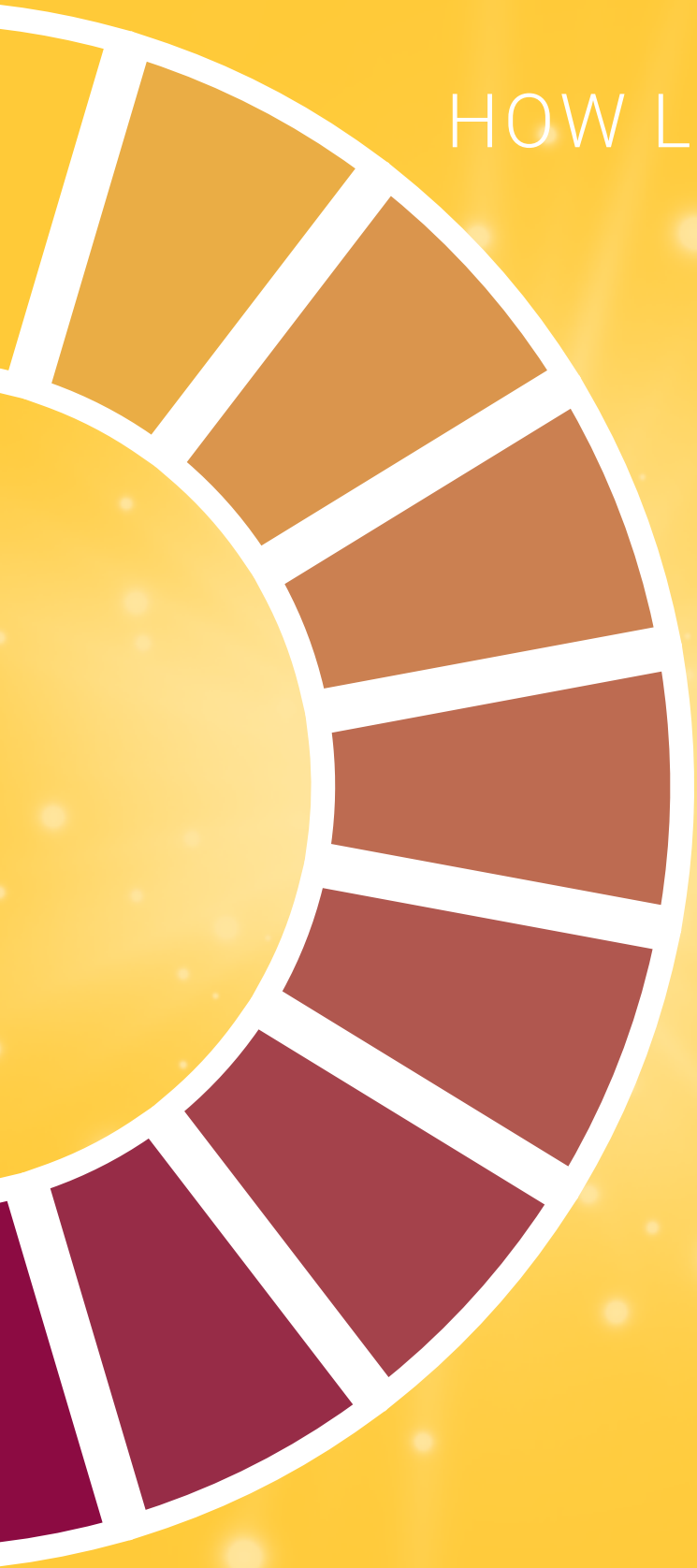

# HOW LIGHT IS SPENT

The future of technology, human ability and economic value

APPLIED FUTURES LAB

ENVISIONING FUTURES FOR ALL

ASU

# HOW LIGHT IS SPENT

The future of technology, human ability and economic value


Technical Report by Cyndi Coon with Brian David Johnson

**AFL** Workshop hosted virtually December 2020 produced by Cyndi Coon

The Applied Futures Lab is supported by

Arizona State University

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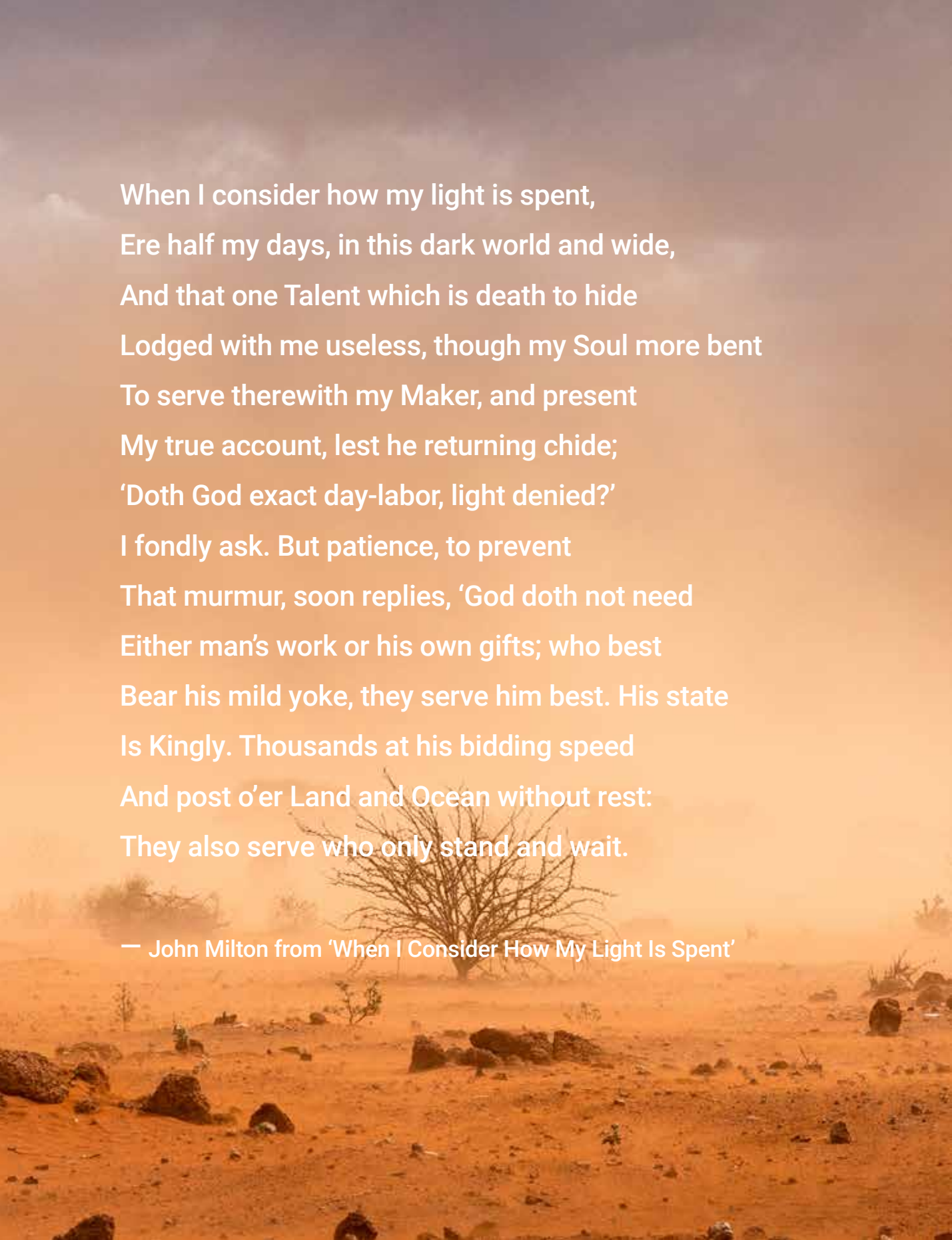

When I consider how my light is spent,
Ere half my days, in this dark world and wide,
And that one Talent which is death to hide
Lodged with me useless, though my Soul more bent
To serve therewith my Maker, and present
My true account, lest he returning chide;
'Doth God exact day-labor, light denied?'
I fondly ask. But patience, to prevent
That murmur, soon replies, 'God doth not need
Either man's work or his own gifts; who best
Bear his mild yoke, they serve him best. His state
Is Kingly. Thousands at his bidding speed
And post o'er Land and Ocean without rest:
They also serve who only stand and wait.

— John Milton from 'When I Consider How My Light Is Spent'

# PARTICIPANTS

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Arizona State University Applied Futures lab serves as the premier resource for strategic insight, teaching materials, and exceptional subject matter expertise on Futurecasting and Threatcasting, envisioning possible futures and threats ten years in the future. The lab provides a wide range of organizations and institutions actionable models to not only comprehend these possible futures but to a means to identify, track, prevent (disrupt, mitigate and recover) or generate (design and enable) them as well. Its reports, programming and materials bridge gaps, and prompt information exchange and learning across the military, academia, industrial, governmental and non-governmental organizations.



The following report captures the goals, subject matter expert inputs, raw data, and findings of Arizona State University's Applied Futures Lab Workshop exploring the future of emerging technologies, humans labor and economic value. The findings are provided to empower people and organizations to take action. The findings in this report identify specifics and provide recommendations through which organizations and individuals can further explore way to enable potential futures and prevent potential threats.

ASU Applied Futures Lab contributors to this report
Cyndi Coon  Chief of Staff
Brian David Johnson  Director
Danielle Beauchamp Analyst

# EXECUTIVE SUMMARY

In the coming decade a constellation of emerging technologies (e.g. Artificial intelligence (AI), Machine learning (ML), The Internet of things (IoT), 5-G and Network Improvement Communities (N.I.C)) will enable a radical reevaluation of human labor. Persistent and unaddressed threats (e.g. climate change, civil and political unrest, pandemics, food insecurity and lack of access to learning combined) will require increased participation in the global work force. These two factors will fundamentally remap our understanding of human ability, ultimately making the notion of a disability obsolete.

In this post-disability future, increased participation in the labor force by a wide swath of untapped potential will have a significant and positive economic effect. Countries, economies or organizations that adopt and implement this fluid understanding of ability will not only have the increased capacity to address their persistent threats but they will harness a wide range of new capabilities amplified by the coming emerging technologies.

"One of the most interesting, thought-provoking, and insightful aspects of the Coolabilties exercise was the insistence that we move far outside our comfort zones to examine today's "disabilities," and future "coolabilities," from very different ethnic, cultural and gender perspectives. In the case of the white males in our team, playing the role of an autistic, African girl in a refugee camp led us to think about issues, opportunities, and limitations beyond anything we would have considered on our own. It was a remarkable learning experience."

Linton Wells



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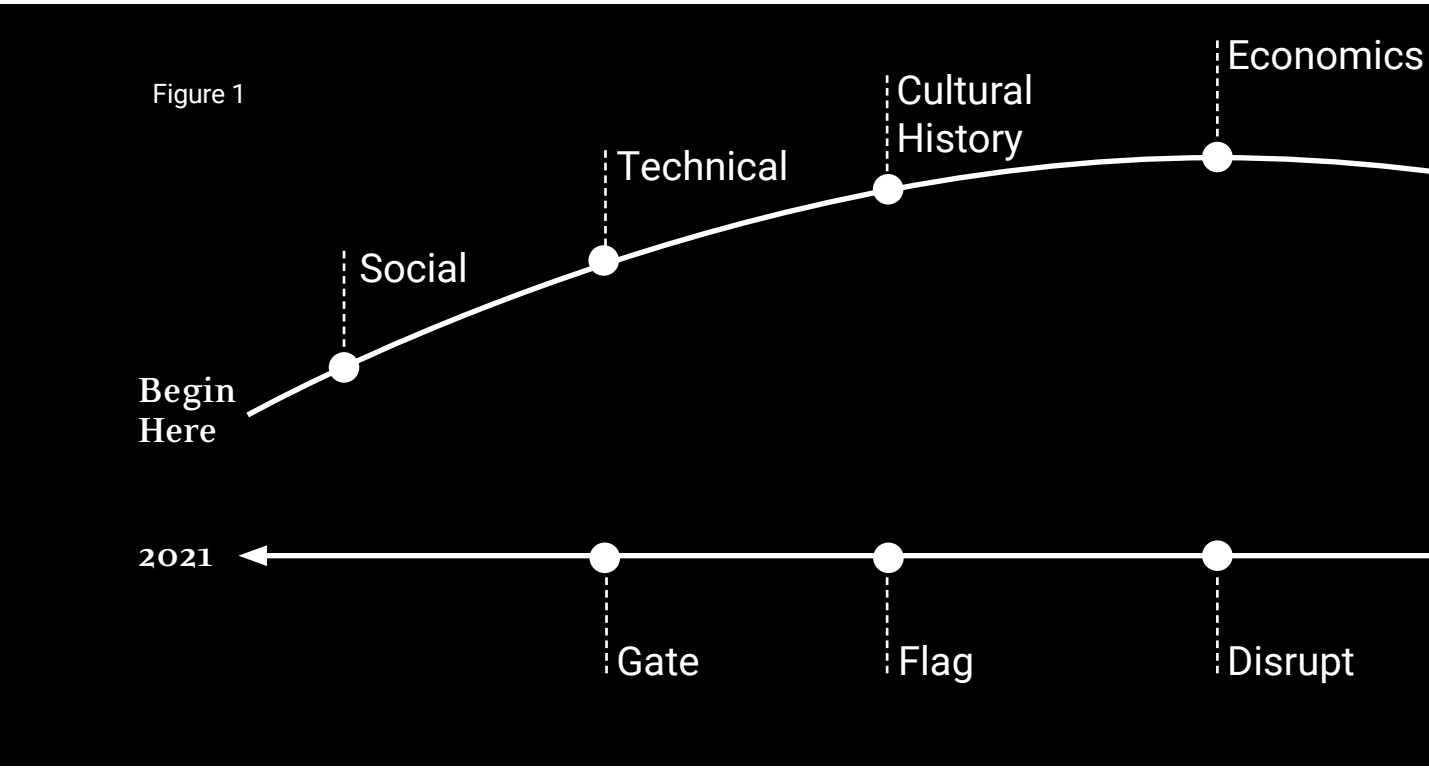
# APPLIED FUTURES: A BRIEF OVERVIEW

The Applied Futures Methodology (Figure 1) enables multidisciplinary groups to envision and plan systematically for possible and potential futures and threats ten years in the future. Groups explore how to transform the future they desire into reality while avoiding an undesired future.

The methodology uses inputs from social science, technical research, cultural history, economics, trends, expert interviews, and even a little science fiction. These various inputs allow the creation of potential futures (focused on the fiction of a person in a place doing a thing). Some of these futures are desirable while others are to be avoided. By placing the threats into a fictional story, it allows decision makers and practitioners to imagine what needs to be done today as

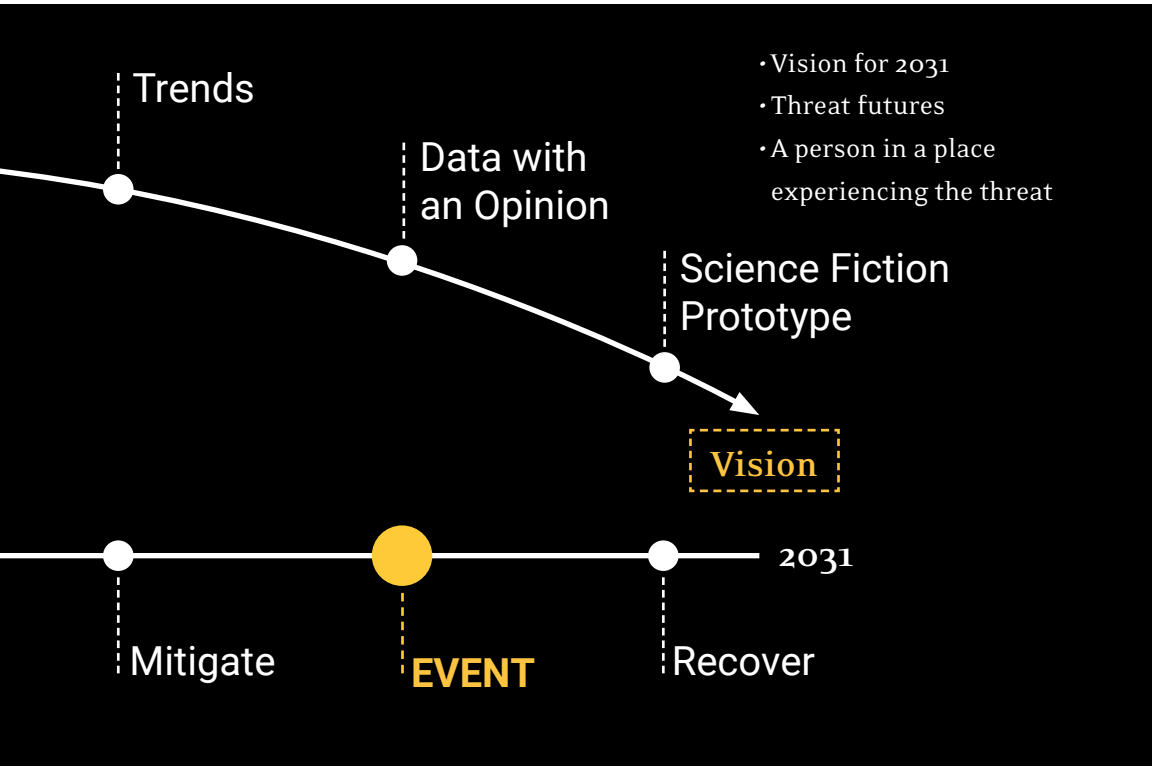


well as two, four and eight years into the future to empower or disrupt the targeted future scenario. The methodology also illustrates what flags, or warning events, could appear in society that indicate the progress toward the threat future. The Applied Futures Methodology is a human-centric process, and therefore the humans that participate in a threatcasting session are critical. Regardless of age, experience, or education, all participants are considered practitioners.

The Applied Futures Methodology is also a theoretical framework and participatory design workshop undertaken by practitioners with special domain knowledge of how to specifically disrupt, mitigate, and recover from theoretical threat futures. Additionally, participants are curated to include outliers, trained foresight professionals, and young participants for a fresh and multi-generational perspective in the groups. When using this approach the mixture of participants should span academia, private industry, government, military and NGO representatives.



Figure 1



PROJECT INTRODUCTION

# TOWARD A POST-DISABILITY WORLD

In the Summer of 2019 Guido van Nispen and Vint Cerf, presented a concept to the People Centered Internet membership. They used the term “Coolabilities” and it had significant implications on learning and the workforce of the future. If humans' unique abilities were seen as positive instead of negative and if new competencies could be discovered it would create global economic and social impact.

## DEFINITION

Coolabilities, traditionally seen as disabilities or oddities, is an overall name for enhanced abilities in disabling conditions. Coolabilities are not isolated phenomena but a general principle that may apply to a variable extent across a wider range of conditions.

**TYPES OF COOLABILITIES**

- 'Contextual Coolabilities': a trait that is disabling in one context (environment) becomes non-significant in another, such as people with ASD who have very specific ("limited") interests and extreme attention to detail, can become experts where the specific knowledge is valued, attention to details is an asset

- 'Compensational Coolabilities': When one or more abilities are strengthened at the loss of another. For example, a person who lost one limb and trains the remaining ones to compensate for the loss

- 'Singular Coolabilities': abilities that do not exist in other people, such as when blind people reorganizes and reassign neural pathways in the visual cortex giving rise to Coolabilities such as echolocation. People with such abilities perceive and act in ways unimaginable to others. See: American jazz pianist, Matthew Whitaker https://en.wikipedia.org/wiki/Matthew_Whitaker_(pianist)

Chally Grundwag, David Nordfors, and Nurit Yirmiya coined the term Coolabilites* created the framework for types of Coolabilities.[1]

September 2020 the People-Centered Internet, a California-based nonprofit organization with a mission to "put humanity at the center of the Internet," co-hosted the Digital Cooperation and Diplomacy day as part of the celebration of the United Nations' 75th Anniversary. Speakers from across the globe ushered in a new era for a personal commitment to acting on science, technology, and art in an interconnected and interdependent way. The goal of these dialogues is to shift the culture of science to be more human and share our hopes and inspiration so that each of our actions on the micro-scale will lead to a macro effect. Dozens of leaders from across the public and private sectors presented their perspectives on bringing humanity to the center of progress. Their expertise and priorities will help guide the vision and priorities for executing on the United Nations' Sustainable Development Goals.

The event's culmination was a call to action for volunteers to "Connect to Thrive" and bring expertise and resources to this momentous effort. Born out of this call the People-Centered Internet announced the launch of the Global Help Desk (GHD). Applying the same principles that guided the Internet's decentralized growth, the GHD serves as an online network to weave people together through a web of goods and services that are proven to address problems and span geographies. GHD weaves communities through coordinated, accessible, and scalable toolkits for solutions-based digital capacity building.

The Global Help Desk members were interested in investigating what the future of learning might look like in the coming decade. After several conversations, the team members most experienced in foresight planning narrowed the questions to look at the the intersection of learning, earning and abilities ten years in the future with the Arizona State University Applied Futures Lab.



[1] Coolabilites origin http://i4j.info/blog/

# PROJECT GOALS

This Applied Futures workshop was intended to help global communities invested in human earning and learning, envision the future made increasingly complex by rapidly evolving technologies offering new understanding around individuals with unique abilities. The shift is multiplied due to the rise of sentient tools, Covid-19 pandemic and the dramatic drop of learning access internationally as a result.

Using the Applied Futures effects based methodology, Arizona State University's Applied Futures Lab convened 30 practitioners together for a virtual workshop over a week and a half in December 2020.

The participants explored the effects of individuals' unique abilities on learning and the future workforce based on subject matter expert inputs (see appendix). The group developed futures that formed the

*What I liked about this threatcasting futurecasting is it gives you an ability to take a look at possibilities, but not just the positive and negative and all those things that wrap up in it and how to address them before some of them happen to keep them positive. I think that part of what this all leads to is storytelling is so important. It's much easier to relate to putting all that into a story.*

Bryan Katz

basis of raw data that was analyzed for the results of this report.

## WHY TEN YEARS IN THE FUTURE?

Applied Futures Methodology focuses on ten years in the future. This is a conscious timing decision in order to reduce innate biases from participant(s) when they participate in the Threatcasting Workshop and explore possible futures. The ten year time horizon allows for and overcomes plausibility concerns. For most, envisioning ten years into the future is an intellectually freeing experience, allowing participant(s) to imagine a broader range of futures beyond their current state. Typically the ten-year time horizon is freeing because it is past the duration of:

- Political administrations
- Corporate executives' appointment
- The life cycle of most projects
- The current career or life position of the participant(s)




Eileen Clegg, vTapestry

## HOW DOES IT WORK?

**The Five Phases of the Applied Futures Methodology**

The Applied Futures Methodology is broken into five steps or distinct phases that contain tasks and activities. These phases are meant to provide the analyst(s) structure and guidance for conducting the Applied Futures Methodology. They need to be followed closely. A phase cannot be omitted or skipped. The tasks and activities inside of each phase need to be performed before the analyst(s) can move on to the next phase.

**Phase 0: Preparation and Curation (Pre-Workshop)**

The first phase of the methodology consists of the preparation of the project and for the workshop, as well as the curation of the decision making team, the participant(s), and research prompts that will be used during the workshop. The initial action for the analyst(s) to develop the Applied Futures Foundation, consisting of

- The topic area to be explored
- The specific research question
- The area(s) where the findings will be applied

Informed and guided by the foundation, the analyst(s) pulls together a team, determines who should participate in the workshop and what research or inputs should be used as prompts to envision threats 10 years into the future. Finally, the materials (e.g. workbooks, presentations, support materials) are created to conduct the workshop.

### FOUNDATION FOR THIS WORKSHOP

- The topic area explored: Uniquely abled humans effects on workforce (earning) and knowledge exchange (learning)
- The specific research question: What is the effect of disabling conditions and constellations of technology on uniquely abled humans learning and earning potential ten years in the future.
- The area(s) where the findings will be applied: People Centered Internet and the Global Help Desk, Networked Improvement Communities

**Phase 1: Prompt Presentation, Research Synthesis and Discussion (Workshop)**

This phase begins the Applied Futures Workshop. Analyst(s) use the prompts and materials to engage in a participatory design session with participant(s). This activity presents the prompt to the participant(s) and then leads them through a session to explore the ramifications of the prompts, capturing their discussion in workbooks for use later by both the participant(s) in the following stages of the workshop and by the analyst(s) in the post workshop phases.

FOR this workshop the prompt present to the subject matter experts and participants:

- What is the effect of disabling conditions (coolabilities) and constellations of technology on uniquely abled humans learning and earning potential ten years in the future.

For this workshop the Synthesis work was completed by the lead analyst in advance of the workshop and preloaded into the workbooks on behalf of participants. Several groups did add their own additional inputs.

**Phase 2: Futurecasting (Workshop)**

Guided by the prompts and research synthesis participant(s) engage in a participatory design session to envision possible and potential futures, ten years out. Participant(s) move from the high level macro view of the research and prompts to the micro perspective of a person in a place experiencing an event. To do this they follow the Science Fiction Prototyping (SFP) and Experience Design Processes to generate and qualitative Effects Based Model (EBM).

FOR this workshop participants were provided with a digitally accessible workbook provided to teams to capture their data. All teams can also see each others data in real time. The completed workbooks are available in the appendix of this report.



**Phase 3: Backcasting (Workshop)**

Using the EBM, participant(s) begin backcasting in small groups, developing a time-phased, alternative-action definition (TAD) phase that generates specific actions that can be taken. Additionally, participant(s) identify the indicators (flags) over the next decade that will show what is beginning to manifest and become a reality.

Phases 2 and 3 can be repeated multiple times during the workshop to generate a high volume of threat futures.

The research synthesis workbooks, along with the Futurecasting and Backcasting workbooks, make up the Threatcasting Methodology's raw data to be processed by the analyst(s).

FOR this workshop we repeated the exercise only once. There were six teams with between two to five participants. Teams Ruby, Garnet, Peridot, Amethyst, Topaz and Sapphire.

**Phase 4: Post Analysis, Synthesis, and Findings (Post Workshop)**

After the workshop's conclusion, the analyst(s) study the raw data, using multiple techniques to cluster and identify the possible and potential. These findings are documented and sometimes peer-reviewed by the participants and SMEs. Additional research is conducted if needed, and the technical documentation captures the actions and indicators.

FOR this workshop the lead analyst was Cyndi Coon with support from Brian David Johnson and Danielle Beauchamp. All participants were encouraged to peer review the report and provide feedback.

**Phase 5: Output (Post Workshop)**

The final phase of the methodology translates the findings into an output. The Applied Futures Foundation determines this output in Phase 0. The correct output (e.g. technical report, academic paper, podcast, etc.) is determined by the person or organization that will be applying or using the Applied Futures Findings for decision making.

FOR this workshop the report is made public by the participants organizations, People Centered Internet and the Global Help Desk.

## APPLYING THE METHODOLOGY

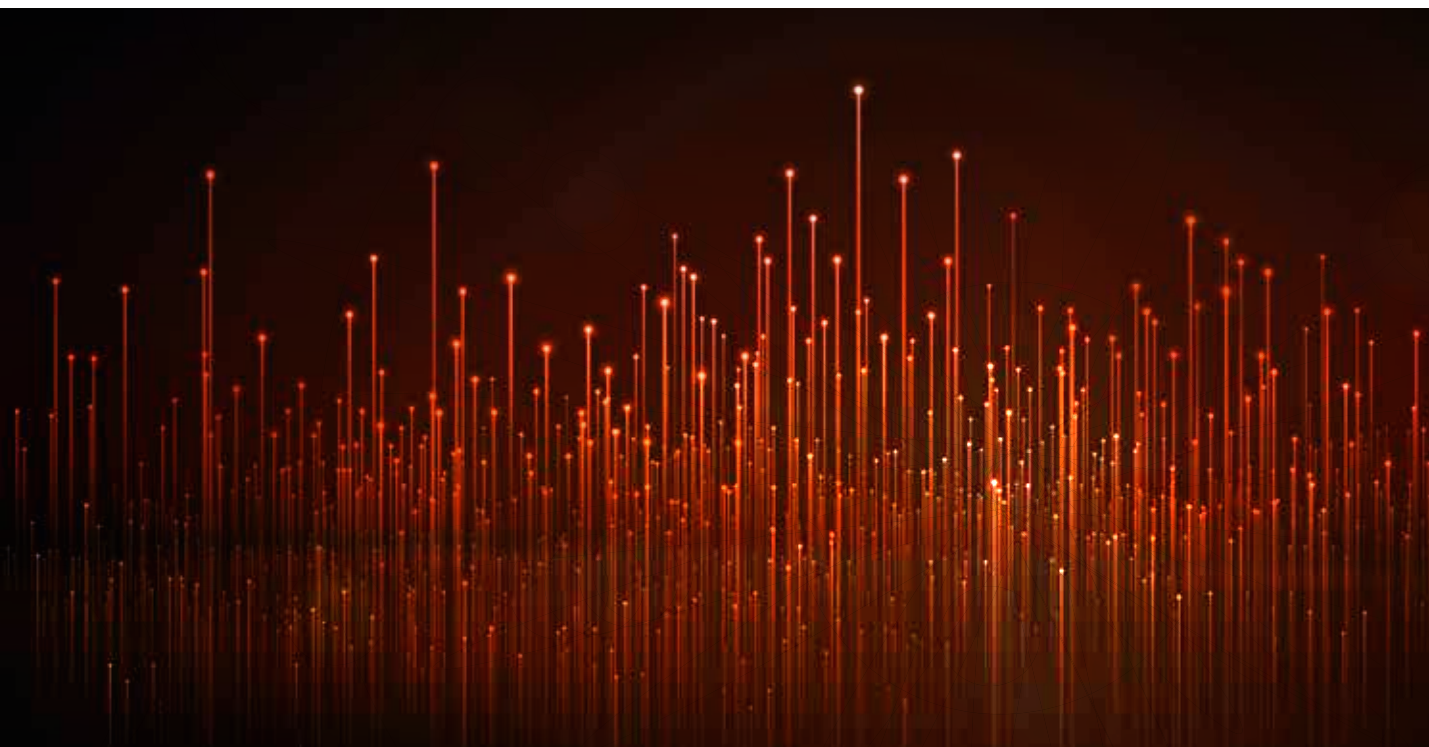
The Applied Futures methodology is distinct from traditional notions of futures thinking, planning, and modeling. Not only does the methodology combine both linear and creative thinking it also requires that a diverse set of participant(s), from both inside and outside of the industry gather and collaborate. This diversity of participant(s) and the multidisciplinary nature of the sources it draws upon, paired with multiple guided exercises to explore possible futures, enables groups to envision a complex and evolving futures landscape.

## PARTICIPANT(S)

The Applied Futures workshop is a process curated, produced, and facilitated by the Lab.

Participants include critical voices from organizations, businesses, government entities, non-governmental organizations (NGOs) with a long-term vested interest in the identified area to explore. Participants come with a wide range of domains, experiences, expertise, education, and passion.  The workshop is curated, and custom-designed small groups of 3 to 4 people are created using their backgrounds, influences, and expertise. At the workshops, they provide opinions and use their imaginations to co-create futures.





# THE FUTURE OF HUMAN ABILITY

For the Applied Futures Workshop, we explored the effect of disabling conditions and technology on learning and earning potential ten years in the future. Exploring this concept provides a means to capture, understand and specify the types of experiences uniquely abled humans have and how they intersect with the individuals earning and learning potential and, therefore, their unique value for all of society.

The following narratives offer experiential stories set in the year 2031.

> *Being part of this workshop was life-transforming for me - the scenarios triggered connections with so much of my life - bringing back vignettes and epiphanies that I could never have connected without the prompts - talking in a small group of three people brought such intense exchange, the intimacy of the stories we shared brought back to life long buried memories and feelings. The workshop was a wake up call to the humanity within me which had been dormant.*
>
> Mei Lin Fung

# Future 1

**Title: The World had once been Dark**

ONE - 2029

The world was dark.

Sadi was scared.

“Ms. Sanchez,” a voice called in the darkness. “Ms. Sanchez? Can you hear me? Nod if you can hear me?”

Sadi nodded.

Her mind raced. What had happened? She remembered getting to the plant a little late…

“There’s been an accident,” the voice reported.

She remembered. The accident. The pain. Then she passed out.

“Tito,” Sadi called out. “My son. My son. Someone needs to get him…I didn’t have time to spot off from the diner…I had to get to the plant…”

“Ms. Sanchez there’s a social worker on her way,” the calm voice responsed. “My name is Juanita. I’m here to help you…”

“Why can’t I see?” Sadi asked touching the bandages that covered her eyes.

“I’m here to help you Ms. Sanchez.”

TWO - 2031

“The world was dark…” Sadi repeated and paused, remembering the accident. The darkness. It seemed so long ago. She repeated again: “The world was dark and with the sun then came the light came… That doesn’t seem right.” She mused.

Sadi leaned back in her chair. Her work rig surrounded her. Following the accident and her loss of sight Sadi embraced the support network and technologies. They created a new kind of situational awareness that was completely aligned with her needs. Once connected to everything in the environment, Sadi used voice commands to function inside this new future, earning a living and learning a new trade.

A digital copy editor now, Sadi finished work on a new children’s book about a little boy that gets lost on the bank of a river overnight. She listened to the machine reading, correcting the book by voice, letting the system get it ready for the author’s review.

“How about this,” she began, “The world had once been dark but with the sun came the light…yes I think that’s better.”

She liked to picture her son Tito as the little boy in the story. He was growing fast these days.

# FUTURE 2

**Title: The Far Widening Possible**

“It has been said that you are one of the best listeners in the world,” the reporter began via a video link. “You transcend traditional language. Your mayor told me that you “feeling listen” - their worlds - to the community. And that you are a superhero.”

That is very kind of them.” Kerubo blushed. “I care very deeply for them…”

“Can you tell me the whole story,” the reporter asked.

Kerubo sat in an old chair and activated clear-mode on her CommunityVision Lenses, gazing out the dwelling's main room window. “It’s been a truly amazing path. I was unable to secure a job because of the cultural and institutionalized discrimination against uniquely abled humans like myself.

“My home town…no the whole region been plagued for a decade by persistent drought, food insecurity. The organized cybercrime rings nearly destroyed our culture, livelihoods, language...

“Is that why you all left?” the reporter interrupted. “The migration?”

“We had no choice,” Kerubo replied. “When we arrived in the camps I was recruited on the "matchmaking" mentor system CommMatch for social entrepreneurs. We are globally linked. That’s how I became a networked community mentor to individuals over the world. The language translation is nearly perfect now. My community is across the world.”

“Would you say that all of the displaced are your community?”

Kerubo thought for a moment and replied, “That and more. I think the possibilities are far wider than that…”

## 2031 TECHNOLOGY LANDSCAPE

Sentient Tools represent the next stage of intelligent, aware and social machines that are designed specifically to interact with people. To better understand this new classification let's dissect its meaning.

Sentient is defined as the ability to perceive the world surrounding us and derive feeling or meaning from those experiences. For a machine or tool, being able to derive meaning infers that the tool is capable of some level of perception, processing and thinking. In this case sentience is both the ability to sense the world around the tool but also to process, understand, make meaning and communicate with that world. To be able to effectively interact with that world the tool needs to be socially aware of the person it is working with. It must understand the person as an individual so that it can more effectively communicate. The definition of a tool is simple. People have been using tools for millions of years. A tool is anything used as a means of accomplishing a task or purpose, typically a device held in the hand, used to carry out a particular function. (Brian David Johnson, The Coming Age of Sentient Tools, see appendix))

## THE NEW ECONOMICS OF HUMAN ABILITY

The speed of technological advance and the economies they create are transforming faster than ever experienced. Facebook, Twitter, and Amazon Web Services (AWS) didn't exist fifteen years ago. A decade ago, there was no Uber, no Kickstarter or GoFundMe, no TikTok, Instagram, or Whatsapp.

With over 8.5 billion people predicted by the U.N. on the planet in 2030 (a billion more than today), two-thirds will live in mega cities with populations of tens of millions.

Over the next decade, global growth continues to slow because emerging market nations can no longer pick up the slack of soft growth in more advanced economies. Emerging nations make sufficient investments in education and digital infrastructure.

Advancing economies and slowing growth rates won't change technological speed. In the coming decade, a scalable temporary workforce with flexibility and consideration for strengths becomes more efficient than whole teams of full-time workers, said Chief Economist John Hawksworth. Hawksworth said the most significant impact on economic growth over the coming decade is the productivity of a nation's workforce and how much value each employed member of

the population generates.

Technological advances made it possible to exploit previously considered inabilities as new opportunities. Human abilities' complex effects might make it tough to work out the exact cost, but there's no mistaking the trends or overall impact. At the same time, it's hard to measure today; in the future, this new value will have measurable matrixes.

## DESTABILIZATION AS AMPLIFIERS

Unique to many of the futures developed in the workshop were very local instances of influence that destabilize businesses, individuals, and communities, thus destabilizing local economies. Multiple futures identified social, economic, or climate disaster situations that opened up a window of opportunity for an adversary or organization. These included an ongoing global pandemic (Covid-19) perspective amplified by destabilizing global events both positive and negative.

- Investments in humans over profit shifts measurements from gain matrix to one of wellbeing.
- Network Improvement Communities (N.I.C) supply broadband and community connectivity at a mass scale and speed.
- Climate change, civil and political unrest, pandemics, and lack of access to learning combined with advances in technologies result in climate refugees.
- Workforce talent mapping solutions are constructed using sentinel tools such as artificial intelligence (AI), machine learning (ML), 5G, and the Internet of things (IoT)
- The fast-moving, fully connected human is an ideal target for threats, as the platform could be cognitively disorienting and confusing. Opportunities abound for emotional manipulation.
- Invisible people, people without formal identities, people outside of digital systems, people with untapped brilliance, people not in formal education systems, indigenous people, those with disabilities who were formally disconnected now have a way to learn and earn on the platform.
- Communities are saddled with fall out from supply chain failures and consistent leaks of data, which creates a global trust collapse.
- Traditional farming is no longer viable, leading to new agricultural methods and cooperatives on the platform.

- Real-time translation of every existing language at conversational speed built over a decade of voice command ML
- Micro-communities build "matchmaking" mentor systems for social entrepreneurs
- Micro-Multidirectional Mentorships make the difference
- The platform offers space to meet, learn and earn.
- Gamification of mentors matching needs with complementary abilities, building mentorship support groups.

# FUTURE INDICATORS: THE FINDINGS

These coming futures will bring about a post-disability word that will shine a light on uniquely abled humans' gifts, value, and worth. Peering into humans' unique abilities all the way to the cellular level allows all humans to understand and amplify their abilities, be it physical, emotional, social, or cognitive. All humans, globally, are able to earn and learn on a shared platform matched with economic opportunities. Learning across languages, geographic locations and previous physical barriers. The platform's connectivity provides tools and pathways for each human to respond to community needs using their unique abilities, thereby demonstrating massive community value.

## WORKFORCE

The following are findings that will affect human earning opportunity futures.

- As this future takes shape, a new framework redefines value and "productivity," so the tools' syntax and design will be completely different. Language and visuals depictions will change. The "who" and "how" the tools are being made over the coming decade dramatically shapes this new framework.
- Opinions are shaped by this framework and advance quickly to norms. There are examples of this in very recent history. Moving from print to the web at the dawn of the internet and Gen Z[2] redefining binary gender in each the metaphors and mental models shifted but in such a way that people barely noticed.
- The 20th century notion of 'employees' becomes obsolete and new definition begins to emerge in popular culture as well as Human Resources (HR) definitions.
- A new workforce emerges via mapping humans' unique abilities.
- The emergence and capitalization of a global linked platform that can read intangibles for future workforce.

## NEW TECHNOLOGY AND MEASUREMENT TOOLS

The following are findings that will affect human technological futures.

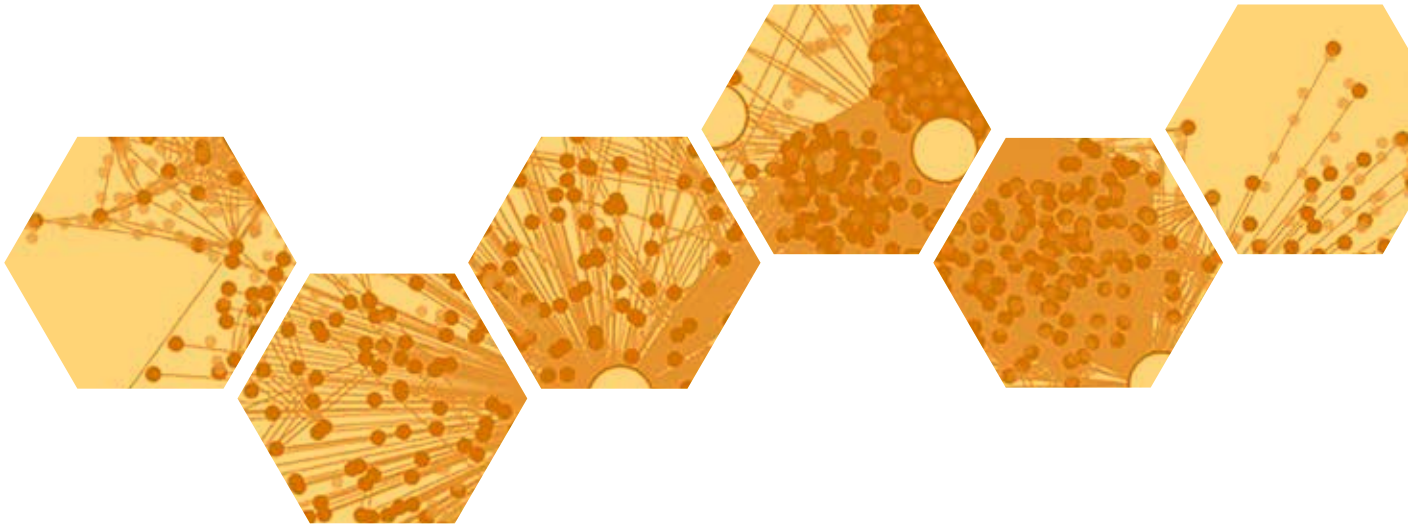
- The climate crisis brings rise to new agricultural methods.
- Instant global real-time translation of every existing language at conversational speed via a decade of voice command Machine Learning (ML)
- Network Improvement Communities (NIC) in a box tools
- New Tools that evaluate intention, impact, and cognitive wellbeing
- Measurable outcomes shift from knowledge to wellbeing.

## OUTLIERS



The following findings the analysts found notable but remained outside of the other clustered areas.

- Every global citizen has a Personal Stock Price (PSP)



[2] Generation Z also known as Gen Z, is the population born between the years 1997 to 2012

# FUTURE ACTIONS

## ACADEMIA - TRAINING AND CURRICULUM

Academic institutions play a role in taking actions.  By using academic freedom to investigate unique research opportunities that could only be conducted only in academic environments. Power of convening people together where industry or government agencies would be unable to.

- Network Improvement Communities (NIC) in a box brings together solutionitis, experienced knowledge managers, a methodology for knowing, and communities of common interest.
- Emotional intelligence & human dynamics become integrated with learning.
- Self-directed curricula for education become mainstream.
- Universities develop curriculum for unique ML programs.
- "Standard" learning models are discontinued replaced by individualized models.

## GOVERNMENTS

Government agencies are positioned to set policies, make legislation and regulations such as the U.S. Law The Americans with Disabilities Act (ADA)[3]

- Policies on indigenous communities' intellectual property rights
- Regulations set for data to be self-owned
- Regulations for the human unique abilities mapping system
- Legislation to regulate technology

## COMMUNITY

Communities play a role in building connectivity across humans, building trust, and providing space for humans to connect physically or virtually.

- Construct virtual gathering spaces such as town squares
- Create matching human abilities to mentors programs, locally within the community
- Create learning support groups

## INDUSTRY

Industry refers to companies ideating, designing, and producing technology, thus directly affecting humans.



- Investment in new tools and training for mapping humans' unique abilities
- Develop Gamification of mentoring networks
- Invest in learning patterns of self-directed communities
- Investment to develop and deploy Network Improvement Communities (NIC) in a box tools
- Investment in new tools that evaluate intention, impact, and cognitive wellbeing as measurable outcomes shift from knowledge and productivity to wellbeing
- Investment in new agricultural methods
- Investment in voice use in Machine Learning (ML) opportunities

[3] The Americans with Disabilities Act (ADA) became law in 1990. The ADA is a civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life, including jobs, schools, transportation, and all public and private places that are open to the general public. The purpose of the law is to make sure that people with disabilities have the same rights and opportunities as everyone else. The ADA gives civil rights protections to individuals with disabilities similar to those provided to individuals on the basis of race, color, sex, national origin, age, and religion.

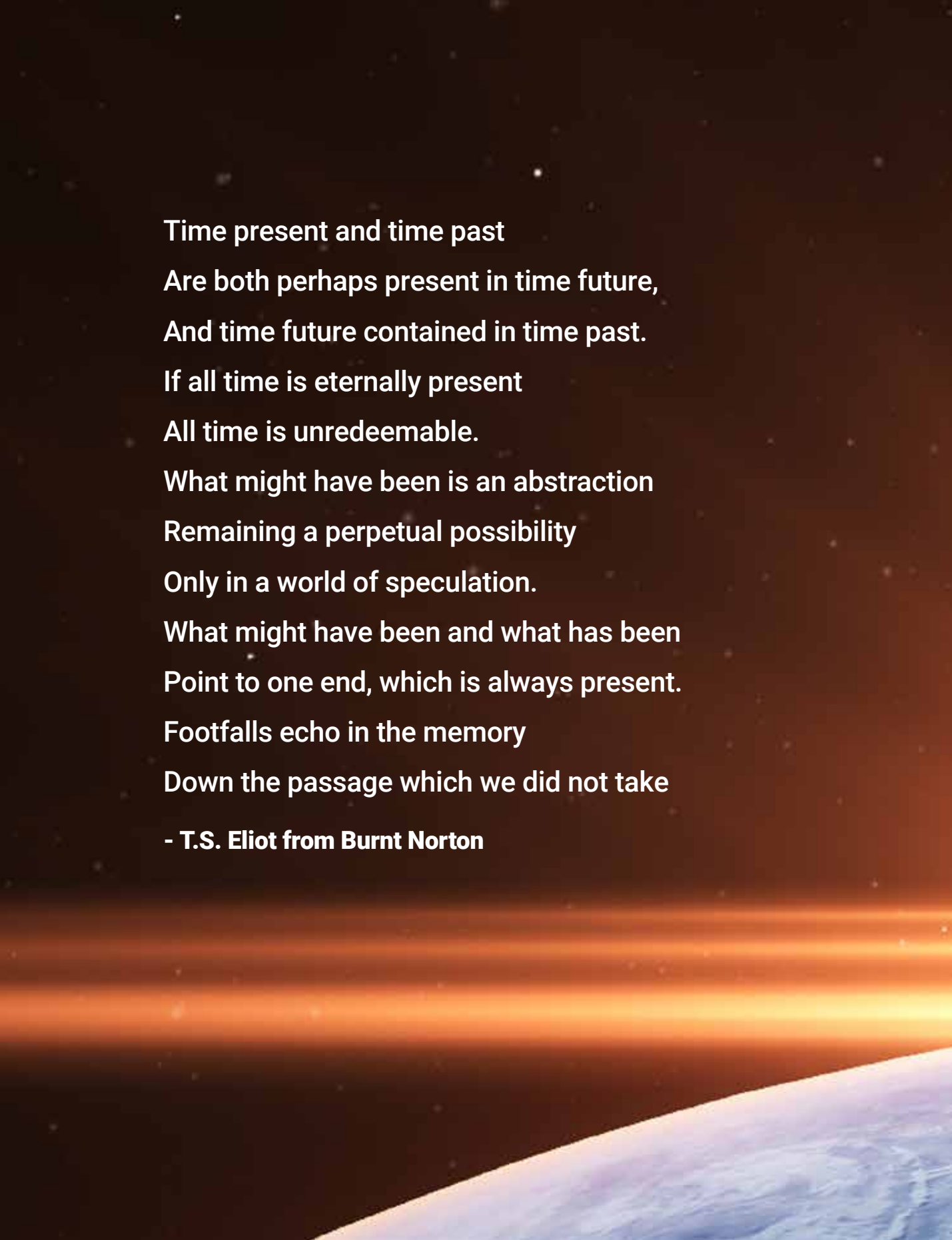
# CLOSING STATEMENT

The participants in this event were brought together by the Global Help Desk (GHD). As a new initiative in support of the United Nations' Sustainable Development Goals, GHD has been building a people-powered network to support connectivity to wisdom around the globe. The first publicly available connection point is this report. The GHD is excited, along with so many others, to imagine a post-disability future that fundamentally remaps our understanding of human ability, ultimately making the notion of a disability obsolete.

*"This training point links back to earlier conversations of building a truly diverse community of futurists and using "future" as a tool for empowerment and hope where it is the most needed. Futures belongs to all and should not be a western dominated practice the way it currently is."*

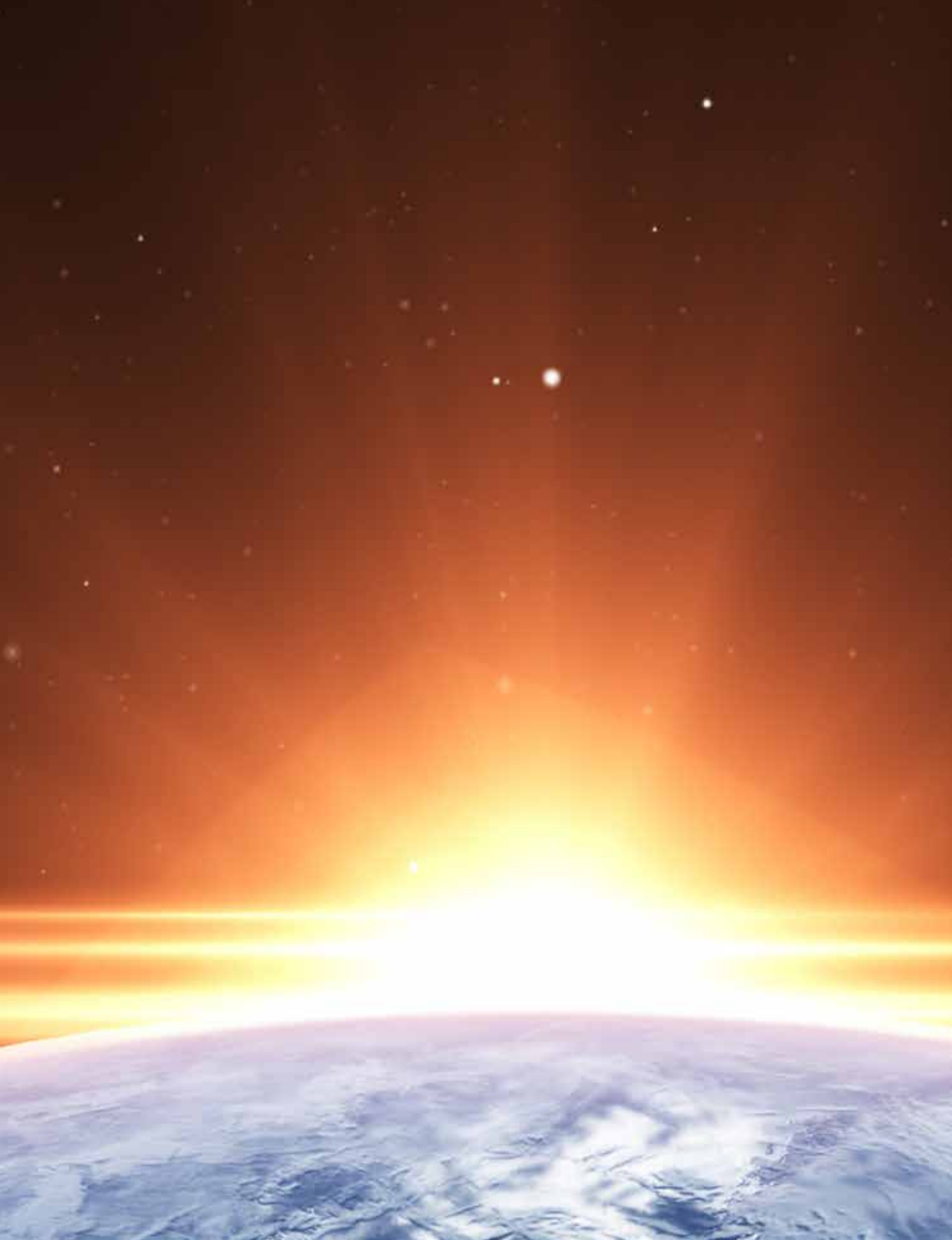
-Tiina Neuvonen UNTIL Finland Thematic Lead in Education, United Nations



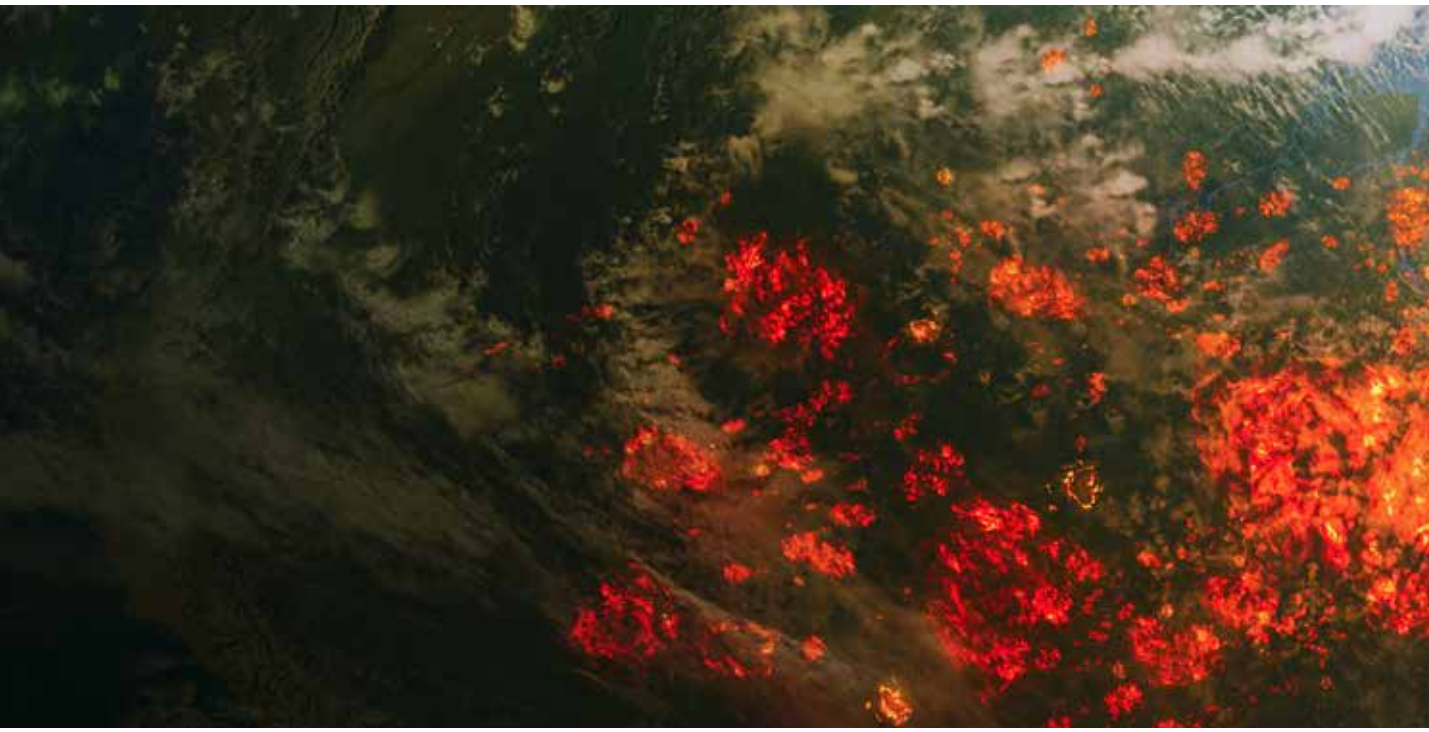


Time present and time past
Are both perhaps present in time future,
And time future contained in time past.
If all time is eternally present
All time is unredeemable.
What might have been is an abstraction
Remaining a perpetual possibility
Only in a world of speculation.
What might have been and what has been
Point to one end, which is always present.
Footfalls echo in the memory
Down the passage which we did not take

**- T.S. Eliot from Burnt Norton**



# APPENDIX



*Thank you again for the remarkable futuring exercise you shared with us.*

*The methods shared, and how we got to work through the workbooks. The collaborations flowed beautifully from conversations and questions in the workbooks. It was super interesting to see all the elements in common across the groups too.*

*The questions were excellent prompts to help us figure out the bigger picture, and what pieces to leave in, or take out, in the final draft. The whole process was so informative, and fun. I think it took the team to a new level of getting to know each other.*

-Brinda C Dalal, Global Help Desk



## SUBJECT MATTER EXPERTS

A Subject Matter Expert (SME) is a person with a particular expertise, perspective or opinion that is selected by the Analyst(s) as a prompt for the Threatcasting Workshop. SMEs do not participate in the workshop. They can participate in a peer review of the findings after the analyst(s) conduct the post analysis.

Curated inputs from subject matter experts helped inform the futures modeled in this workshop. Transcripts of the recordings follow they were transcribed by machine. Context might be missing or misplaced.

# GUIDO VAN NISPEN

**Publisher at MENSEN,WORK**

### Question:

*What effects do you see of coolabilities, formerly disabling conditions, on uniquely abled humans learning and earning potential ten years in the future? And what keeps you up at night on this topic?*

I think one of the extremely interesting points, especially in the U S is that people with handicaps are seen as problems is a huge group. And it's a very underserved group as well, which means that you have a large part of your population that has difficulties finding jobs, keeping jobs, et cetera. And that's a fascinating thing because you would expect that in the current state of knowledge of working with people we should be much better in finding great roles for everybody. And I think that the second thing is, and we call it Coolabilities because its strength is in weakening conditions as other people might see it is we are quite good at pinpointing them. So one of the things, if I look 10 years ahead, that is a extremely long period and on the other end of the extremely short period, because I think what we've seen to COVID-19 is that a lot of the research and digital things have come forward years.

So where a very few people would be working at home and a lot of companies didn't want people to work at home. Now, the prediction is that it will become a little bit more than it is and less than it is now, but it will be a fundamental shift. So I think if I looked at this issue a year ago, I would have looked at it very differently because now a lot of people with cool abilities that wouldn't have been able to do things because they wouldn't be able to, to get to a workplace or, you know, operate really well in a workplace or they couldn't move to a location where that kind of work would be done. Has changed completely, which means that for a lot of things, there's a fundamental shift, disregarding credibility as, as a whole, but creating a lot of opportunities for good abilities, because if you work from home and it doesn't really matter where you work from, there's a lot of things you can do,

which creates a lot of new things.

So if you looked at 10 years from now, then you know, working from anywhere for a lot of people will be much easier than it is now. So broadband will be everywhere and I'm talking from a European perspective and we have it already. So for most of us, it's not even, working from home or not. I see it here has become so easy and everybody's used to it. I think the second thing where people sometimes forget is, through COVID and the working at home, we have become much more personal, like in maybe a year ago, you and I would be sitting in an office and we would be meeting together, or we would be video conferencing from an office. Now we're in each other's living rooms. So yeah, we get much more about personality. The interesting thing there is that in a virtual communication setting, you know, a lot of things which are very big strengths in daily life.

If you would be, you know, super fit, then you could walk around and all these kinds of things have become relevant. They are unimportant, because if we sitting in front of little camera, you don't need to move around. A lot of them, you know, you don't need to run from meeting to meeting. You can just do it. And secondly, you know, it becomes much more personal as well. So if you combine these kinds of elements that working from home will be more or less a standard. A lot of people might move out of cities so that means that a lot of people that find that difficult in cities because of the commuting or, their health. And I think for the from a technological and medical perspective, we will be much better in mapping requirements for jobs. Now it's quite straightforward still, you know, you have reviews, you may go to LinkedIn and that's as more or less as advanced as we get. If you look forward 10 years from now, you know, I think it will be even a smaller, it's not that long ago that we had a profession and the profession has been broken down into jobs or, elements that need to be done. And in 10 years from now, I believe it will be so much more sophisticated that it will be even a more smaller level, where you break things down. So where now there's a lot of energy spent on, training people in organizations, because you expect them to be around your organization for a long time. So you need to upskill them. Re-skill them retrain them, have all kinds of things, which is, you know, sometimes a very complex, difficult and expensive thing that, because you might be, if you're like an insurance company 10 years ago, you would have very different processes to do now. So if you would stick around with the same people, you would need to re-skill them all completely. That would be an issue because now that everybody can be re-skilled. So if you look forward again, 10 years, I think the quantum leap will be even bigger than the looking backwards 10 years. So that means, professions will become jobs, will become micro jobs, and then it becomes extremely

important that your mapping gets even better and better.

If we look at cool abilities, let's take a couple of very simple examples.

Like people on the autism spectrum might have a great quotability of focus. So, if you would just rank them, like next to all the other kinds of people, they would have a disability, but if you're a great in mapping them and things that needs extreme focus, and they don't need to be at the same office, and you don't need to create all kinds of complex environments to do to work for them, imagine what you can do. And secondly, you can micro target them by understanding what their strengths are and when they are required. And then there could be an upside that has a certain value, much higher value than now where they basically, a lot of people with disabilities do very low end jobs. So if you look, if you see those kinds of movements moving, I think there's a lot of positive to be expected.

But there are also some threats, because the, better you get a mapping things, it's like in information warfare, you know, micro targeting is super effective, which means that if you use people's cool abilities in micro-targeting, you know, from them to others and from others through them you might create very complex situations where, the system works in a certain way, because that's the way you directed it. And I think that's quite a dangerous element that potentially could be. Let's take somebody with ADHD. They're very creative, they're very impulsive, they're very fast moving and let's put those kinds of people in situations where we want the opposite. And so I think the positive sites will be explored and exploited, in the benefit of the people with coolabilities.

But I think there's a certain risk as well in the 10 year timeframe that the strengths will be used against others as well. And I think if you start using very specific people in very specific roles it has a danger that all the diversity inclusion goes, and that I think is an issue with coolabilities, you know, the good thing is it's very easy to identify, but it's very difficult to create. They're very inclusive and diverse environment incorporating all of them because very many of them are opposite. So it's not like they balance each other out, but they might make very difficult themes. So if you combine these things like working from home, a lot of technology, a lot of knowledge about coolabilities and how it can be effectively positions. I think for the general workforce, it really probably do a lot of, for people that are in difficult positions now.

# BRIAN DAVID JOHNSON

**Futurist, Professor Arizona State University, Director Threatcasting Lab**

## Question:

*What effects do you see sentient tools having on uniquely abled humans learning and earning potential ten years in the future? And what should we know about these constellations of technology?*

Hello everybody, I'm Brian David Johnson. I'm a futurist, a professor at Arizona State University, and the director of the Threatcasting Lab there.

So as you begin to look out into the future and model both positive and negative futures, I would say consider technology, not a single technology but a constellation of technologies. For me, we know that over the next decade, we're going to see multiple technologies being used all over the world. These (technologies) are going to fundamentally change how we act and interact with technology and, ultimately, how we act and interact with each other. So these technologies include things like artificial intelligence. So we know we're going to have more and more artificial intelligence but when I say AI what I mean is more industrial-grade AI. This is the artificial intelligence that does work; it flies our planes; it gives us suggestions it looks at large amounts of data and gives us a return on probabilistic answers looking at that. I'm not talking about smarter than human AI; that's generally a different conversation and one that's a little more philosophical. So when I say AI, what I mean is more of an industrial-grade AI. Next, we know that we're going to see more and more smart cities coming online. What's interesting about smart cities is that it is a collection of technologies from parking meters to smart infrastructure to smart buildings. It is at a broad-scale, and one of the things we always say about the future is that the future is local, and this is very true about smart cities. All smart cities will be different because all cities are different, and how they use these technologies will look very different.

So on the macro-level, we know we're going to have more and more smart cities. On the micro-level, we're going to have the internet of things or possibly the industrial internet of things. The internet of things is just the ability to take an object and make it smart to give it some computational power to give it some connectivity and some sensing to be able to know what's going on so you can pretty much turn anything in your life into a computer. The next thing we know that we're going to have is what I, from a geek standpoint I as a technological futurist, call distributed computing, so we know that we're going to have computational intelligence wherever we need it. It might be up in the cloud or in big server farms.

It might be at an edge server, it might be a server in a building, or it might even be in a device that you own. But just the idea that you'll have computational intelligence wherever you need it to apply it to these problems. Next, we know that we're going to have autonomy on land, sea, and air, so the ability for us to move people around and move things around as well. It's not just a single thing, so it's not just a single self-driving car or a self-piloting drone or self-sailing ship. It's this complex network of multiple areas multiple vehicles that are all moving together and allows us to really optimize the movement of the physical world as it gets moved into the digital world. And then finally, we know we know we're going to have a lot more robots and a lot more robotics, and these are both physical robots, right? We're starting to see robots move from the factory floor to the warehouse floor, and I believe we're going to see them moving more into the homes, and we're going to see them moving more into kind of healthcare and education. We're going to have kind of going back to AI; we're going to have kind of autonomous digital robots as well, so these will be these agents that are going out and doing things on our behalf. And some of them will be tied very closely to us, and some of them won't be. Imagine not only having a single AI or like a Siri or a Cortana or an Alexa, but imagine if you had multiple AIs, not just one. You could have multiple AI's that were kind of helping you make decisions and helping you. And that had different viewpoints and different goals and what that would do for your decision-making. So think about all of these technologies coming together. And for me, how I think about those is I call them the coming age of sentient tools.

Now a sentient tool is a very specific thing. Number one, it's aware, so it is culturally aware that it is physically aware of its surroundings. But also the people who are around it as well as the culture that it's in. And being very aware and in tune with its environment. So number one, it's aware.

Number two it can think. So it has this industrial intelligence, this industrial artificial intelligence to be able to go and process large amounts of information and sort of make autonomous decisions.

Thirdly and most importantly, a sentient tool will be social. It will know you, and it will know you as an individual; it will know the people who surround you.

Imagine having a sentient building that knows everybody who's inside that building. Now, of course, there are some privacy concerns and things like that - that are really, really important. But imagine a machine that understands if you're an introvert or an extrovert. It understands if you're tired or if you're ready to go and out there ready to go. So it'll have a level of computing that is intensely, intensely human, and that's really the point of the coming age of sentient tools. As we begin

to see that this groundswell of technology, this constellation of technologies is actually going to allow computational power to relate to us on a much more human level. To communicate with us, whether it be via a screen or via audio or I've done work with architects who said they could have buildings that are starting to talk with you through the light and through moving around the walls. So it really kind of blooms out how all of this technology will be able to act and interact with people.

That's ultimately what this is about as a technological futurist, I always tell people that everything we do is about people. It begins with people and ends with people, and there's a lot of technology and processes and procedures, but it's always about people. And sentient tools are actually going to allow us to bring all of these technological advances together and actually focus them more on making the lives of humans better and how we define better, and what we're going to do with them. That is actually our goal as we think about the future. How do we harness all of these constellations of technologies? How do we take sentient tools and begin to think about what are the new problems we can solve?

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Papua New Guinea Demographic and Health Survey National Statistical Office Port Moresby, Papua New Guinea The DHS Program ICF Rockville, Maryland, USA
The 2016-18 Papua New Guinea Demographic and Health Survey (2016-18 PNG DHS) was implemented by the National Statistical Office.
https://dhsprogram.com/pubs/pdf/FR364/FR364.pdf

The Global and Regional Asperger's Syndrome Partnership (GRASP)
https://rarediseases.org/organizations/global-and-regional-aspergers-syndrome-partnership-grasp/ and https://grasp.org/

The Asperger/Autism Network (AANE) provides individuals, families, and professionals with information, education, community, support, and advocacy
https://www.aane.org/



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http://www.uniquelygifted.org/

Book Uniquely Gifted: Identifying and Meeting the Needs of the Twice-Exceptional Student, edited by Kiesa Kay

Documentary: The Avocado War  57min | Episode aired 4 October 2019 Director: Lucy Kennedy
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Hechinger Report: New studies challenge the claim that black students are sent to special ed too much. Two quantitative studies find that black students are under-identified for disabilities at school
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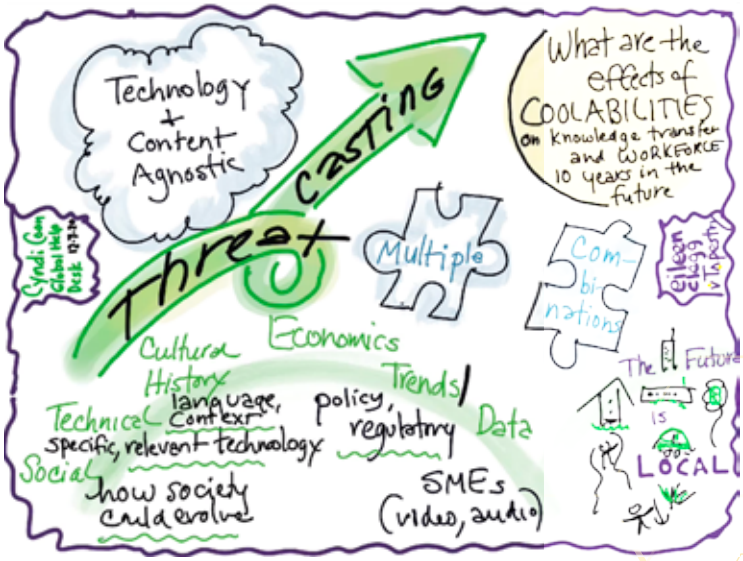


Eileen Clegg, vTapestry