlines the opportunities and challenges that come with the technology era, noting that there are potential paths that can aid in a more ethical, purpose driven tech sector (Allas et al, 2019)
- A Deloitte report argues that technology can assist in overhauling outdated systems of service delivery for citizens and can enable governments to drive continuous improvements and innovations that benefit society (Chew et al, 2021)
- MaRS, a Toronto-based social innovation hub, will launch a $200M fund that funds social impact organizations based on results to encourage organizations to deliver tangible results to their intended communities (Doherty, 2021)
- The World Economic Forum in 2021 recommends building collaborative, mission-based ecosystems where businesses will drive global societal change (Charrie et al, 2021)
- Funding was secured for a Berlin financing platform, Remagine, where their mission is to provide banking services to high growth and impact-driven businesses to use capital and technology services for good (Butcher, 2021)
- An investigative series was launched by the Globe and Mail to explore the gender power gap in the workplace to better understand who holds power in making major decisions in the Canadian economy and society (Doolittle & Wang, 2021)
- The World Economic Forum in 2021 discusses amending the capitalist society that exists today to include the needs of stakeholders to fundamentally address broader societal interests (Schwab & Vanham, 2021)
- COVID-19 has started to change how people make decisions around consumption of goods and services with questions raised around whether the offering is ethical, sustainable or responsibly made (Latham, 2021)

Implications and Questions

- Consumers could continue to pressure businesses to be more environmentally and ethically conscious at a fundamental level. If this happens, traditional business models would have to evolve to include the triple bottom line- people, planet, profit- which should involve a systemic overhaul of traditional capitalism (Kraaijenbrink, 2019). Though there is a rise in conscious companies (known as the B-corp), a wide-spread adoption of these practices could enable sustainability through a fully circular economy (Giddens, 2018). The concept of a circular economy is not new, but today, it fails to gain traction due to current business and government models.

Questions?

  - What challenges would the adoption of a circular economy place on legacy systems in the public and private sector?
  - How might we better understand the impact of adopting a circular economy lens to properly plan for the cannibalization of outdated systems and practices?

- Shifting from a focus on shareholder capitalism to an idea of stakeholder capitalism is another concept that is not brand new. However, it is challenging to communicate the benefits of no longer looking at monetary profit as a measure of success to the people that stand to gain from

this. This shift in consumer values sheds light on a traditional system that was designed to benefit the shareholder. Shifting the system to benefit all involved (state, shareholders, stakeholders) could bring long-term value to any entity, including giving people the ability to also influence decision making, which could result in a more equitable economy. Stakeholder capitalism has met many skeptics that claim it is not possible to implement given the volume of dependencies that require revenue and profit to operate, but the values that it embodies could lend itself to a revitalized measure of profit.

Questions?

- How might we understand and validate the value of what stakeholder capitalism seeks to solve to communicate the importance of moving away from traditional capitalism?
- Is it unrealistic to consider a change in capitalism and traditional business models? How might we explore ways in which capitalism can evolve to serve more than just the bottom line in a way that makes fiscal sense for surrounding ecosystems?

Trend 2: Money makes the world go round (S,T,E,E,P,V)

Characteristics of Trend

Large, private companies are starting to participate in and fund initiatives that affect the public. On one hand, the amount of capital that it will take to engage systemic change around modern infrastructure in the world is substantial. This dynamic poses a challenge in determining who is responsible for building societal and environmental solutions, and potentially places more power into the hands of the private companies doing the funding. Despite good intentions, initiatives that are funded will likely be in the interest of the private company, which can be seen through the lack of tech-enabled infrastructure in developing nations.

Public-private partnerships are also becoming more prevalent in enabling innovation that makes quicker progress to implementation than if either entity did it alone. The success and failures of these partnerships are facilitating conversations globally around what can work and what cannot in the attempt to build innovative solutions for the future. Private companies solve the need for capital and expertise, but increase government reliance on private assistance or partnerships to solve problems in the public space.

Signals of Change

- Despite telecommunication companies building infrastructure globally to support their technology and communication services, an additional $2 trillion may be needed to close the disparity gap in who can access theses connectivity services (Bock et al, 2020)
- Governments are relying on big tech resources, technical expertise and platform power to create centralized data systems to manage the COVID-19 pandemic (Foer, 2020)
- Big tech has interested in capturing their piece of the market in tech-enabled healthcare systems, a need in society brought on by the COVID-19 pandemic (CB Insights, n.d.)
- Technology companies are making efforts to fight climate change by way of data-enabled solutions, clean-tech products/services and providing funding to organizations seeking to mitigate climate change (Bowles, 2020)
- Tech can only solve problems for those who have access to it (Brown et al, 2021)
- Amazon's next headquarters in the US is planned to operate sustainably, contain green outdoor space, support pedestrians and cyclists and is aligned with the company's pledge to net-zero carbon by 2040 (Schoettler, 2021)
- Amazon invested in an Offshore Wind Project, part of a joint venture between Shell and Eneco, to supply the electrical grid that will power the Netherlands (Jackson, 2021)
- Salesforce launches 'Vaccine Cloud' to provide support to countries in COVID-19 vaccine management (Salesforce, 2021)
- Public-private partnerships in building tech solutions can aid in COVID-19 recovery on a global scale to reach the UN's Sustainable Development Goals by 2030 (Gawel et al, 2021)
- Space X and NASA successfully land a rover on Mars (Onanuga, 2021)
- Accenture's partnership with the Australian Institute of Marine Science is aimed to utilize resources from both groups to enable coral reef conservation (Consultancy Australia, 2021)
- Brazil fined Apple in protest to their refusal to include a charger for new devices despite charging the same amount for the device which will cost Apple a negligible amount of 0.00007% of their 2020 revenue (Mehta, 2021)

Implications and Questions

- Depending on private companies to fund initiatives on a societal level contributes to a power dynamic where public entities need private companies to survive. At a healthy level, public private partnerships can work. However, if there is a high reliance on private companies to be part of all larger initiatives, there is a blurred line in the capitalistic landscape.

Questions?

- Does a high reliance for private sector innovation contribute to the unbalanced outputs of new products and services?
- Tech companies can operate in a business model based on identifying gaps in the market where

they are able to help public bodies solve real problems. They have started to solve important and widespread problems such as for-profit vaccine distribution tracking, environmental problems such as saving the Great Barrier Reef coral reefs, and providing new health tech platforms for remote tele-health for access during a time of remote living.

Questions?

- If tech companies have capacity and resources to help solve global issues, how should they be governed with regards to access to data, revenue/profits, benefits to the company?

- If the private companies that are able to fund new innovative projects, it could be challenging to eliminate bias completely. Powerful private sector companies are faced with deciding what problem they would like to be part of solving. This could elicit harmful bias on what is deemed immediately important (or what is most beneficially aligned with the company's offerings or goals), which could contribute to the growing disparity in how social innovation gets implemented in an inclusive, diverse and accessible way on a global scale.

Questions?

- How might we identify key criteria and benefits to ensure ethical participation from private companies for socially responsible impact in solving large-scale problems?

- Big tech has created an imbalanced competitive landscape where the system structure enables their success more than others. The same systems that have allowed big tech companies to succeed and scale has given them visibility and opportunity to partner with public entities to make positive change. If dominant companies are able to utilize their resources and platform to implement and scale significant change, this could have a detrimental impact on any less dominant companies hoping to make a comparable impact or enter the market.

Questions?

- How might we (and should we) re-imagine the key criteria that makes companies eligible to participate in these partnerships?

- Absorptive capacity is innately higher in the private sector than the public sector. This contributes to the growing dependency on private companies to pave the path of innovative solutions.

Questions?

- How might we increase absorptive capacity in the public sector?

Trend 3: Power to the People

Characteristics of Trend

With social platforms, there are less boundaries to cross in drawing collective conversations and sparking community based movements globally. These movements have proven to be both positive and negative (human rights movements vs acting on misinformation). Social platforms have allowed people to connect based on similar interests, beliefs and cultures and they have access to an infinite amount of information that can trigger action.

Societies are seeking decentralized avenues to create their new personal ecosystems. Trust in the institutions/governments has declined, exacerbated by the political, social and pandemic landscape of 2020. Access to information plays a role in how societies are able to form opinions and identify new value systems, contributing to distrust in legacy institutions that have not subjectively protected them in the way that the systems were intended to.

Signals of Change

- Huge Ma, a software engineer based in New York, created a vaccine website that surfaces vaccine system availability and sends the information in real time to Twitter to solve the problem residents were facing finding efficient ways of finding available vaccine appointments (Otterman, 2021)
- Grassroot communities of people are compiling useful vaccine site information into publicly available to assist with information flow (through cloud sites like Google Sheets, social media, and news media) to the public as the government sites could not process quick enough, real-time updates to allow new people to find vaccine appointment availability (Melendez, 2021)
- A community of social media users on Reddit utilized their collective power to penetrate the stock market to capture and disrupt Wall Street's shorts, resulting in millions lost from investment firms and millions gained by retail traders (McDermott, 2021)
- The US Capitol was attacked by angry rioters that organized and planned via social media platforms, bringing into question what role tech platforms play in mediating potentially harmful acts (McKinnon & Tracy, 2021)
- The Black Lives Matter movement was nominated for a Nobel peace prize in relation to their efforts of bringing to light the racial injustices that exist in today's society and their call for systemic change (Belam, 2021)
- After losing in the race to become governor in Georgia, Stacey Abrams persisted, and was successful, in helping her state by assisting people of colour register to vote and created educational pathways by providing tools and information to encourage participation in the US Presidential election (Johnston & Timmons, 2020)
- There is significant influence in spreading information and misinformation on social media, giving rise to both positive and negative community led groups that act on their interpretation of the information that they see (Hills & Menczer, 2020)
- Retail traders took control and made stock market trades based on internet memes and social media discussions that manipulated a few stocks on the market to become volatile without reason (Ballentine & Ponczek, 2021)
- The #MeToo social media movement that began in 2017-2019 has continued to gain traction online, connecting global survivors and victims to form communities of support and has created a global awareness to bring more visibility of sexual threats and gender-based violence (McNabb, 2021)
- In the US, the Black Lives Matter social media movement inspired nationwide (and global) protests made up of frustrated citizens calling out for systemic change regarding police brutality, brought on by the death of George Floyd, where a policeman used deadly force to withhold a black man (Anderson et al, 2020)
- The public is calling for clear boundaries and governance in relation to technology-based solutions like citizen surveillance (facial recognition) that can be manipulated for controversial political gain that discriminates against people of colour which results in disproportionate tracking of vulnerable populations based on race and religious beliefs (Cahn, 2021)

Implications and Questions

- Due to access to information in real time as well as the free market of social media, people are able to react and act in real time, while forming perspectives on issues that resonate with them. Social media platforms are home to groups of people who create movements, with shared ideologies and value systems, resulting in action. The growing distrust in the traditional systems could continue to add fuel to the fire if systemic change does not occur. Recently, the need for systemic change has been raised in many areas, such as (but not limited to) racial inequity, politics, social welfare and the climate crisis. Lack of change will result in increased resistance to abiding by societal norms and increased distrust in traditional systems, which could result in a rebellion that will fight for change. Perspectives could become more polarized than today, leading to a continuity of increased volatility in society.

Questions?

  - How might we leverage automation and AI to deter the spread of misinformation in a digital age?
  - How might we collaboratively take responsibility for the management of misinformation to protect people and communities?

- Movements could cause a tilt in the power dynamic between people seeking systemic change and traditional institutions. When Reddit retail traders collectively challenged who benefited from the stock exchange, it empowered a large population of people who had any doubts of the system to fully embrace a movement that sought to decentralize the investment banking system. This movement was years in the making, and was successful because key players educated themselves enough about how the system worked and how to poke holes in it. Empowered communities could continue to challenge the status quo of institutionalized systems until it comes to a preferred state. It could be dangerous to adopt decentralized systems without knowing enough of its long-term implications, which could cause catastrophic impact on vulnerable communities.

Questions?

  - How might we understand the advantages and disadvantages of adopting decentralized systems to better serve communities at large?

- Information that resonates with groups of people influences their value and belief systems. If there is a significant change in personal value systems, this could alter key inflection points such as where parents and guardians choose to send their kids to school, where people manage their finances, their political stance and where people choose to do business. This could incrementally impact current societal structures and norms such as what communities people choose to live in, who they associate themselves with and where they choose to work. The make-up of communities could change completely where they align on values and beliefs, as opposed to level of income, religion or race.

Questions?

  - How might a shift in personal value systems facilitate more inclusive societies?
  - How could alignment in personal value systems enable more divisive and polarized communities?

Trend 4: The growing data economy

Characteristics of Trend

Tech companies have developed ways for governments and businesses of all industries to make operations and processes exponentially more efficient. However, for technology to work, it involves participation by its users and integration with its systems. Therefore, it has become apparent that while technology companies are dependent on society's data to effectively operate, its users are potentially more dependent on its offerings as part of their daily lives. Tech companies profit off of utilizing and sometimes exploiting personal data to create better insights, better products and better services.

Signals of Change

- Big tech platforms are under intense scrutiny due to evolving demand for rethinking regulation in the technology sector with issues pertaining to privacy, data transparency and anti-competitive practices as a result of their ambiguous and dominant power over their users and peripheral ecosystems (Shavell, 2021)
- Policy and change makers have recognized the scale of innovation in the technology sector and are preparing to propose stronger regulations around taxation, privacy, data, access to tech and transformational new tech (e.g. 5G) to ensure protection of citizens (Kramer, 2021)
- Tech addiction in young people is of rising concern, exacerbated by the COVID-19 pandemic, as many interactions are now facilitated online (education, socializing, entertainment, games), bringing question into what the long term impact of social isolation is when considering their tech habits (Pinna, 2021)
- Google is piloting a launch on a browser standard called FloC (Federated Learning of Cohorts) that is intended to address the privacy concerns of the internet by eliminating third party cookie access, and instead proposing a semi-anonymous data collection that will be less able to specifically identify identities at large (Bohn, 2021)
- Health-tech platforms are rising in popularity, exacerbated by the COVID-19 pandemic to address remote healthcare where platforms collect and distribute data amongst networks of physicians, nurses, health systems and companies that are helping to facilitate the data management (Reader, 2021)
- The Facebook and Cambridge Analytica scandal revealed that the Trump campaign misused personal data from millions of Facebook users in favour of the Presidential campaign (Confessore, 2018)
- Amazon, Alphabet, Salesforce and Microsoft invested in Databricks, a tech start-up whose software works to process big data sets to prepare for analysis and AI models (Novet, 2021)
- AI may be potential to be a preventative force in healthcare, in taking a scalable, proactive approach to diagnosing symptoms or illnesses in humans (Wooldrige, 2021)
- Whatsapp released a new policy for users where it stated that users were required to consent or agree to share data that it collects with Facebook, or else they will lose access to their account (D'Amore, 2021)
- Me.Ring is a new concept that wants to use wearable tech (a ring) that will allow users to activate an anonymous setting which prevents any collection of personal data, to allow users to have more agency to decide when and where they are willing to share their data (Wilson, 2021)

Implications and Questions

- Tech companies have provided the utmost level of convenience for its users. This exacerbates our need and dependence for tech, creating an evolving and growing convenience culture. This shapes what products and services are brought to market, which then affects what products are services are brought to market after that. Consumers have bought into brand ecosystems that may not be able to stack with all or other technologies, further monopolizing the market (Cision PR Newswire, 2020)

Questions?

  - How might we re-shape supply and demand for more conscious and positively impactful products and services through points of intervention within the current system? Where

are the points of intervention within the current system?

- Convenient and useful tech to users can be measured on how personalized the product/service is or becomes to them. In order for a high level of personalization, tech companies leverage an enormous amount of personal data to facilitate this interaction, encroaching on the issue of privacy and trust. In this regard, the users are paramount in facilitating the company's ability to succeed through collection of these insights and personal data, and through this, making them just as much a 'product' as the product offering itself (Jacobson, n.d.)

Questions?

  - How might we re-imagine the governance around what data can be collected and for what purpose to better protect individuals from exploitation for gain?
  - How might we create transparency in modern data governance?
  - How might we value data as an asset?
- The growing distrust in big tech could provide a unique opportunity for competitors to enter the market to provide users with a comparable experience. As the tech sector continues to grow, as does the number of options that users have. Should the volatility of big tech governance continue, users could seek out alternative avenues in using tech. This could continue the increasing number of challenger companies that are entering the market to compete with big tech (Hemerling et al, 2019)

Questions?

  - How might we illuminate and leverage the gaps in the governance models of technology companies to create a more fair competitive landscape?
- The monopolization and hoarding of personal data for private sector profit could elicit a robust open-data model, where data in itself does not belong to a single entity. This would change the value of collecting personal data on a fundamental level. Data would no longer be valued as a proprietary asset, and the open-data model would require an entirely different governance model (Buscher, 2019)

Questions?

  - How might an open data model drive tech innovation?
  - How could open data facilitate more fair competitive ecosystems?

Appendix C: Leverage points

Donella Meadows explains leverage points as places in the system where change can occur. These leverage points are directly from Meadows, in order to explain context for proposed leverage points in the report body. Leverage points in order of effectiveness:
(Meadows, 2008)

Number	Point	Description
12	Constants, parameters, numbers	Standards that rarely change behaviour and have little long-term impact on changing the system such as subsidies or taxes
11	Sizes of buffers or other stabilizing stocks, relative to their flows	The buffer's capacity to stabilize a system when the stock amount is higher than inflows or outflows
10	Structure of material stocks and flows	The structure that houses the system is difficult to change, and instead change tends to come from addressing elements that interact with the structure, such as limitations or bottlenecks
9	Length of delays, relative to the rate of system change	Timing and quantity of information received impacts the efficacy of system change
8	Strength of negative feedback loops, relative to the impacts they are trying to correct against	Negative feedback loops can facilitate a slower process that can enable stability in the system, giving an opportunity to approach change
7	Gain around positive feedback loops	Positive feedback loops facilitate a faster process, but does not always positive impact the system change
6	Structure of information flows	The way that information is delivered into a system can facilitate stronger system structures
5	Rules of the system	Incentives, punishments and constraints can help to create boundaries around unsustainable systems
4	Power to add, change, evolve, or self-organize system structure	A system's ability to change itself by creating new system structures by involving new information, feedback loops, rules etc
3	Goals of the system	Determining new goals of a system changes what the system is working towards
2	Mindset or paradigm out of which the system - its goals, structure, rules, delays, parameters - arises	Collective ideas or beliefs that enable a foundation of a social structure or paradigm
1	Power to transcend paradigms	Ability to shift and share values to enable change