

# INVESTIGATING THE POSSIBLE FUTURES OF COMMUNITY DRIVEN BY EMERGING DIGITAL TECHNOLOGY AND AFFECTED BY COMMUNITY- CENTRED DESIGN

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# ABSTRACT

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Emerging digital technology can positively impact humans, but its existence and rapid advancement also cause unintended consequences and externalities – the costs and benefits of the industry’s activity – in society. In particular, emerging digital technology is disrupting healthy communities. With healthy communities as the backbone of a democratic society, the risks of unintended impacts, such as social fragmentation and social polarization, are significant. Therefore, this research explores a definition of healthy community, the evolution of community in the context of technology, and how digital technology can be designed to preserve and build healthy communities now and across various possible futures. Leveraging systems thinking and foresight methodologies, multi-level system community-fortifying interventions are developed, propelling the paradigm shift from human-centred design to community-centred design.

# ACKNOWLEDGEMENTS

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I want to acknowledge that I stand and create in Tkaronto, on the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples who are the original owners and custodians of the land. Tkaronto is now home to many diverse First Nations, Inuit and Métis peoples, and is covered by Treaty 13 signed with the Mississaugas of the Credit, and the Williams Treaties signed with multiple Mississaugas and Chippewa bands.

This major research project would not have been possible without the support, care, and guidance of my own communities:

Thank you to my advising professor, Helen Kerr, for your guidance and patience as I navigated and explored the complexity that is "community." Your remarkable ability to untangle and challenge my assumptions through insightful questioning propelled me, and this research study, forward.

Thank you to my friends and family, and especially my parents, for your constant encouragement and motivation, for always listening to and believing in my grand ideas, and for being my biggest supporters. Thank you to Milena, for adventuring with me on this journey.

Thank you to my classmates whom I have learned so much from. I have become so much better because of our collaboration.

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A special thank you to the sun, the sea, the land, the art, the food, and the people in the South of France who surrounded me, in community, at the beginning of this research journey.

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# INTRODUCTION

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## PREFACE

November 27, 2022

I am writing from Arles, a town in Provence, France, where I have been living for the last three months. I have just finished addressing thank you cards to those who welcomed me into this Arlésienne community as I leave here in a few days.

I took a sabbatical to explore my major research project in depth and moved to France as an auto-ethnographic research study on building community in a new environment. After arriving, I learned that Vincent Van Gogh famously settled in Arles in 1888, dreaming of establishing his own community of artists.

In contrast to Toronto, Canada, where I was born and have lived for most of my life, Arles is very small, with the ability to walk across the town centre in under 15 minutes. It is a town where you say “bonjour” [hello] and “bonsoir” [good evening] to everyone you pass on the street and anonymity is hard to maintain. In Toronto, I rely heavily on digital technology to connect with people and communities, with seemingly less and less in-person, physical connection with my surroundings. In Arles, without pre-

established digital technology connections, face-to-face physical connection has proven to be the catalyst for finding a sense of belonging and building community. In October, I attended a festival centred around food, art, and community, where every Saturday a communal meal would be shared. From these events, connections grew.

Yes, digital technology was used to further facilitate connections, via the exchange of phone numbers, social media accounts, and email addresses, but it always played a supporting role. As I leave Arles, my major research project topic feels even more vital. What does community mean today? What could it mean in the future? How can we ensure we design digital technology to support and not hinder human connections and community, such as what I experienced here in Arles?

I am not sure if I will remain connected with the people I met, or be a part of the Arles community again, but it has truly been a moment in time of meaningful, healthy community.

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## RESEARCHER POSITIONING

It is important to note that this research has been informed by the researcher’s lived experience. The researcher is a privileged, educated woman, working professionally in the digital technology space, and believes that digital technology can be a catalyst for positive change if it is designed, built, released, and used ethically. The researcher also supports democracy, lives in a Western democratic country, and believes that communities can be vessels for health and societal wellbeing, and should be preserved amidst possible disruptive forces now and in the future. The researcher takes a systemic approach to solving problems, holding a belief in the power of a bottom-up, top-down approach to enact change.

Finally, the researcher envisions and actively works towards building futures that centre around decolonization, dismantling oppressive systems, creating environmental resiliency and regeneration, and supporting inclusion.

The above positioning influences the researcher’s perspective on the topic and thus presents a risk of apparent bias in the research. Mitigation strategies were employed to limit bias, including conducting primary research to gather diverse perspectives, and close collaboration with the advising professor to check the researcher’s bias throughout the process.

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## CONTEXT

Humans have an innate desire to belong (Baumeister & Leary, 1995). In 1943, Abraham Maslow published *A Theory of Human Motivation*, introducing a psychology for understanding human behaviour. This theory includes five basic needs: [1] Physiological needs, [2] Safety needs, [3] Belongingness and love needs, [4] Self-esteem needs, and [5] Self-Actualization needs, ranked in order of hierarchy (Maslow, 1943). Maslow suggests that not until one need is satisfied, such as a physiological need, does another need emerge, such as

a safety need, caveating that there may be some exceptions in the order’s rigidity. Under this logic, belongingness needs are ranked third, achievable only after physiological and safety needs are met. However, it can be argued that belongingness greatly influences and contributes to satisfying physiological and safety needs, and the same argument can be made for achieving self-esteem and self-actualization needs (Lieberman, 2013). Thus, belongingness is actually a foundational need, and if belonging goes unmet, there

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are significant mental, emotional, and physical effects on humans (Kloos et al., 2012), encompassing the other four needs.

For centuries, belonging has manifested in the formation of communities; humans connecting with one another to build protection and collective power (Nature Human Behaviour, 2018). Communities can be defined as relational or geographic groups of people, not inclusive of family, who share a sense of belonging (McMillan & Chavis, 1986; Kloos et al., 2012), and are structured by a sense of space, participation, communication, and organization. Throughout history, communities have evolved, expanding the initial design of physical, geographically-determined groups to include interest-based groups, and in the digital revolution, online and hybrid (a mix of physical and digital) communities (Kloos et al., 2012). In modern day, communities remain the backbone of society, a vital construct that satisfies human beings' evolutionary wiring to strive for social connection (Gruber, 2020). However, the future of communities is at a turning point, with key system drivers influencing the health of communities. For the purposes of this research study, healthy communities are informed by characteristics of shared intent, meaningful social ties, mutuality, trust and belonging, and openness.

This research study focuses on emerging digital technology – specifically digital technologies that impact the ways in which humans interact and connect with each other – as a system driver with immense influence on community health. Digital technology has spurred connection, fostering support and relationships on a global scale and redefining the notion of geo-specific and bordered communities (Lingel, 2017). However, how digital technology is designed and used also has numerous unintended consequences and externalities including contributing to social fragmentation – groups of people separating from society – and

social polarization – groups of people with extreme opposing views (World Economic Forum, 2023a; All Tech Is Human, n.d.; European Forum for Urban Security [Efus], 2021). This is resulting in an erosion of a cohesive, democratic society where wellbeing towards, and inclusion of all members exists, marginalization is fought, and trust and belonging are promoted (OECD, 2011; World Economic Forum 2023a). Healthy communities influence social cohesion (Social Cohesion - Healthy People 2030, n.d.).

With continuous advancements to digital technologies, such as Artificial Intelligence (AI) and Extended Reality (XR), comes greater risk and/or benefit to the individual (Bowles, 2018). Building on established theories such as sociotechnology, the study of the intersections and processes between technology and society (Bunge, 1999), emerging fields in technology are exploring how to mitigate risks to the individual via ethical and responsible practices. The current gap in research is the ripple effect those individual impacts could have on the larger community in the possible futures to come. The full extent of digital technology's impacts may not be evident or accepted until decades later, similar to the pattern of climate change. This is why there is an urgency to explore possible futures and interventions now, creating awareness of potential impacts of emerging digital technologies on healthy communities.

With healthy communities vital to a cohesive democratic society, how might the impacts of digital technology on communities – not just individuals – be considered when designing digital technology? This research investigates how digital technology can be designed to build healthy communities for futures to come, transcending human-centred design and evolving into community-centred design.

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## PURPOSE

The purpose of this research study is to understand the impacts of digital technology on community and investigate how digital technology can be designed to build and preserve healthy community in the possible futures to come. For the purposes of this study, healthy community is informed by its shared intent, meaningful social ties, mutuality, trust and belonging, and openness.

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## GOALS

Outcomes of this major research project will be a deeper understanding of the impacts emerging technology has on communities, investigated through exploratory futures of community, and the system interventions that can be employed to better design digital technology to build healthier communities, as defined in this work. A conceptual prototype to support an intervention will be shared to help facilitate the initial application of these strategies amongst interested stakeholders for further evaluation and iteration.

In the short-term, this research will add data, perspective, and value to the emerging field of responsible technology and technology ethics, and will create awareness by sharing with an expanded audience through storytelling. In the long-term, the developed interventions could contribute to supporting the paradigm shift from human-centred design to community-centred design, changing the way digital technology is imagined, designed, built, and launched into society, and building healthy communities, as defined in this research study.

# RESEARCH QUESTION

The primary question this major research project aims to answer is:

What is community, how has community evolved driven by emerging digital technology, and how might digital technology be designed to build healthy community?

Supporting areas of inquiry include:

- Providing a definition of healthy community, its components and characteristics.

- Examining the evolution of community throughout history, and its intersection with technology.
- Understanding impacts of emerging digital technology on communities.
- Exploring the possible futures of communities driven by emerging digital technologies.

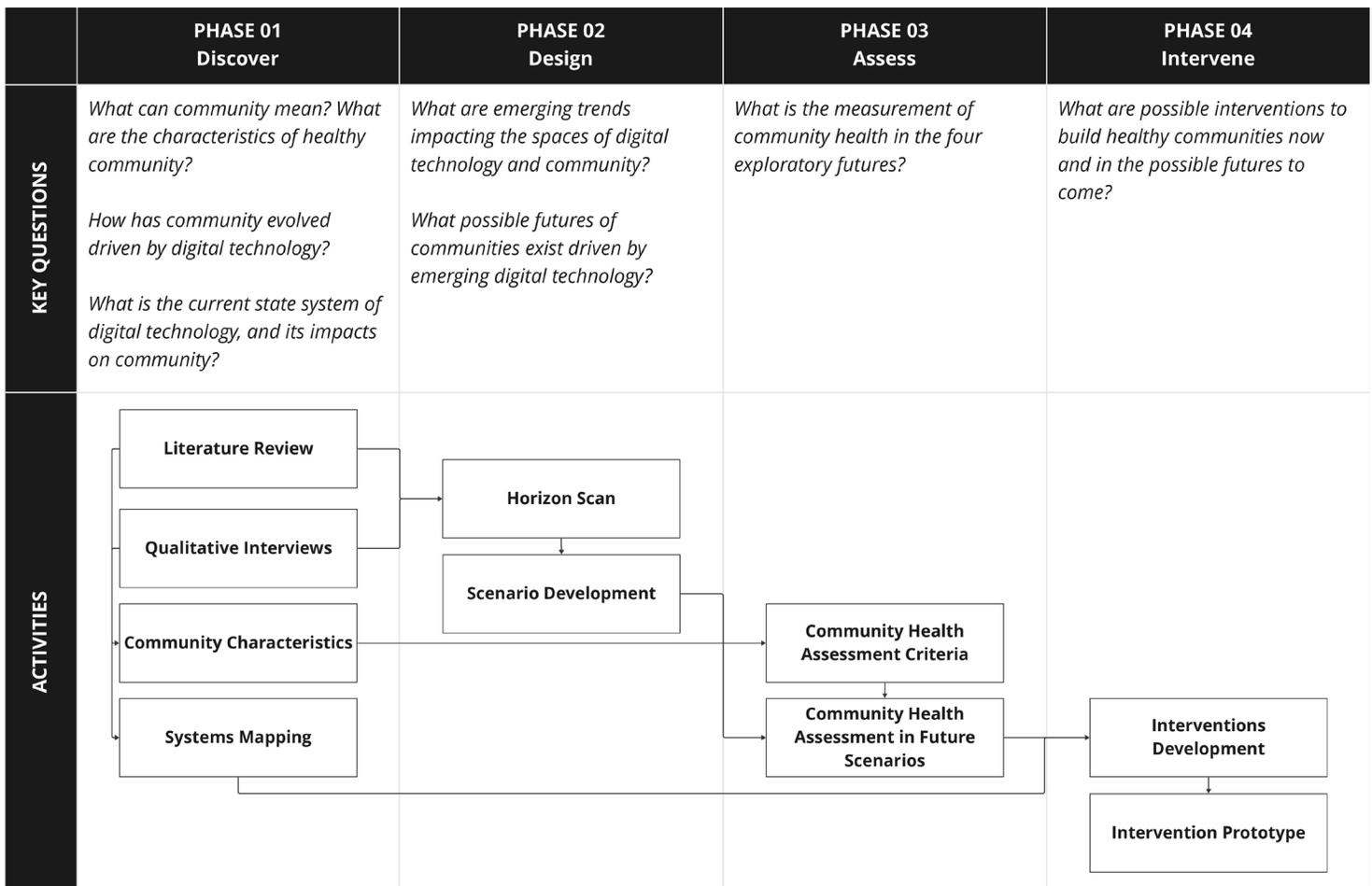


**Figure 1.** A visual breakdown of the primary research question.

# METHODOLOGY

## PROJECT METHODOLOGY

To answer the primary research question, a combination of methods and tools from the disciplines of systems thinking and strategic foresight were employed. The exploration was framed leveraging an adaptation of the design thinking methodology and followed the following phases: [1] Discover, [2] Design, [3] Assess, and [4] Intervene. Each phase includes secondary key research questions that help break down and support the primary research question. A visual summary of the project methodology can be found below. More fulsome activity descriptions and definitions are described below.



**Figure 2.** A visual representation of the research process design, demonstrating the phases, key questions, activities, and connections between each activity.

# PHASE 01 – DISCOVER

## LITERATURE REVIEW

The literature review includes a robust selection of sources across three domains of inquiry: [1] Understanding what community can mean, its components, and its evolution in a Western context; [2] Understanding emerging digital technology, and its impacts and externalities on communities; and [3] Emerging practices of responsible technology and technology ethics. The review

compared data, tools, and frameworks, identifying key gaps that exist in the research. During the research synthesis and analysis process, inductive coding methodologies and affinity diagramming were used to develop insights and identify patterns (Creswell, 2014).

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## PRIMARY RESEARCH: QUALITATIVE INTERVIEWS

One-to-one qualitative interviews were conducted with 21 participants: digital technologists currently working in digital technology as founders, product designers, researchers, and engineers, and with professionals and volunteers in community-building and public interest fields, across for-profit, non-profit, and volunteer organizations. This sample size reflects the goal to capture diverse data from digital technologists and community-builders in North America and/or Europe. The purpose of these interviews was to better understand their definitions of community and how digital technology impacts community. Although a wider pool of interviewees could have provided more insight, the number of interviews also reflects the capacity of the graduate student researcher.

Participants were selected by their interest in the study, expertise in the research topic, and by occupation. Interview participants were located geographically across Canada, the United States, the Netherlands, The United Kingdom, and France. Each interview was 45-minutes in length and held virtually via a video conferencing platform.

Primary research was employed to close the gap in existing secondary research, as opposed to using this method to extract already known data. The topic of community is deeply human and very personal with different meanings for different individuals. Therefore, the researcher determined that any solutions pertaining to sustaining community must engage humans directly.

Participants were recruited via email outreach and an interview pre-screening filter was shared on social platforms to gauge

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## COMMUNITY CHARACTERISTICS

In combining the literature review and the primary research, community characteristics were developed, defining “community” for the purposes of this major research project. It should be noted that these community characteristics were determined with the data gathered to date given the project scope and constraints and may differ with the introduction of new data. In addition, characteristics are not all encompassing and may adapt based on the type of communities in question and as communities continue to evolve driven by external forces.

the codes were grouped into 16 categories, and these categories were then cross-referenced against the secondary research to determine the community components and characteristics. Key secondary research inputs include: *The Signals Research* (NewPublic, 2022), *Sense of Community Criteria* (McMillian & Chavis, 1986), *Elements of Community* (Green & Mercer, 2001), *Human Values with Ethical Import* (Friedman & Kahn, 2003), and *Society Centred Design Manifesto principles* (*Society Centered Design*, 2020).

Leveraging the inductive coding style, 77 codes were created from 21 participant interview transcripts. Using affinity diagramming,

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## SYSTEMS MAPPING

Using systems mapping, it is possible to visualize the relationships between the various people and processes that make up a complex system. Systems mapping facilitates a holistic understanding of a system’s structure and dynamics, as well as identifying strategic intervention areas (Voinov, 2010). Systems maps were created in this research to better understand the intersection of healthy communities and emerging digital technology.

## COMMUNITY EVOLUTION: MULTI-LEVEL PERSPECTIVE

Adapting the Multi-Level Perspective tool developed by Geels (2005), a visual illustration of the evolution of community was created – inclusive of three layers: macro, meso, and micro – to identify the systemic influences and major developments that have informed the trajectory of community today. Understanding

the historical happenings of the past and the interconnected nature of community and technology with a systems lens was essential to building a foundation for the possible futures to come.

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## CAUSAL LOOP DIAGRAMS

Causal loop diagrams were created to understand orthodoxies and archetypes of the digital technology current state system. *The System Archetypes* (Braun, 2002) served as a foundation for this exploration, adapting the archetype “Limits to Growth” to

illustrate the reinforcing and balancing influences in the system. This archetype originates from Donella Meadows et al.’s 1972 book *Limits to Growth* (Braun, 2002).

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## INFLUENCE MAPPING

As part of Systems Mapping, an influence map, adapted from Jones and Ael’s *Design Journeys through Complex Systems* (2022), was created to visualize the system factors of the current digital technology system and the relationships existing between them. Referencing Gharajedaghi’s iterative process of inquiry

from *Systems Thinking: Managing Chaos and Complexity* (2011), the system factors are defined by context, function, structure, and process. By understanding the flow of influence, barriers in the system were identified, indicating intervention points for potential opportunity exploration.

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# PHASE 02 – DESIGN

## HORIZON SCAN

A horizon scan is an examination of the environment to identify emerging trends, issues, and potential threats that may affect an organization, industry, or society in the future. In it, potential risks and opportunities are anticipated and prepared for in advance (Rij, 2010).

A horizon scan was conducted in this research to better understand emerging forces that could impact the spaces of community and emerging digital technology. Signals were gathered and clustered to form trends, which were categorized using the STEEP+V

categories of Social, Technical, Environmental, Economic, Political, and Values. The STEEP+V is a framework used in the disciplines of strategic foresight and strategy to ensure breadth of research of external factors shaping spaces of exploration. The initial concept of STEEP+V can be traced to Francis J. Aguilar’s *Scanning the Business Environment* (1967). The trends identified were prioritized based on possible impacts to the research space, and then plotted across a timeline from present day to the year 2043 to ensure that the trends considered were plausible in the short-, mid- and/or long-term.

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## EXPLORATORY FUTURES

Early in the research process, it became clear that an existing gap in this domain is an exploration into many possible alternate futures at the intersection of communities and emerging digital technologies. The focus is often on generating one singular normative future – a desirable future state – which serves as a magnet and roadmap to work towards (Harman, 1975; Dator, 2009). However, given the ever-changing nature of the socio-technological space, solely focusing on one future proved limiting. Best practices in futures work suggest the aperture must be widened to anticipate the many possibilities and develop robust interventions that can withstand those many possibilities (Dator, 2009; Van der Heijden, 2005). Therefore, this report refers to “futures,” indicating the plurality of multiple possible future states.

It is recommended that exploratory future scenarios are co-created and experienced with stakeholders, and a preferred future is later envisioned (Dator, 2009). However, given the research scope constraints, the scenarios developed in this research study have been solely created by the researcher. Strategies for limiting researcher bias were to refrain from envisioning a preferred future and frame the interventions to be applicable to all scenarios. Co-creation with stakeholders to develop scenarios is included as a recommended next step.

## SCENARIO DEVELOPMENT METHOD

Jim Dator's Four Generic Futures (2009) was used to develop exploratory futures of communities, with inputs from emerging trends rooted in the Horizon Scan. The selection of Jim Dator's Four Generic Futures was intentional in order to explore varied scenarios that are agnostic of "good" or "bad," "desired" or "feared." Dator developed a framework for four existing archetypes based

on years of data gathering: [1] Growth, [2] Collapse, [3] Discipline or Sustain, and [4] Transform. In each scenario, there are winners and losers, and to limit bias, a preferred future is not selected, but rather, the scenarios are used to explore how communities may be impacted in the futures to come to elicit critical thinking (Dator, 2009).

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## TIMEFRAME FOR FUTURES EXPLORATION

The timeframe of 2043 for exploration was chosen strategically based on the rapid advancements that have occurred in digital technology over the past three decades since the world wide web became available for universal use in 1993 (*The World Wide Web*, 2018), signaling immense capabilities for change over the next two decades. From an environmental perspective, in 2043, current key milestones will have come and gone, one being the 2030 UN Sustainable Development Goals (United Nations, 2015), and another, Canada's determination to reach Net Zero by 2030.

By 2050, the UN projects that 68% of the global population will be living in urban centres (United Nations, 2018).

Enough time will have passed in this timeframe for new generations to come into the workforce, into government, and as legal citizens. For these socio-technical-ecological reasons, 2043 is far enough for real change in any direction to occur, and close enough for changes to be made today to influence potential paths forward.

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## THE VERGE ETHNOGRAPHIC FUTURES FRAMEWORK

The VERGE Ethnographic Futures framework, created by Richard Lum and Michelle Bowman, was applied to each scenario, ensuring that the scenarios had a human-lens and were robust in their anthropological elements, as communities are a humanistic problem space. VERGE consists of six categories

that define the lived human experience: [1] Define, [2] Relate, [3] Connect, [4] Create, [5] Consume, and [6] Destroy. These categories are used to explore possible impacts on people in future scenarios (Schultz, 2011).

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## BACKCASTING

Backcasting, a foresight methodology originally developed in the 1970s (Quist & Vergragt, 2006), was used to validate the plausibility of each scenario. Backcasting is working back from one endpoint in the future, to the present, to understand feasibility of that future (Bibri, 2018). In the context of this research study,

specific milestones were identified in the short-, mid-, and long-term timelines leading from the year the scenarios occur, 2043, to present day. These milestones can serve as indicators of the scenario events unfolding in the future (Rhydderch, 2009; Dator, 2009).

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# PHASE 03 – ASSESS

## COMMUNITY HEALTH CRITERIA AND ASSESSMENT

The community health assessment criteria were adapted based on Cantril's Self Anchoring Thriving Scale developed in 1965 (Cantril, 1965). The health of each community characteristic was measured on a scale from suffering to struggling to thriving. Thriving, with a numeric measurement of 4-5, indicates that the health of that community characteristic is optimized; struggling (3) indicates that the characteristic is inconsistent or moderate in its ability to be met given the environment; and suffering (1-2) indicates that the characteristic is not being achieved and it is high risk.

A community health assessment was conducted to evaluate the health of communities in each future scenario, to understand the impact on community in the futures to come and provide direction for possible means of intervention.

# PHASE 04 – INTERVENE

## INTERVENTIONS DEVELOPMENT

From the community health assessment in each future scenario, opportunity areas were identified. These areas helped inform the creation of an ecosystem of interventions. The interventions are systemic in order to address the systemic problem the research study is investigating. An impact timeline for intervention is

proposed, with a conceptual prototype that supports a short-term intervention. The interventions should be co-created and validated with actors, however, that was out of scope for this research study, and is a recommended next step.

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## RESEARCH LIMITATIONS

### RESEARCH METHODS

The research methods were selected based on the knowledge gathered at the time the proposal for this major research project was crafted. Now that the research process is complete, with new data gathered and transformed into new knowledge, the design of the research methodology may have shifted to produce different results. When exploring futures of communities, there is an importance related to ensuring diversity in the process. The researcher, a North American post-secondary educated woman, only has access to their own lived experience. While the primary research discussion guide included future envisioning questions, a co-creation exercise to develop scenarios could have produced more diverse and divergent worlds.

The interview pre-screener did not ask for identifying characteristics, and therefore selected participants could have been more diverse to garner a wider perspective of responses. The range of educational backgrounds of participants was narrow, with the majority of participants holding undergraduate degrees or higher.

Despite best efforts to limit researcher bias, the research results could be unintentionally biased.

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### TIME AND RESOURCE LIMITATIONS

A fixed time was allotted to this major research project as a requirement for the completion of OCAD University's Master of Design, Strategic Foresight and Innovation program. With an extended timeframe, further research studies could have been conducted, including the co-creation sessions with participants. In addition, funding was a constraint when planning and executing this research project. Participants did not receive incentives for their time, and any project costs were self-funded by the graduate researcher. The research study as designed was able to be executed within the timeframe constraint, within the researcher's capacity, and within the budget available.

03.

# DISCOVER I: UNDERSTANDING HEALTHY COMMUNITY

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In this section of Phase 01: Discover, an understanding of community informed by primary and secondary research is created, outlining structural components of community, and community characteristics that inform the health of community. Communities are a determinant of the health of the larger system and of the individual, and therefore, there is an importance to preserve healthy communities amidst drivers of change, such as rapid technological advancement.

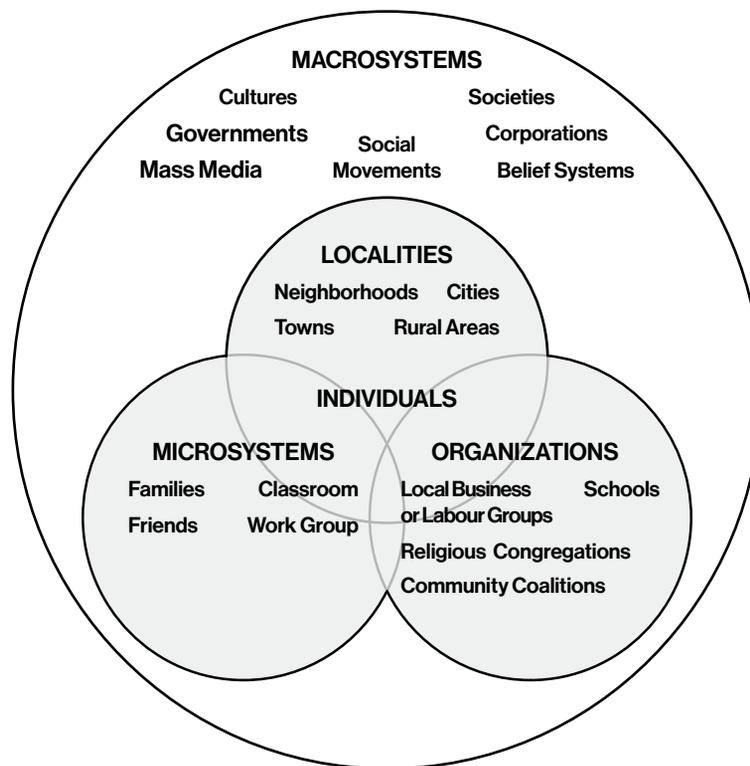
# DEVELOPING A DEFINITION FOR HEALTHY COMMUNITY

## UNDERSTANDING COMMUNITY: PERSPECTIVES FROM THE STUDY OF PSYCHOLOGY

Literature written by psychologists and community psychologists acknowledges that defining community as a concept is challenging due to its emotional nature and because community is constantly evolving (Kloos et al., 2012). Historically, community as a term has two key usages: [1] Community used to describe a geographic area where humans live, such as a settlement or region; [2] Community in reference to the relationships of humans, without needing to specify a geographic location, such as online interest-based groups, cultures, and religions (McMillan & Chavis, 1986).

In Community Psychology (Kloos et al., 2012), it is described that communities can exist at four different ecological levels: [1] Microsystems: such as a school classroom, [2] Organizations: such as a civic group, [3] Localities: such as a neighbourhood, and [4]

Macrosystems: such as a cultural community. These four levels of community are interconnected and influence one another. For instance, an individual from communities at the macrolevel is also in communities at the locality level. In modern life, individuals can belong to multiple communities, experiencing a layering of communities, and these communities may or may not have competing interests with one another (McMillan & Chavis, 1986). Community members choose to invest in and prioritize specific communities, and membership in communities may change over time as individuals evolve and as external factors influence (McMillan & Chavis, 1986). What is important to note is that, in order to understand individuals in communities and communities themselves, human diversity must be deeply understood to avoid generalizations (Kloos et al., 2012).



**Figure 3.** Illustration of levels of community from Community Psychology: Linking Individuals and Communities by Kloos et al., 2012, Wadsworth Cengage Learning. Copyright 2012, 2007 Wadsworth, Cengage Learning. Reprinted with permission.

When defining the group of people who form communities, literature specifies that there is a distinction between family members or close friends and communities. Family members and close friends are requirements of social networks and social support systems, versus a group of people in a community that could include people who do not know each other, or do not have regular contact (Hill, 1996). However, these relationships are further distinguished by a sense of personal

affection, value, and an obligation that exists between individuals in community with one another. This is a concept called “Gemeinschaft” relationships, developed by German sociologist Ferdinand Tönnies in 1887, which translates to “community.” In contrast, Gesellschaft or “society” are relationships that are more transactional, a means to an end, and do not form community (Kloos et al., 2012).

Diving deeper into the concept of community, in 1986, McMillan and Chavis developed a theory of sense of community, building on decades of previous research and responding to research gaps. The theory of sense of community focuses on the emotional response individuals have in relation with a group, defined by belonging to the group, mattering to the group, and trusting that their needs will be satisfied through the shared commitment of the group. There are four elements to sense of community: [1] membership: belonging and personal relatedness, [2] influence: a reciprocal relationship of mattering between members and

the group, [3] integration and fulfillment of needs: members' belief that needs will be met through received group resources, and [4] shared emotional connection: sharing of commitment, experiences, and time together.

Based on literature research conducted to date, and in the broadest of terms, community can be defined as a relational or geographic group of people, not inclusive of family, who share a sense of belonging (McMillan & Chavis, 1986; Kloos et al., 2012).

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## UNDERSTANDING COMMUNITY: PERSPECTIVES FROM INTERVIEW PARTICIPANTS

As literature states, community is difficult to define because of its personal nature. To create a more robust definition, interview participants were asked to explain what community means to them. Overall, interview participants provided varied definitions, and it was clear that the interpretation of community is very contextual and is based on lived experiences. It was also clear that the definition of community has evolved for these participants because of external factors, such as digital technology. This is expanded on in 04 - Discover II. One participant stated that it is limiting to define community, because if one or six thousand people self-identify as belonging to a group, who is to say what is and is not a community? A participant expressed that the traditional notion of community is bounded and narrow because it assumes a definable area.

Expanding on the idea from literature that communities are layered, multiple participants commented that there is a multiplicity to community, with one participant stating that "community" in its singular form is insufficient because within a community, there are sub-communities. Communities are never fixed, because identities are never fixed, they are ever-evolving. One participant stated that they would not be able to define what is their community as they belong to many different communities.

Participants acknowledged that there are different types and levels of community: work related, personal interest-based, geographically or culturally centred, and/or existing solely online. The idea of choice and agency to belong to, or leave, a community was mentioned multiple times. An individual may not have as much agency around the cultural or geographic community they belong to

or identify with, however, there is more control and choice regarding interest-based and relational communities. Some participants specified that they have a stronger affinity towards communities where they have higher levels of agency over membership.

Scale and proximity were concepts participants referred to when describing community. 10 unique participants shared the importance of proximity to community, using terminology such as "in person," "local," "physical environment," and "where you live." Scale of community and size of community were referenced by a quarter of participants as a factor affecting community, specifically community engagement.

Permanency and duration were identified as defining factors of community by some participants, specifying that high levels of frequency, regularity, and longevity of interaction between community members positively affects community. In contrast, another participant specified that a community can be transient, contingent, fragmentary, and a moment in time, and can still be meaningful.

Interview participants from different geographic regions and cultures responded differently to the question of the meaning of community. One participant originally from South Asia noted that their country of origin's society is inherently communal, and Canada, where they now reside, is more individualistic. Two participants from France interpreted community as negative for different reasons: one participant stated that community today is performative, with real communities being unconscious, and another responded that communities hold a negative connotation because of the silos communities create.

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## ESTABLISHING STRUCTURAL COMMUNITY COMPONENTS, AND HEALTHY CHARACTERISTICS OF COMMUNITY

Through the analysis and synthesis of literature and participant perspectives of community, four structural components and five characteristics of community were identified. These components and characteristics further expand the understanding of community, and introduce the definition of a healthy community for the purposes of this research study.

Community components that are defined as structural to a community's existence:

- **SPACE:** Community has a defined space with boundaries. This can include digital space, physical space, a mixed space (digital and physical), and/or a mindset.
- **PARTICIPATION:** Community has participants - individuals who identify as part of the community.
- **COMMUNICATION:** Community has both verbal and non-verbal (e.g., symbols) communication.
- **ORGANIZATION:** Community has leadership, established norms and standards, and governance to protect and retain a sense of control.

Community characteristics that are high impact items, influencing the health of a community for community members and society:

- **SHARED INTENT:** There are defined values, commonalities, and an identity that members are aligned with.
- **MUTUALITY:** There is reciprocity: cooperation, collaboration, and togetherness, mutual care, and members feel a sense of responsibility and accountability for actions.
- **MEANINGFUL SOCIAL TIES:** Mutually beneficial and trusting connections and relationships are established within the community and between other diverse communities.
- **TRUST AND BELONGING:** Trust is built and maintained amongst members and other actors, a sense of belonging can develop, and emotional, mental, and physical safety is provided to members.
- **OPENNESS:** The sharing of experiences and resources, including time and knowledge.

Therefore, for the purposes of this research study, healthy community is a relational or geographic group of people, not inclusive of family, that possesses characteristics of shared intent, mutuality, meaningful social ties in the community and between other communities, trust and a sense of belonging, and openness. For healthy communities to form, the structural components of space, participation, communication, and organization must exist.

While structural community components are fixed, community characteristics are variable, heavily influenced by external forces. These characteristics determine the health of a community for members and society at large. With major drivers like emerging digital technology at play, there is a need to anticipate how community characteristics may perform in possible futures to come. The characteristics are assessed in exploratory scenarios (O5 - Design and Assess) to understand possible future impacts of communities and to develop interventions in the short-, mid-, and long-term to preserve healthy communities.

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## IMPORTANCE OF PRESERVING HEALTHY COMMUNITY

An individual's sense of belonging, identified as one of Maslow's foundational needs in his 1943 Theory of Human Motivation, influences all other basic needs: physiological, safety, self-esteem and self-actualization. While Maslow does suggest a ranking for the needs - with physiological needs the first to be satisfied prior to other needs being achievable - based on literature analyzed, sense of belonging is the most foundational need (Lieberman, 2013).

Sense of belonging is a key defining factor of community. An individual influences a community and vice versa – it is an interdependent relationship. Communities are a determinant of the health of the larger system and ecology and are a determinant of individual health (Chavis & Newbrough, 1986).

While human biases may interpret the definition of community to be inherently positive, and even if the majority of the characteristics of healthy communities are present, communities can have negative effects on individuals and society. Communities can be homogenous entities, comprised of like-minded individuals who have easily found a sense of belonging because of their similarities.

These homogenous community groups can trigger and increase polarization with other groups (McMillan & Chavis, 1986; Kloos et al., 2012). It is how communities act towards other communities that must be examined; it is important to look at the wider systemic impact: does sense of belonging positively reinforce a just society? Does it contribute to the preservation or strengthening of democracy? Differences within communities can strengthen communities, and differences between communities can strengthen society, only if diversity is truly valued and accepted (Kloos et al., 2012). Therefore, a healthy community, also known as a competent community (Iscoe, 1974), is not only resilient, sustaining itself through problem solving when met with external factors, but it also enables individuals and the wider collective society to achieve its full potential (Chavis & Newbrough, 1986).

Healthy communities are vital to individuals and society due to humans' innate desire to belong (Baumeister and Leary, 1995). As external system drivers continue to change the world, such as the continuation of rapid advancements of digital technology, it is important to understand how healthy communities will be impacted and evolve to develop interventions that preserve the health of communities, and therefore, the wider society.

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**This section explored what community can mean from psychology and participants, resulting in a definition of healthy community for the purposes of this research study. The importance of healthy community for individuals and the wider society was also emphasized, highlighting the role communities can play in satisfying humans' foundational sense of belonging. With this understanding of community and its importance, the next section in Phase O1: Discover examines the impacts of external forces – specifically digital technology – on communities, and how communities are evolving as a result.**

04.

# DISCOVER II: THE EVOLUTION OF COMMUNITY DRIVEN BY EMERGING TECHNOLOGIES

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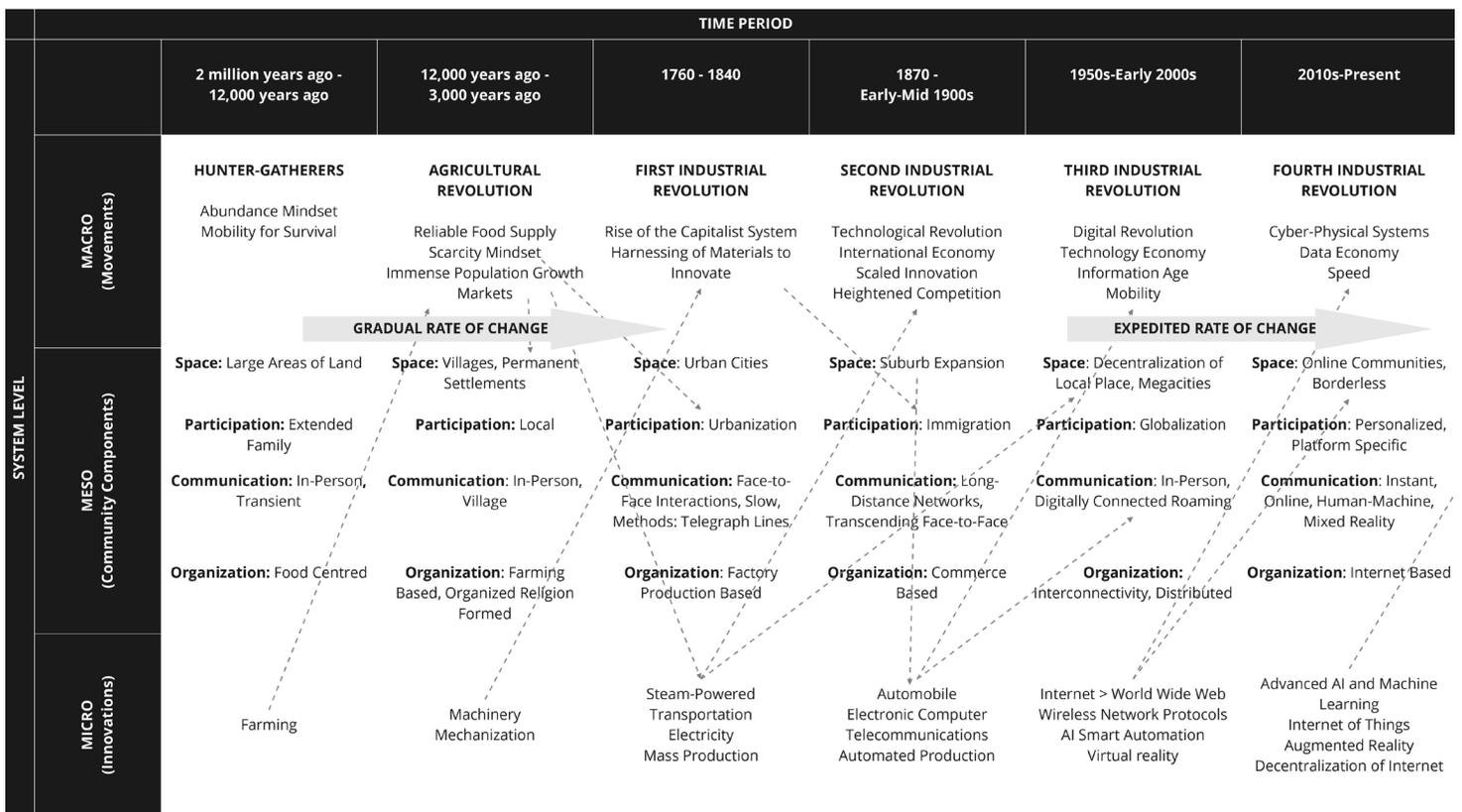
Phase 01: Discover continues in this section, focusing on community and its relationship with digital technology over time. From a socio-technological perspective, the historical evolution of community during the Hunter-Gatherers period to the Fourth Industrial Revolution is examined. This leads to an understanding of emerging digital technology today, the current system and impacts on community, and potential system disruptors attempting to mitigate unintended consequences of digital technology.

# CONTINUOUS EVOLUTION OF COMMUNITY

Community has been evolving for centuries, and it continues to evolve (Kloos et al., 2012). One of the major drivers throughout history contributing to community's evolution is technology. From the introduction of agriculture in the Neolithic period, to the mechanization of machinery in the industrial revolution, to the mass adoption of the internet in the Digital Revolution technology has been impacting the way humans socially organize and connect (Kloos et al., 2012).

To gain a holistic understanding of the evolution of community from a Western perspective, a systems lens is applied. Geels' (2005) Multi-Level Perspective (MLP) serves as the foundational tool to understand the socio-technical systems that have informed present-day community. There are three socio-technical system levels examined and mapped: macro (movements), meso

(community components), and micro (innovations). The macro level represents a slow-moving and slow-changing system environment, events, and forces. The meso level typically communicates social norms and networks that exist within the macro level, however in this adaptation of the MLP for the context of this research, the meso level communicates the structural components of community (as defined in 03 - Discover I): space, participation, communication, and organization. The micro level is composed of radical innovations occurring outside or on the fringes of the system. System transitions occur because of the relationships and interconnections between the different levels (Geels, 2005). This is illustrated in the below figure via the arrows indicating the flow of influence between the levels, which eventually transitions the macro system into its next evolution.



**Figure 4.** Multi-Level Perspective visualizing the evolution of community influenced by technology.

## MULTI-LEVEL PERSPECTIVE ANALYSIS:

### HUNTER-GATHERERS:

In the Hunter-Gatherers era, ending 12,000 years ago, the macro level consisted of mobility for survival and there was an abundance mindset – a belief that resources were sufficient for all. At the meso level, communities were formed with small groups of extended families up to 100 people, and were organized and governed by food finding strategies, with communication being

transient in nature due to movement (*Hunter-Gatherers*, 2019; *Hunter-Gatherer Culture*, 2023).

Farming and agricultural practices began to emerge at the micro level in the system, thereby shifting the system towards the Agricultural Revolution.

## AGRICULTURE REVOLUTION:

In the Agricultural Revolution, beginning around 12,000 years ago and ending around 3,000 years ago, the macro level was centred around a reliable food supply, introducing a scarcity mindset, and saw the emergence of trade and markets, and increased population growth. Permanent settlements and villages structured the space of the meso level, with participation being limited to the locality, communication in person, and

organized around agriculture (*Neolithic Revolution*, 2019; Violatti, 2018; *What Was the Neolithic Revolution?*, 2019). Organized religion and the idea of a “High God” also gained adoption to enforce cooperation (Peoples & Marlowe, 2012).

Machinery and mechanization were micro level innovations pushing the system towards further evolution.

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## FIRST INDUSTRIAL REVOLUTION:

From the mid-1700s to mid-1800s, the rise of the capitalist system dominated the macro level of the First Industrial Revolution, with the harnessing of materials such as coal, water, and steam leading to major innovations. The macro dictated the meso level’s evolution from village-based spaces to urban city-based spaces. Participants were a part of urbanization, with factory work organizing communities and leading the movement of populations into cities. Despite the introduction of new methods

of communication such as telegraph lines, these were slow and unreliable, necessitating communication to remain primarily face-to-face (*Industrial Revolution*, 2023; *Industrial Revolution and Technology*, 2022; *The History of Cities*, 2002).

The micro level technological innovations that propelled the system forward were steam-powered transportation, electricity, and the beginnings of mass production.

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## SECOND INDUSTRIAL REVOLUTION:

The Second Industrial Revolution, or the “technology revolution,” beginning in the mid-1800s and ending in the early- to mid-1900s, had a macro level composed of the international economy, scaled innovation, and heightened competition (Khan & Isreb, 2018). The meso level saw the transition from urban to suburban with automobile technology at the micro level supporting this transition (Belshaw, 2016). Participation evolved to include more immigrant populations, organized around zones dictated by

commercial purposes. Communication began transcending face-to-face interactions to include long-distance networks with telecommunication innovations developing at the micro level (*The History of Telecommunication*, n.d.).

Automated production and the electronic computer drove the system forward to the Third Industrial Revolution, the “Digital Revolution.”

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## THIRD INDUSTRIAL REVOLUTION (DIGITAL):

The Third Industrial Revolution’s macro level, from the mid-1950s to early 2000s, gave way to the technology economy, with more and more information being exchanged, and increased global mobility. At the meso level, space included the formation of megacities and sense of local place became decentralized as transportation and communication innovations evolved. Participation became globalized, and communication was now

digitally connected and roaming, organized by interconnectivity and distributed networks (Belshaw, 2016; Khan & Isreb, 2018).

At the micro system level, the Internet and World Wide Web innovations, wireless network protocols, smart automation, and virtual reality began defining the next revolution.

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## FOURTH INDUSTRIAL REVOLUTION:

The Fourth Industrial Revolution, referred to as 4RI or Industry 4.0 and beginning in the mid-2010s to today, is one of Cyber-Physical systems. The macro level consists of the data economy, and high speed is the rate of change. The meso level is formed by online and borderless spaces, personalized and platform-specific participation, instant online and human-to-machine and machine-to-machine communication, and internet-based organization, all influenced by the micro level developments of the Third Industrial Revolution (*What are Industry 4.0, the Fourth Industrial Revolution, and 4IR*, 2022; *The Fourth Industrial Revolution*, 2016).

Micro level technological advancements of AI and machine learning (ML), the augmented human and reality, the internet of things (IOT), and the decentralization of the internet are informing the next systems to come and continuing to evolve communities.

A noticeable shift at the macro level in the Fourth Industrial Revolution is the speed at which change is occurring. As illustrated in the Multi-Level Perspective, in earlier time periods change was happening and transitions were occurring, but it was gradual. Spurred by the capitalist economy, free markets, and technological advancements in the first and second industrial revolutions,

efficiency and productivity emerged, and the “faster the better” and “time is money” mindsets were adopted. Society has never had to adapt to change this rapidly before, and the effects, driven by emerging digital technology at the micro level, are widely felt.

The emerging digital technology innovations in the Fourth Industrial Revolution, which society exists within today, are key indicators to understanding and anticipating what future revolutions might be, and what each level of the socio-technical system, including communities, might become.

## EXPEDITING EVOLUTION VIA EMERGING TECHNOLOGY

### DEFINING EMERGING DIGITAL TECHNOLOGY

As indicated in the Multi-Level Perspective, the emergence of digital technology gained prominence in the Third and Fourth Industrial Revolutions with the mass adoption of the internet in the Third Revolution, and the developments of smart artificial intelligence, human-machine interaction, and pervasive data and constant connectivity in the fourth industrial revolution.

For the purposes of this research study, emerging digital technology is intentionally referred to in broad terms. This is to produce recommendations that can be applied widely and are not specifically based on the type of digital technology. The research, specifically the horizon scan, focused on two key

areas of emerging digital technology: artificial intelligence (AI) and extended reality (XR). Artificial intelligence is described as “the science and engineering of making intelligent machines, especially intelligent computer programs” (McCarthy, 2007). Extended reality, inclusive of augmented reality, mixed reality, and virtual reality, is the layering of digital technology onto the physical environment, producing new spaces where individuals can access and interact (*The Future of the Metaverse Will Be Shaped by These 3 Technologies*, 2022; BITKRAFT, 2021). These areas are identified as high influence drivers, impacting how humans interact and connect with one another, and therefore, directing the future trajectories of communities.

### IMPACTS OF EMERGING DIGITAL TECHNOLOGY

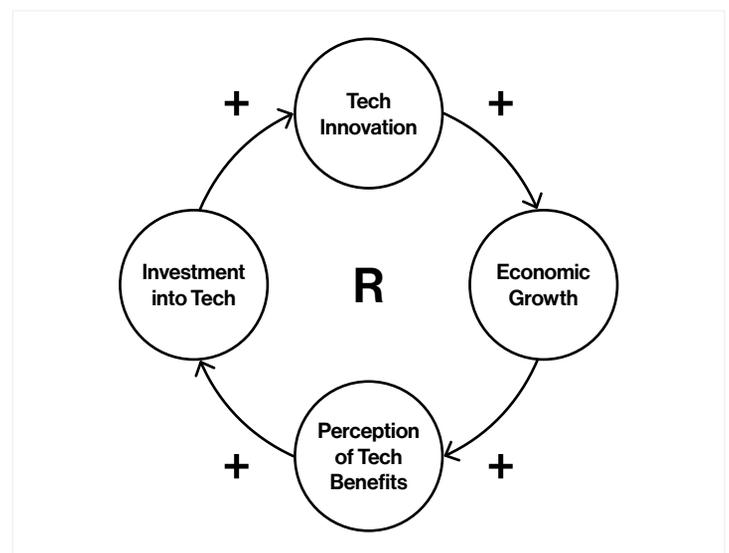
Present day, 2023, is part of the Fourth Industrial Revolution, but focus is beginning to shift to subsequent (Fifth and Six) Revolutions. The speed of technological advancement, rate of change, and rate of adoption are greater than ever, increasing the level of impact on communities. Understanding potential impacts of digital

technology is necessary to mitigate unintended consequences of emerging digital technology innovation. Consequences from past revolutions are embedded in the current revolution, including climate change, and a similar pattern may follow if awareness of impact is not considered in the possible futures to come.

## CURRENT STATE SYSTEM OF DIGITAL TECHNOLOGY

### TECH AS SAVIOUR

From worldwide adoption of the internet in the mid-1990s, to the first period of high-growth in the technology sector (“dot-com bubble”) in the late-1990s, followed by the second technology boom in the 2010s, there has been immense belief placed in technology and its potential for solving all problems that span humanity, the environment, and ecology (Lee, 2015; *A Short History of the Internet*, 2020). This is called technology solutionism (Lenhart & Owens, 2020). In large part, this stems from technology’s success driving the economy – despite periods of crashes – propelling an orthodoxy that technology can solve everything (Lesnes, 2022). Therefore, more money is invested into technology, leading to more innovation, and the perpetual growth cycle of technology innovation continues (Qureshi, 2022). This is visualized in a causal loop diagram, showcasing the reinforcing relationships between components in the digital technology system.

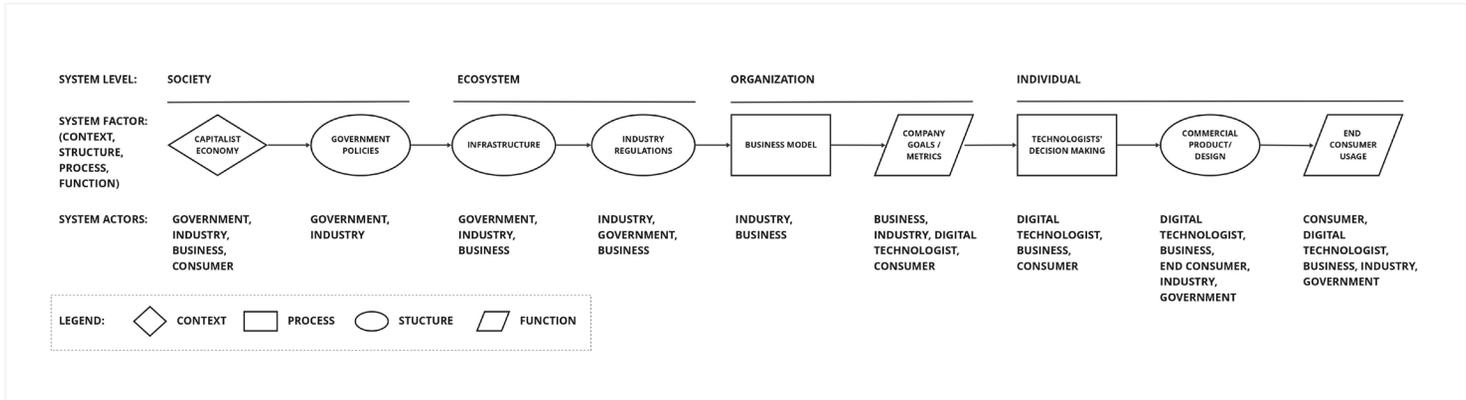


**Figure 5.** Reinforcing causal loop diagram demonstrating the current state of the digital technology system.

## SYSTEM FACTORS AND INFLUENCES

To understand the intricacies in the system and system influences, an influence map, adapted from Jones and Ael's *Design Journeys through Complex Systems* (2022), was created leveraging inputs from primary and secondary research. The influence map includes the system level – society, ecosystem, organization, and individual, – key system factors – context, process, structure, or function, leveraged from Gharajedaghi's

iterative process of inquiry (2011) – that are generating influence, and system actors participating in the influence. At each level of the system, the context, processes, structures, and functions in place have influenced the current state of digital technology. This map is meant to illustrate the flow of influence and highlight the deeply interconnected and nested nature of the digital technology system.



**Figure 6.** Illustration of systems factors and influences within the digital technology sector.

## UNDERSTANDING THE CURRENT STATE OF SYSTEM FACTORS

**CAPITALIST ECONOMY:** The current capitalist economy propels ideals of perpetual growth, thriving in a state of freedom, and rewards efficiency and productivity (Weinstein, et al., 2021).

**GOVERNMENT POLICIES:** Government policies and regulations are lacking or slow to implement in the digital technology industry. There can be reluctance to intervene with growth as digital technology leads innovation, therefore contributing to economic growth (Weinstein, et al., 2021). In addition, the speed at which the government operates cannot keep pace with rapid technological advancements, limiting the policies in place pertaining to how digital technology is built, and how digital technology is used.

**INFRASTRUCTURE:** Hardware to access the internet and wireless networking either enables or hinders digital technology growth. Investment in infrastructure by Government has historically been prioritized for areas of high growth potential and high contribution to the capitalist economy, and lacks in more rural areas with marginalized communities (2022 Tech Trends Report, 2022).

**INDUSTRY REGULATIONS:** Some companies in the technology industry have adopted self-regulation approaches in lieu of robust policies and regulations provided by the government (Quest & Charrie, 2019). However, self-regulation is influenced by companies' business models, heightening risks of bias in the regulations enacted and followed if business models centre around profit and data (Farthing & Sooriyakumaran, 2021). Industry regulation in its current state is fragmented, and siloed, without enforceable standards and guidelines for oversight of industry activity (PricewaterhouseCoopers, 2019).

**BUSINESS MODEL:** Profit-driven business models are outputs of both the capitalist economy and government which measures Gross Domestic Product (money) as success. As in most for-profit industries, there is a focus on generating revenue from consumers. In the digital technology sector, there is a strong focus on monetizing consumers' attention and engagement (data) when using a product (Lenhart & Owens, 2020).

**COMPANY GOALS/METRICS:** Adhering to business models derived from the capitalist economy and Government policies, companies' goals and metrics are tied to profitability. Goals and metrics are focused on short-term gains, including scaling, and target consumer groups with the highest probability of monetization (Weinstein, et al., 2021).

**TECHNOLOGISTS' DECISION MAKING:** Performance is measured by the ability to achieve goals and metrics determined by the company, influencing the decisions technologists make. A focus on increasing individual consumer engagement drives designs, in addition to optimization (Lenhart & Owens, 2020; Weinstein, et al., 2021).

**COMMERCIAL PRODUCT:** A structure of the system is a digital technology product that has been designed and optimized for individual consumer attention and engagement (Weinstein, et al., 2021).

**END CONSUMER:** Consumers are incentivized to engage with a digital product via personalized and individualized experiences in exchange for their personal data. Data collection and a push for

engagement are outcomes of technologists' decision making, informed by company goals, driven by the business model, and influenced by the government and capitalist economy (Weinstein, et al., 2021). With limited regulations, consumers have the freedom to use and misuse digital technology to generate harm in society.

The current digital technology system design, while enabling innovation at an expedited rate of change and contributing

to geopolitical power and economic growth, produces social externalities and unintended consequences, impacting individuals and communities. A tradeoff of values is occurring, with different actors and factors of the system determining the values that should be included or excluded from the commercial product used and consumed by humans. The values that are compromised are often those that contribute to social cohesion and wellbeing, therefore impacting individuals and the collective (Weinstein, et al., 2021).

## HOW DIGITAL TECHNOLOGY IS IMPACTING COMMUNITY

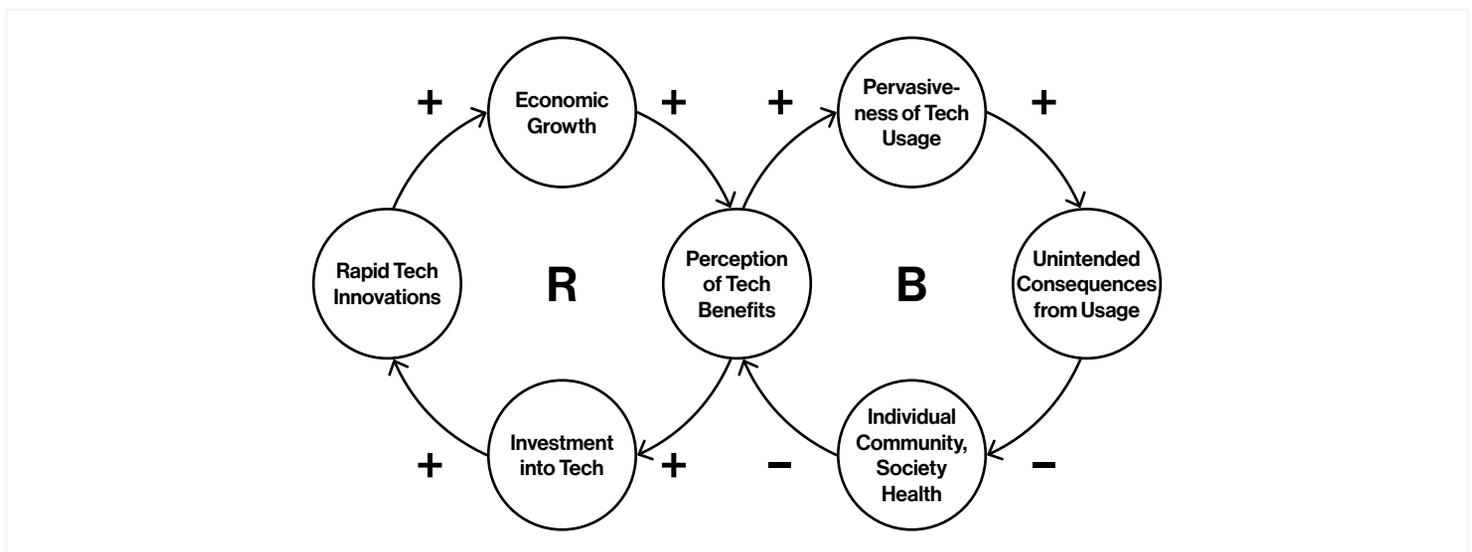
### UNINTENDED CONSEQUENCES AND EXTERNALITIES

The positive impacts of digital technology are widely found in public discourse. Digital technology has enabled social connection between humans at a global level (Lingel, 2017). It has enabled marginalized individuals to feel a sense of belonging online, when physical communities fail them (Russell, 2020).

However, as digital technology continues its rapid advancement, its unintended consequences and externalities – the costs and benefits of the digital technology industry's activity – are becoming more apparent and harder to ignore. Social fragmentation is spurred by a growing digital divide – a gap in digital literacy and/or infrastructure to access digital technology – and increasing rates of loneliness and isolation driven by an over-connected world (Jenkins, 2022; Overcoming Digital Divides, 2021; Eisen & Emes, 2022). Fragmentation puts vulnerable populations at risk of being disenfranchised in a digital-first world. Increasing social polarization is fueled by pervasive misinformation and disinformation spread on digital technology, capable of generating echo chambers and groupthink mentality, and heightening risks of extremist group formation. Polarization is necessary to exist in a democratic society, however, increased and extreme polarization can fracture the social contracts that exist for society to function

(World Economic Forum, 2023a; Efus, 2021). A society that is fragmented and polarized destabilizes trust amongst citizens, institutions, and governments, and erodes social cohesion, impacting societal, community, and individual health (World Economic Forum, 2023a).

This is visualized in the Limits to Growth system archetype, whereby the reinforcing loop of Tech as Saviour orthodoxy [labelled R below] is balanced by the impacts of the unintended consequences of digital technology without intervention in the balancing loop [labelled B below]. A positive perception of digital technology's benefits can increase the usage of digital technology. This can lead to an increase in the potential for unintended consequences from usage to occur – such as social polarization and fragmentation – therefore, heightening the negative risk of impacts to individuals, communities, and overall societal health. With an awareness and/or acknowledgement of impacts to societal health of certain technology, the perception of technology benefits may decrease. Interventions to protect society against unintended consequences of technology, while also supporting technology innovation and the benefits it offers society should be explored.



**Figure 7.** Causal loop diagram of the Limits to Growth archetype including a reinforcing loop and balancing loop depicting the unintended consequences of digital technology.

A more in-depth analysis of emerging trends at the intersection of digital technology and community, and the implications for healthy communities, can be found in the horizon scan in 05 - Design and Assess.

System factors and system actors at every level in the system have participated in facilitating the current state of digital

technology through decisions made in the design, development, and public access of digital technology. Responsibility and accountability at all levels in the system must be taken to change the trajectory of the effects of digital technology, disrupting the status quo and transitioning to a new way of governing digital technology, designing digital technology, and interacting with digital technology (Weinstein, et al., 2021).

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## PARTICIPANT INSIGHTS

Interview participants acknowledged the positive benefits of digital technology, such as creating awareness of communities in physical locations and helping to foster individual connections. However, patterns derived from primary research highlight the value trade-offs made by various levels in the digital technology system, impacting community.

### **“Community” has lost its meaning:**

- The meaning of “community” has been usurped by digital technology via the proliferation of social media networks. Community is now a business model, and humans are consumers of community, instead of owners – accountability is missing. Owners are empowered to take responsibility; consumers take without care, and repeat – a pattern driving towards loss of social capital and cohesion.

### **Technology increases connection but not social cohesion:**

- While it was acknowledged that technology increases connection, and can enable and scale community, it does not create social cohesion. Many participants stated that digital technology has created an isolating and individualistic experience. Engagement has changed in an online environment, with less obligation or commitment to participate actively and consistently, when compared to engaging within a physically based community.

### **Remove the relational, improve the transactional:**

- Digital technology has resulted in increased efficiency and productivity, but in turn, social interactions have become primarily transactional, removing the joy, playfulness, and relational being that is experienced in physical face-to-face interactions.

### **Disrupting physical communities:**

- Most participants stated that digital communities cannot achieve the same benefits that physical communities can, such

as creating safe spaces, and satisfying the human need for physical contact. Health is impacted by physical community, and digital technology is impacting physical community, therefore impacting health. Neighbourhood connections are decaying or never formed, and people are not greeting one another in the streets.

### **Decreased trust:**

- Digital technology has increased the speed at which everything moves, and that in turn, has impacted the ability to build and maintain trust, as trust takes time to develop.
- When designing digital technology, the lack of trust that exists among historically marginalized populations, such as Indigenous communities, is rarely considered, resulting in features of products and/or whole products themselves perpetuating that distrust.

### **Impacted inclusivity and power:**

- Digital technology is being used in ways it originally was not intended for, including to disrupt existing systems of oppression. Even so, digital technology is not wholly inclusive of historically marginalized communities, or older populations, and digital technology as it is designed today is not flexible enough to meet the multiplicity and multi-faceted identities of humans.
- If infrastructure to support digital technology is non-existent, such as wireless networks, some communities cannot exist online, as was the experience of one participant when a physical community shifted online during the COVID-19 pandemic.
- Communities may lack agency, power, and control over the digital technology that impacts them.

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## ACKNOWLEDGING A NEED FOR CHANGE

Participants interviewed working in the digital technology field provided insight into the current state of the design process. Participants shared that an awareness of design implications is necessary, but not always realized, especially by those participants not working in the responsible technology or public interest technology fields.

Two participants called attention to the negative impacts of widely accepted and practiced design methodologies, such as human-

centred design and community consultation. Although positive development has come, and can increase from leveraging those types of methodologies, corporations have coopted them to meet profit-driven goals, such as solely designing for identified “power users” with high monetization probability and excluding marginalized populations.

Participants stated that when designing digital technology, traditionally, the focus is on individual needs, pain points, or

goals, and the larger community is not actively considered in the process. If impacts on the wider community are considered, it occurs at higher hierarchical levels within organizations, and not by the technologists designing, developing, and releasing the technology. Interestingly, four participants had educational backgrounds in architecture, and among these participants, it was stated that the collective and individual are both considered when designing, but there were contrasting points of view regarding the order of hierarchy: are individual or collective needs higher priority? Designing architecture requires understanding how the project impacts the public space surrounding it (a physical building, structure, public park, etc.). How that is applied can be debated but was out of scope for this research study. Based on the patterns identified from participant data, there are parallels between digital technology and building for the built environment, but digital technology can lack an awareness of, and consideration for, the larger community collective.

Barriers to designing differently were also discussed in detail, with a large portion of participants stating that the current economic

system, which prioritizes shareholder value, rewards profit as the bottom line, and promotes individualism and competition, is a barrier to change. The “time is money” mindset prevents the slowing down of the design process, impacting the emergence of co-design and co-ownership ways of working with communities and the building of trust, both requiring more time investment. A participant said that technology must “move at the speed of trust,” which can be attributed to adrienne maree brown’s *Emergent Strategy* (2017). A digital technologist shared that working in digital technology is exciting because of the speed of change, however, that speed is also a barrier due to the ever-evolving tools and knowledge in the space; it is challenging to constantly be in a state of adaption.

One participant shared that working in the transition space, attempting to shift the current digital technology system, is emotionally taxing and unsustainable for one individual actor. Replicable tools, scalable processes, commercial case studies that demonstrate impact, and networks of actors are needed to build resilience, power, and change.

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## CHANGING THE SYSTEM

### POTENTIAL SYSTEM DISRUPTORS

There are actors in the system challenging the status quo of the implications of digital technology. Emerging fields of public interest technology, responsible technology, Values Sensitive Design, and design justice, are working to bring awareness to the unintended consequences of digital technology and chart new paths forward, aiming to shift the system. A growing number of technology companies, non-profit technology organizations, and entrepreneurs are also actively working in this transition space. In addition, there is a growing urgency and demand from all levels of the system for stricter digital technology governance and industry regulations.

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### EMERGING ETHICAL PLAYERS IN DIGITAL TECHNOLOGY

Public interest technology focuses on ensuring technology is made ethically for the public good, modeled after the field of public interest law. This includes intentionally centering, understanding, and designing for the lived experiences of traditionally marginalized communities (*Public Interest Technology and Its Origins*, 2022). Responsible technology prioritizes understanding and considering “...values, unintended consequences, and negative impacts of technology” and aims to reduce risks to all communities that may be impacted by the technology (*The State of Responsible Technology*, 2023). Values Sensitive Design theory explores the relationship humans have with technology and provides an approach to designing technology that considers moral values, and values related to justice and human welfare throughout the design process (Friedman, et al. 2006; Friedman & Hendry, 2019).

Design justice practitioners advocate for design that extends beyond the traditionally targeted “power users” who have

historically been populations of privilege and challenges the concept of a “universal user.” There is a need to understand who is left out or ignored in the design process - intentionally or unintentionally - and why, who is impacted and why, who benefits and why, and how to actively bring marginalized communities into the forefront, redistributing power (Costanza-Chock, 2020). Design justice also emphasizes the need to bring communities into the design process. Presently, community consultations and community participatory design occur, but it can lead to extractive practices and community appropriation if those communities lack agency and power over the process and the digital technology produced. Design justice proposes a new community ownership model of partnership, accountability, and control (Costanza-Chock, 2020).

In this research study, three participants interviewed have founded, or are employed by, companies that offer digital products

and/or services that actively attempt to change the approach to designing and building digital technologies. One participant shared that design principles are embedded into the company's business strategy, providing direction for how company decisions are made, and how the digital product is built. The intention of the design principles is to protect the communities that use the digital product. Another participant shared how the organization where

they are employed partners with communities to co-design digital spaces, redistributing power from digital technology companies to communities. Finally, the importance of educating stakeholders about the different approaches strategically being taken to designing digital technology, and why, is vital to building a shared understanding that helps disrupt the current state.

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## GOVERNMENT POLICIES AND TECHNOLOGY COMPANY REGULATIONS

Rapid advancement of emerging technologies, such as artificial intelligence and extended reality, are putting pressure on governments to intervene and establish global governing rules and regulations, with consumers of the technology, in addition to disruptive design actors, calling attention to heightened risks. Governing bodies are beginning to act, with the most recent example being that of the European Commission's Artificial Intelligence Act outlining rules and risk levels of the technology impacting the fundamental human rights of citizens (European Commission, 2021; *The EU's Artificial Intelligence Act, Explained*, 2023). Able to move faster than governments, organizations across private, civil, and multi-stakeholder sectors are establishing and adopting self-regulation models. A report published in 2020 mapped 37 principled approaches to AI governance creating more ethical and rights-based technology and therefore limiting the risk of unintended consequences (Fjeld et al., 2020).

The rise in emerging players aiming to disrupt the current digital technology system, and demand for increased governance and regulations, are indicators that a system shift may be underway. There are opportunities at every level to influence the trajectory of the system state (Meadows, 1999), potentially lessening the unintended consequences caused by digital technology. As communities are vital to humans' innate need to belong, ultimately impacting individual and societal health, the risks of rapidly advancing digital technology on communities are heightened and should be understood and mitigated. This is a systemic problem, and singular solutions at one level in the system may not create lasting change. Interventions developed must be designed to support a transition state, from the current digital technology paradigm to a new paradigm that considers the impacts of community when designing.

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**This section aimed to understand emerging digital technology and its current system state, explored how community is evolving driven by emerging digital technology, and introduced possible system disruptors, informed by primary and secondary research, to transition to a new paradigm. The next section explores what futures scenarios may be in 2043 considering emerging trends and signals, and how that will impact healthy communities.**

05.

# DESIGN AND ASSESS: EXPLORING POSSIBLE FUTURES OF HEALTHY COMMUNITIES

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This section includes Phase 02: Design, and Phase 03: Assess, of the project methodology. High impact emerging trends at the intersection of digital technology and community set the foundation for four exploratory future scenarios of healthy communities in the year 2043. A community characteristics health assessment in each future scenario is conducted identifying key opportunity areas for intervention to preserve healthy communities.

# OVERVIEW

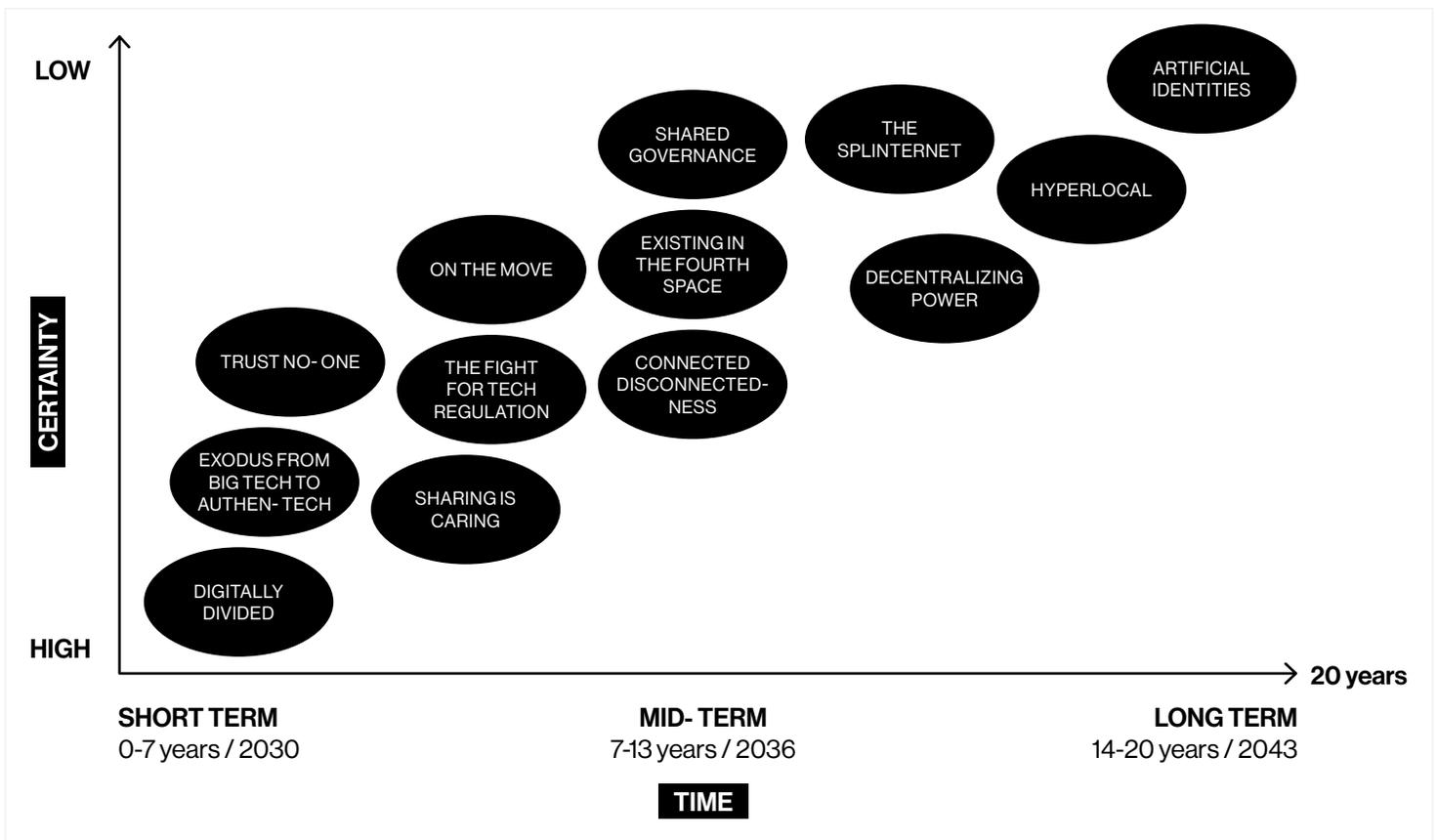
Investigating the current system state of digital technology, its impacts on community, and identifying possible leverage points for change set the foundation to begin exploring the possible futures of community, following the historical pattern of consistent community evolution. While predicting the future is an impossible task, foresight methods were employed to extrapolate identified trends and drivers in the spaces of emerging digital technology and community to inform possible futures of healthy community in 2043.

Anticipating a wide range of possible futures was an identified gap in the initial literature review. So often with digital technology, a utopian or dystopian future scenario is built, and a desired future is selected as a guiding force for supportive or mitigative strategies. Instead, because of the speed of change that is occurring due to digital technological advancements, four exploratory futures have been intentionally created leveraging Jim Dator's Four Generic Images of the Future.

# HORIZON SCAN

A horizon scan was conducted to identify weak signals of change in the current landscape that could possibly become dominant in the future. Trends were then developed by affinity diagramming the weak signals, and the STEEP+V framework was used to structure a holistic scan across Society, Technology,

Environment, Economy, Politics, and Values areas that could influence the futures of digital technology and community spaces. The trends are mapped by level of certainty and time to ensure there is enough data to build scenarios in the selected timeframe.



**Figure 8.** Illustration of trends from the horizon scan plotted on a graph from high to low certainty on the Y axis, and a short-term to long-term timeline – on the X axis.

There were 13 trends identified that could impact the futures of communities. This is not an exhaustive inventory of trends in the spaces of digital technology and communities – many more were identified – however, these trends were prioritized based on the potential for high impact and influence. The trends

include a summary, as well as implications for community, and possible extrapolations of the trend given the timeline of 2043. A selection of weak signals that informed the trends are included in Appendix B.

## DIGITALLY DIVIDED

Unequal access to digital literacy and/or infrastructure necessary to support digital technology (hardware and wireless networks) has created a divide between social groups determined by economic status, geography, age, and historic systemic oppression (United Nations, 2016; *State of Digital Inequity Report*, 2023). In 2016, access to the internet was deemed a human right by the United Nations (United Nations, 2016), yet it is projected that the majority of the global population (90%) will not have access until 2050 (Sample, 2019). Amidst rapid advancement of digital technology, the digital divide is growing, with more vulnerable populations, such as the aging population, at risk of being left behind in a digital-first world (*Overcoming Digital Divides*, 2021; Eisen & Emes, 2022).

**IMPLICATIONS FOR COMMUNITY:** There is an economic incentive to close the digital divide gap, as there is a direct correlation between the digital divide and income inequality. Having more people in society contributing to the economy will grow the

economy (Ochillo, 2022). As the world continues its digital-first path, there is a real risk of communities on the fringes of society being completely excluded and erased in digital technology spaces (Costanza-Chock, 2020), as was seen during the recent global pandemic when communities pivoted online, resulting in high levels of social isolation and loneliness (Sweet, 2020).

**EXTRAPOLATIONS:** An increasing digital divide could lead to digital classism and generational digital wealth, perpetuating the cycle of unequal access. Entire populations of communities may be negatively affected by the digital divide, and may be erased in online environments, impacting erasure in the physical environment. In response to a digital-first world, some people may intentionally extract themselves from the digital economy and spaces, intentionally participating in the digital divide and growing the divide even further.

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## CONNECTED DISCONNECTEDNESS

In a world that has never been more connected, the feeling of disconnectedness continues to rise, with 1 in 10 Canadians having experienced loneliness, stating they are often or are always lonely (Government of Canada, 2021a) and approximately 33% of adults globally reporting loneliness (Statista, 2022). Mental health issues related to loneliness and isolation are increasing, putting a strain on resources and the economy (Kelland, 2018). This has been triggered by the COVID-19 pandemic which increased social reclusion (United Nations, 2022; The Japan Times, 2023) and the rising cost of living (World Economic Forum, 2023a) which forces people, often elderly, to stay home and alone (Stephenson, 2022). Fueled by digital technology, Generation Z has been deemed the loneliness generation because of constant overstimulation and online presence resulting in less time for physical human connection (Jenkins, 2022).

**IMPLICATIONS FOR COMMUNITY:** The increase in disconnectedness and isolation may result in the lack of

development of social skills and mass behaviour change, altering how humans interact with each other. Participation is a structural community component as defined by this research study, and this trend could result in decreased participation, therefore compromising the existence of communities. The economy may also suffer due to impacts of increased mental health issues, such as strains on social services and resources (Kelland, 2018).

**EXTRAPOLATIONS:** To capitalize on increasing mental health issues, wellness and technology industries may explore alternative forms of wellness treatments, including coopting "community" as a treatment, resulting in immense growth for the industry. Technology addiction may be recognized as a disease, heightening government regulations and protections, and sparking an exodus from digital technology. Relationships may blossom between human and machine, in lieu of human social contact, and entire generations may be lost by staying inside without any face-to-face interactions with other people.

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## HYPERLOCAL

A shift to a local-first mindset occurs where smaller communities become self-sufficient, no longer relying on national and international supply chains that were continuously disrupted by the COVID-19 pandemic and increasing natural disasters caused by climate change (*Supply Chain Issues?*, 2022). Local agriculture, production, and economic systems advance helping limit reliance on external players ("Local Food," n.d.). In addition, neighbourhoods are redesigned to optimize proximity to support health and wellbeing and limit negative contributions to climate change via commuting (Sibbald, 2022), and socializing is prescribed as healthcare treatments (Nowak & Mulligan, 2021).

**IMPLICATIONS FOR COMMUNITY:** Wealth and resources, including infrastructure, across hyper-localities may not be

equally distributed, causing new inequities to form, especially in more suburban and rural areas where infrastructure may already be lacking. Cities are said to be a major influence to combating climate change and with a focus on local, real change may happen, creating resilient, climate-ready communities.

**EXTRAPOLATIONS:** Intense competition between hyper-localities can arise, creating silos, but cooperation flourishes within localities. Each community develops its own governance model, ideologies, and identity. Community waitlists form for preferred municipalities creating housing shortages, and dead zones and abandoned communities emerge.

## EXODUS FROM BIG TECH TO AUTHEN-TECH

Due to growing distrust with Big Tech (Alphabet, Apple, Amazon, Meta, Microsoft) and exhaustion from the online performative nature of social media, people are choosing to leave Big Tech platforms in favour of alternative means of connection and community. People gravitate towards smaller communities that foster a sense of belonging built around niche interests on decentralized platforms powered by emerging digital technology (*Accenture Life Trends 2023, 2023*). Online, the influencing culture is replaced with authenticity, people are choosing to prioritize protecting identities versus oversharing (Pauly, 2023; *Trends 2023: Collide, Connect, Care, 2023*), and there is a nascent luddite movement of smartphone technology being replaced with simpler flip phones to protect mental health that has been damaged by Big Tech (Maruf, 2023).

**IMPLICATIONS FOR COMMUNITY:** With a rise in diverse niche communities and smaller-sized communities, there is a higher risk

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## ARTIFICIAL IDENTITIES

As artificial intelligence continues advancing in sophistication, the line between human identity and digital technology becomes blurred whereby complete artificial identities emerge. Digital selves begin to operate independently from physical selves (Ngayi, 2023; *Human Digital Twins, n.d.*), and the concept of digital afterlives is introduced, as digital data exists beyond the human body and mind (Robitzski, 2018; Johnson, 2020; Sauer, 2022).

**IMPLICATIONS FOR COMMUNITY:** Artificial identities may create more efficiencies, allowing humans to complete the necessary transactional tasks online with a digital identity, while creating time and space to participate in geographic and relational communities. Community trust and belonging may

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## EXISTING IN THE FOURTH PLACE

The continuous evolution of the internet has spurred momentum around virtual and augmented spaces, and proliferation of access to tools that bring these spaces to life grows (Gurman, 2023). During the COVID-19 pandemic, the shift to online was drastic, and the amount of time spent online increased (Government of Canada, 2021b). The virtual world now offers nearly all aspects of the physical world – seemingly intangibles like scent and touch (*Tech Trends 2023, 2022*), digital fashion (Maddowell & Schulz, 2023; Zwięglinska, 2023), real estate (Cyr, 2022), V-commerce (Wiggers, 2023), and wellness retreats led by VR shamans (Vogl, 2016) – blurring the lines between the two. The fourth place is born, a virtual place, transcending the first place: home, the second place: office, and the third place: coffee shop as defined by Ray Oldenburg in *The Great Good Place* (Oldenburg, 1989).

**IMPLICATIONS FOR COMMUNITY:** While virtual reality is becoming more accessible and inches closer to mass adoption,

of silos developing and the formation of echo chambers, affecting the open dialogue necessary for a strong democracy. Brands and companies recognize the shift of humans searching for a sense of belonging in alternate online spaces away from social media and capitalize on it, developing a community-as-a-service model. This community-first, product-later approach to business engages active participation from members to build product offerings (*Accenture Life Trends 2023, 2023*).

**EXTRAPOLATIONS:** A fragmented and divided cyberspace with isolated dialogue between niche communities may arise, but a sense of belonging may increase globally. In person, physical communities strengthen with an analog technology movement that counters Big Tech dominance. Big Tech may collapse and along with it, data spills from abandoned storage centres flood the internet, and an international cybersecurity threat may unfold.

decline by the rise of deepfakes leading to copied or stolen digital identities, and confusion around content on the internet produced by human vs. machine.

**EXTRAPOLATIONS:** Disclaimer messages are now included on content shared online to discern between human and machine. Marginalized communities are exploited via artificial identities as avatars owned by white men, and multiple identities lead to distrust, catfishing, and deepfakes. Consciousnesses can be publicly shared and massive life changing science and medical breakthroughs made possible via the collectiveness of minds. Humans are pronounced dead once their digital data is taken offline, not when their physical body fails.

it is still restrictive to those impacted by the digital divide, potentially creating homogenous virtual communities. With more people spending time online, this impacts the physical world, including limiting participation in local geographic communities, causing community support to suffer. Tension and psychological ramifications could be created between virtual identities that do not match physical identities.

**EXTRAPOLATIONS:** “Staying in” may take on a new meaning, with people favouring being their digital selves over leaving home, wearing digital clothing, and living in digital homes. The physical environment may heal with the rewilding of green spaces due to lack of outside activity, and digital fashion may replace the physical fashion industry, one of the biggest contributors to climate change. Intangibles in the physical world may become lost, like an old language, including shared meals and scent memories.

## ON THE MOVE

Environmental and economic changes are driving people to leave their geographic areas and homes, voluntarily and involuntarily, resulting in increased movement of populations. The COVID-19 pandemic has shifted the way work is conducted, with companies adopting a digital-first model of Work From Anywhere (WFA) (2022 *Tech Trends Report*, 2022; *Tech Trends* 2023, 2022). Climate change is continuing to wreak havoc on the environment with natural disasters increasing in frequency and intensity (2022 *Tech Trends Report*, 2022; World Economic Forum, 2023a), and to combat an aging population and to ensure a stable workforce, immigration rates are increasing (Government of Canada, 2022; Government of Canada, 2023a).

**IMPLICATIONS FOR COMMUNITY:** Existing physical communities may be flooded with mass immigration, spurring the need for more housing and resulting in the demolition of protected green spaces for real estate development. Tension

may develop between community impermanence and instability due to constant movement of people, and the need for connection, support, and care during dire times of climate change. A growing divide between who can move and who cannot move will become apparent, with the majority of white-collar workers having the flexibility to move (2022 *Tech Trends Report*, 2023).

**EXTRAPOLATIONS:** Dead zones may emerge from geographic regions that have been abandoned by those on the move. Small rural communities may be overtaken by Work From Anywhere workers, resulting in home prices rising, and displacement of local populations. Digital space may become the only available space that remains in some communities; existing and building connections in the physical is nearly impossible in a world of finite resources.

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## SHARING IS CARING

Operating in the current capitalist economic system is becoming more challenging for many people across many social groups. Astronomical cost of living, paired with a growing population, erosion of mental health, and limited resources is demanding a new economic model, one that prioritizes sharing of resources. The sharing economy is not a new phenomenon, going back to time immemorial with Indigenous economic practices (Hilton, 2021). Now new ways of sharing are gaining traction, including co-ownership of property (Middleton, 2023), cohousing (Novotney, 2019; McCord, 2021), and fractional investments and community fundraising powered by digital technologies (Simerman, 2020; Best, et al., 2023; Smallchange, n.d.). There is a return to a collective approach in order to withstand and adapt to the immense changes occurring in society.

**IMPLICATIONS FOR COMMUNITY:** The sharing economy may create access points into the economic system for people who

may traditionally not have been able to participate in investing, building trust and belonging and mutuality in and between communities. The aging population strain on the economy may be relieved by including multi-generational households in co-investment and living opportunities, creating more diverse communities. The sharing model may transform the Western economy from individualistic to collective, which could have ramifications on perceived freedom for individuals.

**EXTRAPOLATIONS:** With a new sharing economy model created, the dollar may decrease in worth and be replaced by alternative forms of values. The co-operative model could have a strong resurgence, with its evolution being Decentralized Autonomous Organizations (DAOs) powered by blockchain technologies. Community resilience grows and a community of care is built, with care labour being properly recognized and compensated.

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## SHARED GOVERNANCE

With reconciliation and climate change as major drivers, the Western world is turning to Indigenous populations, their leaders, and values and practices to establish a way forward for the future that is inclusive of Indigenous worldviews. Through shared governance (David Suzuki Foundation, 2023), the climate crisis could be addressed with Indigenous land stewardship which has kept one-third of the Earth in good or fair ecological condition (World Economic Forum, 2023b), and the capitalist economy would evolve from a model of perpetual growth to one that is inclusive and supportive of Indigenous economic contributions (Hilton, 2021; Indigenomics Institute, n.d.).

**IMPLICATIONS FOR COMMUNITY:** There is a huge opportunity for society, including the economy and communities, to become

more resilient in the future with the inclusion and equality of Indigenous peoples, however, major infrastructure investment is required to ensure the closing of the digital divide, especially for Indigenous youth (Shrumm, et al., 2021). Nature may become a stakeholder, recognized by Western society, with Indigenous-led climate action, therefore stabilizing the effects of climate change, and in turn, communities and the wider economy.

**EXTRAPOLATIONS:** A paradigm shift may occur whereby the Western perspective and Indigenous perspective co-exist and are in partnership. The fear of assimilation and appropriation of Indigenous practices may be mitigated by enacting a shared governance model between Western and Indigenous leaders.

## THE FIGHT FOR TECH REGULATION

Growing concerns of the spread of disinformation and misinformation on Big Technology platforms, and the rapid advancements of – and ease of access to – Artificial Intelligence technologies, are increasing demand for digital technology governing laws, rules, and regulations. Citizens, the digital technology companies themselves, and industry advocacy groups are calling for guardrails to be developed to protect society from intentional or unintentional harm caused by digital technology tools and usage (McNamee, 2020; Wadhwa & Wadhwa, 2021; “Pause Giant AI Experiments,” 2023). The European Union released its Artificial Intelligence Act in March 2023 (European Commission, 2021; *The EU’s Artificial Intelligence Act, Explained*, 2023), and Italy placed a temporary ban on ChatGPT due to ethical data collection concerns (Thomas Reuters, 2023).

**IMPLICATIONS FOR COMMUNITY:** The extent of the impacts of emerging digital technology are not fully known or understood;

technology regulation can potentially control or limit negative impacts such as biases against marginalized and racialized communities. Technology regulation may also slow down innovation, impacting the competitiveness of the economy, science and research developments, and geopolitical strength against international powers.

**EXTRAPOLATIONS:** A global tech regulation body may be enacted to monitor activities and ethics of governments and companies, similar to the United Nations or the Intergovernmental Panel on Climate Change (IPCC). However, tech regulation may be implemented too late, and the impacts of digital technology only become apparent decades later, similar to the pattern of climate change.

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## THE SPLINTERNET

The Splinternet shifts the open, global internet to a more fragmented and closed internet, driven by political, geographical, economic, or interest motivations. This could look like blocking, censoring, or restricting access to content and connection such as China’s Great Firewall (Bloomberg News, 2018) and Russia’s Sovereign Internet (Stokel-Walker, 2022), internet shutdowns (Vincent, 2021; Cheng, et al., 2023), and/or one-sided ideological rhetoric (Fletcher, et al., 2022). The UN has declared that access to the internet is a human right. The Splinternet, especially in the context of government shutdowns, infringes on that human right (United Nations, 2016).

**IMPLICATIONS FOR COMMUNITY:** The Splinternet results in polarization, social division and fragmentation caused by confirmation bias in personalization algorithms implemented by Big Tech social platforms (Seneca, 2020). This may negatively impact the creation of meaningful social ties, spurring extremist

communities that are harmful to society. The digital divide widens with unequal access to the internet based on geography, backsliding on globalization. Internet shutdowns have significant impacts on communication in communities, and on economies, costing hundreds of millions to billions of dollars (Cheng, et al., 2023).

**EXTRAPOLATIONS:** The weaponization of the internet becomes the go-to weapon of war for governments. Governments use the Splinternet to protect against cybersecurity attacks and carbon emission control for climate change action, conducting regular blackout periods. The internet may become more fragmented with communities establishing their own iterations of the internet, blocking information from other community internets. The internet may become individualized and unique for each person using it, catered to personal preferences and interests driven by harvested data-powered algorithms.

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## DECENTRALIZING POWER

Power and control are transferred from one dominant body and dispersed across networks of actors and entities, employing community-driven practices of equal authority, countering a top-down approach (United Nations, 1996). Decentralization is emerging as an alternative approach to historically centralized political governance with increasing empowerment of local governance (*The Future of Local Government*, 2021; *Cities, local and regional governments and human rights*, n.d.). Hierarchical organizational structures are being disrupted with Decentralized Autonomous Organizations (DAOs); a democratic member-owned organization powered by blockchain (World Economic Forum, 2022). Digital infrastructure, such as WiFi networks, are decentralizing via community-owned internet provider services (DiBenedetto, 2021; Knight, 2021).

**IMPLICATIONS FOR COMMUNITY:** Loss of trust of centralized bodies may grow, resulting in the dissolving or fracturing of

traditional hierarchical structures. Cooperation strengthens in communities, supporting citizen health and wellbeing, however, silos are created between smaller organizations and communities, leading to heightened competition.

**EXTRAPOLATION:** Geographic borders may be redrawn at smaller scales, and cities and communities may become recognized as independent nations (Stucki & Tran, n.d.; Big Think, 2023). Traditionally marginalized communities under a new decentralized power model may become an equal player in the new system, whereby they have accountability and agency. However, while seemingly democratic at the beginning, it may become clear that there are power members in communities who still hold control, and micro-hierarchies may form in the decentralized world.

## TRUST NO-ONE

Modern society has been built on trust existing between citizens, governments, and institutions, facilitated through the concept of social contracts. These social contracts are crumbling in large part due to the spread of misinformation and disinformation, attacks on human rights (World Economic Forum, 2023a), compromised privacy and safety because of the pervasiveness of digital data (*Trends 2023: Collide, Connect, Care*, 2023), and lack of transparency and traceability in existing manipulative systems (*Accenture Life Trends 2023*, 2023). Trust is eroding in society, and civilians are advocating for and protecting themselves.

**IMPLICATIONS FOR COMMUNITY:** Trust is the backbone of cooperation, and without it, democracy is at stake. Lack of trust in traditional institutions, like governments, may spur a new wave

of individuals, communities, and organizations to innovate and disrupt existing systems, fueling a societal revolution. Eroding trust may impact openness and trust and belonging in communities, with some communities unravelling.

**EXTRAPOLATION:** Lower social capital due to broken social contracts and lack of trust may impact the economy as businesses and governments falter without societal support. As rebuilding trust takes time, this could force the entire social system to slow allowing for success to be redefined with new values. Community members may take agency and control, combatting distrustful institutions, to lead the process of developing net new social contracts.

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# FUTURES OF COMMUNITIES

## SCENARIOS

Scenario building to envision not just a desired future, but many possible alternate futures, was used as a technique to understand where these trends could lead. Leveraging Jim Dator's Four Generic Images of the Future, four exploratory scenarios were created. Each scenario aims to explore the possible future evolutions of community impacted by digital technology in the year 2043.

Jim Dator's Four Generic Images of the Future is a foresight framework that allows for creating four different and distinct versions of the future (Dator, 2009). The four worlds are titled

Growth, Collapse, Discipline, and Transform. The methodology frames each world through dimensions such as Population, Economy, Environment, Society, Technology, Governance, and Health, thereby building a holistic future world. Each scenario has a different makeup of these dimensions, that when paired with storytelling, allow for an immersive exploration of four future alternative worlds. To create plausible scenarios, information rooted in the literature review, participant interviews, and the horizon scan are used as inputs, and a timeline of key milestones leading up to 2043 is provided.

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## ASSESSING COMMUNITY CHARACTERISTICS

To generate an understanding of the impacts on the health of communities that these worlds could have, the community characteristics that were formed from the literature review and primary research were then assessed across each scenario. The assessment results uncover risks and opportunities for preserving community characteristics.

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## ASSESSMENT CRITERIA

The assessment criteria used in this report is based on Cantril's Self-Anchoring Striving Scale (1965), with a scale of suffering, struggling, and thriving. A description of the criteria for each community characteristic is provided in the assessment rubric below. It is important to note that this assessment was conducted individually by the researcher. To limit bias, an assessment should be conducted with a group of individuals with varied lived experiences.

CHARACTERISTIC	SUFFERING (1-2)	STRUGGLING (3)	THRIVING (4-5)
<b>SHARED INTENT</b> <ul style="list-style-type: none"> <li>• There are defined values in the community that members are aligned with</li> <li>• There is a community identity and members identify with the community</li> </ul>	Shared intent is lost and replaced with divisiveness	Shared intent is experiencing fragmentation and misalignment	Shared intent is understood and followed and rarely wavers
<b>MUTUALITY</b> <ul style="list-style-type: none"> <li>• There is reciprocity: cooperation, collaboration, and togetherness</li> <li>• There is genuine care for each other and for the community as a whole</li> <li>• Community members feel a sense of responsibility and accountability for actions</li> </ul>	Mutuality is lost; lack of respect and concern for solely the individual prevails, creating an extractive culture, with no self-accountability for actions	Mutuality becomes fractured, struggling with lack of cooperation, diminishing respect, and mounting polarization	Mutuality is intact, with genuine care, mutual exchange, and responsibility being delivered by the community
<b>MEANINGFUL SOCIAL TIES</b> <ul style="list-style-type: none"> <li>• Ability to establish meaningful connections within the community and with other communities</li> <li>• Quality of mutually beneficial and trusting relationships developed</li> </ul>	Meaningful social ties are non-existent, siloes within the community and between other communities occur	Meaningful social ties are weakened, heightening fragmentation within and between communities	Meaningful social ties are strengthened, with connections and relationships between members and other communities being mutually beneficial
<b>TRUST &amp; BELONGING</b> <ul style="list-style-type: none"> <li>• Ability to build and maintain trust amongst community members, institutions, and other actors of influence</li> <li>• Develop a sense of belonging in the community</li> <li>• Provides emotional, mental, physical, safety to community members</li> </ul>	Trust and belonging are easily lost and/or cannot be formed in an environment that does not foster safety and belonging	Trust and belonging are compromised and not easily built in an environment that inconsistently provides safety	Trust and belonging are easily built and maintained in an environment that is consistently safe, emotionally, physically, and mentally
<b>OPENNESS</b> <ul style="list-style-type: none"> <li>• Shared experiences (joyful life milestones, suffering)</li> <li>• Shared resources (time, knowledge)</li> </ul>	Openness turns to closedness, with resources being privatized and increased isolation replacing shared experiences	Openness is disrupted and conditional, resources and experiences are inconsistently shared	Openness of sharing resources and experiences amongst community members thrives

**Table 1.** Assessment criteria for assessing community characteristics in each of the four future scenarios.

Prior to engaging in future scenarios, it is important to align on the current conditions from which these alternate futures stem. Key present day data points are found below.

**PRESENT: 2023**

- Emerging digital technology accelerates with Chat-GPT4 (Chat Generative Pre-Trained Transformer) released in March 2023 (OpenAI, 2023) just 4 months after Chat-GPT 3.5's initial release, and Apple is rumoured to release its virtual reality headset in June 2023 at its Worldwide Developers Conference (Gurman, 2023).
- International Panel on Climate Change (IPCC)'s final report released in March 2023 states that by 2030 GHG emissions must be cut in half in order to limit warming to 1.5 degrees

Celcius by end of century (International Panel on Climate Change [IPCC], 2023).

- Canada's population grew by over 1 million people in 2022, primarily due to immigration (Government of Canada, 2023a).
- The Liberal Minority Federal Government of Canada has tabled the Digital Charter Implementation Act to bolster regulations around digital technology, such as Artificial Intelligence, but it has not yet passed (Government of Canada, 2023b).
- Triggered by the COVID-19 pandemic, mental health issues significantly increased, struggling to be met by the

overwhelmed traditional healthcare system (United Nations, 2022), and in February 2023 Amazon closed a deal and acquired a virtual health provider, OneMedical, expanding its presence in the healthcare space (*One Medical Joins*

*Amazon to Make It Easier for People to Get and Stay Healthier*, 2023).

- Social divisiveness is growing, influenced by polarizing political and human rights views (Ragan & Sarlieve, 2022; Brewster, 2023).

An overview of the four futures of community and emerging digital technology is provided below. More information on each world can be found in the subsequent pages.

WORLDS	GROWTH	COLLAPSE	DISCIPLINED	TRANSFORM
<i>DIMENSIONS:</i>				
POPULATION	GROWING	DECLINING	TAXED	AUGMENTED
ECONOMY	DOMINANT	SHARED	CONTROLLED	ALTERNATIVE
ENVIRONMENT	SACRIFICED	REBUILT	PROTECTED	HYBRID
SOCIETY	DIVIDED	COLLECTIVE	FAMILY	INTERCONNECTED
TECHNOLOGY	PERVASIVE	REUSED	REGULATED	REFORMED
GOVERNANCE	CORPORATE	LOCAL	STRICT	SHARED
HEALTH	DECLINING	REPAIRING	PRESCRIBED	HOLISTIC

**Table 2.** Description of the world dimensions in each of the four scenarios.

GROWTH: 2043

**Digital proliferates community. Run by democratic government, funded by technology.**

WORLDS	GROWTH
<i>DIMENSIONS:</i>	
POPULATION	GROWING
ECONOMY	DOMINANT
ENVIRONMENT	SACRIFICED
SOCIETY	DIVIDED
TECHNOLOGY	PERVASIVE
GOVERNANCE	CORPORATE
HEALTH	DECLINING

**Table 3.** Dimensions in the Growth scenario.

**Milestones leading to GROWTH in 2043:**

*Short-Term: 2023-2030*

- Technology companies become a key partner with government, embedded across all levels, as governments struggle amidst political polarization and fighting climate change alone.
- OpenAI releases ChatGPT 15 in 2030; the number of new technology companies and innovations multiples at astounding rates; rising inauthenticity, social polarization and distrust is reported.

*Mid-Term: 2030-2036*

- The value of money as currency decreases as there is a rise in personal data being exchanged in goods and services; the economy is booming in new ways.
- To combat the ever-growing digital divide, the government implements a tax rebate on VR headsets; VR headset sales increase.

*Long-Term: 2036-2043*

- The population of Canada exceeds 50 million in 2043 due to immigration, and the last green space is developed to accommodate more housing.
- With over 23% of the population over 65 years old, the digital afterlife business is skyrocketing. People now must plan for data storage after death, limited or infinite, or data removal.
- Significant mental and physical health decline is evident amongst the population.

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COMMUNITY STRUCTURAL COMPONENT	GROWTH
SPACE	VIRTUAL
PARTICIPANTS	HUMANS, AVATARS / FRAGMENTED
COMMUNICATION	AUTOMATED
ORGANIZATION	ALGORITHM

**Table 4.** *Community structural components in the Growth scenario.*

**Communities are held in virtual spaces with human and avatar participants. Technology facilitates automated communication and organization is controlled by algorithms.**

A seemingly democratic government hangs on by a thread in a socially polarized world with the support of the technology industry keeping it intact. Investment and funding into digital technology continues, by both public and private institutions, as digital technology is seen as the last remaining hope to combat the increasing climate disasters and societal issues, given the political instability. As digital technology capitalizes on environmental and societal issues, innovation increases, and technology pervasiveness spreads throughout all aspects of society: health, education, culture, and governance. The industry heavily invests in digital infrastructure to connect the previously disconnected populations, democratizing access to emerging technologies, and increasing the attention-economy. In consultation with the technology industry, the government subsidizes access to digital technology equipment, and offers digital literacy programs to support non-digital natives. This access and knowledge powers lucrative entrepreneurial pursuits; humans can now be in multiple places at once because of digital twins, allowing some people to multiply their income in all the worlds where they co-exist. Wealth grows amongst all levels in society, and digital natives become the new billionaires.

Inauthenticity is an epidemic, with the true identity of a person rarely revealed and trusted. There is an issue of digital identity theft, and avatars are used as anonymity protection. In some cases, marginalized communities are exploited by this tactic as avatars can be designed to be any race yet controlled by another. However, the people and communities who have always been digital-first, such as gaming communities and those who sought virtual worlds because the physical world never served them, have a massive advantage navigating this virtual state and thrive in terms of status and power.

Loneliness is at an all-time high in this always connected world, especially amongst the aging population. To treat mental health issues caused by loneliness, technology companies have made a foray into the wellness industry, performing treatments in VR, led by VR shamans. Virtual Support Workers (VSWs) – a new category of Personal Support Workers – emerges to support humans in the physical while living in the virtual emerges. These VSWs also help treat muscular atrophy that is a growing concern due to lack of physical activity when one is in a virtual setting. Viebots, “Life Robots,” are created to support the aging population, serving as loneliness companions, and medical caregivers.

Work From Anywhere visas emerge allowing people with the freedom of movement to transcend physical and virtual borders. People gravitate towards rural and remote places, displacing existing populations to overcrowded cities, along with climate and political refugees who have fled unlivable regions and dangerous regimes globally. Remaining green space is compromised, driving new housing developments to accommodate the rising population. “Green space” is now accessed through virtual realities, VR real-estate skyrockets, and food is grown at the individual level, with personal tech-controlled vegetable and meat makers. Physical communities as they once were no longer exist, with a prominent culture of “avoid eye contact at all costs” when one must emerge out of the house due to lost social norms and rising distrust. Community-as-a-service, becomes a lucrative digital industry, capitalizing on the nostalgia of the past. Physical intangibles experienced in communal settings, such as scent and touch, are now like a forgotten old language; however, companies produce custom senses packages to recreate in virtual spaces.

The exchange of personal data is an officially recognized currency in this world, and while individuals are finally in control of their data, some humans’ data is valued more than others, perpetuating inequality and inequity. Data proliferation has caused data spills to be equally as dangerous as oil spills – environmentally, economically, and socially – posing an existential risk to exposing governments’, companies’, and civilians’ data.

The thought of death is less fearful for some because of the digital afterlife capabilities that have emerged. Digital selves can now live on as a mechanism for self-preservation and longevity, and some consider date of death to be no longer when one's heart stops, but when one's data is removed from servers. There is a market for digital afterlife protection and insurance, and dead data; even death is for sale.

**COUNTERCULTURE:** In this digital-first world, there are individuals who have avoided having their identities digitized. These people are untracked and uncounted for in society, completely slipping through the cracks of the system, some by choice, some forgotten, all erased. Outlier physical groups of people who crave physical touch and an analog way of living begin to form, creating modern versions of communes.

*GROWTH'S IMPACT ON COMMUNITIES:*

CHARACTERISTIC	SUFFERING (1-2)	STRUGGLING (3)	THRIVING (4-5)
SHARED INTENT		3	
MUTUALITY		3	
MEANINGFUL SOCIAL TIES		3	
TRUST & BELONGING	2		
OPENNESS		3	

**Table 5.** Analysis of Growth's impact on communities.

**SHARED INTENT:** While some previously existing virtual communities maintain strong values and identity, others that cannot withstand the transition from physical to virtual suffer. Values can become misaligned and compromised driven by businesses capitalizing on the concept of community. Identities can be blurred by the multiplicity of identities enabled by digital technology.

**MUTUALITY:** Individualism - every person for themselves - becomes the status quo. Reciprocity is replaced with extraction, competition, and minimal care. Accountability and responsibility for one's actions in communities are rare.

**MEANINGFUL SOCIAL TIES:** Meaningful connections within communities can exist but can be harder to make.

There is a deepening disconnect and widening gap between communities.

**TRUST AND BELONGING:** The virtual space of communities makes communities inaccessible for some, reducing the ability to find a sense of belonging. Anonymity and identity fabrication unravel trust and authenticity, impacting the safety of some communities. However, for some, belonging flourishes in virtual spaces.

**OPENNESS:** Sharing is only conducted when met with an incentive, like sharing data as currency. The adage that time is money remains strong, and digital technology drives productivity and efficiency.

COLLAPSE: 2043

**Distrust in government and technology has resulted in a collapse, giving way for community to take control.**

WORLDS	GROWTH
<i>DIMENSIONS:</i>	
POPULATION	DECLINING
ECONOMY	SHARED
ENVIRONMENT	REBUILT
SOCIETY	COLLECTIVE
TECHNOLOGY	REUSED
GOVERNANCE	LOCAL
HEALTH	REPAIRING

**Table 6.** Dimensions in the Collapse scenario.

**Milestones leading to COLLAPSE in 2043:**

*Short-Term: 2023-2030*

- Record breaking interest rates begin presenting barriers to the rapid advancement technology has experienced in previous decades when “free money” was plentiful. A decrease is seen in high risk, high growth bets, like technology.
- Cost of living continues to skyrocket, making it unaffordable to raise a family.
- Government misses environmental target goals needed to be met by 2030 in order to limit global warming to 1.5 degrees Celsius by the end of the century, putting the population at risk and triggering political distrust and polarization.

*Mid-Term: 2030-2036*

- Technology dominance falls due to all time high interest rates reducing investments into tech and innovation, and the slowdown exposed the unintended consequences of digital technology, including addiction and isolation. There is a significant technology crash resulting in an economic recession and mental health issues increase.

- An increase in the population due to involuntary migration from climate disasters and the lasting effects of the pre-recession economy has made it challenging for the government to serve the population at a centralized level. More power is redistributed to the local level.
- To mitigate against history repeating itself, local governments implement laws restricting the creation of net new digital technologies, and a program to reuse and repair old technologies is created.

*Long-Term: 2036-2043*

- Smaller scale local communities begin taking on identities, ideologies, and governance of their own, creating safe enclaves from - and support systems for - the growing disasters around them, vying to be formally recognized as independent entities. Immigration is paused, and movement between communities is restricted to preserve resources.
- There is an urgent need to reconstruct the capitalist system from the ground up, including new value exchanges centred around sharing.

COMMUNITY STRUCTURAL COMPONENT	COLLAPSE
SPACE	PHYSICAL
PARTICIPANTS	HUMANS / ACTIVE
COMMUNICATION	IN PERSON
ORGANIZATION	GRASSROOTS

**Table 7.** Community structural components in the Collapse scenario.

**Communities are physical, created by proximity and choice, with humans as active participants. Communication is in person. Decentralized technology is used to support grassroots organization and governance.**

The trifecta of climate change inaction, tech advancements that exploited humans, and heightened polarization has led to immense societal distrust resulting in the collapse of the capitalist technology-fueled economy that dominated for decades. Humanity enters survival mode with a declining population, a major economic recession, and the exorbitant cost of living compromising quality of life. Economies are localized and a new economic model based on sharing dominates, inching out capitalism. People band together to share resources, time, energy, food, and spaces, and co-ownership becomes the primary form of investment, bringing the co-operative model to prominence once again.

After years of being digitally isolated, human beings are taking off their VR headsets and emerging in the streets. Although, there are some populations who never emerge from their homes, remaining digital recluses.

A shift from global to local occurs as supply chain systems are fractured by climate disasters, sparking a communal approach

to living. Multi-generational co-housing provides support during this collapsed state. Geographic boundaries are redrawn around hyperlocal communities, and these communities act as separate nations building their own Wi-Fi networks, energy supplies, and decentralized internet to support organization and governance. There is an infrastructure redesign underway by community leaders to optimize the location and accessibility of resources, ensuring a 15-minute walk to food, schools, and community squares. Abandoned office buildings, parking lots, and cars in the wake of capitalism’s fall are now home to shared gardens, farms, and workshops. Unintentional rewilding occurred while many people lived in the virtual for years; these areas are now community protected spaces.

Any “new” tech that is developed is built from reclaimed and discarded old digital technology – hardware and software – and is focused on environmental protection and fostering physical togetherness. Trust is being rebuilt through communities reclaiming ownership and agency, and stolen digital data is returned to the rightful owners by reluctant fallen technology executives, pressured by community governance and the public. Tech addiction is actively treated through a mix of immersive therapy in nature; a true survival experience to rid one of perpetual screens.

Achieving cooperation in each community is successful, but competition grows between communities, fueled by differences of identity and resource comparisons. While more connected geographically than ever before, there is a complete disconnect globally, and community silos form.

**COUNTERCULTURE:** Those who do not fit in with specific communities, or wish to exist in multiple, struggle with identity and sense of belonging. They become known as the Splintered – existing between communities. The pressure of collective ways can be restricting and limiting to individual freedoms.

*COLLAPSE'S IMPACT ON COMMUNITIES:*

CHARACTERISTIC	SUFFERING (1-2)	STRUGGLING (3)	THRIVING (4-5)
SHARED INTENT			4
MUTUALITY			5
MEANINGFUL SOCIAL TIES		3	
TRUST & BELONGING		3	
OPENNESS			4

**Table 8.** Analysis of Collapse's impact on communities.

**SHARED INTENT:** Defined shared values and community identity are strong in this world, but with limitations. Governance is community-led and actively believed in, but there is tension experienced when wanting to identify with multiple communities.

**TRUST AND BELONGING:** People can easily build and maintain trust and safety, however belonging among some members is struggling because of the singular nature of community; one cannot belong to multiple communities.

**MUTUALITY:** Cooperation and reciprocity are high in this world, where people in communities take accountability and care for each other as survival and rebuild strategies.

**OPENNESS:** Sharing of time and resources within communities thrives, however, between communities there is increased competition due to resource disparities.

**MEANINGFUL SOCIAL TIES:** Connections and relationships built within communities are very strong and meaningful, but competition with other communities drives silos, polarization, and fragmentation.

DISCIPLINE: 2043

**Government tightens grips on technology, aware of negative impacts, trying to regain trust and power via enforcing community and collectivism.**

WORLDS	GROWTH
<i>DIMENSIONS:</i>	
POPULATION	TAXED
ECONOMY	CONTROLLED
ENVIRONMENT	PROTECTED
SOCIETY	FAMILY
TECHNOLOGY	REGULATED
GOVERNANCE	STRICT
HEALTH	PRESCRIBED

**Table 9.** Dimensions in the Discipline scenario.

**Milestones leading to DISCIPLINE in 2043:**

*Short-Term: 2023-2030*

- In response to the 2023 warning from IPCC that significantly more action must be taken by 2030 to limit global warming to 1.5 degrees Celsius by the end of the century, the government takes strict action, implementing significant taxes and restrictions.
- The threat of cyberwarfare significantly rises, with major cyberattacks impacting Big Technology companies.

*Mid-Term: 2030-2036*

- Via an unprecedented executive decree, the government seizes control of the Internet in the interest of national security

and the first government-initiated internet blackout is piloted in Canada.

- The government releases a campaign promoting a return to the nuclear family ideals for safety, health, and human longevity.

*Long-Term: 2036-2043*

- The government launches a buy-back program for all non-government sanctioned digital technologies – hardware and software – and corresponding data from before the takeover.
- Billionaires, as a concept, are extinct as the government redirects their income towards the economy, climate change, and insurance for future generations.

COMMUNITY STRUCTURAL COMPONENT	DISCIPLINE
SPACE	PHYSICAL
PARTICIPANTS	HUMANS / ASSIGNED
COMMUNICATION	FACILITATED
ORGANIZATION	TOP DOWN

**Table 10.** Community structural components in the Discipline scenario.

**Communities are physical, with a counterculture of virtual community networks. Community participants are humans assigned to a community by the government, without agency. Communication is facilitated and curated, and the communities are controlled and rules for engagement created by the government.**

Governmental rule is greatly exercised in this world in an effort to correct and manage past and future threats, keeping civilians safe. At its height, the technology industry had infiltrated all aspects of everyday life, overstepping into governmental territory and compromising the privacy and security of society. Responding to public fear and crumbling societal health, the government is elected by citizens with the mandate to intervene with tight regulations, placing a chokehold on the speed of technology and its reckless advancements. Any new technology must pass through a government-run check point prior to its release in market, and business models are mandated to consider more than just profit. For safety, digital application stores are government run, taken over from Big Tech.

To combat distrust and misinformation running rampant in society, the government filters content, and disclaimers are automatically generated and added to any content stating if it was produced by technology, a human, or other. Warning labels are applied to hardware and software products, advising of the ill effects of usage. Cyberattacks are frequent occurrences with the internet being used often as a weapon of war, and the government has heavily regulated of the Internet, becoming the holder of its figurative keys, to protect citizens' data from being exposed when these attacks happen. Periodic Internet blackouts are conducted for training.

In the interest of protection, the government has implemented a data tracking system on civilians, to ensure they are not exceeding their carbon emissions allotment and to monitor health and wellness. To stabilize and protect environmental health, multiple steps are being taken, maintaining livability. Carbon Tax has been introduced, payable for each child born, to control population and reduce the impact on the environment. Additional Wellness Taxes are added to new products, recognizing the implications of over-consumerism, therefore deterring excessive purchasing. The government has enacted Billionaire Status Control, redistributing the amassed wealth to civilians – therefore back into the economy – and to long-term projects to secure the success of humanity's future. 'Sustain & Reclaim' is the government's latest campaign. The heavily controlled economy and regulated technology industry leads to population and business emigration to more lenient countries where innovation is faster and freer. To counteract the movement and loss of talent, the government opens competitions, incentivizing and rewarding those who stay to build (government approved) innovations focused on life longevity.

A Ministry of Community is developed by the government to promote a wellbeing agenda spanning mind, body, and soul health. A government program that assigns family units to hazard-proof designed communities is implemented. Time is controlled and monitored via technology tracking, with allotments for facilitated engagement and connection, tech-free periods for health and wellness, and indoor-only periods for engineered rewilding. A return to familial ideals is advised, and there is a resurgence of philosophies and religions, like paganism, existentialism, and longtermism – a focus on protecting humanity for centuries to come – to find meaning.

Constant government surveillance is an accepted state by most in this world, with the betterment of humankind and nature at its core. However, while data shows that the population is “healthy,” unmeasurable attributes, such as feelings of loss of self, loss of privacy, disconnection, and happiness, grow.

**COUNTERCULTURE:** There is a counterculture who rebels against the government, fleeing to remote unmonitored islands as if fleeing a draft to war. An underground decentralized virtual network of communities is created by former technology entrepreneurs to break free from the constraints of the traditional family.

*DISCIPLINE'S IMPACT ON COMMUNITIES:*

CHARACTERISTIC	SUFFERING (1-2)	STRUGGLING (3)	THRIVING (4-5)
SHARED INTENT			4
MUTUALITY		3	
MEANINGFUL SOCIAL TIES		3	
TRUST & BELONGING		3	
OPENNESS		3	

**Table 11.** Analysis of Discipline's impact on communities.

**SHARED INTENT:** Shared values of bettering humankind and community identity are deeply understood as a mandate from the government, however, some of the population dissent to government authority.

**MUTUALITY:** Reciprocity, cooperation and accountability, and care exist due to the disciplined nature of the world, however, it is mandated rather than organic. Everything is tracked and documented, and everyone plays a role in sustaining humanity.

**MEANINGFUL SOCIAL TIES:** Meaningful connections and relationships are inconsistent in development within assigned communities. Communities are connected to one another via the government, however, not in direct relationship with each other.

**TRUST AND BELONGING:** Safety and trust are high in this world, with the government's focus on sustaining humanity. However, sense of belonging is a struggle for those who are constrained by the government's prescribed communities.

**OPENNESS:** Sharing of time and resources is struggling due to the restricted and conditional nature of government-assigned communities.

TRANSFORM: 2043

**Existing in the fourth place, a fluid digital/physical existence, designed for cohesion.**

WORLDS	GROWTH
<i>DIMENSIONS:</i>	
POPULATION	AUGMENTED
ECONOMY	ALTERNATIVE
ENVIRONMENT	HYBRID
SOCIETY	INTERCONNECTED
TECHNOLOGY	REFORMED
GOVERNANCE	SHARED
HEALTH	HOLISTIC

**Table 12.** Dimensions in the Transform scenario.

**Milestones leading to TRANSFORM in 2043:**

*Short-Term: 2023-2030*

- A growing coalition of technology ethicists successfully advocate for stricter regulations and laws of technological advancements from governments globally after continued societal destruction compromises democracy. The Ministry of Technology Ethics is formed in government, along with the Independent International Ethics Board (IIEB), tackling the issue of technology from bottom up and top down.
- The government begins closer partnership with Indigenous leaders to tackle climate change after missing climate targets in 2030 triggered an urgent change for leadership and course of action.

*Mid-Term: 2030-2036*

- A community fund is created to transition digital Internet spaces from private to public-owned, sharing ownership with corporations and government.

- Technology companies and Indigenous communities collaborate to develop climate-proofing solutions to preserve and protect nature.

*Long-Term: 2036-2043*

- As part of the Indigenous and government shared climate-action strategy, the economy shifts from capitalism to one that recognizes care as a value.
- The first human consciousness is downloaded, filtered for bias, and uploaded to the shared consciousness to advance research and collective knowledge.

COMMUNITY STRUCTURAL COMPONENT	TRANSFORM
SPACE	PHYSICAL/DIGITAL
PARTICIPANTS	HUMANS, NATURE, SENTIENT BEINGS
COMMUNICATION	OPEN
ORGANIZATION	CO-CREATED

**Table 13.** Community structural components in the Transform scenario.

**Communities are a mix of physical and digital spaces, and participants include people, nature, and other sentient beings. Communication is open and free, and the organization and governance of communities is co-created and co-owned.**

Digital technology, nature, and humans reach equal co-existence in this world, the population is no longer just measured by humans, but includes sentient beings – animals and machines. The augmented human has taken flight, existing in what is now known as the fourth place, transcending that of the first place: home, the second place: office, and third place: coffee shop, to that of a truly blended, fluid physical/digital existence. Communities are multifaceted and flexible, interchanging with one another, adapting to the complexity of changing interests and spaces.

It is now possible to download one’s consciousness and share with a public repository to contribute to science, health, technology, and environmental advancements, and to once and for all eliminate the bias of AI. Open source and open knowledge prevail, doing away with the gatekeeping, privatized approach of the past. Technology creates the utmost efficiency, performing the transactional tasks humans once were responsible for, and therefore freeing up time for humans to be relational together. Free time can be overwhelming, and constant relational activity can be draining. Anonymity of the digital past is sometimes craved. Some people experience job loss and begin questioning their usefulness

due to technology. The government creates opportunities for the unemployed through community creator roles, and mandates that employers create space for employees to actively participate and take ownership in their communities.

Themes of restoration and reconciliation are ever present in this world, made possible by the coming together of grassroots movements (bottom up) and government (top down) to enact change in a near collapsing state. Western leaders and Indigenous leaders share governance to right the wrongs that have prevailed for centuries in the economy, against humanity, and the environment. The system is disrupted and dismantled giving way for decolonized, interspecies design to flourish. A collective ceremony is held to officially rewrite a new social contract, leveraging blockchain technology for an immutable, trustworthy agreement, slowly rebuilding trust and relationships between all parties – nature, people, technology, institutions.

By way of shared governance, acknowledging the limits of capitalist perpetual growth, currency has transitioned from that of solely money and personal data, to include an alternate value exchange of care, calculated in hours spent caring for people and the environment. Historically marginalized communities thrive in this new economy, with a surplus of care currency, earned over generations of unpaid care provided for each other and for the environment. While rebalancing power, this shift has

negatively impacted traditionally wealthy individuals whose money contributed to many facets of healthy society, including philanthropy.

Technology ethics training and licensing is mandated for all humans and artificial identities by the Ministry of Technology Ethics and the Independent International Ethics Board (IIEB), keeping technology companies, practitioners, and governments accountable for implications on humanity, including nature. New technology innovations must adhere to IIEB's standards which are accepted globally, and the profession of digital technology medical specialists is created to support in treating unintended implications to humans and other species. As part of a technology rehabilitation plan, it is now possible to foster technology prior to its re-release into society. Technology companies are driven to innovate by values, and compete for recognition of being IIEB Certified, a mark of positive impact innovation on society and/or the environment. Inauthentic approaches to ethics and values emerge to win market share, but community members can report technology concerns to the IIEB. Underground illegal trade rings for the ultra-rich whose money was unsuccessfully converted to the currency of care emerge. If caught by the IIEB, the careless money – money made exploiting humans and their data in the now-dubbed tech doom of the 2010s/2020s – must be funneled back into the new economy to fuel climate technology advancements, creating a wasteless world. This high level of oversight requires vigilant intervention to remain viable. Some find the imposition of continuous surveillance a limit to personal freedom.

Public spaces are designed to foster connection, trust, and relationships in person, with social physical interaction being prescribed by healthcare professionals as a form of human wellbeing restoration. Digital spaces have been reclaimed from corporations by the public – the Internet is officially community-owned – and exist to promote social cohesion. Physical spaces are designed to be responsive to the individual and the collective, with digital responsive technology adapting based on moods and needs. NaturePods, open but protected public spaces where anyone can connect with nature in climate-change free zones are erected, monitored by climate technologies. A weekly community feast takes place in these pods. Healthcare is holistic, keeping a pulse on digital technology health, mental health, spiritual health, nature health, physical health, and community health.

While social cohesion is strong in this world, group norming forms, leaving those with strong or opposing views excluded from the discourse. Individuals who need time alone to refuel or prefer to be independent suffer from exhaustion and overstimulation. Community creators attempt mediation to heal social rifts, not always successfully or welcomed.

**COUNTERCULTURE:** There are some people who refuse to participate and cohere in this “values meet technology” society, choosing personal agency over collectivism. They are viewed as outsiders in society and as going against the public good. However, these individuals feel free by removing themselves from the “for good” narrative.

*TRANSFORM'S IMPACT ON COMMUNITIES:*

CHARACTERISTIC	SUFFERING (1-2)	STRUGGLING (3)	THRIVING (4-5)
SHARED INTENT		3	
MUTUALITY			4
MEANINGFUL SOCIAL TIES			4
TRUST & BELONGING			4
OPENNESS			4

**Table 14.** Analysis of Transform's impact on communities.

**SHARED INTENT:** Shared values and identity can be strong in this world, however, the fluidness of the world in terms of its space and its community participants may not be fully embraced by those who have individualistic views.

**MUTUALITY:** Reciprocity, care, and accountability are thriving in a world where awareness of one's actions is high, and the acknowledgment of cooperation as an asset is strong amongst most.

**MEANINGFUL SOCIAL TIES:** The ability to make meaningful connections and relationships within community is thriving, and of equal importance, the bridges between communities are thriving.

**TRUST AND BELONGING:** Inclusivity of the environment, and of historically marginalized populations, such as Indigenous, bring a thriving sense of belonging. Trust and safety are supported through measures implemented by the shared governance model and independent oversight too, although constant oversight can impede trust.

**OPENNESS:** Sharing experiences is thriving in a world that fosters togetherness and connection as a determinant of health, and resources are shared in an open-source network. At times, however, tension exists between the need for individuality vs. collectivity.

# FUTURES OF COMMUNITIES

A summary of the structural components of community and community characteristic health assessment in each scenario.

WORLDS	GROWTH	COLLAPSE	DISCIPLINED	TRANSFORM
<b>COMPONENT:</b>				
SPACE	VIRTUAL	PHYSICAL	PHYSICAL	PHYSICAL/ DIGITAL
PARTICIPATION	HUMANS, AVATARS/ FRAGMENTED	HUMANS/ ACTIVE	HUMANS/ ASSIGNED	HUMANS, NATURE, SENTIENT BEINGS/ UNITED
COMMUNICATION	AUTOMATED	IN PERSON	FACILITATED	OPEN
ORGANIZATION	ALGORITHM	GRASSROOTS	TOP DOWN	CO-CREATED
<b>CHARACTERISTIC:</b>				
SHARED INTENT	Struggling (3)	Thriving (4)	Thriving (4)	Struggling (3)
MUTUALITY	Struggling (3)	Thriving (5)	Struggling (3)	Thriving (4)
MEANINGFUL SOCIAL TIES	Struggling (3)	Struggling (3)	Struggling (3)	Thriving (4)
TRUST & BELONGING	Suffering (2)	Struggling (3)	Struggling (3)	Thriving (4)
OPENNESS	Struggling (3)	Thriving (4)	Struggling (3)	Thriving (4)
TOTAL HEALTH	<b>14</b>	<b>19</b>	<b>16</b>	<b>19</b>

**Table 15.** Summary of community structural components and characteristics across all four future scenarios with total health count included at the bottom row.

## INSIGHTS

The Transform and Collapse scenarios rank highest on the community characteristics assessment, with Discipline ranking third, and the Growth scenario ranking the lowest.

**SHARED INTENT** is ranked highest in Collapse and Discipline, and both follow a pattern of collectivism driving success. **There are very defined values that are embraced by community members, for different reasons:** in Collapse, members come together for survival, in Discipline, members come together under the direction of the government.

**MUTUALITY** is struggling in Growth because of individualism and inconsistency of care and accountability. In contrast, Collapse and Transform provide **environments where other values are recognized, including care, and in order to sustain and remain resilient**, cooperation, respect, and accountability must exist.

**MEANINGFUL SOCIAL TIES** are strongest in the Transform scenario because both **connections and relationships within the community and between other communities exist and are maintained**. There is strong social cohesion for those who share the same values.

**TRUST AND BELONGING** is lowest in Growth due to the barrier of an all-virtual community space impacting some populations. Whereas in Transform, Trust & Belonging ranks highest because of the **inclusion of historically marginalized community members sharing in co-ownership and governance**.

**OPENNESS** is influenced by **investment of time, resources, and energy into community** – when that does not reap economic benefits, it is not made a priority in a capitalist world, like in the Growth scenario. In the Discipline scenario, when sharing is forced, there is lesser need, desire, or effort placed on openness; there is a restriction or limit.

Communities that possess all characteristics: shared intent, mutuality, meaningful social ties, trust and belonging, and openness can be both harmful and positive. The differentiating characteristic is meaningful social ties **between** communities. How does a community build bridges with other communities? How does a community influence or impact another community? Are actions harmful to others? If they are, that community may not be a healthy community based on this research study's analysis.

There is not one scenario explored where community characteristics are all thriving. This reinforces that community health characteristics are heavily influenced by external factors. Therefore, embedding a consideration for community health in decision making at every level of the system is necessary to preserve the health of communities now and in the possible futures to come.

These opportunity areas have informed the creation of interventions to help preserve community health amidst rapid digital technological advancement.

**The key areas of opportunity that emerged during the assessment are:**

1. Recognizing and supporting diverse value exchanges
2. Building bridges between communities
3. Inclusion in communities and community co-ownership models
4. Increased investment of time in communities

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**This section highlighted emerging trends at the intersection of emerging digital technology and community and potential implications on communities, which helped generate four exploratory future scenarios in the timeframe of 2043. The health of communities in each future scenario was assessed based on community characteristics criteria, and from the assessment, key opportunities for intervention were identified. Proposed interventions will be further defined in 06 - Intervene.**

06.

# INTERVENE: AN ECOSYSTEM OF INTERVENTIONS FOR COMMUNITY PRESERVATION

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This section includes Phase 04: Intervene of the project methodology. Eight interventions, forming an ecosystem of interventions, are proposed to preserve healthy communities. The interventions span multiple levels of the system, requiring participation from multiple systems actors. No one intervention alone will enact lasting change. Ultimately, a paradigm shift is necessary in digital technology to move beyond human-centred design towards community-centred design, thereby preserving healthy communities. Conceptual prototypes are explored as tangible research outputs, to be tested and co-created with stakeholders.

# OVERVIEW

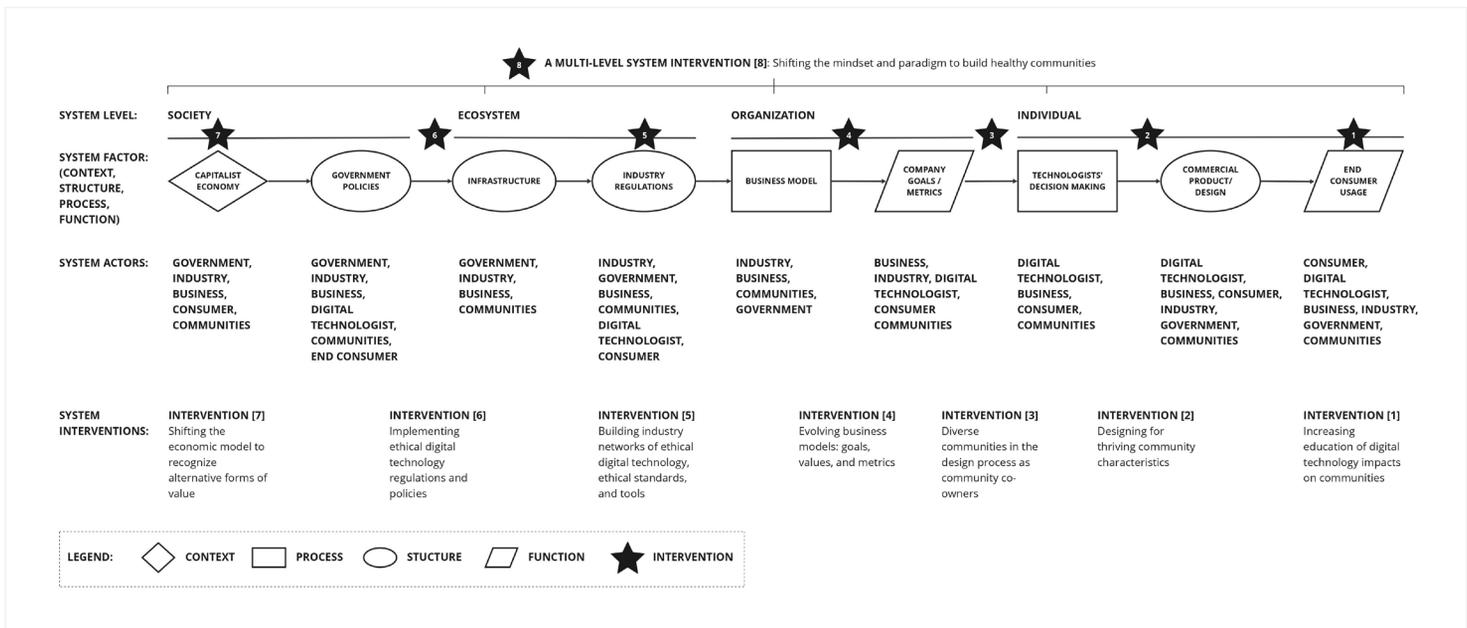
From the community characteristics assessment, areas of opportunity for preserving communities for future scenarios were identified. The key themes are [1] recognizing and supporting diverse value exchanges [2] building bridges between communities [3] inclusion in communities and community co-ownership models, and [4] increased investment of time in communities. The futures of communities' health assessments and patterns derived from primary and secondary research have made clear that siloed interventions will not be

effective in building healthy communities amidst rapid emerging digital technology. An ecosystem of interventions is proposed; composed of interventions at multiple levels of the system, engaging multiple actors, and are implemented over multiple timeframes to effect holistic systems change. This section outlines the ecosystem of interventions to support transitioning the system of digital technology to preserve community health for the possible futures to come.

## ECOSYSTEM OF INTERVENTIONS: BUILDING A SYSTEM OF CHANGE

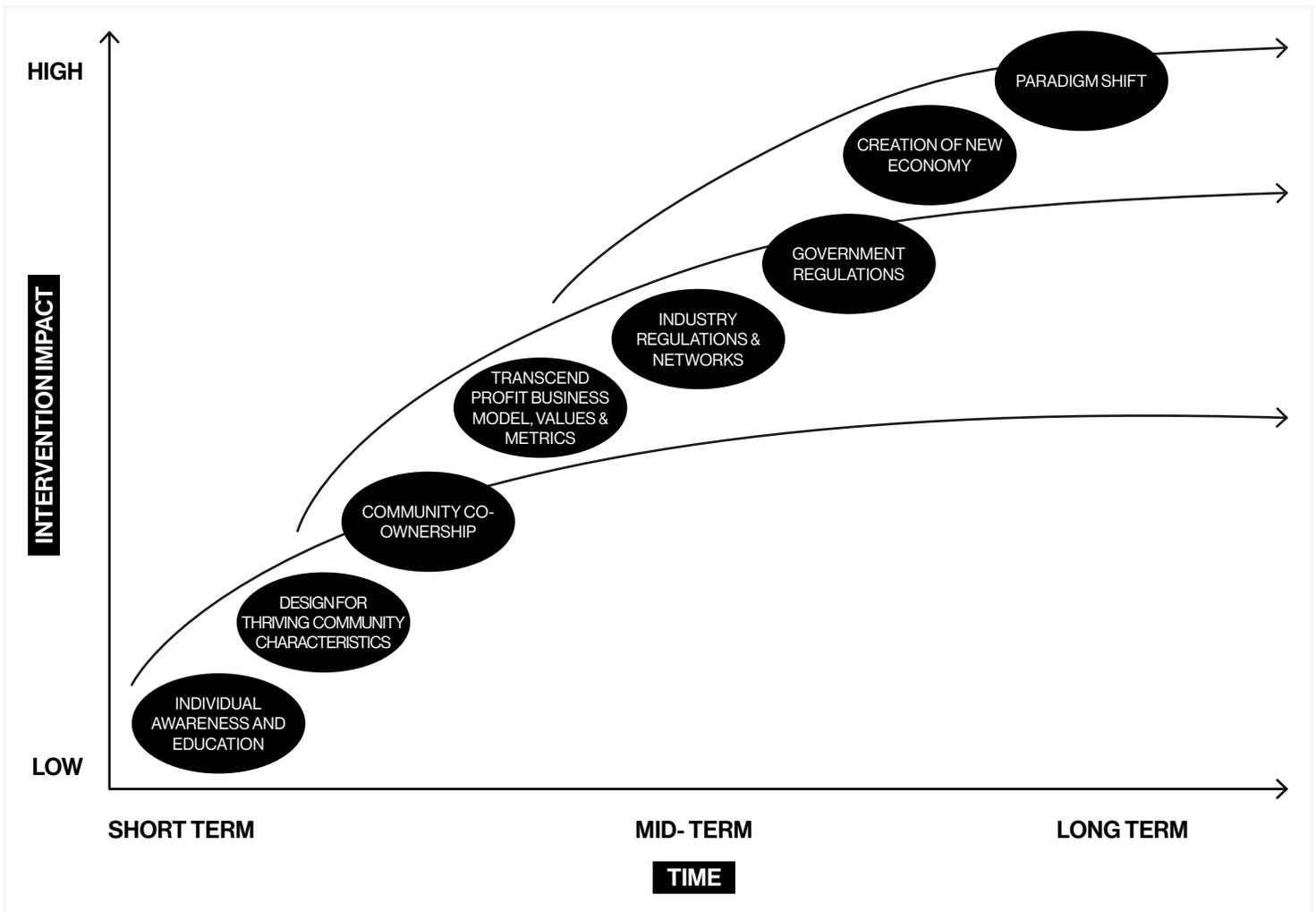
Eight interventions are proposed to shift towards designing digital technology to build healthy communities. The interventions were developed with inputs from qualitative participant interviews, mapping the current digital technology system to identify potential leverage points, and assessing the health of communities in four exploratory futures driven by emerging digital technology. The interventions create an ecosystem of change. While interventions implemented independently at various levels in the system by various actors in

the system can propel change forward, when the interventions are implemented together, as an ecosystem, significant change can occur. The interventions, and where they exist in the system, are visualized below via an updated digital technology influence map, originally documented in O4 - Discover II. New system actors have been added to the influence map based on intervention recommendations, which are outlined in detail in this section.



**Figure 9.** A visual representation of the interventions and where they exist in the digital technology system via a future state influence map.

Shifting a system does not occur quickly; these interventions should be applied consistently, analyzed, and adjusted as necessary over a long-term timeframe. There are actions that can be initiated over the short- and mid-term that will build towards the longer-term interventions. A phased timeline is presented visualizing the interventions' impact over time.



**Figure 10.** Illustration of systems interventions plotted on a graph of impact on the Y axis and time on the X axis.

**SHORT-TERM**

[1] INCREASING EDUCATION OF DIGITAL TECHNOLOGY IMPACTS ON COMMUNITIES

**SYSTEM LEVEL:** Individual

**SYSTEM ACTORS LEADING THE INTERVENTION:** Government, industry, business, communities

**SYSTEM ACTORS PARTICIPATING IN THE INTERVENTION:** End consumer, digital technologist

Across all levels of the system, all actors can develop an awareness of the impacts of digital technology on individuals and communities through digital technology learning. This may improve a more holistic understanding of digital technology and increase advocacy for ethical practices. Governments, the industry network, and communities can implement awareness campaigns, trainings, regulations, and industry standards and licensing to increase education of digital technology impacts. Through this, end consumers can be empowered with more knowledge – and therefore increase agency – to choose to engage with digital technology in ways that support ethical

social values. Businesses can improve access to education and resources for digital technologists, end consumers, and the wider industry network to build a shared understanding of designing while considering impacts to communities. All system actors can participate in increasing education of the impacts of digital technology.

[2] DESIGNING FOR THRIVING COMMUNITY CHARACTERISTICS

**SYSTEM LEVEL:** Individual

**SYSTEM ACTORS LEADING THE INTERVENTION:** Digital technologist

**SYSTEM ACTORS PARTICIPATING IN THE INTERVENTION:** End consumer, communities, business, industry, government

Digital technologists can develop an awareness of impacts that transcend just the individual or target group that is being designed for, to include the wider communities, designing for both the individual and the collective. Decisions made throughout

the digital technology design process can be assessed for present and future impacts – intended and unintended – on community characteristics. In order to move at the speed of trust, understanding and creating awareness of the impacts of design decisions, the digital technology process should slow down; trust is at stake between humans and technology, and trust takes time to build. Understanding who is designing and how the digital technology is being designed should be embedded

in the process, taking the time to share ownership and partner with communities, transcending consultation. Design for thriving community characteristics as an intervention can be led by digital technologists but will require participation of end consumers and communities to co-design, and business, industry, and government actors to enable through regulations and new business models.

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## MID-TERM

### [3] DIVERSE COMMUNITIES IN THE DESIGN PROCESS AS COMMUNITY CO-OWNERS

**SYSTEM LEVEL:** Individual, Organization

**SYSTEM ACTORS LEADING THE INTERVENTION:** Digital technologist, business, communities

**SYSTEM ACTORS PARTICIPATING IN THE INTERVENTION:** End consumer, industry, government

The digital technology design process could change models of community involvement from consultation to co-ownership, increasing the agency of communities to control outputs, and impacts of outputs, and limiting practices of community extraction. The design process could shift from designing **for** “power users” or “power communities” to designing **with** diverse communities (Costanza-Chock, 2020). Not only does this mitigate erasure of historically underrepresented groups in digital technology experiences, but it also increases the market opportunity and impact of the technology for companies. This intervention requires dedicated learning to understand marginalized communities, and mindsets of reconciliation and decolonization to disrupt existing oppressive systems impacting communities and access to or interactions with technology. Businesses need to support diverse communities in the design process by providing resources – including time – to digital technologists, and by building trust with and empowering agency in communities to participate. Industry standards that support and advocate for ethical design practices, and government regulation and policies focused on building digital infrastructure to ensure communities have access to and understand digital technology will enable this intervention.

### [4] EVOLVING BUSINESS MODELS: GOALS, VALUES, AND METRICS

**SYSTEM LEVEL:** Organization

**SYSTEM ACTORS LEADING THE INTERVENTION:** Business

**SYSTEM ACTORS PARTICIPATING IN THE INTERVENTION:** Industry, government, communities, end consumer, digital technologist

Changing the metrics of measurement from solely profit-based to include other values would allow for different business models to emerge, moving away from the attention driven model to a holistic model that considers collective wellbeing and community health. Community cannot always be measured – especially in a hybrid world of both physical and digital existence – and if

collecting quantitative data from the end consumer is the highest priority, this limits the ability to design and deliver real value to support communities. Businesses should engage with diverse communities and end consumers to co-create new metrics and business models that support individual consumer health and healthy communities.

Transitioning the business mindset from short-term gains to long-term gains to assess opportunities for potential impacts may mitigate unintended consequences on individuals and communities created by short-sighted monetary targets. Businesses can introduce ethical and inclusive design values into the overarching business strategy, to ensure values are followed and embedded in goal creation and throughout the design process by digital technologists.

For businesses to enact this intervention and transition to a new way of thinking and working, commercial cases need to be proven that indicate viability in the current state capitalist system. In addition, businesses should build capacity and skills to embed strategic foresight for resiliency planning. Enabling this intervention are industry and government actors, providing industry standard guidelines and governance regulations that should be incorporated into business strategies (PricewaterhouseCoopers, 2019).

### [5] BUILDING INDUSTRY NETWORKS, STANDARDS, AND TOOLS OF ETHICAL DIGITAL TECHNOLOGY

**SYSTEM LEVEL:** Ecosystem

**SYSTEM ACTORS LEADING THE INTERVENTION:** Industry, business, digital technologist

**SYSTEM ACTORS PARTICIPATING IN THE INTERVENTION:** Government, communities, end consumers

Participants, specifically those working in emerging fields of digital technology such as responsible technology, when asked about the future of their industry shared a hope that there would be a larger network of stakeholders – a collective – participating in changing the system. From the secondary research, it is evident that there are many practices focused on challenging the status quo of digital technology by implementing ethical approaches. These practices and organizations can explore working together to propel the paradigm shift forward, building bridges between them, and sharing replicable resources and tools that prove the importance of change (PricewaterhouseCoopers, 2019). Ethical

industry norms, regulations, and professional licensing could be explored to create a sense of accountability and responsibility amongst digital technologists and businesses to produce ethical technologies and better discern the technologies that should not be built at all (Weinstein, et al., 2021). This could require the creation of independent industry regulators that are enacted to collaborate with businesses, governments, communities, and digital technologists to create regulations, and be responsible for enforcement and licensing (Quest & Charrie, 2019). End consumers can be empowered to participate in the regulatory of digital technology ethics through the creation of reporting systems to notify regulators – whether government or industry – of potential digital technology violations or potentially harmful designs (Susarla, 2021).

**[6] IMPLEMENTING ETHICAL DIGITAL TECHNOLOGY REGULATIONS AND POLICIES TO PRESERVE HEALTHY COMMUNITIES**

**SYSTEM LEVEL:** Society, Ecosystem

**SYSTEM ACTORS LEADING THE INTERVENTION:**

Government

**SYSTEM ACTORS PARTICIPATING IN THE INTERVENTION:**

Industry, business, communities, digital technologist, end consumers

At the society and ecosystem levels in the system, there could continue to be heightened emphasis placed on developing government regulations to support digital technological innovation while ensuring ethical and responsible practices are followed by companies and entrepreneurs. Additional focus could be placed on creating regulations that support the preservation of community characteristics that inform healthy communities, supporting a healthy society. This should include policies that prioritize investment in building resilient digital infrastructure to include, support, and increase agency of all communities amidst heightened external factors (World Economic Forum, 2022a). Regulations and policies should be developed in partnership with system actors, including the technology industry, businesses, communities, digital technologists, and end consumers and should not be done in isolation (PricewaterhouseCoopers, 2019; Quest & Charrie, 2019). In Taiwan, this is facilitated via a digital minister who was appointed by government to build a closer relationship between the technology industry and government (Weinstein, et al., 2021).

**LONG-TERM**

**[7] SHIFTING THE ECONOMIC MODEL TO RECOGNIZE ALTERNATIVE FORMS OF VALUE**

**SYSTEM LEVEL:** Society

**SYSTEM ACTORS LEADING THE INTERVENTION:**

Government

**SYSTEM ACTORS PARTICIPATING IN THE INTERVENTION:**

Industry, business, communities, end consumers

The economic capitalist system requires restructuring to recognize other values as meaningful forms of exchange in the system, transcending profit. The capitalist economy powers the current digital technology system, prioritizing profit and productivity with limited regard to consequences of perpetual growth in a world of finite resources. To enable a resilient new way of designing that preserves healthy communities, capitalism should evolve to a new economy that measures success differently. To facilitate the transition from capitalism to the next economy, governments can lead the intervention by acknowledging the unsustainable state of perpetual growth on societal and environmental health and finite resources, and implementing policies to support innovation while reducing harm. A new way of working and operating should be established, with businesses and industry participating in the creation of regulations and business models to support a new economy that recognizes alternative forms of value, transcending profit, and supporting healthy communities. End consumers and communities, through advocating for change and through agency of purchasing and engagement behaviour, can put pressure on government, industry, and business, aiding in the shift of the economic model.

**[8] SHIFTING THE MINDSET AND PARADIGM TO BUILD HEALTHY COMMUNITIES**

**SYSTEM LEVEL:** Society, Ecosystem, Organization, Individual

**SYSTEM ACTORS LEADING AND PARTICIPATING IN THE INTERVENTION:** Government, industry, business, communities, digital technologist, and end consumers

A mindset shift – one of the most impactful leverage points in the system to create change as described by Donella Meadows (1999) – is needed to actively consider the impacts of digital technology on communities when designing. A shift in posturing is needed from solely solving for individual needs and driving profit as motivation, towards designing technology through a systems lens, considering impacts on healthy communities. A mindset shift can have a ripple effect across the entire system, and influences and enables all interventions. Across all actors – governments, industry, businesses, communities, digital technologists, and end consumers – a mindset shift is necessary to create a lasting systemic shift of designing digital technology to build healthy communities.

The proposed ecosystem of eight interventions has been informed by primary and secondary research and was developed in an effort to better design digital technology to preserve and build healthy communities for the possible futures to come. As findings from this research study indicate, there is not one intervention that with certainty can preserve the health of communities. However, these interventions can serve as a foundation for continued

awareness building of the importance of considering the impacts on communities while designing and building digital technology. As evident in the evolution of community – depicted through the Multi-Level Perspective – and in the four future scenarios of community – Growth, Collapse, Discipline, and Transform – community health is influenced by external forces and is constantly changing. Therefore, interventions may adjust as new data is gathered, and as environments and technology innovations

continue to shift and influence communities. As a research study next step, interventions can be tested, or windtunneled (Van der Heijden, 2005), in future scenarios to understand how the community characteristics health assessment may change with interventions applied. This process can also inform areas of opportunity for intervention refinements to create more robust interventions.

## COMMUNITY-CENTRED DESIGN

The ecosystem of interventions creates a new design methodology: community-centred design. The eight interventions are visualized below as components of community-centred design: [1] Ethical Digital Technology Education, [2] Design for Thriving Community Characteristics, [3] Community Co-ownership, [4] Holistic Wellbeing Business Models and Metrics, [5] Ethical Industry Networks, Standards, and Tools, [6] Ethical Government Regulations, [7] Transcending Profit as Measurement, and [8] Shared Mindset to Build Healthy Community.

[3] Community Co-ownership, [4] Holistic Wellbeing Business Models and Metrics, [5] Ethical Industry Networks, Standards, and Tools, [6] Ethical Government Regulations, [7] Transcending Profit as Measurement, and [8] Shared Mindset to Build Healthy Community.



**Figure 11.** Illustration of community-centred design methodology.

### DESIGNING FOR THRIVING COMMUNITY CHARACTERISTICS

For the purposes of this research study, a conceptual prototype supporting the short-term intervention [02]: Designing for Thriving Community Characteristics has been created. This prototype exists to support digital technology stakeholders who can create immediate change by considering the impacts of decisions on characteristics that inform healthy community, therefore applying pressure to higher system levels to propel the shift forward.

The design, development, and release to the public of digital technology has an immense impact on society, and as evident

from the research gathered and presented, on communities. Digital technologists, even at a lower level in the system, hold power in decision making during the design process that in turn impact communities. A pattern from participant research was that digital technologists interviewed do not currently consider the wider impact on communities, but it would be valuable to do so. Therefore, the prototype developed aims to empower technologists to generate awareness of decisions on communities via Designing for Thriving Community Characteristics. As government, economy, and industry interventions shift at a slower

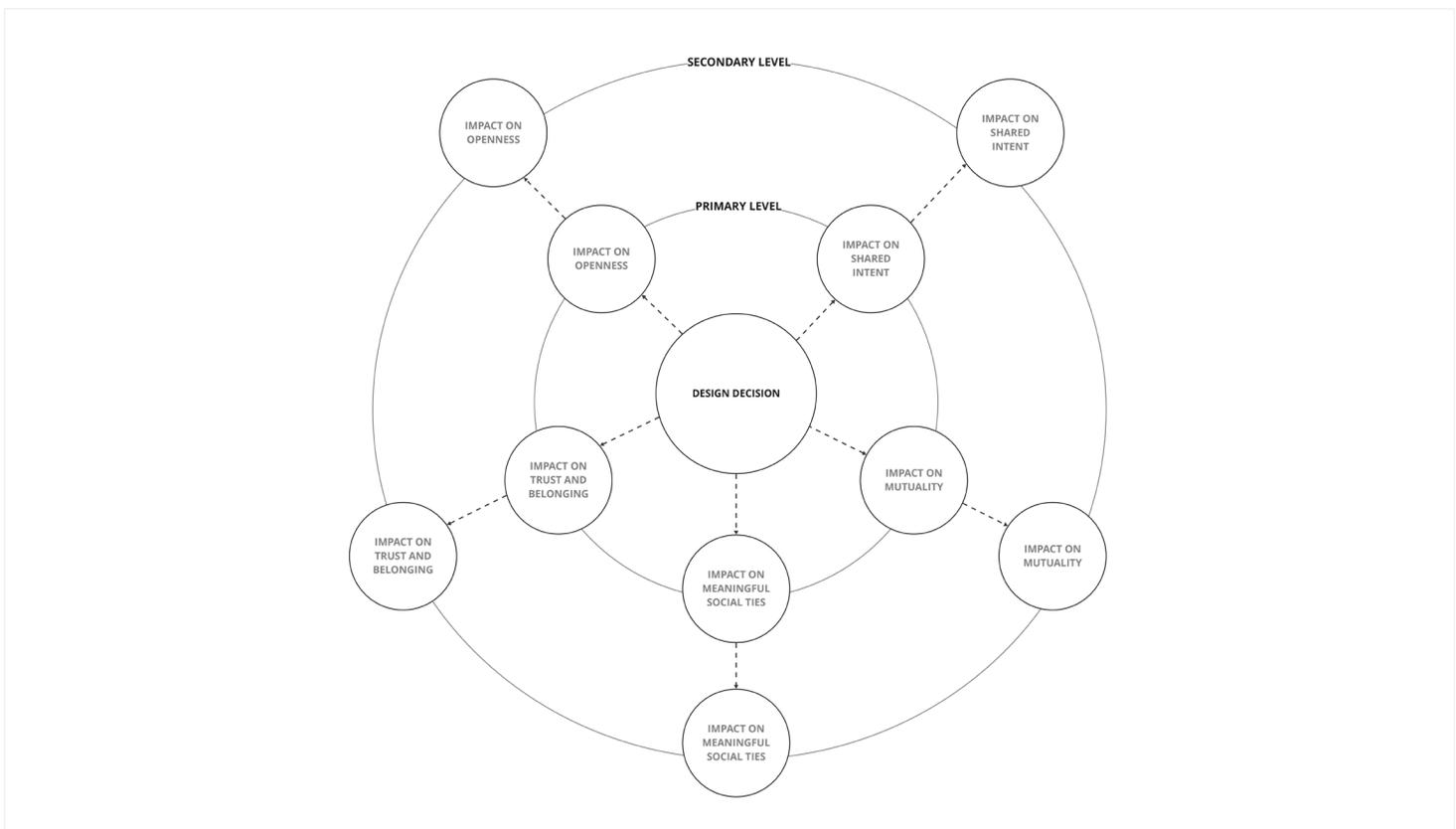
pace over time, technologists can begin to create change from the bottom up.

Designing for Thriving Community Characteristics is a systems thinking and foresight tool to prompt thinking of the impacts of decisions on communities beyond the individual “user.” The framework is an adaptation of the Futures Wheel, created by Jerome Glenn in 1971 (Glenn, 2021), which was developed to understand future implications of a trend or event.

In this iteration, the primary level of impact considers how the design decision may impact the community, using the community characteristics as impact prompts (prompts included below). The secondary level of impact illustrates how the design decision may impact other communities, bringing the defining healthy community characteristic of creating meaningful social ties **between** other communities into consideration. For example, after

completing the primary level of impact, if it is decided that a design decision does not harm the community characteristics, but in the secondary level of impact, it is anticipated that the design decision is harmful towards another community, awareness has been created of all possible consequences, and a decision to move forward must be made.

Any timeline can be set to use this tool: a technologist can explore and anticipate impacts of design decisions on communities in the present and in the future(s). It is recommended that this exercise is applied at the beginning of the design process to inform strategies, and all throughout the design process, co-designed directly with communities. Designing for Thriving Community Characteristics is meant to be adaptable; the community characteristics are crafted based on the research conducted during this study and may shift as more data is gathered, and/or are interchangeable to satisfy unique communities.



**Figure 12.** Conceptual prototype of the Designing for Thriving Community Characteristics tool.

## TOOL PROMPTS

To help facilitate the usage of the tool, key prompts were created, informed by the community characteristics' criteria as defined in this research study. These question prompts can be used to critically consider the impacts any design decision may have, now or in the future, on communities.

- **SHARED INTENT:** How does the design decision impact the identity and/or values of communities? Does the design

decision support communities' shared intents? Does the design decision cause fragmentation, misalignment, or divisiveness?

- **MUTUALITY:** How does the design decision impact reciprocity, care, and accountability in communities? Does the design decision affect respect and cooperation within and between communities? Is there a risk the design decision may spark polarization?

- **MEANINGFUL SOCIAL TIES:** How does the design decision impact the ability to establish meaningful connections that are mutually beneficial? Does the design decision create siloes within and between communities?
- **TRUST AND BELONGING:** How does the design decision impact the ability to build and maintain trust and find a sense of belonging within communities? Does the design decision affect emotional, mental, and physical safety within communities?
- **OPENNESS:** How does the design decision impact the ability to share experiences and resources within communities? Does the design decision impact time and/or knowledge with communities? Does the design decision increase isolation or sharing in communities?

It is important that these question prompts are used to facilitate discussion, and ultimately, create awareness of the impacts not just on target communities, but of all communities that may be affected by the design.

Community-centred design, and the Designing for Thriving Community Characteristics tool, are proposed concepts, and outputs of this research study which has limitations. As the next steps, these concepts should be tested – and the next iteration co-created – with stakeholders.

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## CONSIDERATIONS

There are many considerations and risks pertaining to implementation of community-centred design. The list below highlights some; however, the list is not exhaustive:

- For community-centred design – an ecosystem of interventions – to be adopted, there needs to be an awareness of the importance of healthy communities in society. In tandem, there also must be an understanding that the current digital technology system can produce impacts and unintended consequences that harm healthy communities. Leaders at the governmental, industry, business, and community levels can serve as enablers – or barriers – to inform awareness and understanding.
- A shift in the incentivization and operating model of businesses will be necessary. Key performance metrics will need to evolve to account for long-term gains, and the measurement of other values and goals besides monetization. Existing tooling and/or infrastructure may not be sufficient to support these changes and will need to undergo updates as well.
- Intergovernmental and interindustry collaboration and cooperation to enact regulations, laws, and/or licensing may be necessary for consistency.
- There is a risk of community-centred design being coopted to serve capitalist needs, leading to further extraction from communities and/or monetization of communities to benefit businesses. Additionally, community-centred design could be leveraged to bolster communities that are harmful to the wider society, leading to suffering levels of meaningful social ties between communities.
- There is an awareness that the digital technology industry is saturated with methodologies and frameworks. Adopting this approach may take an investment of time, and there may be a learning curve, which could present a barrier. Community-centred design is not meant to replace existing practices but serve as an additive layer to help foster an understanding of the impacts of digital technology on healthy communities.
- Community-centred design is intended to be a general approach that can be applied universally to digital technologies. However, for every decision, or every type of digital technology, the approach may not be applicable or necessary.

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**This section proposed an ecosystem of interventions, community-centred design, to design digital technology to preserve and build healthy communities. There are eight multi-system, multi-actor interventions within community-centred design, and to enact a lasting paradigm shift, all interventions must be interconnected. A short-term, mid-term, and long-term phased approach to the impacts of interventions is outlined, and a conceptual prototype to support a short-term intervention is introduced: Designing for Thriving Community Characteristics. Community-centred design as an ecosystem of interventions should be shared with stakeholders for validation and continued co-creation.**

# CONCLUSION

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Communities are vital to individuals and to the wider society as they facilitate humans' innate desire to belong and connect, a foundational need. The emergence of digital technology has spurred connections; however, unintended consequences, such as social fragmentation and polarization leading to the erosion of social cohesion, are occurring because of its rapid advancement. Community health – defined in this research study by characteristics of social intent, mutuality, meaningful ties, trust and belonging, and openness – is impacted by emerging digital technology, which affects societal wellbeing.

The research aimed to answer how digital technology might be better designed to build healthy communities. The research methodology followed a four-phased approach – [1] Discover, [2] Design, [3] Assess, and [4] Intervene – to investigate how community has evolved driven by technology, the impacts of emerging digital technology on communities, and how healthy communities may evolve in exploratory futures. Informed by data from primary and secondary research, and through systems thinking, foresight methodologies, and future health of communities' assessment, intervention opportunities were identified. An ecosystem of interventions, composed of eight multi-level, multi-actor interventions, proposed a paradigm shift from human-centred design towards community-centred design. Involvement from top-down actors, such as government, and bottom-up actors, such as end consumers and digital technologists, will enact systemic change necessary to build and preserve healthy communities for the possible futures to come.

This research study is not without previously shared limitations, and there are recommendations to continue this investigation and bolster results and outcomes. Further research opportunities include conducting workshops with multi-level systems actors – end consumers, communities, digital technologists, businesses, industries, and governments – to generate co-created alternative futures of communities. Preferred futures could be selected to work towards, and further interventions to support building healthy communities could be generated and windtunneled in future scenarios to assess for robustness and resiliency.

Concept testing of community-centred design with system actors is a necessary next step to inform the validity of the concept and to produce further iterations that have been co-created with stakeholders. There are a growing number of emerging fields, companies, organizations, and entrepreneurs in the digital technology space actively challenging conventions of digital technology to support the public good. Collaboration with actors is a recommendation to share knowledge and build networks to create sustainable change. Ultimately, community-centred design should aim to be a scalable and repeatable methodology that empowers system actors in digital technology to consider how to build and preserve healthy communities. As existing research and methodologies informed this research study, this research study may now serve as an additional input into the collective knowledge and resources necessary to shift to new paradigms of ethically designing digital technology.

There is a larger opportunity to empower individual communities – relational or geographic based – to apply the methodology used in this research study to understand their own community health, envision possible futures with digital technology and/or other drivers of change, and develop interventions to preserve health. Developing a capacity for strategic foresight and systems thinking within communities could build healthy community resiliency amidst rapid external change.

As an immediate next step, storytelling will be leveraged as an accessible technique to share insights and outcomes from this research study with a wider audience via a public exhibition. The exhibition will increase awareness of the impacts of digital technology on communities, allowing audience members to explore future scenarios, therefore contributing to the mindset shift that is necessary for change.

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# APPENDICES

## APPENDIX A: INTERVIEW DISCUSSION GUIDES

<b>TOPIC</b>	Digital Technology Affecting Community
<b>PURPOSE</b>	Discussion guide: <ul style="list-style-type: none"><li>• Understanding community</li><li>• Understanding experiences, enablers, and challenges in respective fields</li><li>• Looking into the future at possibilities</li></ul>
<b>PROCESS</b>	45 minute semi-structured 1:1 interviews with digital technologists and community professionals

### PARTICIPANT CRITERIA

#### *Technologists*

- Currently working in digital technology as founders, product managers, engineers, designers, researchers
- A mix of technologists who specialize in responsible technology and those who do not
- Experience in North America or Europe

#### *Community Professionals*

- Currently works in the community-building field
- Experience in North America or Europe

### DISCUSSION GUIDE

#### *Researcher Intro*

- Thanks again for taking the time to chat today. My name is Elizabeth Lane and I'm the graduate student researcher conducting this study, in collaboration with the principal investigator and faculty supervisor, Helen Kerr. I am a graduate student at OCAD University, studying a Master in Design, Strategic Foresight and Innovation.

#### *Topic of Exploration & About the Interview*

- Before we get started, I want to make sure you are fully informed about this study's purpose, what we will do with the information we learn from the study, and that you give your consent to voluntarily participate. Thank you for sending through your completed consent form.
- The purpose of this research study is to understand the impacts of digital technology on community and investigate how we can better design digital technology to build healthy community in the possible futures to come.

#### *About the Interview*

- Our session today will be 45-minutes in length, and I will ask you questions about your experiences and involvement in digital technology and/or community work. If at any point you would not like to discuss any of the topics we are touching on let me know and we'll move on to another topic. You may also indicate a need for pause.
- We'll communicate what we learn from this study in a final report.

The contents of that report won't talk about you as an individual, but only about what we learn in general from everyone we talk to. It may include quotes or details from our discussion, but they will be anonymized and not include information that could identify you.

#### *Consent to Participate & Record*

- If you provided consent on the consent form, we may reference the organization you are a part of. You can withdraw from the process at any time, for any reason as this study is completely voluntary. Even after this session is completed, if you decide to withdraw your consent by December 19, 2022, the data you provided will be deleted and not included in the report, with no consequences to yourself or this project.
- Finally, I'd like to audio record this session for the sole purpose of facilitating notetaking and synthesis post-interview. Is that OK with you? Do you have any questions before we begin?

#### **Getting to Know Participant**

1. Tell me a bit about yourself:
  - a. Your name and pronouns
  - b. Where you're located
  - c. What you do for a profession

#### **COMMUNITY PROFESSIONALS:**

#### **Understanding Community**

1. How would you define community?
2. What are the key characteristics/pillars of community?
3. In your experience, how has digital technology affected those pillars, and community overall?
4. Have your experiences with communities always been positive? Or have you encountered negative communities? If yes, what have the core differences been in those experiences?
5. If you could create an ideal community, what would it look like and why?
  - a. What would you need to create it?

## Understanding the Field

1. Tell me about how you got into the community field.
2. What are the biggest challenges or barriers you experience in your field?
3. What are the biggest enablers in your field?
4. What are core tools, processes, methodologies you leverage in your field?
5. How does digital technology play a role in your field?

## TECHNOLOGISTS:

### Understanding Community

1. How would you define community?
2. What are the key characteristics/pillars of community?
3. In your opinion, how does digital technology affect community?
4. If you could create an ideal community, what would it look like and why?

### Understanding the Field

1. Tell me about how you got into technology?
2. What are the biggest challenges or barriers you experience in your field?
3. What are the biggest enablers in your field?
4. What are core tools, processes, methodologies you leverage in your field?

5. Have you ever considered community when designing/building?
  - a. If yes, please expand.
  - b. If no, what would need to change in the current state to support a consideration of community when designing?

### Future State

1. What are you most excited about in your field, and what are you fearful of?
2. Imagine you're 75+ years of age reflecting on your career, what is your greatest accomplishment and why?
3. What would you have to change today or do today to achieve that vision?

### Wrap

- Is there a question you wished I had asked? Anything you'd like to add?
- Thank you very much for taking the time to share all that you have with me today.
- As next steps, I will be continuing to conduct research, and will compile findings in a report produced April 2023. If you indicated your interest on the consent form, I will share the report with you via the email provided.
- Do you have any final questions for me?

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# APPENDIX B: SIGNALS OF CHANGE

## DIGITALLY DIVIDED

**STEEP+V:** Technology, Social, Economic

### SIGNALS:

- Unequal access to digital literacy: It is one thing to have access to digital technology, it is another to be able to understand and be proficient in digital technology. There is tension between these two, and historically, it is systemically oppressed populations that have lower rates of digital literacy. Organizations such as Powrplnt in New York City are trying to close the gap, democratizing access to digital technology education for youth (POWRPLNT, n.d.).
- The aging population is another group with lower digital literacy rates, and with the aging population growth estimated to spike

in Canada with approximately 22.5% of the population over 65 by 2030, and the digital momentum not slowing down, it is a vulnerable population that could be left behind in a digital-first world (*Overcoming Digital Divides*, 2021; Eisen & Emes, 2022)

- Unequal access to infrastructure: while hardware necessary to access the internet, such as computers and smartphones, is more readily available globally, suboptimal wireless infrastructure in rural areas is blocking equal access to the internet (United Nations, 2017; *State of Digital Inequity Report*, 2023)

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## CONNECTED DISCONNECTEDNESS

**STEEP+V:** Technology, Social

### SIGNALS:

- The loneliness epidemic: 1 in 10 Canadians have experienced loneliness, stating they are often, or always lonely (Government of Canada, 2021a) and approximately 33% of adults globally reporting loneliness (Statista, 2022).
- Generation Z has been deemed the loneliness generation because of constant overstimulation and online presence resulting in less time for physical human connection (Jenkins, 2022).
- Inflation driving isolation: going out and socializing costs money, and with the cost of living increasing due to inflation, this is forcing people to cancel plans and stay in their homes.

For the older generation, that at times means staying alone (Stephenson, 2022)

- Designing to combat isolation: Allocated slow grocery lanes in supermarkets created to provide the opportunity for people who would like to chat longer with cashiers, originally implemented in The Netherlands to combat loneliness amongst the elderly, are now found in the United Kingdom and Canada (Wong, 2023).
- Hikikomori: There are 1.5 million people in Japan living as social recluses post-COVID 19 pandemic (The Japan Times, 2023).
- Mental health issues globally have increased due to COVID-19 (United Nations, 2022)

- Alternative forms of mental health interventions such as psychedelics, immersive wellness technologies, and technology-driven chatbots are being developed to combat loneliness and isolation (*Trends 2023: Collide, Connect, Care*, 2023; Jargon, 2023; Wang, 2023).
- Loneliness and isolation have been linked to increased risk of physical and mental conditions impacting overall health and wellbeing (National Institute on Aging, 2019). This can have a significant impact on social resources and the economy (Kelland, 2018).

## HYPERLOCAL

**STEEP+V:** Social, Values

**SIGNALS:**

- Local Supply Chain: Companies are looking to re-shore or onshore manufacturing, moving from international to local, in order to create resiliency amidst supply chain disruptions (*Supply Chain Issues?*, 2022).
- Local Urban Agriculture: Buying local food is a huge contributor to the economy. As farmland is compromised by housing developments and climate change, alternative innovations are rising to continue local food production and combat food insecurity including reuse of space for urban farms like rooftops and parking garages and vertical farming ("Local Food," n.d.).
- 15-Minute City: An urban planning concept focused on creating access to quality amenities within a 15-minute proximity to develop health resiliency, lower carbon impact, and tackle a growing population. Ottawa is the first city in Canada to adopt this concept into its Official Plan until 2046 (Canadian Public Health Association, n.d.; Sibbald, 2022), while the concept is heavily informed by Jane Jacobs, it was coined in Paris by Carlos Moreno where implementation is in progress under the leaderships of Paris' Mayor, Anne Hidalgo (Gee, 2020; UNFCCC, 2021).
- Proximity is a determinant of health and wellbeing (Lefever, 2020).
- Social prescribing: Doctors with connections to and/or partnerships with local non-clinical organizations are prescribing patients to participate in programming specific to their needs as part of a holistic approach to treatment (Nowak & Mulligan, 2021).

## EXODUS FROM BIG TECH TO AUTHEN-TECH

**STEEP+V:** Technology, Values

**SIGNALS:**

- Community-run: Mass surge of users quit Twitter amidst the Elon Musk takeover and joined Mastodon, a federated software network that allows for communication across multiple self-hosted servers, offering more control than a centralized platform, like Twitter (Lunden, 2022). While not a direct replacement, with the surge now falling, the act of leaving rang loud and clear to Big Tech players (Hoover, 2023).
- Niche communities: Leaving larger social media behind, people are gravitating towards smaller communities that foster a sense of community and belonging built around niche interests on platforms such as Discord and powered by emerging digital technology such as Blockchain (*Accenture Life Trends 2023*, 2023).
- Demand for authenticity: People are breaking free of the constraints of filters and are displaying authenticity instead of perfection. There is a nascent movement of #deinfluencing trending on various platforms - led by Generation Z - denouncing the culture of influence and consumerism that is prevalent on social media (Pauly, 2023).
- Anonymous vs. Oversharing: Some people wish to keep their identities anonymous online by choosing platforms where oversharing is not the default, and you can contribute and be in connection with others, while still maintaining privacy in more intimate settings (*Trends 2023: Collide, Connect, Care*, 2023).
- Luddite teens: Generation Z teenagers are replacing smartphone technology and associated Big Tech social media with simple flip phones in order to unplug and protect their mental health from the harms of Big Tech (Maruf, 2023).

## ARTIFICIAL IDENTITIES

**STEEP+V:** Technology, Social

**SIGNALS:**

- Generative AI: Generative AI, such as ChatGPT created by OpenAI, a language modeling tool for dialogue, is changing the way content is produced. Humans enter prompts or questions to AI technology, and the outputs are fully formed ideas in sentence form (*GPT-4*, n.d.).
- NVDA eye contact: NVDA has recently released AI technology that seemingly forces a human's eyes to focus on the camera, even if that human is completely another task or looking away, to the audience, it is as if they are completely focused (Delgado, 2023).
- Digital Afterlife: The digital afterlife is here, with companies creating offerings for loved ones to manage data of the dead, or to prepare data in advance of death, like a will. Other AI companies are creating replicas of deceased humans by training the AI with data of the deceased (Robitzski, 2018).
- Digital Twins: Digital Twins, a replicated virtual environment of a physical environment, exist today to support industries such as manufacturing and even medicine (McKinsey, 2022). Some cities are beginning to adopt this same practice, and digital avatars are becoming more realistic (Ngayi, 2023; *Human Digital Twins*, n.d.).
- Consciousness download: Elon Musk's company Neuralink (2023) is currently working towards the development of brain interface technology claiming that one day it may be possible to download one's consciousness and upload to a machine, essentially prolonging one's "life" (Johnson, 2020; Sauer, 2022)

## EXISTING IN THE FOURTH PLACE

**STEEP+V:** Technology, Social

**SIGNALS:**

- Proliferation of access to equipment, with Apple set to release its mixed reality headset in 2023 (Gurman, 2023)
  - Virtual wealth: Virtual commerce (e-commerce) is disrupting e-commerce with brands and companies now building shopping experiences in virtual reality (Wiggers, 2023). The virtual real estate market has grown, with plots of virtual land and houses being purchased for millions of dollars (Cyr, 2022).
  - Wellbeing and health entering virtual reality: Currently in clinical trials, COMPASS Pathways are using psilocybin in combination with digital environments for mental health treatments (Frog, 2023). With prolonged virtual immersive experiences, people require guidance in the physical space to eat, access the bathroom, and navigate to bed. Sara Lisa Vogl dubs herself a VR shaman, which could open doors for an evolution of a personal support worked (Vogl, 2016).
- Virtual intangibles: Feedback from digital environments has always been its lack of intangibles that the physical environment can provide, however, that feedback may be mute as companies are now introducing virtual intangibles, including scent packages and haptic technology to accompany virtual experiences (*Tech Trends 2023, 2022*).
  - Fashion: Fashion houses are investing in digital fashion, creating digital collectibles and digital clothing for wear in virtual and digital environments, and even exhibiting digital clothing during Fashion Weeks (Macdowell & Schulz, 2023). A digital fashion platform, DressX (n.d.), is encouraging people to not buy less clothing, but to buy digital clothing, with the belief that there is overproduction of physical clothing leading to waste, and digital is truly zero-waste, even partnering with clothing brands, such as H&M (Zwieglinska, 2023).

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## ON THE MOVE

**STEEP+V:** Social, Environment

**SIGNALS:**

- Work From Anywhere (WFA): spurred by the Pandemic, more and more employees are demanding the new normal of work to be digital-first and transitioning to a digital nomad lifestyle, having the freedom to work remotely and from anywhere in the world (*2022 Tech Trends Report, 2022; Tech Trends 2023, 2022*).
- Natural disasters and unlivable conditions attributed to climate change are displacing millions of people, with estimates of 1 billion people being displaced by 2050 (*2022 Tech Trends Report, 2022; World Economic Forum, 2023a*).
  - To combat an aging population and to ensure a stable workforce, countries are increasing rates of immigration (Government of Canada, 2022; Government of Canada, 2023a).

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## SHARING IS CARING

**STEEP+V:** Economy, Values

**SIGNALS:**

- Co-ownership of property: financial institutions are creating new mortgage products to help facilitate shared ownership that limits risk to each party involved, hacking the unaffordable housing market (Middleton, 2023).
  - Community fundraising: Digital technology platforms are creating opportunities for collective fundraising, supporting community ownership. Smallchange is a crowdfunding platform for real estate, opening the door for more people to invest in real estate (Smallchange, n.d.), and Substack recently completed its first community fundraising round, allowing platform users and the public to invest in the future of the company (Best, et al., 2023).
- Fractional investments: smart contracts and tokenization built in Blockchain are now able to facilitate democratized investing where unrelated parties can co-invest in stocks and art, in addition to real estate (Simerman, 2020).
  - Cohousing: People are rethinking the traditional single-family home model and exploring co-housing and living models. Individuals as a collective are coming together to repurpose rundown buildings or purchase land, architectures are designing buildings community-first, and entrepreneurs are seizing the opportunity to target like-minded individuals. In a time where individuals have experienced extreme loneliness, co-housing is proving to positively impact mental health and wellbeing (Novotney, 2019; McCord, 2021).

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## SHARED GOVERNANCE

**STEEP+V:** Social, Technology, Environment, Economy, Politics, Values

**SIGNALS:**

- In Canada, it is projected that the Indigenous economy could grow from its current \$32B to \$100B, greatly contributing to the entire Canadian economy (Indigenomics Institute, n.d.; Godwell & Nooh, 2022).
- One third of the Earth is Indigenous peoples and local community land, and approximately 91% of that land is deemed in good or fair ecological condition due to the Indigenous care and approach to stewardship of the land, an indicator that Indigenous-led climate action is essential (World Economic Forum, 2023b).
- Toronto District School Board in Ontario, Canada announces that a new mandatory course will be taught in high schools across the district to Grade 11 students: English: Understanding

- Contemporary First Nations, Métis, and Inuit Voices (Toronto District School Board, 2023).
- Raven Capital Partners, the first and only Indigenous-led investments firm in North America raised \$100MM for their second Fund which will support Indigenous enterprises and entrepreneurs (Alcaraz, 2023).

- The Indigenous population is growing faster than the non-Indigenous population in Canada, and by 2030, Indigenous youth will represent 45% of the Indigenous population (Schrumm et al., 2021).

## THE FIGHT FOR TECH REGULATION

**STEEP+V:** Technology, Social, Values

**SIGNALS:**

- Global dialogue on the ethics of emerging technology via global governing bodies, grassroots organizations, non-profit organizations, and citizens advocacy for tech regulation (Wadhwa & Wadhwa, 2021).
- Digital technology competition and ethics and data privacy and protection laws are being written by governments globally driven by rapid technological advancements, such as Artificial Intelligence and Big Tech monopoly, and its effects. In 2018, the European Union established the General Data Protection Regulation (GDPR) (Zaeem & Barber, 2020), followed by the California Consumer Privacy Act (CCPA) which came into effect in 2020 (*California Consumer Privacy Act (CCPA)*, 2018). More recently, antitrust bills that would have controlled Big Tech's market monopoly were narrowly

defeated in the United States (Birnbaum, 2022), the European Union's Artificial Intelligence Act was released in March 2023 (European Commission, 2021; *The EU's Artificial Intelligence Act, Explained*, 2023), and Italy placed a temporary ban on ChatGPT due to ethical data collection concerns (Thomas Reuters, 2023).

- OpenAI, the organization that developed ChatGPT, a Generative AI tool, is calling for government regulation on AI to ensure ethical usage (Simons, 2023).
- A letter from executives within the technology community was published calling for a slowdown in AI development to allow governments time to catch up and regulate the industry ("Pause Giant AI Experiments," 2023).
- OpenAI creates a Bug Bounty program rewarding the public for discovering bugs to help improve the technology (OpenAI, 2023).

## THE SPLINTERNET

**STEEP+V:** Political, Technology, Social

**SIGNALS:**

- Government control lockouts: Nations are weaponizing the Internet by shutting down access to civilians and therefore disconnecting civilians from the rest of the world, and from their own communities and support networks and social resources (Vincent, 2021). 35 shutdowns occurred in 2022 (Cheng, et al., 2023).
- Interest echo chambers: Polarization across digital social media is rising, and online social platforms, communities, and

content divided by partisan lines are growing. Whether self-selected to participate or prompted via an algorithm, being in the presence of one-sided opinions without rebuttals has a splintering effect on the open internet (Fletcher, et al., 2022).

- Governments, such as China ("The Great Firewall of China," 2018) and Russia (Stokel-Walker, 2022), are enacting borders in the Internet's borderless space by placing government control, including censoring, over the internet
- Internet blackouts have cost the global economy \$42.1 billion since 2019 (*The Global Cost of Internet Shutdowns*, 2023)

## DECENTRALIZATING POWER

**STEEP+V:** Politics, Social

**SIGNALS:**

- Empowering Local Governance: Municipal governments are closest to citizens and businesses that drive GDP, and each community has unique needs that a centralized government cannot fully address. The uproar from opposition when Bill-39 was put into effect to centralize power at the mayoral level, passing bylaws with only one third of council votes (CBC News, 2022), indicates that centralization is not sufficient to protect democracy and help community wellbeing thrive, especially as cities like Toronto continue to grow (*The Future of Local Government*, 2021; Cities, local and regional governments and human rights, n.d.).
- Significant rise of Decentralized Autonomous Organizations

(DAOs), with the total value of DAO treasuries reaching \$16B in 2021 and 1.6 million participants. Powered by blockchain, a DAO is democratic collective member-owned organization that is not reliant on a dominant leader(s) but instead leverages a smart contract for transparency and verifiability (World Economic Forum, 2022).

- Community-Owned Wi-Fi Networks: To combat the digital divide, communities are banding together to advocate for and build a community owned internet provider service. Telecom companies have left many communities underserved, and to solve this, municipalities are taking back control (DiBenedetto, 2021; Knight, 2021).

## TRUST NO-ONE

**STEEP+V:** Values, Politics, Technology

**SIGNALS:**

- Rise in civilian protests and the emergence of grassroots and activist movements are demonstrations of the distrust civilians have towards government institutions and media (World Economic Forum, 2023a)
- Individuals are more empowered and aware than ever before and are viewing existing systems with skepticism and demanding transparency and traceability after decades of manipulation (Accenture Life Trends 2023, 2023).
- Individuals are taking proactive measures to protect themselves (and their data) against surveillance and security breaches with digital technologies such as messaging apps like Signal, and digital wallets (Trends 2023: Collide, Connect, Care, 2023), and advocating for ownership over their data, including the agency to sell their data to companies on their own terms (Kihn, 2022).