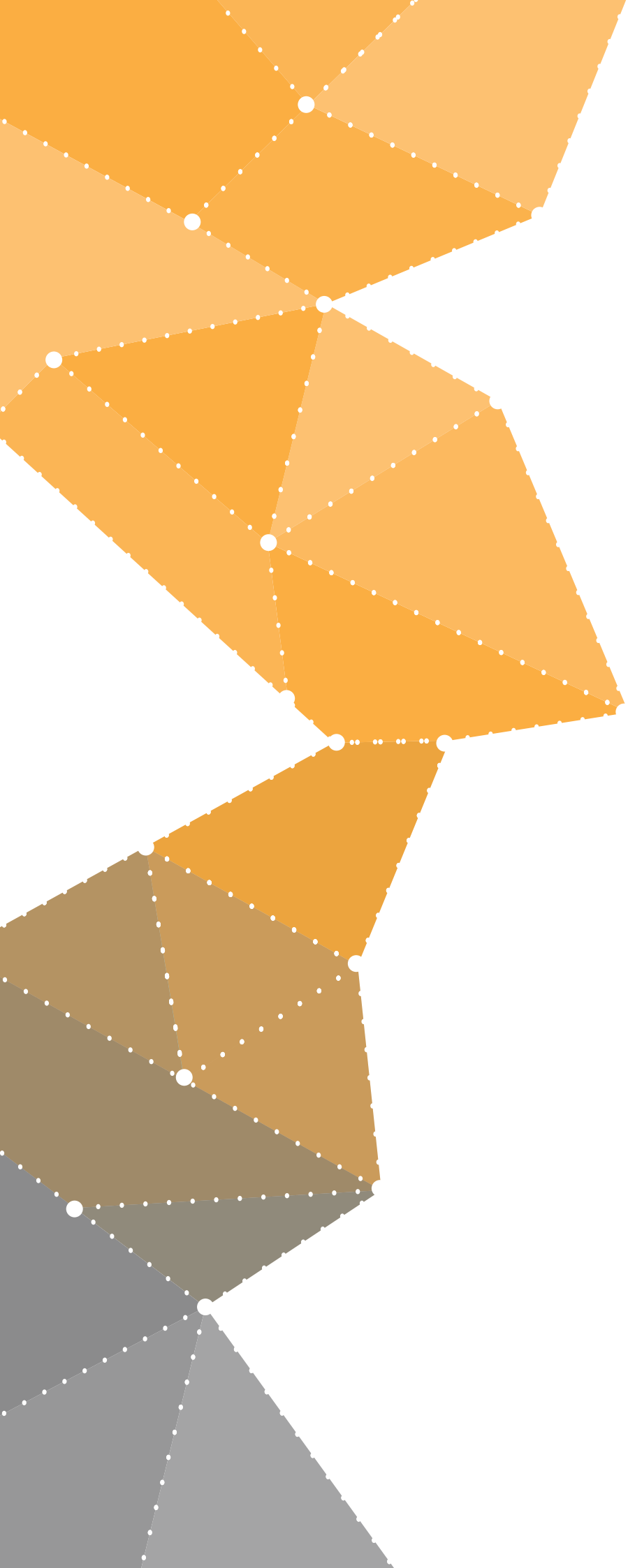

W42

Be Optimal

W42

Technology and the Futures of Wellbeing
Foresight Studio
April, 2022
OCAD University

ANY USEFUL STATEMENT ABOUT THE FUTURE SHOULD AT FIRST SEEM RIDICULOUS.

Jim Dator

W42
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MEET THE TEAM

Kendra

Kendra is a passionate marketer and strategist who seeks to apply human-centered design principles to better organizations. Through her experience within higher education and community building, she desires to present creative solutions to complex problems through futures thinking, innovation strategy, and design thinking practices.

Pedro

Pedro is an entrepreneur who is enthusiastic about music, technology, design thinking and foresight. Highly motivated and driven to new environments and challenges. Responsible for audio visuals and keeping the team caffeinated.

Faizah

Faizah Balogun is a design thinking specialist with an infectious level of energy, enthusiasm and drive that is unmatched. She co-founded ‘Envly,’ with a vision to accelerate sustainable shopping. Faizah is currently doing her Masters in Strategic Foresight and Innovation to change present day issues to future solutions.

Sumona

Sumona is a digital designer focused on developing impactful content- aimed towards building well-being, identity and resilience in individuals and companies by combining subjects of psychology, ancient philosophies (mind/body), technology innovation and systems design.

This project on technology and the futures of wellbeing seeks to inform the Canadian Patient Safety Institute on how Canadians may experience wellbeing in the year 2040. This knowledge may be used to increase awareness among patients and explore further patient and user protection opportunities.

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INTRODUCTION

To explore technology and the futures of wellbeing within the focus of pluralism, we began by defining what pluralism and wellbeing mean for this topic.

A pluralistic approach to wellbeing and health care in general includes the equal acceptance of different wellbeing understandings, beliefs, and needs. The wellness wheel serves as a visual reminder of this plurality.

PLURALISM:
EQUAL ACCEPTANCE OF DIFFERENT WELLBEING UNDERSTANDINGS, BELIEFS, AND NEEDS

Defining WELLBEING

Our understanding of wellbeing is centered around the wellness wheel, defined for our purposes as the state and balance of the emotional, occupational, physical, social, intellectual, and spiritual dimensions. Approaching each of these areas with equal attention contributes to the overall wellbeing of an individual.

OVERVIEW

The Futures of Wellbeing and Technology seeks to inform the Canadian Patient Safety Institute on how Canadians may experience wellbeing in the year 2040. This knowledge may be used to increase awareness among patients and explore further patient and user protection opportunities.

The Canadian Patient Safety Institute (CPSI) aims to lead system strategies that ensure safe healthcare. CPSI (2022) works with governments, health organizations, leaders, patients, and healthcare providers to inspire improvement in patient safety and quality. Their interest in the futures of wellbeing stems from a perspective of patient safety and education of healthcare workers and system policies, leading to improved wellbeing in Canada.

Our goal is to expand awareness with CPSI of the futures of wellbeing in Canada as they intersect with technology, and to explore the long-term effects that trust in technology can have on society. We seek to communicate the balance between public and private health care models in Canada, which affects access to health care for many populations within the country. We also seek to express how high and low trust in technology in public and private models of healthcare further compounds wellbeing outcomes.

We believe this topic is of utmost importance to CPSI and to the Canadian public, due to the complex challenges presently involved in current trends of technology and wellbeing. As well, it is our belief that plurality in wellbeing is changing alongside these trends, and the equal acceptance of different wellbeing understandings, beliefs, and needs, is being challenged in unique ways. In exploring technology and the futures of wellbeing, we can become more resilient to these changes and more pluralistic in our responses to the needs and desires of Canadians.

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BREATHE
RELAX
ENJOY

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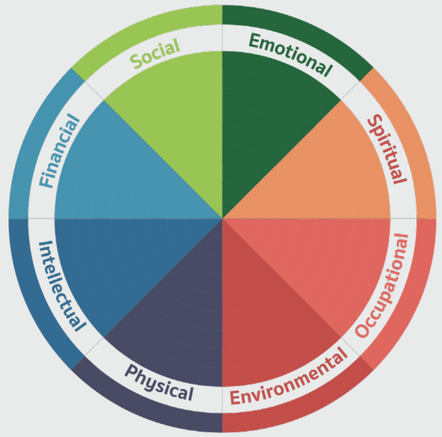
To explore these themes further, we use W42 as a fictional representation of a private wellbeing company in the year 2040. In our designed future, W42 is hired by the Government of Ontario to conduct wellbeing assessments used in daily life. This is descriptive of stakeholders in both private and public arenas, and imagines how Canadians could navigate technology and the futures of wellbeing in the coming years.

WELLNESS WHEEL

Our understanding of wellbeing is centered around the wellness wheel, defined as the state and balance of the emotional, occupational, physical, social, intellectual, and spiritual dimensions. Approaching each of these areas with equal attention contributes to the overall wellbeing of an individual.

A pluralistic approach to wellbeing and health care in general includes the equal acceptance of different wellbeing understandings, beliefs, and needs. The wellness wheel serves as a visual reminder of this plurality.



BACKGROUND

Horizon Scan

To deepen our understanding of current trends in relation to plurality in Canada, we conducted a horizon scan to capture information as signals of change that may impact the domain of pluralism in 2040. We implemented a STEEPV framework to be inclusive in our scanning for weak signals of change that indicate current trends in this area and synthesized these signals into new insights.

These trends form a picture of pluralism, wellbeing and technology rooted in current events that informs our analysis into the futures. Wellbeing and health care are complex systems supported by unbalanced power structures, with stakeholders in both wellbeing and technology domains and patients having little ownership or power over their own wellbeing. Nonetheless, with greater access to information through the internet along with increased access to education, patients are looking for more agency in their health care.

The Canadian context of public health care adds further complexity, with the understanding that health care should be public and equally accessible by all citizens. However, we see that certain groups have greater access to care than others. This prompts us to question whether health care will remain public in Canada, and whether private companies will continue to take ownership in this sector with the increase of digital health solutions. How will patient wellbeing, safety, and trust in technology be affected as a result?

STEEPV TRENDS

SOCIETY

- Count-ech
- Eye-Catching Evidence
- Loneliness

TECHNOLOGY

- Sick Care to Healthcare
- Technology for Addiction Therapy
- Wearable Technology: Human's Next Gadget

ECONOMIC

- Dematerialization
- Competition in Health Tech
- Capitalizing on Therapy and Mental Health Care
- The End of "Ownership"

ENVIROMENTAL

- Exploration of Microbiomes

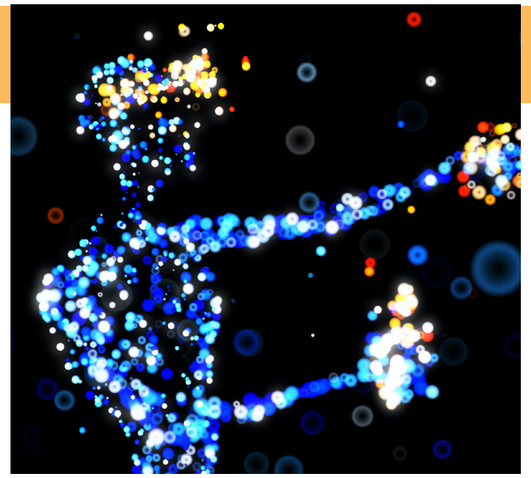
POLITICAL

- Government Regulation of Social Media

VALUES

- Low Trust in Journalism
- Self-Care for Self-Preservation

COUNT-ECH



Due to the increasing popularity of the metaverse and its emerging subcultures, individuals are now forming social groups in the metaverse based on shared beliefs. These communities with locales in the metaverse are in some instances less pluralist than others, as they reflect their own value systems or are part of a digital colonialism due to lack of regulation. The effects and possibilities of having locales in the metaverse are potentially reflections of the plurality of current world systems. Pluralism may not be fully actualized in the metaverse due to the differing beliefs and viewpoints surrounding the metaverse, and this trend may further expand the digital divide among the global population.

Signals

- Internet connectivity is higher than it's ever been, and 5G technologies allow for more processing and access to information on the internet. This is seen as the way to facilitate the next generation of technology (Loftus, n.d.).
- Individuals have begun to invest in and purchase real estate in the metaverse. The value is projected to double from $500 million this year (Frank, 2022).
- Due to the increasing popularity of the metaverse and its emerging subcultures, there is now a possibility of creating locales in the metaverse based on similar beliefs. Dominant beliefs tend to differ based on political ideals, and a new locale could emerge based on partisan beliefs that are not "left" or "right", but rather "upper" and "lower" (Davis, 2022).
- Individuals are being shaped by efforts to change alongside digital and technological advances. Despite this being a technological determinist belief based on the perceived economic value of the metaverse, it seems that for people to benefit from this value and exchange value, communities in the metaverse need to be stronger (Adam, 2022).
- As the digital space grows, tech companies are attempting to expand in countries with little to no digital regulations. This is particular to third-world countries, and tech companies are exploring ways to extract and monetize data in these spaces in a digital colonialism (Vargas, 2022).

Related Trends

- Decentralization
- NFTs and cryptocurrencies
- Neo-Luddism opposing modern technology
- Technological determinism

Implications

- Issues of isolation may emerge, affecting individuals mentally, emotionally, and physically if people end up being confined in their spaces.

EYE-CATCHING EVIDENCE

As a result of injustices perpetuated by the police and the use of smartphones to capture these events, recording-enabled lenses will be used to observe these acts on camera discretely (Altman, 2022). This can be used as a new way to understand how crimes occur, and how law enforcement officials perform with the knowledge of being recorded. It has the potential to expand beyond police brutality to other crimes that are put into question, such as in "he said, she said" scenarios, and indicates a broad acceptance of digital surveillance as a means to increase public safety and wellbeing. This could affect public trust in technology and its contribution to justice.

Signals

- Smartphones have been repurposed as a tool to fight the police, despite their limitations. This has transformed the relationship civil society has with law enforcement. By capturing moments of injustices, citizens are better equipped to come together to protest the systemic problems in law enforcement (Aschoff, et al., 2020).
- Individuals are beginning to stand up against issues that have long been tolerated as the norm – from racism in hiring practices to clear gaps in treatment based on gender (Khadem, 2022). These exposés are often treated as allegations and ultimately swept under the rug until irrefutable evidence comes into play, such as recordings (Associated Press, 2022).
- A group of mothers have come together to expose indoctrination in their children's school. This group is made up of individuals with varying viewpoints on the political spectrum, however, due to the concerns of their children's futures they came together to try and obtain proof of this event through recordings (Morris, 2022).
- The pervasive nature of social media captures almost everything at each moment in time. Platforms such as Instagram, Snapchat, and Facebook encourage up-to-the-minute engagement of content captured by cameras for people's social circles. This enables insight about other people's actions through simple search features on social media sites (Liu, et al., 2021).

Related Trends

- Software company PredPol provides the use of artificial intelligence for officers to support them and increase efficiency. Past data is fed to the system to help it in predictive policing. The problem is that it is based on biased data which causes a constant loop of more bias. The outputs of this system disproportionately overrepresents people of colour and individuals in lower income communities (Guariglia, 2022).

Implications

- While increased digital surveillance may initially reduce public faith in the justice system, in the long term minority groups may see more justice as a result. This is an instance of digital surveillance being used positively, although the side effects of being constantly "on camera" and trusting technology with the increased collection of data are yet to be seen.

LONELINESS

Loneliness and isolation are affecting the psychological and physical health of society, generating serious consequences, including economic ones. Lack of human contact and intimacy is increasing, especially during the COVID-19 pandemic and as we move ahead into new plains of socialization online (Weissbourd et al., 2021). Identify formation is largely based on others' reactions and responses to us, and forming a healthy identity also includes going through the fallacies and discomfort of physical interactions. When these situations are substituted by curated social apps that provide the safety of not dealing with consequences of online communication, this has negative impacts on identity formation and the overall wellness of our society.

Signals

- Not surprisingly, loneliness appears to have increased substantially since the outbreak of the global pandemic. Recent findings suggest that 36% of Americans (including 61% of young adults and 51% of mothers with young children) reported feeling "serious loneliness" (Weissbourd, et al., 2021).
- Loneliness is increasing world-wide; one study reported 113 countries experience loneliness at a problematic level (Henderson, 2022). In Canada, nearly one in four respondents said could not access the mental health support they needed in 2021 (Jabakhanji, 2022). Italy also is experiencing high reports of loneliness, calling for more attention to the problem (Carlo, 2022).
- One reason younger people may feel more isolated may be their greater tendency to use social media, as one study found an increasing correlation between social media usage and feelings of loneliness (Weissbourd et al., 2021).
- "Facebook depression" refers to depression that develops because children and teens are spending a lot of time on social media sites and begin to experience depression as a result. When teens compare themselves to photos of others and are presented with the illusion of other "better" lives, they can experience low self-esteem and depression (Brent, 2011).

Implications

- Reports of loneliness and isolation prompt new responses from health care and new social supports from our governments, schools, and workplaces, as mental health affects every area of wellbeing. However, responses to mental health crises tend to not be pluralist, disproportionately leaving out minority communities.
- Intimacy is a core human need that will find new ways to adapt and manifest digitally. New relationship bonds will be created through online avatars in the Metaverse, that may or may not fulfill the physical needs of contact that friendship bloom from. Social skills may have to be focused on as training, and AR will hopefully launch games that interact with the primary world, responding to a need for bonding and communication.
- Intimacy therapy is on the rise, and A.I assisted designed intimacy its already taking form.

SICK-CARE TO HEALTHCARE

Technology is being used more and more in all aspects of health care and is influencing a move toward preventative medicine. This method of care focuses on disease prevention rather than disease treatment. In some cases, preventative medicine can also give a very early diagnosis of the disease, thus facilitating treatments and possibilities of new cures. This has given rise to more debatable topics, such as big data, wearable devices, and even genome editing.

Signals

- Countries are ramping up their regulations and strategies to adapt digital solutions for preventative medicine. Queensland Health has recently published a decade-long strategy to digitally transform the state's healthcare services in rural and remote areas (Ang, 2022).
- Vaccines are a long-recognized course of action in preventative health care. Recently, the infants of mothers who completed two doses of either the Moderna or Pfizer/BioNTech coronavirus vaccines during pregnancy had about a 60% reduced risk for being hospitalized with COVID-19 in the first six months of their lives (Howard, 2022).
- The debate around the ethics and boundaries of genome editing to correct genetic dysfunctions in a fetus is picking up pace with urgency. In 2018, scientist He Jiankui, a researcher at the Southern University of Science and Technology in China, claimed to have produced the world's first genome-edited babies using CRISPR technology — twin girls born resistant to HIV (Riley, 2022). There is also a recent call for people who need IVF treatment being urged not to go to other countries to create "designer babies" that are screened for certain traits (Ng, 2022).
- Health technology companies are increasingly focused on wearable devices, and the digital health space has grown fast in recent years, as more people have embraced telemedicine, at-home fitness setups, and mental health apps (Donnelly, 2022). There are already more than 300 health institutions that use wearable devices, and the number is only increasing (Healthcare Insights, 2021). These devices can promote the prevention and control of numerous diseases, in addition to improving the patient experience. An Apple Watch could track metrics like your heart rate and your oxygen level and share that data with a sleep monitoring device to determine the optimal light and temperature for the highest sleep quality (Field, 2021).
- Global venture capital investment in digital health companies in 2021 totaled more than $57 billion, an increase of nearly 80% compared with 2020 (Donnelly, 2022).

Implications

- Industry 4.0 is bringing a series of new concepts to different markets, such as the Internet of Things, big data, storage, accessibility, and sharing, among others. Within that context, "health 4.0" is a new technological and operational solutions that will directly influence the development of new treatments, the monitoring of patients, and the management of resources in health units.
- Genome editing will also lead to a more resilient evolution of our species, and designer babies may be an eventuality, where customizing physical features could be the new elite norm.
- Age reversal technologies may also see light, bringing down mortality rates for the wealthy.

TECHNOLOGY FOR ADDICTION THERAPY

With the continuous innovation of technology, addiction therapists look for new ways to tackle addiction. These are catered programs to wean users off habitual substances such as opioids. As a result, the substance no longer runs in the patient's body, rather they can experience it in small increments in a controlled setting via VR or other technologies to guide the reduction or end of their reliance on the substance.

Signals

- VR is now used for addiction therapy, where users are weaned off habitual substances, by experiencing it in small increments in a controlled setting via VR to guide the reduction or end of their reliance on the substance (Esumi, et al., 2020; Center, 2021).
- Known side effects of opium (other than addiction) include respiratory depressions and oversedation. However, VR has been used as a means for anesthesia as well as analgesic therapy that contributes to a 25-75% dose reduction in the administration of opioids. Immersive environments are played while a user places VR headsets on and are shown to be effective in treatment as an ongoing therapy as well as anesthesia in operating rooms (Faruki, et al., 2019).
- Among other things, biohackers look for ways to boost physical and cognitive performance, forming a section of transhumanism. This movement explores how technology can evolve the human species and, as a result, uses technological methods to alter the way bodies work. This can be a step in the "right" direction to have the experience of doing something without the body suffering the physical consequences of it (Samuel, 2019).
- Individuals who have been affected by severed spines are now able to walk again due to implants in their bodies. The implants work by the brain sending signals to the legs via nerves in the spinal cord boosting the signals' ability to allow the legs to work again. These electric implants can reorient the way the body works, so in the case of addiction treatment, it is possible that therapies like this can rewire the brain in new and conducive ways (Hicks, 2022).

Implications

- An over-reliance on the VR experience may bring out other means of major addiction and outweigh the ideal impact of weaning off the substance. Due to the versatility in the way this experience can be used to get off addictions, the virtual experience could be used by many people, and in turn their realities may be altered in terms of what is beneficial for them.
- This trend could support the idea of pluralism, however there is potential for the use of technology to bring about a divide among those who are in support of it versus those who are not. It may become a new political way of thinking and approaching life.

WEARABLE TECHNOLOGY: HUMAN'S NEXT GADGET

Wearable technology has become popular with the use of fitness trackers like Fitbit or the Apple Watch. This technology is not only making advances in watches and glasses, but also in fabrics, clothing, tattooed ink, and accessories like rings and chains. Many users are monitoring the data collected by these devices to track temperature, blood pressure, blood oxygen levels, breathing rate, volume, physical movement, and more. Wearables will soon have multiple sensors of data input that will detect, analyze, and transmit information. Businesses are investing in this technology to make processes more efficient, avoid bad practices, and lower margins of error.

Signals

- Leading industries for wearable technology will be healthcare, sports and fitness, and manufacturing. Several key benefits of wearable technologies include worker safety, increased productivity, and cost reductions (Business Wire, 2022; Roach, 2022).
- Current wearables include fitness trackers, smart watches, smart clothing, and smart glasses. Future wearables that are in development now include exoskeletons, prosthetics, 3D human tissue, and AI for the human brain. Scientists have also discovered how to convert EMDR tappers into wearable devices that can help alleviate symptoms of stress and anxiety (Botkin-Kowacki, 2022; Marr, 2020).
- One wearable pairs with an app which effectively turns a patient's hand and wrist into a video game controller, and rehabilitation exercises into games (Balsara, 2022).
- The wearable healthcare technology market is surging, and its maturation will put more wearable technology in the hands of consumers and US businesses. According to Insider Intelligence research, the number of health and fitness app users will remain above 84 million through 2022. The wearable technology market size is expected to reach $57 billion by the end of 2022, with a compound annual growth rate of 16.2% (Phaneuf, 2021).

Implications

- Security and privacy are concerns for how the data collected through wearables will be used, and potentially used disproportionately for different classes of society. While surveillance is a key implication of wearables, with increased data collection opportunities there are also questions about trust in these technologies and how data is being used and exploited. This could have rippling effects in working environments, as well as in families with parents surveilling their children. As a result, wearables could increase health benefits for those who use them but could also leave out other classes of the population, preventing them from accessing health care in the future.

DEMATERIALIZATION

The transfer of items and systems from the material world into digital spaces is occurring at an exponentially growing rate, including changes in our approaches to the value of a product, possession, purchase, or use. Dematerialization as a process consumes less resources but still increases the value of those resources, enabling enterprises to create more with less. The metaverse has accelerated and amplified this process through the integration of e-commerce via NFTs, digital real estate, skins, clothes, cars, and home decor in virtual reality. These are representations of physical products that will not undergo wear and tear, and hence devaluation. There could also be an immense impact on the environment, as dematerialization uses less raw materials like paper, plastic, or wood. However, it also has extremely high electric and water needs to carry out its processes, prompting companies to already look for more sustainable ways to advance.

Signals

- The Dematerialised is a digital department store that sells nothing but virtual luxuries; clothing and accessories that will only ever exist online (Wire, 2022).
- After conquering the physical world of interior design, Roar will operate in a user-owned digital world as a furniture showroom, an art gallery, and a studio that develops decor solutions for clients in the virtual environment (Munyal, 2022).
- Thanks to new technologies, many advanced economies are reducing their use of timber, metals, fertilizer, and other resources. The dematerialization trend is spreading to other parts of the globe and offers some hope for environmental protection when combined with effective public policy (Erlandsson, 2019).
- CodeNekt (2022) has identified an opportunity to utilize digital tools to solve pressing issues in the automotive market, such as the increased importance of vehicle safety, carbon footprints, public authorities and insurance companies dematerializing their services.
- Gryn, CEO of MetaHero, is doing his part to make this new reality as real as possible, creating high-definition 3D scans of people, objects, and animals that you may soon encounter in games, virtual worlds and NFTs (Ahonen, 2022).

Implications

- On the optimist side, we will see a growth of dematerialized enterprises able to create more with less. Artificial intelligence and data mining is enabling white-collar employees to be faster and more productive. Many enterprises are showing significant CO2 reductions driven by dematerialization efforts, such as selling digital products and services instead of physical products, or by moving data and applications to the cloud instead of having their own servers. Real estate, car shopping, e-shopping, comic books and art, human presence and all their belongings in the metaverse will create a whole new economy for creators, developers and artists.

COMPETITION IN HEALTH TECH

Based on the growing awareness of mental health concerns along with innovation in biotechnology, companies see potential for profitability in health tech. As opposed to relying on public health measures, entrepreneurs and investors see this as an opportunity to profit from individuals who need these services. What began with the development of apps to help track certain symptoms or to support healthcare, is now moving toward organizations creating different departments to cater to all kinds of health for individuals.

Signals

- The global pandemic has elevated the demand for virtual services. Tech founders are shaping the future of health services and investors are eager to invest in disruptive and scalable tech (Bousleiman, 2021).
- The first three quarters of 2021 closed with an astounding $34B invested globally across 1,040 deals in global health tech (Bousleiman, 2021).
- The digital health market size will be worth $295.4 billion by 2028, with a compounding annual growth rate of 15.1% (Grand View Research, 2022).
- Consumers are spending more on wellness than they ever have before. Wellness is now a $1.5 trillion market globally, and it's growing at a fast pace of 5-10% per year (McKinsey & Co, 2021).

Related Trends

- Biohacking
- Technological determinism
- Sick care to healthcare

Implications

- Growth of monopolies will make this space difficult to regulate and increase the cost of health care for individuals exponentially. This leads to significant division between individuals and families that have the means to afford this service and those who do not, contributing to a widening wealth disparity.
- As well, data access will be required, causing it to be an area of concern due to the large amounts of information acquired by private organizations. Ensuing concerns about the profitable use of data will be raised.

CAPITALIZING ON THERAPY AND MENTAL HEALTH CARE

Varying forms of therapy that help resolve individual traumas have become popularized as an opportunity for profit. Primarily focusing on mental health related therapies, the cost to support individuals are high, and the frequency and number of individuals seeking this support will increase in the coming years.

Signals

- The digital health market size exceeded $141.8 billion in 2020 and is estimated to grow at over 17.4% by 2027. This market growth is attributed to the growing popularity of healthcare IT. Many private and public institutions have already shifted with the wave of IT adoption by fully digitizing their entire enterprises (Ugalmugle & Swain, 2021).
- The mental health industry is enjoying a global renaissance of sorts. Across the world, there is increased awareness, education, spending, and de-stigmatization of mental health issues (Adracare Team, 2021).
- Employees need, and increasingly demand, resources to help them cope with mental health problems. If companies make mental health services more accessible and intervene in the workplace in ways that improve well-being, they will simultaneously make investments that will provide real improvements in employee outcomes and consequently in company performance (Pfeffer & Williams, 2022).
- The global mental health market was valued at $383.31 billion in 2020, and is estimated to reach $537.97 billion by 2030, growing at a CAGR of 3.5% from 2021 to 2030. (Srivastava & Sumant, 2021).

Related Trends

- Wearable technology for healthcare

Implications

- As more research is funded on interventions to support mental illnesses, there will also be an increase in job availability within the mental health and technology space.
- As well, there will be a premium placed on the services and products in this space, as it becomes more and more profitable.

THE END OF “OWNERSHIP”

Society is transitioning to a new economic system where experiences have more value than owning physical things. The sharing economy has grown in multiple industries such as housing, cars, boats, tools, entertainment, and clothing. The purpose is to maximize and utilize physical assets that we use partially and offer them to people who may need it. As a result, renting items are becoming more accessible than ownership. Thanks to the development of Information Communication Technology (ICT), it is easier to connect people who own with people who want to rent or share. The concept of owning a DVD or a CD has already faded with the opportunity to access an extensive library of media provided by companies like Netflix or Spotify on a subscription basis. Along this trend, businesses have been transitioning to membership models where users access software or video games as part of a subscription with recurring fees.

Signals

- We are moving toward a sharing economy where assets are shared as services in different industries such as housing (Airbnb), transportation (Uber), entertainment (Spotify) (Rendaje, 2021). Music, software, even cars— the things we once “owned” are now subscription or service-based (Killick, 2021). The sharing economy is projected to grow from $15 billion in 2014 to $335 billion in 2025 (Tabcum, 2019).
- Mobility-as-a-Service (MaaS) is a model for traffic without ownership. Users pay a monthly fee for it, like with Spotify, tell the app where to go, and get instant access to taxis, Ubers, buses, and more. Everything is available on-demand and ownership is no longer needed (Helsinki, 2017).
- As a result, material yearning is starting to fade and accessibility to experiences takes precedence over ownership (Tabcum, 2019). Future generations may value simplicity and owning less over clutter and excess, and experiences over material goods (Allison, 2021).
- In a world where property is networked and programmable, ultra-fast micro-payments can happen automatically, and software records and enforces who owns what, the pool of possible transactions is potentially infinite (Tarnoff, 2017).

Implications

- Maximizing the use of an asset may help to reduce the rate of global consumption, which will have a great environmental impact. Some of the sharing businesses are growing at a higher rate, leaving traditional services like hotels or taxis with less market share.

EXPLORATION OF MICROBIOMES

The increase in urbanization and technological innovation has caused the earth's planetary boundaries to be pushed beyond the zones of uncertainty. This imbalance, affects the natural ecosystems, causing biodiversity loss and land change. Altogether, it limits human exposure to microbiomes in the environment. The benefit of microbiota incentivizes scientists to explore other avenues for access to them for humans.

Signals

- "Deforestation and other land-use changes are devastating biodiversity globally and turning rich natural ecosystems into agricultural monocultures and sprawling metropolitan districts. That makes replenishing our own natural microbiome far more challenging" (Asher, 2022).
- Diets rich in fermented foods enhance the diversity of gut microbes and decrease molecular signs of inflammation (Weaver, 2021).
- The Government of Canada and partners invest $18M in crucial microbiome research (Canadian Institutes of Health, 2020).
- Between 2011-2015, venture funding in microbiome firms soared 458.5% to $114.5 million, while overall venture investment grew 103.4% to $75.29 billion (Sandle, 2019).

Implications

- Increase in cost of microbiome-related products for human health.
- Alternative solutions to enhance biodiversity in different regions of the world.
- Policy implementation to limit urbanization efforts
- Exploitation of microbiota benefits for increased profits by private wellness organizations.

GOVERNMENT REGULATION OF SOCIAL MEDIA

This regulatory trend responds to signals from social media platforms reporting an increase in government intervention on content, as well as growing dialogue around how platforms should be responsible to intervene or shift their business models. This trend has been polarizing, sparking fear over censorship and infringement on free speech, which hinders more nuanced dialogue about harm and how harm can be minimized. There will be further regulation in the coming years as governments continue to face the challenges of social media platforms, but questions remain on how to do this with any lasting benefit.

Signals

- Social media sites are under regular scrutiny from governments worldwide to intervene and remove content from their platforms. Twitter reported that in 2020 and 2021 it had seen a surge in government demands to take down content, including posts by journalists and news outlets. Between January and June of 2021, Twitter received a record number of such requests (Culliford, 2022).
- The Canadian Liberal Party's Bill C-10 was a proposed amendment to the Broadcasting Act, passed in June 2021. The amendment allowed user-generated content uploaded to social media platforms to be regulated by the federal government. The bill was highly controversial as it raised concerns for unintended consequences on citizens' right to freedom of speech, while critics also argued that the bill did not fully address the need for legislation in this area (Jones, 2021).
- In response to the 2021 violence in the U.S. Capitol, social media regulation has been under scrutiny and social media companies have been changing how they operate. The debate centers on whether social media should be treated differently from traditional media, and how to adapt regulations (or self-regulations) accordingly (Ghosh, 2021).
- Haggart and Tusikov (2021) argue that by focusing on the question of free speech, Canadians have missed broader questions on advertising-dependent and data-fueled business models of social media platforms. This polarization, they posit, simplifies the need for regulation in a vague constitutional battle, rather than the nuanced needs of internet and digital economy reformation in general.

Implications

- Social media platforms incentivize content according to their business models, and the implications of increased government regulation are in positioning power in the hands of a government rather than a privately-owned business.
- While there are both benefits and consequences to these various models of regulation, the trend continues to be toward regulation. In relation to pluralism, these policies must be created with a pluralist mindset in order to benefit the greater good of our society.

LOW TRUST IN JOURNALISM

While the media has always been distrusted to varying extents, even in recent decades, there is a current trend of low trust in journalism that some have termed a “trust crisis”. The term “trust crises” certainly raises concern, especially when recent reports indicate that there is in fact a low in trust in media compared to previous decades that have been measured. The trend in journalism further points to a trend in decreasing trust in institutions at this time, such as in governments, health care providers, educators, and businesses.

Signals

- Lewis (2019) reports what he calls a “trust crisis” in the media, at a particularly unstable moment in media with heightened anxieties around “fake news”, algorithmic media manipulation, and social media.
- This trend leads to less informed, more polarized citizens, due to an increasing disconnect between the press and the public and a failure to transition from a product model of traditional media to a service model. This trend correlates with a current trend of distrust towards institutions at large (Lewis, 2019; Columbia Journalism Review, 2019).
- News organizations have felt the safety of their journalists is threatened in Canada. In a recent tweet, CTV reporter Jeremy Thompson (2022) stated that the news organization had decided to remove branding from their vehicles to increase reporters’ safety.
- Global communications firm Edelman published a report called the, “2021 Canadian Edelman Trust Barometer”. Surveys found that trust in traditional media (as well as all information sources) is at an all-time low, having witnessed a decline in trust compared to the previous year. In fact, it was found that 46% of Canadians surveyed believe the media is purposely trying to mislead them (Edelman, 2021).

Related Trends

- Institutions in all sectors are also experiencing low trust in the so-called “trust crisis”. This may be in direct proportion to rates of trust in the media as the face or messenger in this situation (Edelman, 2021; Butts, 2020; Urback, 2020; Mantashyan, 2020).

Implications

- The implications of low trust in the media and journalism are, as Lewis (2019) stated, an increasingly uninformed and polarized public. This is certainly at odds with a pluralist perspective and does not lend to an increasingly pluralistic society in Canada. However, media outlets would need to make significant changes to their business models and journalism practices to see any shift in public trust.

SELF-CARE FOR SELF-PRESERVATION

Traditionally, there has been a perception that selfcare is intended for pampering and living a “soft life”. However, this is shifting toward a view that selfcare is paramount for quality of life and even survival. This is due to the nature of work focused on hyper-productivity, which has been very draining, alongside recent liberation from the conventional nine-to-five lifestyle and growing awareness of the effects of stress on mental health. Consequently, self-care has increasingly become a priority. The global pandemic further exacerbated this need because individuals needed new coping mechanisms to deal with increased stress.

Signals

- According to one recent national survey, 80% of adults said they intend to be more mindful about practicing self-care regularly after the pandemic. Another global research study conducted this year found that consumers’ prioritization of wellness has jumped as much as 65% in the past two to three years (Morgan, 2022).
- The consumer pursuit of self-care has fertilized a $4.2 trillion global wellness industry that extends from food and beauty to apparel, household cleaning products and routine medical treatments, such as teeth straightening (Pearson, 2019).
- The wellness market is booming. Consumers intend to keep spending more on products that improve their health, fitness, nutrition, appearance, sleep, and mindfulness (McKinsey & Co, 2021).

Implications

- There is potential for increased advocacy and implementation of a reduced work week in different regions around the world. This also could have an impact on education systems and a change in learning concepts, as we see self-reflection prioritized as a central aspect of individual lifestyles.

SCENARIO DEVELOPMENT

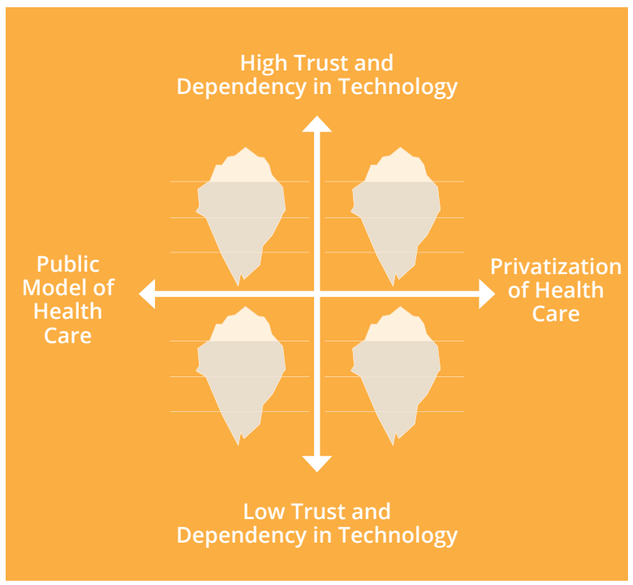
The purpose of creating scenarios is to develop surprising but plausible divergent accounts of how change could unfold. To that end, the following scenarios describe what different futures could look like for Canadians at the intersection of wellbeing and technology, given the rapid changes in technology, science, social, political, and economic environments. Four different descriptive scenarios emerged from our analysis, with the time horizon of 2040.

Process

To explore the Futures of Wellbeing within the focus of pluralism, we began by defining what pluralism and wellbeing mean for this topic. We defined pluralism as the equal acceptance of different wellbeing understandings, beliefs, and needs. Wellbeing was defined as the state and balance of the emotional, occupational, physical, social, intellectual, and spiritual dimensions.

This common understanding helped us to select the 2x2 Matrix as our foresight method. Since wellbeing is a known topic, we can describe its components while exploring the polarities of the spectrum of wellbeing, highlighting tensions within each scenario. We then identified matrix axes that would form the basis of our scenario generation. The intersection of trust in technology and public/private systems was interesting because of the perceived lag in public health care models to compete with private companies in the wellbeing sector.

In generating scenarios, we first conducted a causal layered analysis for each quadrant of the matrix. Beginning with the imagined deep myth for each scenario, we then generated upward the worldviews and values, structures and systems, and litany. This helped us frame what would have to exist for the deep myth to be true.



CLA (Causal Layered Analysis)

Informed by the trend analysis in our horizon scan, as well as the causal layered analyses, we developed a unique scenario for each of the four quadrants in the 2x2 matrix. Taking a creative approach, we also developed narratives for each scenario that provide a story for what could be.

High Trust and
Dependency in Technology

01
EVERYTHING'S UNDER CONTROL

- High trust in technology resulting from user risk mitigation policies, data privacy regulations, and successful instances of technology into healthcare systems
- Government provides public health insurance
- Funding and costing models support more cost-effective preventative health-care and balanced approach to wellbeing
- Resources devoted to researching and adapting advanced technologies such as AI and cell regeneration

03
IT'S ALL DIGITAL

- High trust in technology stems from increased tech education
- Failure of government to adopt scientific decisions and create policies to uphold them
- Private health companies work hand-in-hand with the government
- Rapid growth in technology results in high dependency on these innovations

Public
Model of
Health
Care

Privatization
of Health
Care

02
IN WHOM DO WE TRUST NOW?

- Low trust in technology, due to cybersecurity attacks and limited innovation in the technology sector
- New interest in offline devices and "off-the-grid" lifestyles
- Public healthcare is nationalized with expanded coverage
- Integrative health care app and nationalized pharmacy
- Increasingly polarized society results from opposing views of technology and government-regulated healthcare

04
BACK TO OUR ROOTS

- Low trust in technology, having experienced harmful effects of over-dependence on digital devices
- A private model of health care has led to three primary corporations which offer naturopathic support to their patients
- Wellbeing is for those who can afford it, and therefore there is a major class divide between those who are well and those who are not

Low Trust and
Dependency in Technology

2x2 Matrix and Causal Layered Analysis

High Trust and Dependency in Technology + Public Model of Health Care

01
EVERYTHING'S UNDER CONTROL

LITANY

- Focus on mental and behavioral health, suicide, loneliness, and social isolation
- Virtual care services and same-day care offered
- A.I. capability to read exams with accuracy and predict disease
- High degree of information exchange among health providers
- Retirement is delayed and people are working longer
- Wearable technologies prescribed and covered by health insurance
- Expanded wellbeing services covered by health insurance
- Government approves of genetic engineering of designer babies
- Neuralink available for further data integration
- Remote monitoring biosensors from home

STRUCTURES & SYSTEMS

- Preventative healthcare model adopted to lessen costs of healthcare interventions
- Public healthcare and social services combined under the umbrella of "Wellness"
- Personal health data centralized
- Physician payment is more aligned with wellness goals
- Focus on personalized health and wellbeing care
- Quality assurance is prioritized across healthcare sector
- Government invests heavily in healthcare technologies
- Public support for raising taxes
- Policies advance with technology around user protection

WORLDVIEW & VALUES

- Socialism
- The government will take care of me
- Health is wealth
- Technology determines quality of life
- Public healthcare is a good investment
- Wellness is worth the cost of data privacy
- Science and tech should influence policy-making

DEEP MYTH

The end justifies the means

2x2 Matrix and Causal Layered Analysis

Low Trust and Dependency in Technology + Public Model of Health Care

02
IN WHOM DO WE TRUST NOW?

LITANY

- New restrictions for people who haven't registered on the OHIP App
- Government acquires five million Neuralink chips for public workers
- Canada ranked as #1 as the most productive country
- Data collected by OHIP wearable
- Vaccines passports are mandatory
- Rise of alternative medicine and self-medicating
- Health students can get government grants if after graduation they work for the public sector
- Consumers not willing to use wearable tech

STRUCTURES & SYSTEMS

- Health care system implements a multidisciplinary approach
- Government is tracking all our moves, resulting in a lack of privacy
- Allocation of funds to cover bureaucracy
- Inconsistent creation of infrastructure, health department and agencies
- Data and health records will be owned and accessed only by the government
- Resources allocated to treatment and not prevention
- Social groups formed around anti-A.I. and anti-robot thinking, as well as "off the grid" culture
- Social division between people who can get private health care outside the system or region
- Lack of policies on mental health problems and prevention
- Lack of innovation and decline in the tech industry
- Services provided by the public sector do not meet the demand

WORLDVIEW & VALUES

- Mental health not recognized as a real issue
- Lack of trust on medical examinations, results and data collection
- Fear of new medications and medical procedures

DEEP MYTH

Big Brother is watching you

2x2 Matrix and Causal Layered Analysis

High Trust and Dependency in Technology + Privatization of Health Care

03
IT'S ALL DIGITAL

LITANY

- Psychologists encourage rewinding memory to confront trauma
- Man makes oldest human alive at 310 years old
- Yes, you can now buy time!
- Depression rates still increasing at an exponential rate
- Bio studies show atrophy of pre-frontal and neo cortex
- 95% of all fatal traffic accidents have been eliminated globally
- Beauty features added to GenEdit
- Doctors prescribe hormone regulating three times a day
- AI can now predict disease outbreak and alert all those in high risk based on personal medical data
- Neuralink removes language barriers forever

STRUCTURES & SYSTEMS

- Memory invasion becoming the new cybercrime
- Food intake is all in the form of nutrition pills
- Genetic modification features included after second trimester of pregnancy
- Science is privately funded
- Private insurance covers wellbeing
- DAO's create tech policies
- Neuralink is commonly used
- A.I. is replacing mundane work and humans are building a creator economy
- Data decentralization and tight privacy
- Mass tech dependency
- Humans with the capital can afford to live longer
- Verified anonymous identities are the new norm

WORLDVIEW & VALUES

- It's crazy that people died of hereditary diseases.
- Genetic engineering and designer babies are ethical
- Algorithms make more accurate decisions
- Humans need to take evolution in their own hands
- Tech can help eliminate human errors
- Those who aren't tech savvy will be left behind
- People should take personal responsibility for their own well-being
- Capitalism and free market economy
- Individuals can be trusted, governments cannot
- Individuals have more control over their data and trust tech to store it

DEEP MYTH

God helps those who helps themselves

2x2 Matrix and Causal Layered Analysis

Low Trust and Dependency in Technology + Privatization of Health Care

04
BACK TO OUR ROOTS

LITANY

- Stark difference between hyper-well individuals versus those who struggle
- Utilization of nature-based solutions for wellness
- Government struggles to regulate businesses
- Data overexploitation
- Reduced transparency of information and attributes of techniques to approach wellness
- Difficulties with information transfer between organizations
- Personalized and creative paths to individual wellness

STRUCTURES & SYSTEMS

- Development of alternative modes and forms of technology
- Conflict between circular processes of retrieving nature-based items versus overuse and extraction
- Corporations are money-making tools
- Use of biometrics as a tool to exploit for profit
- Over-dependency on technological advancements
- Focus on hyper productivity and continuous innovation and "progress"
- Increased reliance on naturopathic supports over technological or scientific support
- Large class division between those with access (monetary and information) versus those without
- The super-rich have access to holistic medicine
- Privately funded research
- Prioritization of workplace wellbeing

WORLDVIEW & VALUES

- Introduction of health-related monopolies and oligopolies
- Purpose economy
- Technological Determinism
- Focus on individualism over community orientation
- Individual wellness over everything

DEEP MYTH

One person's meat is another's poison

SCENARIO: 01 Everything's Under Control

OVERVIEW

Located in Canada in the year 2040, this futures scenario is characterized by high trust in technology within a public health system. The high level of trust in technology indicates that hesitancy around regulations, privacy, and harm are significantly reduced. Innovations in the tech sector are viewed as low risks and are quickly adapted into health and wellness practices at system and individual levels. The public health system, supported by policy changes and updated regulations, is seen as operating on the cutting edge of technology.

The deep myth in this world system is that the end justifies the means. This drives socialist beliefs that healthcare should be available to all citizens, public healthcare is a good investment, and government should manage personal data. While there may be losses - such as loss of personal privacy and freedom of choice, higher taxes, and social inequalities between those who have access to these technologies and those who do not – these are considered worth the cost to pursue technological solutions for wellbeing. There is a continued drive toward technology that motivates innovations in the healthcare sector, and a push for individuals to have more perceived control over their own access to holistic healthcare.

At a systemic level, the government adopts a preventative healthcare model to lessen costs of advanced health care interventions. This includes expanding health insurance to cover a broad spectrum of wellness interventions, such as counseling and psychotherapy, alternative medicines, and fitness costs, as well as increasing funding to social services to holistically care for people. Data centralization in healthcare systems is fully integrated across data entry points at all health and wellness providers, supported by new and updated privacy and insurance policies. This improves research opportunities and speeds innovations in disease prevention and outbreak control. Patients are also given the tools to control their own wellness, such as access to their own health data, request interventions, and participate in virtual health checkups that are fully integrated into policies and physician practices.

By investing in medical research and innovation, technology is more integrated into the healthcare system, increasing the use of AI, and seeks to improve the patient's life by increasing their control over their own wellness. The government is highly involved in accessing, using, and managing personal data to provide better care and improve the overall wellbeing of the society.

BACKGROUND

Health care and wellness needs are changing. As use of social media and screen time increases alongside reports of isolation and loneliness, mental health challenges are a greater concern. Canada's aging population affects demands on the healthcare system, and people are working longer, delaying retirement. Technological advances are making continual, substantial improvements in health outcomes, decreasing risks of common diseases and preventable illnesses. A.I. is being developed to read tests and exams with accuracy and to predict disease, and Neuralink capabilities are expanding into testing phases of development. These changes are beginning to shift the conversation in healthcare to a more preventative, personalized healthcare model of delivery.

Advancements in the availability, useability and applications of wearable technologies have inspired many potential applications in healthcare. Wearables are shaping the future of wellness, changing how we work, learn, and monitor our one help. For example, during the COVID-19 pandemic, there was a twenty-five percent increase in mobile health app downloads (Stefanic, 2021). This is part of a trend that encourages individuals to use digital technologies to track and improve their own wellbeing. In this futures scenario, this trend continues, and public health models improve the health system's data centralization capabilities to further enable people to take control over their own wellbeing.
Additionally, virtual healthcare is in high demand, as patients and physicians see the benefits of having increased, virtual access to professionals. This was widely acknowledged during the pandemic. Canada scores poorly in global rankings on access to primary care, and virtual appointments could greatly affect preventative health care outcomes (Tollinsky, 2021).

"I love being so connected digitally, but I miss having more face-to-face interaction with my community."

NARRATIVE

Robin's alarm wakes her, blinking against the bright sunshine through her condo window. She rests a beat, then stretches into her morning meditation and breathing ritual as her wearable tech bracelet keeps her on track. 75 years of breathing pollutants resulted in her being diagnosed with COPD a few months ago, and the exercises have helped her to breathe easier.

Ten minutes pass before she rises and requests her smart speaker to read her notifications for the day - a sunny forecast for Toronto, a voice text from her daughter living in Vancouver, a message from a student, her daily health profile. She pauses to listen through the profile, hoping for a positive score, scanning for warnings her breathing was irregular during the night, and signs of emotional irregularity. A notification arrives - would she like to speak to a care worker? Since her husband's death, she was assigned a care worker to speak with daily. Some days it's a total nuisance - she's just fine on her own, after all. But other days, speaking with a live care worker on a virtual call, or just knowing she can, makes the loneliness and isolation feel more bearable.

Today, Robin declines the call, knowing she has another virtual call with a physician later this morning. She's surprised when her daughter calls instead, asking her to reconsider accepting more home care, urging her to explore the Neuralink options OHIP offers, to integrate her biometrics into her health data and raise any red flags for her wellness. Her daughter has been worried since Robin's battle with breast cancer a few years ago. Now, the amount of data she has access to feels overwhelming - what would she do with the additional info Neuralink could offer? Her daughter may have a point, but Robin finds herself wishing she could just talk to someone in person about it all.

It's a lot to consider. She's still teaching two university classes and is working on an abstract for an upcoming conference. All this information feels difficult to navigate, and the integrations are never as seamless for her as her daughter finds them. Robin has more control over her own wellness, but she's not sure what to do with it, and how this can help her.

ROBIN

PERSONAL BACKGROUND

Age: 75
Family Composition: Widow, with one son and two grandchildren who live in Vancouver
Location: Lives alone in Toronto
Education: Master's Degree
Occupation: College Faculty (partial load)

MOTIVATIONS

Wellbeing, Work, Family/Friends

HEALTH NEEDS

Suffers from COPD due to air pollutants; recently survived breast cancer

EMOTIONS & BEHAVIORS

Struggles with feelings of loneliness and isolation; regularly attends a fitness program at the local retirement centre where she meets with friends; feels overwhelmed by travel so she tries to stay within her neighbourhood

PAIN POINTS

- Digital literacy
- Adaptability to change
- Opportunities for social connection
- Ability to make wellbeing decisions

WELLNESS WHEEL

SCENARIO: 02 In Whom Do We Trust Now?

OVERVIEW

The Government of Canada nationalized public health insurance in 2040, approving the new Canada Health Insurance Plan Plus (CHIP+), including unveiling a new public pharmacy, PharmaCAD. Although citizen trust in technology is low, the Ministry of Health also released a newly updated CHIP+ app. Notable changes introduced in CHIP+ include full coverage of prescriptions, examinations, health services for all Canadian and temporary residents, as well as additional services like dental and optometrist coverage, and wearable health-monitoring devices. PharmaCAD is now the biggest public pharmacy in the country, having opened over two thousand pharmacies nationwide. The key to its success is seamless integration with the CHIP+ mobile app that gives patients, doctors, and pharmacists a unified, direct channel of communication.

However, increasing distrust in technology, especially in relation to public health and wearables, has caused citizens to opt out of data collection, leading to a low number of data collection points and a shift away from a preventative health model. Consequently, early intervention services and advanced illness screenings are no longer health care system priorities. Illness is addressed by medication and treatment after signs and symptoms are present.

Societal polarization has increased over the past twenty years, and one of the strongest movements in 2040 is the "off-the-grid lifestyle", which advocates for disconnection and independence from technology, freedom of choice, and concerns over data privacy and safety. The movement has directly influenced the rise of natural and alternative medicines, and previously eradicated diseases like measles, chicken pox, and COVID-19 have returned. Even outside the movement there is a minority of people who are skeptical of wearables, implants, biochips, and Neuralink chips that collect, upload, and analyze the data, raising concerns over the potential data breaches, leaks, and hacks.

After the successful introduction of PharmaCAD and the commercialization of drugs by the Federal Government, a new phase of investment was planned for the public pharmaceutical industry that involved research and production of new drugs and vaccines. In response, opposing groups of independent researchers, scientists, and opportunistic entrepreneurs have increased production, development, and consequent smuggling of experimental drugs and medicine into the Canadian black market.

BACKGROUND

The pursuit of a digital transformation quickly led to the incorporation of technology into daily life, allowing personal data to be collected and exploited for free. This collection of personal data leaves citizens vulnerable to security hacks and misinformation, resulting in a more polarized society. Cybersecurity attacks are at times targeted at healthcare organizations and service providers, but trends show that in the future the direct victims will be the patients and healthcare professionals (CyberPeace Institute, 2021).

Societal appetite for new technologies and current concerns for patient-centric wellbeing experiences are encouraging tech companies to develop more accessible health monitors and wearable devices (Landi, 2021). Any leak of personal data may put the trust of the users on a thin line, and regulation of health data is falling behind. At the same time, the number of personal devices is growing, such as smartphones and watches that have the technology to collect valuable personal data like names, date of birth, gender, geolocation and depending on the sensors, health, and activity data (Landi, 2021). This leaves citizens having to choose between improving wellbeing and being vulnerable to misuse.

"Whenever my glucose levels allow me, I love to go out to the park and get a sweet snack with my family."

NARRATIVE

It has been three months since ten-year-old Diego and his family arrived in Canada as refugees from South America, and he is already enrolled in school and enjoying his new neighbourhood. He requires consultation and treatment for his type 2 diabetes and obesity condition. Upon his arrival, he received a mobile device with his Digital ID, Digital Refugee Card, and the digital credentials for the CHIP+ App, although his parents continually consider how to protect Diego's data.

Diego has difficulty waking up in the morning, usually experiencing fatigue and low energy, and today he is also dealing with a headache. His mother patiently wakes him up, and he takes his time getting ready for school. The first task of the day is to measure his glucose level and record the data in a small notebook he always keeps with him. Diego uses an offline system since his parents informed his doctor that they do not want any implant or wearable technology to measure and share his data.

Diego's mom prepares his breakfast while he dresses, carefully considering his glucose levels and the nutritionist's recommendations. Since he requires a very strict diet, his family was able to qualify for a CHIP+ program that offers him a supplement shake machine that contains various powders and automatically mixes them in the proper proportions based on the glucose levels that enter the system each day. Diego's mom takes care of operating the machine which looks very similar to a coffee maker, and there is a display area where she inputs the last reading of Diego's glucose levels. Ready for breakfast, he drinks his vanilla-flavoured milkshake, saving an extra one to drink throughout the day at school. Just before leaving, he takes medication for his pancreas that will prevent him from having high blood sugar after eating his meals.

Although his school offers a free autonomous bus service, Diego's mother does not trust that service and prefers to walk with him in the mornings. At his new school, Diego really enjoys Intro to Coding, science, and especially ESL classes, where he has a few friends that speak his primary language. Before lunchtime, he tests his blood glucose levels to see if he can drink the extra shake he brings from home and get some fruit from the cafeteria as well. Once the school day is over, Diego attends an extracurricular virtual reality sports course involving physical activities to stay active, following the recommendations of his doctor. At home, Diego helps his mother prepare dinner and looks forward to his father coming home from work. Before dinner, another glucose check is performed and recorded in his journal, and based on that information he decides how large the food portions should be. Dinner is a highlight for the family, when they share about their day and video call their extended family back in Colombia.

Following dinner, Diego can play an hour on his VR set before getting ready for bed. It is very important that just before going to sleep he checks his glucose level for a final time, to see if he needs a snack before bed. Diego finds it a little difficult to fall asleep, so he normally asks the smart house to play relaxing music in his room that helps him relax and have a good night's sleep.

DIEGO

PERSONAL BACKGROUND

Age: 10
Family Composition: Only child, lives with mom and dad.
Nationality: Colombian
Education: Middle School
Health status: Diabetes, Obesity

MOTIVATIONS

School, Health, and Family

HEALTH NEEDS

Incorporate a healthy diet and physical activity into his routine.

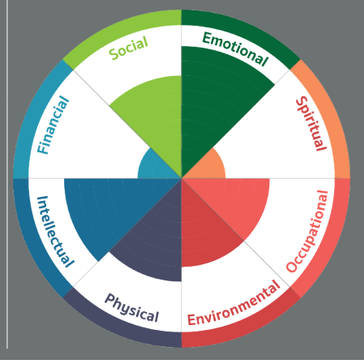
EMOTIONS & BEHAVIORS

Diego is a shy kid who enjoys reading and playing video games. He is quite responsible and mature for his age and helps mom and dad with multiple day-to-day chores. He wants to get a dog so they can play together in the park.

PAIN POINTS

- Household income
- Access to treatment
- Special diet
- Enrollment to school
- Explore new friendships

WELLNESS WHEEL



SCENARIO:
03 It's All Digital

OVERVIEW

In 2040, private companies work closely with the Canadian government, actively addressing climate change, hyper-fluctuating economies, citizen productivity, animal welfare, and individual wellbeing. Technology continues to be a primary solution to the problems and concerns of society, and ethical, mindful use of technology is held in high regard. Many technological advances in wellbeing and health care greatly affect the length and quality of life for Canadians. For example, children born may have a two-hundred-year lifespan, barring an accident or fatal disease, through gene therapy, stem cell, and nano-scale medicine administered by CRISPR and cryogenic-deploying companies.

Private insurance partially covers these procedures, but public health insurance does not, lending to a growing class disparity. Private insurance plans also offer externally worn support structures for the elderly that help them stay mobile for longer and provides A.I.-based prosthetics for those who suffer from paralysis and disability. In this scenario, disability is a sign of extreme poverty which is only prevalent in the pockets of the world that did not adopt the Global Universal Basic Income policy.

As more people are educated, there is higher trust in technology and hence greater dependency on algorithms to make daily life decisions. Humans allow data to drive decisions more than emotions and gut feelings. Technology is privatized because the rate of government absorption is too slow and centralized and DAO companies bring experts and people together to make more informed decisions on the ethics and boundaries of the current technologies. There is a running hot debate about whether robots and machines are becoming our slaves or our masters.

Multiple tech-lashes and terrorist attacks have occurred against scientists and entrepreneurs who are driving the speed of innovation and adoption but have since fallen to the wayside. Major companies that own software and tech are decentralized on the blockchain including the health, education, policing, and justice departments. Mental health and wellbeing companies have pushed the narrative of algorithmic data analysis being crucial to understanding our minds and bodies, thus equating technology to self-awareness. Many disapprove strongly and argue that it is doing the opposite, atrophying the natural gifts of thousands of years of evolution, and that man is trying dangerously to play God.

BACKGROUND

Across multiple industries, artificial intelligence has made great waves as a useful technology in 2022, especially for healthcare, improving efficiency, information processing and decision making (Tsymbal, 2022). In the healthcare industry, machine learning is developing new pharmaceuticals and diagnosis processes (Trafton, 2020). Wearables in the mental health space also increasingly monitor the status of a patient throughout the day remotely or allow an individual to monitor their own status is incredibly valuable (O'Hara, 2019).

One of the most profound applications for IoT technology in healthcare is the concept of a smart pill, edible electronics that not only serve as pharmaceuticals but can provide care providers with valuable information about patients (Pradhan et al., 2021). Additionally, a complete human genome will improve treatments for cancers, HIV, blood disorders, muscular dystrophy, blindness, COVID-19 and many other diseases (Li, 2020).

These advancements being made today could have profound implications for the quality of life for humans in 2040. However, governments are struggling to keep up with the pace of innovation, and regulations regarding patient safety are falling behind. Additionally, political polarization contributes to low trust in the government's ability to make sound scientific decisions around digital transformation and public policy. This leaves a gap for opportunistic private companies to come to the market in the absence of regulatory bodies (Farr, 2018). As government continues to lag in supporting innovation, private companies are increasing their resources and capacity to provide solutions, such as in movements of sustainability and climate action that call for urgent, adaptable change. This could lead to higher degrees of trust in private companies, while alienating sections of society far more skeptical about how much it devalues what it means to be human.

NARRATIVE

Becca, a 25-year-old deaf woman, wakes up in her city condo two hours prior to when she needs to check into her virtual work. She doesn't need an alarm clock anymore because the new biometric chip installed in her body sends signals to her brain to gently wake her up. As she wakes up, the lights turn on, the bed inclines to get her up. She walks to the washroom where her toothbrush, brush and shower are all connected to the smart home and start sequentially. A pleasant AR visual stimulation communicates to her about her day, asking how she is feeling, giving her the statistics of last night's sleep and calculating current hormone and chemical levels in her body. It gives her the schedule for her day, and she gets ready in her weekly top-picked attire. She takes a breakfast pill which gives her body everything it needs for the day. The nutritional value in these pills is 30% higher than grown food and regular food is expensive. She gets into her EV car and using the brain chip, telepathically communicates where she wants to head, as her car takes off. She sits reading in the back, going over her latest architecture design in AR 3D. She has an important presentation to give for crypto funding approval. Her car heads into a massive green dome which is an all-accessibility compatible/nature designed workspace. She goes in and sets up her automated ASL to English systems and AR office software from which she checks in to work.

She is nervous about her presentation and her blood pressure shows a spike, along with her adrenaline and epinephrine. Her lens gives her the option to optimize baseline adrenaline and slow the heart rate down, which she opts for. Within 2-3 minutes she feels calmer and collected. Her presentation goes through successfully. After a long day of work, she hops into her car and heads over to a bar where she meets some of her friends, and some other friends who couldn't join, join in through holographs. Becca wears a jacket that allows her to feel music all over her body and dance to it as well. After a fun night of celebration, she heads over home. A sudden deep sense of sadness overtakes her, and her watch monitor vibrates, to ask her why she is feeling sad. She doesn't know the answer. She reaches home and starts crying, taking out a tub of chocolate ice cream and ignoring all her smart home warnings against diet cheating. She calls a therapist but an A.I answers due to short staffing. She is annoyed because she wants compassion, not answers and advice, and so hangs up. She tries to head back to sleep, eventually custom tuning her neural networks to fire a high level of melatonin so she can fall asleep.

> "There is no greater disability in society than the inability to see a person as more."

BECCA

PERSONAL BACKGROUND

Age: 25
Family Composition: Lives with mother, father, and a younger brother.
Location: Toronto
Education: Online certifications in Accessibility Design in Coding
Occupation: Accessibility Designer

MOTIVATIONS

Career growth, self-development and socialization

HEALTH NEEDS

Visual aids, Language transfer ASL-English, Accessibility needs, Neurochem regulation.

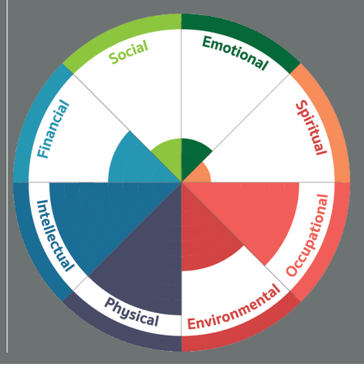
EMOTIONS & BEHAVIORS

Anxiety, Depressive episodes, hormone control treatment.

PAIN POINTS

- Intimacy
- Loneliness
- Self-regulation
- Dependency on tech
- Career as source of purpose

WELLNESS WHEEL



SCENARIO: 04 Back To Our Roots

OVERVIEW

In 2040, Canadian citizens are living in a purpose-based economy wherein private companies serve the greater needs of the community rather than serving their own capitalistic desires through profit models. Societies around the world that were previously reliant on digital technology have crashed, and citizens' expectations of health care have transitioned to a manual model of living characterized by a high degree of agency and ownership of personal wellbeing. People take responsibility for their own health and wellbeing and rely heavily on traditional naturopathic remedies and beliefs.

Health care is primarily provided by private corporations, with reduced reliance on public health care. Private corporations have eclipsed public health because of dissatisfaction with governmental policies concerning the speed and quality of care. Patients struggled with lengthy wait times to be served, and despite public pressure, the government failed to make any significant changes. Healthcare workers were significantly overworked, and underpaid, and private organizations were able to tackle both problems by adequately paying workers and creating systems to better streamline the entry and exit points patients had to deal with.

In this futures scenario, people rely on private companies to inform and educate them on wellbeing methods and interventions, holding these companies accountable for their decisions and the veracity of the information provided. There is little to no government regulation in health and wellbeing, and there is no preventative model of health care.

Three private corporations emerged in the Canadian health sector – Fineco, Smooth and BeWell. They each offer naturopathic support for individual needs ranging from physical to mental. The administration of these supports varies but is based primarily on natural and herbal remedies and uses digital technologies to manage their systems. Additionally, due to the low trust in technology, patients are offered face-to-face customer service with wellbeing professionals.

BACKGROUND

As dependence on digital devices and technology in daily life increases, personal protection and safety are at risk of data leaks, digital colonialism, and data mining (Aleccia, 2016; Valinsky, 2020). Governments are struggling to keep up with the pace of these innovations with public policies and regulations. This naturally leads to a general distrust in technology, and eventually could lead to the breakdown of companies that abuse public trust as well as low trust in the government due to lack of intervention.

Rather than integrating into the virtual lifestyles that social media and the metaverse offer, the effects of overreliance on digital technologies are a magnified sense of isolation and loneliness, exacerbating mental illness and feelings of depression and anxiety (Kilfoyle, 2022). Mental illness in many countries is peaking while access to public services is limited (Jabakhanji, 2022).

Meanwhile, digital health care is a rapidly growing sector (Tsymbal, 2022; Donnelly, 2021), with private companies moving into mental health care, including Apple and Amazon (Field, 2021; Farr, 2018). Private companies are providing more and more services, increasing treatment options for patients who may be disappointed by current public health models.

"It feels like it most times, but I don't have to be alone. I just need to take it one step at a time."

NARRATIVE

Adia, a forty-five-year-old executive, has struggled with mental illness for the past twenty years. She used to use various self-therapy apps back in the 2020's, however that increased her reliance on her mobile device and exacerbated her sense of loneliness. After the death of her only child, she entered a state of numbness affecting her perception of life and family.

To regulate her emotions and manage her depression, she now intakes a concoction of herbs to stimulate her hormones. This is the foundation that supports her day-to-day functions. She attends regular therapy sessions with her therapist Rebecca, who inquiries about any deviations from her state of being that affects how she navigates her day to day.

Within the first ten minutes of waking, Adia consumes her morning vitamins – a blend of herbs that gives her a serotonin and energy boost for the day. Using her self-testing home kit, she collects a sample of her saliva and inserts a litmus indicator to determine her emotional state. Today she feels mild anxiety thinking about upcoming meetings in her workday, feelings she is used to and knows how to manage. Getting out her journal prescribed by her therapist, Adia reflects on her mood and writes about any deviations of mood from the previous day. Then, adjusting herself on the mat next to her bed, she meditates.

As Adia goes about her day at work, she strategizes about next-level business moves in response to scandals about data leaks in her organization. She leads critical meetings with her PR team about these pressing issues and makes strategic plans for their next steps. At the middle of the day, she consumes her second vitamin of the day in response to fluctuations in her mood.

By the end of the workday, Adia is exhausted, but knows it is important to address her emotional state. She meets with her therapist to follow up about the results of her litmus test, along with her journal reflection. If there are any highs or lows with her emotions her therapist administers an increased dose of a modified melatonin to bring her to a regulated state. Feeling more in controls of her own wellbeing, Adia ends her day at home with her partner, trying for another child.

AIDA

PERSONAL BACKGROUND

Age: 45
Family Composition: Domestic Partnership with one child Ade who passed away three days after birth.
Location: Downtown Toronto with her Partner
Education: PhD
Occupation: Chief Operating Officer

MOTIVATIONS

Financial stability, wellbeing, family

HEALTH NEEDS

Suffers with anxiety and depression from her 20s, came out of postpartum depression 5 years prior.

EMOTIONS & BEHAVIORS

Struggles with feelings of depression and anxiety; actively journals and engages well in her therapy sessions; feels overwhelmed at her job because of the workload and level of responsibility she holds.

PAIN POINTS

- Duration of treatments
- Workload at job
- Uncertainties about the future of the world/society
- Lack of consistency with healthy routine

WELLNESS WHEEL

PLURALISM

01 Everything's Under Control

The Canadian public health system is founded in Western medicine practices and does not acknowledge or accommodate other cultural approaches to wellbeing. The system also predominantly focuses on physical health without taking into consideration other aspects of wellness. In this futures scenario, individuals are enabled to take more control of their own wellness, having the option to include more pluralistic wellness methods into their own care.

However, certain populations can do this more easily than others. Language barriers and physical or mental disabilities can make it more difficult to access virtual healthcare. As well, there is a growing digital divide in Canada stemming from income inequality, unequal access to the internet, low digital literacy, and ageism that makes it difficult for some populations to access virtual healthcare. While this scenario presents advances in digital technology in the future wellness, it also describes those who will be disadvantaged as a result.

02 In Whom Do We Trust Now?

In this scenario, pluralism depends on the extent to which there is respect and acceptance of the individual's perception of wellbeing, depending on their individual beliefs and values. Patients seek the freedom to choose offline devices and own their personal health data, which is an advancement toward more pluralistic approaches.

The government's intent to offer medicine to all Canadians may be seen as means of regulating, streamlining, and reducing price gouging, but also makes medicine more available to those who need it. To meet the different needs of varying patients, other factors should also be considered, such as their privacy and freedom to choose what they believe is the best solution. Education and awareness are key to people being informed about the risks and benefits of the technologies available and how they may affect their health.

03 It's All Digital

In this scenario, a clear class divide continues to develop, caused by unequal access to privatized health care. There are high costs associated with treatment, and those who cannot afford it experience detrimental impacts to their wellbeing. While wellbeing is prioritized in this scenario, it is relegated to those who have access to afford the services, and they access both preventative and reactive models of care. The recognition of this affects those who do not have the ability to utilize these services to their advantage.

04 Back To Our Roots

This scenario involves a shift away from traditional Western medicine to more alternative forms of health care and notions of wellbeing. This is a more pluralistic acceptance of multiple understandings of wellbeing and is widely accepting of multiple viewpoints. However, the private nature of care provision can be polarizing because access could easily be restricted and there are no formal agreements to provide equal access to care.

DESIGNED FUTURE

Designed futures offer another view into this information, going beyond the narrative to elicit broader discussion and communicate ideas that are often provocatively charged. We chose to present a designed future that would convey a sense of agency over technology, possible effects of over-reliance on data, and relationships between public and private organizations. In keeping with a pluralistic idea of wellbeing based on the wellness wheel, we also wanted to imagine related technological innovations and their intersection with wellbeing.

OCADU's W42 Assessment is set in 2040 within the context of a scenario characterized by high trust and dependency in technology, as well as a public model of health care. To convey both the technological aspects of this scenario, the multi-dimensional perspective of wellbeing, as well as the individual experience of the societal impacts of data collection, we chose to combine an immersive experience with a performance. This designed future took place at the OCAD University Waterfront Campus on April 21, 2022.

STEPS

- Define futures & cluster ideas
- Scenario Development
- Piloting
- Immersive set design
- Recording A/V
- Stage scenario
- Set ambience
- Export and test A/V

TOOLS

- 2x2 Matrix
- CLA
- Storyboard & script
- Announcements
- Animation & visual effects
- Set list
- Recording equipment
- Props
- A/V equipment

ABOUT W42

W42 is a private wellbeing company committed to helping individuals find balance on their journeys toward optimal wellness. Founded upon a belief that greater knowledge of the self leads to optimal wellbeing, W42 specializes in applying innovative technologies to further self-discovery. Through cutting edge A.I. and data collection systems, W42 can identify individual needs, pain points, and areas for improvement on the journey to wellbeing. Users have full access to their own biometrics and wellbeing information, from blood tests to emotional status, and can use this information to take control of their own wellbeing.

Our unique understanding of wellbeing scores each individual user on a scale of forty-two points, in pre-determined areas that align with the wellness wheel. Providing holistic, comprehensive assessments on all areas of wellbeing gives users access to information on the whole self. This score gives users the ability to compare their wellbeing on a normative scale specific to their country. Hospitals, wellness organizations, educational institutions, and workplaces benefit from access to this score to improve quality of life in a variety of areas, contributing to the happiness and prosperity of society as a whole.

Accessing an extensive database of therapies, treatments, medications, remedies, and services, W42 also provides users with practical, professional advice to improve individual wellbeing, based on the user's data points. These wellbeing pathways are recommended to improve W42 scores so people can reach optimal, balanced lives, and inform national health insurance on needed, personalized insurance coverage. In some areas, users are given access to W42's specialized Rebalancing Rooms, a resolution center where users can practice various forms of meditation, live therapy and coaching, medical aid, and passion time to help them rebalance their wellness wheel.

W42
Be Optimal

This annual assessment scores each individual out of 42 points. Each year, individuals prove their optimal wellness through this assessment, and this score informs hospitals and wellness enterprises, schools, workplaces, and other organizations on their wellness levels and general "fit". W42 system will help to determines what services and therapies may be needed and which ones will be covered by OHIP.

WELCOME TO OCAD'S W42 ASSESSMENT

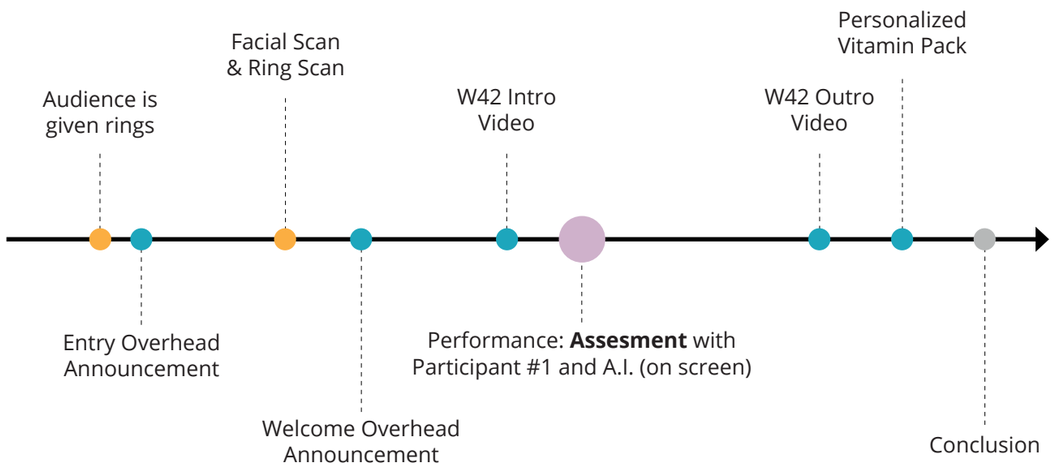
Each year, individuals prove their optimal wellness through the W42 assessment. The Government of Ontario has recently hired W42 to conduct their renowned wellness assessment for all residents of Ontario. As of 2040, all OCAD University students are required to participate in this annual assessment to determine their wellbeing status for the year.

It is our sincere hope that this assessment will assist you on your journey toward optimal wellness. Across the globe, millions of individuals have experienced optimal wellbeing through W42's wellbeing assessments, and we believe this assessment and its recommendations will help you contribute society in a greater capacity.

As a reminder, if your score is lower than the optimal forty-two points, you will receive recommended pathways to improve your score, and may experience consequences with regards to your status at OCAD University.

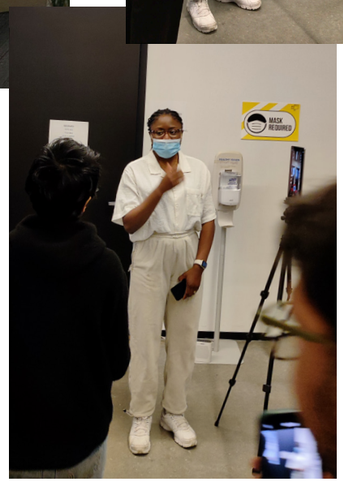
Let's begin!

OUR PROCESS



IMMERSIVE EXPERIENCE

Audience members entered the scenario through a back hallway, receiving rings as they lined up to enter, signifying a biotech device that allows users to permit data access. This explored the idea of wearable technology that gave the user the choice to give data access.

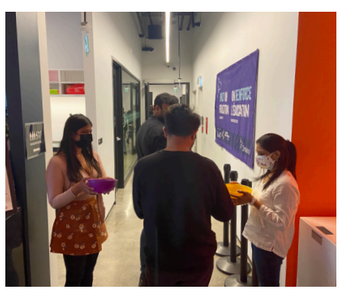


Each participant was asked to complete a facial recognition scan on an iPad to confirm ID verification, and a W42 associate approved each participant for entry. They then symbolically chose to enter the scenario between two doors, one to observe the assessment, and the other to participate in the assessment.

As they waited in the hallway, an announcement played over a speaker welcoming them to the assessment, prepare for the assessment and determine whether they wanted to give data access.

Upon entry, participants found seating in a small room designed to feel calming and close to nature, with cushion seating on wooden blocks and on the floor, among potted plants and lavender diffusers.

The audience faced a blank screen, and an overhead announcement directed them to take a seat and wait for the assessment to begin.

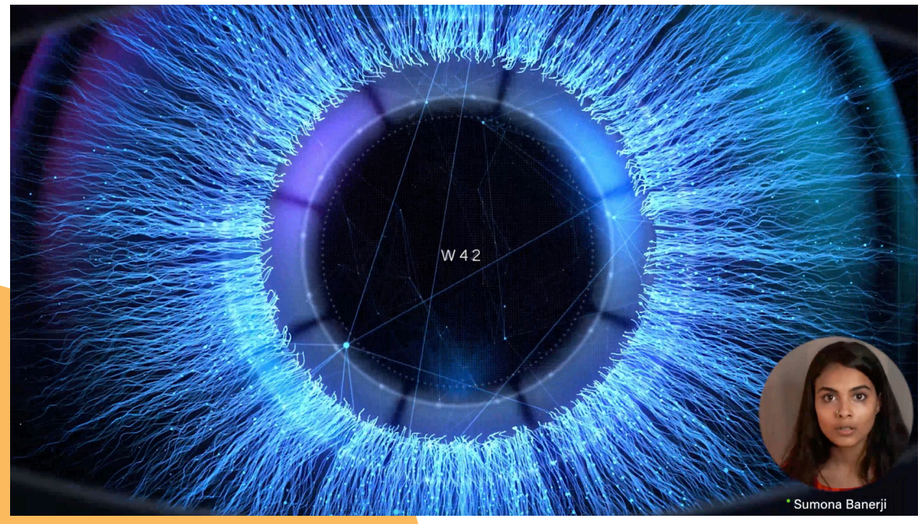


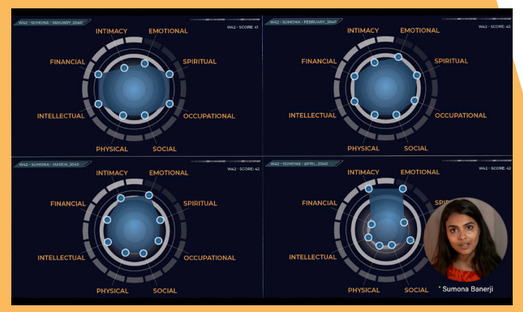
PERFORMATIVE EXPERIENCE

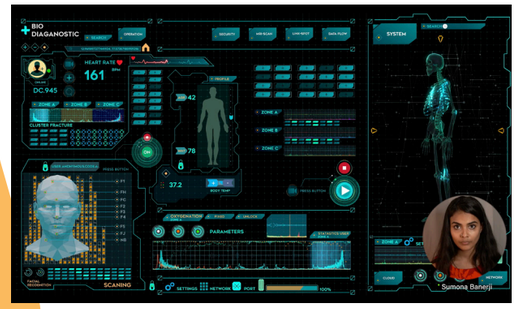
Once all participants were seated in the assessment “rebalancing” room, audio played welcoming the audience to the assessment and giving them context for W42.

A video then began to play on the screen, showing a participant interacting with a W42 AI. The participant is shown their data and gives consent to the W42 AI throughout the video and is given an overall score at the end of the assessment, along with potential ways to improve.

As the video ends, the lights turn on and W42 associates hand out customized “vitamins” based on their individual needs as per their accessed data, concluding the scenario.







BREATHE RELAX ENJOY

OCAD’S W42 ASSESSMENT

SCAN TO WATCH THE VIDEO

“THANK YOU, AND WE HOPE YOU HAVE A BALANCED DAY.“

CONCLUSION

As technology continues to advance in the wellbeing space, society grapples with its impact on quality of life. The Canadian health sector is a complex system with actors in both public and private arenas, and a pluralistic understanding of wellbeing is continually under threat as social class divides deepen.

These scenarios describe the tensions between publicly provided health care and private organizations in the wellbeing industry, which prompted us to include both in our designed future where W42 was a private company that had been hired by the government. Our primary goals with this were to show CPSI how the private sector could continue to profit off wellbeing, and how the state may continue to enforce regulation and public policy. Personal agency over wellbeing and the data collection involved would be navigated through both public and private actors, with little option to opt-out of the assessment and remain in dominant society.

In each of these futures scenarios, trust in and dependence on technology was also debated. Current concerns over security, privacy and regulation have yet to be addressed, and research is still young in the effects of dependency and overreliance on technology. These concerns will continue to influence personal wellbeing in both predominantly public and private scenarios.

A VISION FORWARD

How will patient wellbeing be experienced in the future? Additionally, how does the future inform the present? The Canadian Patient Safety Institute is committed to leading system strategies that ensure safe healthcare, contributing to a more resilient, pluralistic future in response to the changing, complex needs of Canadians.

KEY GUIDING QUESTIONS

How can health care include more pluralistic understandings of wellbeing?

How can data collection and consent increase personal agency over their wellbeing?

How does reliance and dependence on technology impact patients?

How does the digital divide affect Canadians accessing wellbeing support?

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